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Research Article

Migration and Influencing Factors of Auto Rice Mill Workers' Intentions to Stay in Villages: An Empirical Study in Selected Areas of Dinajpur District

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ABSTRACT

The study aims to explore the impact of urban-rural migration on the socio-demographic, economic, and occupational dynamics influencing the lives of workers in rural communities, particularly those employed in auto rice mills in the Dinajpur district of the Rangpur division, Bangladesh. It investigates the socio-economic challenges faced by auto rice mill workers in rural Bangladesh, with a specific focus on their migration patterns and the factors that influence their decision to stay in rural areas. This study utilized a structured questionnaire to gather data from 245 workers, Q-methodology to explore subjective perspectives to identify key influencing factors, and correlation analysis to examine the relationships between socio-demographic factors and workers' intentions to stay in villages. The analysis reveals a predominantly male-headed, middle-aged workforce, with significant educational disparities and a strong reliance on full-time industrial employment. Migration emerged as a key factor, with nearly 69% of workers relocating to access better job opportunities. Despite economic benefits, extended working hours and inadequate amenities highlight the precarious nature of their livelihoods. Key challenges identified include insufficient support from government and non-government organizations, limited access to credit, and a lack of essential resources such as food and clothing. Correlation analysis underscores the impact of various factors on workers' intentions to remain in villages. Physical factors, including housing and infrastructure, and welfare factors, such as access to utilities and healthcare, play a pivotal role in improving retention. Social, educational, and occupational factors also exhibit significant influence, with better conditions leading to greater satisfaction and prolonged stays in rural areas. The findings have important policy implications. Aligning with the Sustainable Development Goals (SDGs), interventions should focus on improving educational opportunities (SDG 4), promoting gender equity (SDG 5), ensuring decent work conditions (SDG 8), and enhancing rural infrastructure (SDG 9). Addressing food security (SDG 2), access to clean water and energy (SDGs 6 and 7), and reducing inequalities (SDG 10) are also critical. By fostering partnerships and leveraging multi-sectoral approaches (SDG 17), these measures can drive inclusive development, improve workers' quality of life, and ensure sustainable progress in rural communities. The study underscores the need for comprehensive strategies that address both immediate challenges and long-term socio-economic goals.

Introduction

Bangladesh, as the sixth-largest sending nation for migrants globally, experienced 7.40 million migrants in 2020, driven by economic opportunities and stable income, highlighting the country's significant role in migration (IOM, 2021). Urban-rural migration is a significant global phenomenon that has impacted the socioeconomic and cultural conditions of numerous countries, particularly in developing countries (Khanam et al., 2024). The number of migrants from inter-district urban to rural areas is 84.7 per cent, and rural to urban migration is 43.47 per cent in the year 2022 (The Daily Star 2024). Push factors such as impingement, drought, scarcity, or maximal focus problems force individuals to move involuntarily. Pull factors, on the other hand, are unforced and are attached to the target country, such as area serviceable, which is the desirability of a place that attracts people. These factors can be categorized

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into push and pull factors (Islam & Yesmin et al., 2022). Personal factors, such as educational background, family size, commitments, dependencies, economic, agricultural ownership, job opportunities, and pay rates, as well as commercial goals, may drive the migration to cities based on factors such as skill and family size (Agasty et al., 2021).

The auto rice mill industry in Sadar Upazila, Dinajpur, has experienced substantial growth over recent years, presenting a unique opportunity to bolster the local economy and improve livelihoods. However, the growth of this industry has been fast and, therefore, has brought some serious socio-economic issues that require the warrant of thorough investigation. A phenomenon that is driven by a complex interplay of various factors is the intention to migrate among auto rice mill workers, which is one of the most pressing issues. This research seeks to comprehensively assess and understand these factors to provide actionable insights for policymakers, industry stakeholders, and local communities. Migration decisions are inherently influenced by both push and pull factors. About 75% of Bangladesh's population resides in remote locations. This is a substantial quantity of labour, as the rice industry, directly and indirectly, provides 48% of rural employment (Khan et al. 2021). Rice is the dominant food item, and Bangladeshi people eat these meals three times a day. Per capita rice consumption in Bangladesh is 400 grams daily, which is the highest in the world (The Daily Star, 2021).

Moreover, Sadar Upazila in Dinajpur, an important agricultural hub in northern Bangladesh, is home to a significant number of auto rice mills. Districts such as Chapainawabganj, Dinajpur, Kushtia, and the Noapara municipality of Jessore have attracted significant investments for the establishment of large-scale, mechanized rice mills (Daily Star, 2021). As Bangladesh continues to industrialize, the rice processing industry has increasingly moved towards mechanization.

This study aims to explore the factors influencing the migration intentions of auto rice mill workers in Sadar Upazila, Dinajpur, by examining their socio-economic characteristics, key push and pull factors, and the impact of working conditions, personal aspirations, and social influences. Additionally, it seeks to identify policy gaps and provide evidence-based recommendations to ensure equitable distribution of industry growth benefits while minimizing negative consequences. Given the study's relevance to global development efforts, it aligns with several Sustainable Development Goals (SDGs), including SDG 4 (Quality Education) by addressing educational disparities, SDG 8 (Decent Work and Economic Growth) by evaluating labor conditions and employment stability, SDG 9 (Industry, Innovation, and Infrastructure) by analyzing the role of infrastructure in worker retention, and SDG 10 (Reduced Inequalities) by identifying socio-economic challenges faced by migrant workers. By integrating these objectives, the study contributes to a comprehensive understanding of migration dynamics and offers policy insights that support sustainable rural development.

Review of Literature

Khan & Illiyan et al (2023) studied on the statistical analysis of push and pull factors of migration of India. Their study used descriptive statistics, Principal component analysis, reliability analysis, and regression analysis with 385 respondents for analyzing migration. Their study identified that push factors like lack of jobs, low wages, lack financial environment, debt, and social disagreement majority migration and pull factors, such as the availability of family, greater job expectations, higher living standards, personal growth, and appealing settings. However, the study revealed that 41% of migrant peoples that main cause is push factor for migrations. People relocated because of pull factors only 3%, 27%, and 23% cited both as the same reason influenced to migration in different areas.

Al-Maruf et al., (2022) examined the determinates factors of farmers' rural–urban migration in Bangladesh. Researchers used Q-methodology and Principal Component Analysis were conducting for rural to urban migrations with 254 respondents to evaluation variables, and identified 21 variables that overcome a cutoff of 0.50 for more examination. The results of this studied analysis six key factors that mostly influence migration decide on such as separate elements, household factors, economic status, personal factors, local considerations, and climate-induced extremes. Moreover, the research also found that variables like seasonal dearth (monga), family loan, age, agricultural learning, joblessness in village areas, urban job opportunities, deficit on agricultural input finally river degradation mostly affected to farmers' decisions for discard them cultivate.

By applying Pearson's Product Moment Coefficient of Correlation (r) and Spearman's Rank Order Coefficients (ρ) and Hanif et al., (2020) examined the affecting rural urban migration of agricultural labors influenced by various factors like pull and push to migrant in Dumuria upozila of Khulna district. They were used interview pertaining the pull-push factors with 80 respondents from August to September 2019. The research analyzed that 48.75% of migration is adjusted service, with majority 63.25% valuing their new urban environment. However, they were found that significant push factors

highlighted the landlessness 67.50% and extreme poverty 65.83%, while attractive quality of life 82.08% and more wealth 81.25% an arise as major pull factors. Also, they found that other pull factors such as resources 81.25% and best service 79.17% rank 2nd and 3rd.

Majumder and Rahman et al (2023) conducted research on rural-urban migration and its impact on environment and health from Cumilla City Corporation, Bangladesh. They used Structural Equation Model with a total of respondents 246 for analyzing the push and pull factors. They found that push factor like financial difficulties, job issues, worry about the future, intense poverty, political problems, and landlessness and pull factors such as give better facilities, positive information, joint families, demographic and more income migration significantly contributes to environmental elements to public health susceptibility. The research highlighted the acute effect of migration on environmental erosion and safety concerns, highlighting the necessity of well-thought-out migration plans that take a town's capacity and assets into account.

Ghimira et al., (2019) state that in this research the critical role of economic factors is the key factor for shaping migration intentions among rural workers. Rural workers migrate to urban areas to get better work opportunities and better wages, just because of agricultural instability. Their study identified that economic incentives push workers to make migration decisions.

Using Logit Model, Basu et al (2021) investigated the household welfare rural urban migration in Bangladesh. Assessed a total number of 108 families during the 2012 to 2019. They found that fifty percent of the respondents were moved to the make money with increases in income, savings, and landholding size. Additionally, the study showed that migration enhances living standards through better housing, sanitation, bank access, and asset ownership. Logistic regression reveled that education as a positive predictor of migration, while age, satisfaction, and additional earners reduce migration likelihood.

In a study on rural urban migration in Bangladesh, Hossain et al (2016) selected 480 migrants and 210 non-migrant households across 30 rural clusters survey. The study analyzed that 10.31% rural-urban migration rate across villages, with education level, household head occupation, landholding, male members, and dependency ratio as significant factors. Migration is more likely among households with primary-educated members, non-agricultural occupations, or at extreme landholding levels. About 89% of migrants noted worsening urban amenities, while 83% expressed the desire to return to rural areas post-retirement, citing urban strains.

Atiqur & Sarker et al., (2021) studied on socio-economic conditions of rice-mills workers: a study on Sherpur district in Bangladesh. They used questionnaire, and data were collected by direct interview with 110 respondents from 27 automatic rice mills. The findings indicated that rice mill workers get very low wages, unfriendly working environment, and there are inadequate provisions for addressing health, diet, pension, and medical issues.

Mannan et al., (2022) did research on impact of rice mill pollution on surrounding environment at sadar upazila in Dinajpur, Bangladesh. They were used semi-structured questionnaire from October 2018 to October 2019 and Microsoft Excel and the Statistical Package for Social Sciences program with a total 104 respondents for analyzing the rice mill environmental contamination. Results were showed that over 50% of respondents had a negative attitude workers' health condition is not well, its effected-on pollution from paddy mills on the agriculture, environment.

All above the mention papers focuses on push- pull factor influencing migration decisions, rural to urban migration on agricultural labor, migration effect of environmental and health, economic factor, household welfare factor rural to urban migration and socio-economic characteristics, pollution for influenced to remain in rural to urban. Almost previous study papers worked push to pull factors influenced rural to urban migration and no research has been conducted that urban to rural migration. The study is concerned with identifying determinants of the auto rice mills ' intention to migrate to rural areas and provide recommendations for policymaking.

Methodology

Study area

The study areas within Dinajpur District were selected using a purposive sampling approach, prioritizing regions with a high concentration of auto rice mills to facilitate a comprehensive examination of the industry's socio-economic impact. This methodological approach enabled the strategic identification of locations where the rice mill sector significantly influences employment patterns and migration dynamics, thereby allowing for a detailed analysis of workers' experiences. Additionally, surrounding agricultural communities associated with these rice mills were incorporated to capture broader economic and social interdependencies. The selected study sites encompass major rice mill clusters that are

primary locations for assessing labor conditions, migration trends, and rural development challenges. To ensure a holistic evaluation, the study included employees of these rice mills, enabling a nuanced understanding of workforce dynamics and industry-related socio-economic factors. A graphical representation of the study area is provided in Map 1.

Figure 1. Map of Study Area

Determination of Sample Size

Calculating a suitable sample size is an important step in research practice to achieve statistically sound and generalizable results (Lakens, 2022; VanVoorhis & Morgan, 2017). Researchers must decide on a suitable sample, with little information on the population size, so as to not expending resources while aiming for accuracy (Ritchie et al., 2003; Asiamah et al., 2017). To resolve this issue, Kothari (2004) proposed a widely used method of sample size determination based on the principles of probability sampling. Researchers use this formula to calculate the least number of observations needed to obtain a desired confidence level and margin of error. This method allows researchers to strengthen the reliability of their research, without expending unnecessary resources or introducing biases (Mohajan, 2020; Almalki, 2016). Since the population size is unknown in the study areas, determination of the sample size followed a proportionate to size sampling methodology as specified by Kothari (2004) for unknown population and is calculated as:

$$N = \frac{Z^2 pq}{e^2} \quad \text{..... (1)}$$

Where;

N = Sample size in number; Z^2 = Confidence level at 95% (standard value of 1.96); p = This was an assumption that 80% of respondent experienced positive impact of rice mill in the study area; q = This is the weighting variable given by (1- P); e^2 = Margin of error at 5% (standard value of 0.05).

By putting values, we have

$$N = \frac{(1.96)^2(0.80)(0.20)}{(0.05)^2} = 245$$

Thus our sample size is 245 employees of rice mill in selected areas of Dinajpur district.

Questionnaires

This study used a questionnaire to collect primary data to achieve its objectives. The questionnaire was divided into two parts. In the first part, 7 questions were asked about demographic information of the participants. The demographic information questions were about the auto rice mill workers' age, gender, educational status, households' members, migration status, job patterns, and working hours.

In the second part, expert and research advisor opinions guarantee the validity of the contents, regardless of whether the items measure the intended concept or the area of interest, which adds to the validity of the data. This part examines the variables influencing the Auto Rice Mill worker's desire to remain in rural regions using a Bangla questionnaire created by the researcher, including six categories (physical, social, educational and cultural, occupational, welfare, personal, and family factors). This survey section consisted of 27 variables with a 5-point Likert scale from "very high" to "very low." After preparing a primary questionnaire, a pilot survey was made by five members of a team. This study's validity was also assured through interviews with a sample population to determine the accuracy of the findings drawn from the questionnaire.

The study design itself draws from well-established methodologies and the underlying theoretical frameworks needed to create a research instrument, which can measure socio-economic, occupational, and migration relevant factors. The questionnaire was structured based on best practices followed in scale development for assessing the living conditions, nature of employment, and socio-economic influences among auto rice mill workers to achieve reliability and validity in the required measurements. Adopting the recommendation of DeVellis & Thorpe (2021) and Boateng et al. (2018) who discuss the need for systematic questionnaire design, construct validity, and reliability testing. This step dictates the manner in which a strong instrument is constructed capable of accurately reflecting the Intended Research variables. And frameworks to assess worker well-being and satisfaction (Diener et al. (1999) and Clark & Oswald (1994), which serve as the basis for evaluating factors such as employment conditions, income satisfaction, and workplace dynamics. Additionally, migration and rural development theories, especially the ones set forth by Todaro (1969) and Massey et al. (1993), influence how we interpret the results of our analysis on rural-to-urban labor movement in response to economic conditions. A focus on decision-making related to key elements of the study, such as migration and employment, is also offered by their models. Finally, the international documents like the UNDP Human Development Report (2019) and the Gatti (2020) also provide indicators to measure living conditions, access to infrastructure and social services, which supports the methodological perspective adopted in this study in evaluating rural workers' livelihoods. Incorporating these primary and literary sources enables the study to ground its data collection instrument in both established theory and evidence. The inclusion of diverse data sources adds validity to the results and provides valuable insights into the socio-economic factors influencing the livelihood experiences of auto rice mill workers in rural Bangladesh. This section's questions evaluated the living conditions of auto rice mill workers, who also had their own residences in the hamlet and were compelled to take a profession in rice mill workers, residents' movement patterns, attitudes toward them, the availability of high schools for their children, the presence of educational facilities in the villages, the satisfaction of workers' salaries in the rice mill system, and understanding of their job description and responsibilities upon employment official oversight and monitoring, the officials' demeanor, and their general contentment with their work assignments and the workplace as a whole, general contentment with income, having access to the Internet, having a phone line or a cell phone, having basic utilities like power and water, and the amenities and attractions of cities, extensive distances between rural and urban locations, social services provided to auto rice mill workers, land used for farming and animal husbandry, a propensity to live and work in cities, family impact on the decision to work in a rice mill, the desire for the job, living in a rural region while employed, and the relocation of close family members from villages. From 27 to 135, each response was categorized as very high (5 points), high (4 scores), moderate (3 scores), low (2 scores), and very low (1 score). Factors related to education and physical condition were rated from 2 to 10. The lowest score for social factors was 3, and the highest score was 15. Scores ranged from 7 to 35 for occupational and welfare factors, and Scores for family and personal factors ranged from 6 to 30.

Data analysis

The collected data from survey was analyzed systematically to assess the migratory dynamics and examine the factors influencing auto rice millers' intentions to stay at the villages. We used descriptive and inferential statistical techniques to interpret the results and to draw the appropriate conclusions. Demographic characteristics such as age, gender, education level, household arrangement, migration status, work patterns and working hours of the respondents were summarized using descriptive analysis. To provide a comprehensive overview of the workforce profile, frequency distributions, means and standard deviations were calculated. Results were represented visually by charts, figures, and tables for ease of understanding. Figure 2 shows a graphical representation of study design and whole process of the study. Data were analyzed by the STATA 18.0 version. These findings contribute to a more nuanced understanding of the socio-economic dynamics driving auto rice mill workers' migration decisions and have implications for policy formulation regarding rural workforce retention and sustainable development strategies in Bangladesh.

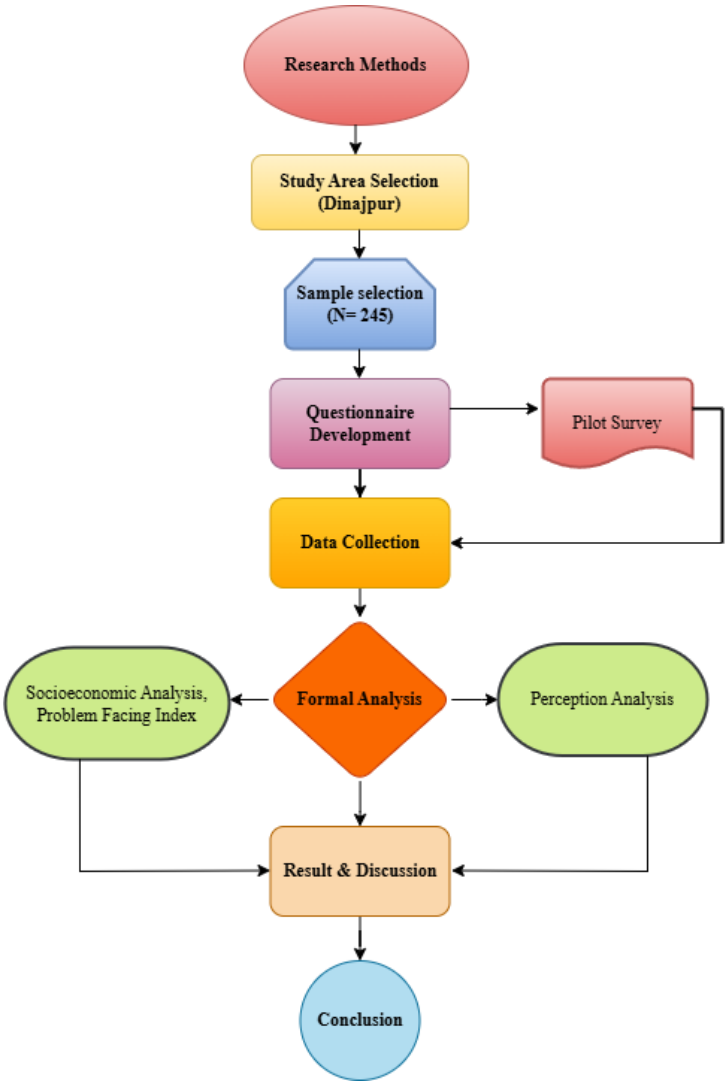

Figure 2. Flowchart of study design

Results

Descriptive analysis

The data provides an insightful look into the socio-demographic and work-related characteristics of individuals in a rural setting, highlighting key patterns in household dynamics, education, employment, and migration. The majority of households (74.69%) are led by males, with only a quarter (25.31%) headed by females, reflecting a predominantly patriarchal structure in this community. The age distribution shows a balanced spread, with the largest group (36.33%) aged 35 to 50 years, followed by 20 to 35 years (31.84%). A smaller proportion (19.59%) falls within the 50 to 65 years' bracket, and the least representation is in the extremes of below 20 years (8.16%) and above 65 years (4.08%). This indicates a predominantly middle-aged workforce. Educational attainment reveals significant disparities. Most individuals (37.96%) have primary education, and a substantial portion has achieved SSC-level (29.39%). However, higher education is rare, with only 16.73% reaching HSC and a negligible fraction attaining Honors (1.63%) or MS and above (0.82%). Alarmingly, 13.47% of respondents lack formal education, highlighting the need for educational interventions. The nuclear family structure dominates (71.84%), with a smaller proportion of joint or extended families (23.27%) and a very limited number of childless families (4.89%). This suggests that family units are generally small and self-contained, aligning with broader societal trends toward nuclear families. Migration for work is a prevalent phenomenon, with 68.98% of individuals moving to the area for employment opportunities, particularly in auto rice mills. Non-migrants account for only 31.02%, underscoring the economic pull of industrial activities in the region. Most individuals (68.49%) work full-time, while part-time employees make up a significant minority (35.59%). This reflects a community largely reliant on stable, full-time employment.

The analysis of working hours' reveals varying degrees of labor intensity. While 11.43% work normal hours (8 hours per day), a majority endure extended hours, with 25.31% working moderate hours (10 hours), 29.80% working 12-hour shifts, and 33.46% in extreme conditions exceeding 12 hours per day. This suggests high levels of work commitment but also raises concerns about potential labor exploitation and health implications. The findings highlight a predominantly male-headed community with middle-aged workers, modest educational backgrounds, and a strong reliance on industrial labor. High levels of migration and extended working hours reflect economic pressures and limited opportunities in native regions. Policies aimed at improving educational access, supporting female-led households, and addressing labor welfare could significantly enhance the socio-economic status of this community. Investments in skill development and healthcare services are also vital to ensure sustainable livelihoods and mitigate the effects of prolonged working hours.

Table 1. Demographic status of the workers

Variable	Frequency	%
Gender Status of household head		
Male	183	74.69
Female	62	25.31
Age range		
below 20	20	8.16
>20 to 35 years	78	31.84
>35 to 50 years	89	36.33
>50 to 65 years	48	19.59
>65 years	10	4.08
Educational status		
No formal education	33	13.47
Primary education	93	37.96
SSC	72	29.39
HSC	41	16.73
Hons	4	1.63
MS or above	2	0.82
Household members		
Childless family (2 family members)	12	4.89
Nuclear Family (2 to 5 family members)	176	71.84
Joint or extended family (>5 family members)	57	23.27
Migration status		
Migrated from other place to work in Auto rice mills	169	68.98
Not migrated	76	31.02
Job patterns		
Part time employee	87	35.59
Full time employee	158	68.49
Working hours		
Normal (8 hours)	28	11.43
Moderate (Normal+2 hours Overtime=10 hours)	62	25.31
Highly involved (Normal+ 4 hours Overtime=12 hours)	73	29.80
Extreme case (>12 hours)	82	33.46

Source: Authors' own calculation from field survey, 2024

Result of Problem Facing Index

Table 2 presents an index of problems faced by respondents due to migration, ranked by severity based on their scores. The most significant issue, ranked 1st, is the lack of support from government or non-government organizations, with a high score of 639. The 2nd most pressing issue is inadequate credit facilities, scoring 553, followed by the 3rd-ranked problem of a lack of livelihood capitals, with a score of 548. Food-related issues are also prominent, with "We do not have enough food" ranked 4th with a score of 474, and "Clothing problem" ranked 5th with a score of 449. "Lack of job facility" and "Our children did not get nutritional food" are ranked 6th and 7th, respectively.

The problems "Education of children is negatively affected" and "Societal acceptance problems" rank lowest, with scores of 283 and 300, indicating they are less severe in comparison. Overall, the table highlights that respondents face various challenges due to migration, with the lack of support and credit facilities being the most pressing issues.

Table 2. Problem facing index of the respondents due to migration

Problems faced due to migration	High	Moderate	Low	No	Score	Rank
Our children did not get nutritional food	74	52	81	38	407	7
Lack of livelihoods capitals	125	69	35	16	548	3
We do not get any support from government or non-government organization or others	192	28	7	18	639	1
Clothing problem	70	73	93	9	449	5
We do not have enough food	92	52	94	7	474	4
Education of children is 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 or accommodation problem	63	42	59	81	332	8
Societal acceptances problem	71	30	27	117	300	9

Table 3 presents that, according to the Pearson correlation coefficient test, the average effect of physical factors on the auto rice mill workers' intention to stay in villages was 76.28, which shows a high impact. The average effect of social factors on the auto rice mill workers' aim to stay in the village was 79.91, which was also a high impact. The average effect of educational and cultural factors on the auto rice mill workers' aim to stay in the village was 71.62, which was also a moderate to high effect. Additionally, the average effect of occupational and welfare factors on the auto rice mill worker's aim to stay in villages was 84.71 and 81.39, respectively, highlighting these factors' most significant and very high effects. The average effect of personal and family factors on the auto rice mill workers' aim to stay in villages was 79.24, which also had a moderate effect.

There was a notable relationship between the physical factors (physical environment factors including the small size of the work environment, the inadequacy of the living place), social factors (including compulsion in choosing their work, migration of villagers to cities, inappropriate attitudes of people), educational and cultural factors (including school, educational facilities such as language classes, etc.), occupational factors (including salary, information on job description and Auto Rice Mill Worker's duties at the time of recruitment, supervision and monitoring by officials, attitude of authorities, overall satisfaction with job tasks, overall satisfaction with the work environment, overall satisfaction with income), welfare factors (including plumbed water in the village, electricity, telephone, internet access, facilities and attractions of cities, distance from village to city, amenities of health homes, having land for agriculture and animal husbandry), and personal and family factors (tendency to settle in urban areas, inclination to work in urban areas, the impact of the family on choosing the health care working job, interest in the health care working job, residence in the village at the time of employment, impact of the immediate family from the village), and the Auto Rice Mill Worker's intention to remain in villages (p-value<0.05). This data highlights the physical factors and auto rice mill workers' intentions to remain in rural areas; it shows higher quality factors extending their stay. Social factors and auto rice mill workers' intentions to stay in villages suggest that better social conditions lead to extended stays and improved quality of life. The study results show that the higher the educational and cultural factors are; the longer auto rice mill workers tend to stay in villages. According to study results, occupational factors are the higher indicator for job satisfaction of the auto rice mill workers, the longer they will stay in rural areas. The study findings reveal that the higher the quality of welfare factors such as plumbed water in villages, electricity, telephone, Internet access, amenities, and rural attractions, the longer the auto rice mill workers would remain in villages. The research findings highlighted that the high quality of personal and family factors led to the village's remaining auto rice mill workers being absent. Also, this data indicates a positive and strong correlation between physical, social, educational, cultural, occupational, welfare, personal, and family factors and the auto rice mill workers' intention to remain in villages.

Table 3. Results of the Effect of Factors on the Workers' Intention to Remain in Rural Areas Based on the Respondents' Answers

Measure	Items	Very high		High		Moderate		Low		Very low		Total		Rank from 100	Result
		N	%	N	%	N	%	N	%	N	%	N	%		
Physical factors	2	296	60.41	64	13.06	56	11.43	38	7.76	36	7.35	490	100	76.28	Much impact
Social factors	3	516	70.20	69	9.39	36	4.90	54	7.35	60	8.16	735	100	78.91	Much impact
Educational and cultural factors	2	250	51.02	46	9.39	82	16.73	76	15.51	36	7.35	490	100	71.62	Much impact
Occupational factors	7	1428	83.27	84	4.90	112	6.53	63	3.67	28	1.63	1715	100	84.71	Too much impact
Welfare factors	7	1288	75.10	329	19.18	49	2.86	14	0.82	35	2.04	1715	100	81.39	Too much impact
Personal and family factors	7	1253	73.06	105	6.12	161	9.39	105	6.12	91	5.31	1715	100	79.24	Much impact

Discussion

This study provides a comprehensive assessment of the factors influencing the intentions of auto rice mill workers in Sadar Upazila, Dinajpur, to remain in rural areas, while also highlighting the socio-economic challenges they face. The research identifies both push and pull factors as crucial determinants in the decision-making process regarding migration, particularly in the context of the rapidly expanding auto rice mill industry. The findings from the demographic data reveal that the majority of workers in auto rice mills are male (74.69%), with a significant proportion (68.98%) migrating from other places to work in these mills. The workers are primarily young, with 68.33% of them falling within the age group of 20-50 years, which aligns with the notion that young adults are often more mobile and willing to relocate for better job opportunities. Education levels among workers vary, with the majority having primary (37.96%) or secondary (29.39%) education, indicating that many are not highly educated, which may limit their mobility or ability to access better opportunities elsewhere. The study also highlights the issue of job patterns, with a substantial portion of workers (68.49%) being full-time employees, indicating a strong commitment to their current roles despite the challenges they face. The results from the "Problems Faced Due to Migration" index shed light on the significant socio-economic hardships faced by migrant workers. The lack of support from government or non-government organizations was identified as the most pressing issue, followed by the limited availability of credit facilities and livelihood capitals. These findings underscore the vulnerability of migrant workers, who often lack the safety nets needed to address financial and social challenges. Additionally, issues such as food insecurity, inadequate shelter, and a lack of educational opportunities for children further compound the difficulties faced by these workers. These findings are consistent with previous studies (e.g., Khan & Illiyan et al., 2023; Al-Maruf et al., 2022) that emphasize the importance of addressing socio-economic disparities and providing adequate support systems to mitigate migration-related hardships. The study also explores the various factors influencing the workers' intention to remain in rural areas, with physical, social, educational, occupational, welfare, and family factors all playing a significant role. The data reveals that the most impactful factors are related to work conditions. The findings suggest several actionable insights for policymakers and stakeholders involved in the rice mill industry and rural development. First, addressing the welfare and occupational factors that affect workers' job satisfaction should be a priority. Improving working conditions, offering better wages, and providing social services such as health care and credit facilities can significantly reduce the likelihood of migration. Moreover, investments in rural infrastructure, such as better roads, educational facilities, and access to the internet, can create a more attractive living environment for workers. Furthermore, it is crucial to develop programs that target family and social cohesion, as these factors are pivotal in workers' decisions to stay in rural areas. In particular, improving social acceptance and community integration will help migrant workers feel more connected to their rural homes. Finally, future research could delve deeper into the specific barriers to improving rural living standards and explore how the auto rice mill industry can better integrate with the broader rural economy to create sustainable livelihoods for workers. Additionally, examining the psychological aspects of migration decisions, such as aspirations for upward mobility or cultural ties to the land, would provide further insights into the complexities of rural-urban migration dynamics.

This study provides critical insights into the socio-demographic dynamics, labor patterns, and factors influencing the intentions of auto rice mill workers to remain in rural areas. The results reflect broader societal trends and structural issues that shape the experiences and livelihoods of workers in the studied rural setting. This section discusses these findings in the context of existing literature, emphasizing their implications for policy and practice. The data reveals a predominantly patriarchal community structure, with 74.69% of households headed by males and only

25.31% by females. This reflects traditional gender norms commonly observed in rural areas of developing countries ((Mudimba, 2020). Female-headed households often face additional challenges, including limited access to resources and decision-making opportunities. Studies have shown that empowering women through targeted policies, such as access to education and credit, can significantly enhance household welfare and community development (Mehra, 1997; Garikipati, 2008; Banu et al., 2021; Balasubramanian et al., 2024; Sarker et al., 2024). In this context, strategies to support female-headed households, such as social safety nets and gender-inclusive programs, are critical (Arintyas, 2024; Bhuwania et al., 2024; Kitole & Genda, 2024).

The age distribution indicates that a majority of the workforce is middle-aged, with 68.17% between 20 and 50 years. This demographic represents a critical segment for economic productivity and social stability. However, the limited representation of younger workers (8.16% under 20 years) and older individuals (4.08% above 65 years) may indicate barriers to youth employment and challenges in accommodating aging workers. Previous research highlights the importance of intergenerational workforce strategies to ensure the sustainability of rural labor markets (Olmsted, 2024; Hafiz, 2024; Sharma et al., 2024; Amin et al., 2024; Tong et al., 2024). Education emerges as a key area of concern. While primary education is the highest achieved by 37.96% of respondents, only 2.45% attain higher education levels (Honors or MS). This low level of educational attainment is consistent with findings in similar rural contexts, where limited access to schools and financial constraints impede progress (Pfeffer, 2008; Dhillon & Meier, 2022; Thelma, 2024). Education has been identified as a critical enabler for economic mobility and empowerment, particularly for marginalized groups (Tikly & Barrett, 2011; Horwitz & Jain, 2011; Jejeniwa et al., 2024). Programs focusing on vocational training and adult education can bridge skill gaps and enhance employability. The study highlights a labor-intensive environment, with 68.49% of respondents working full-time and a significant portion enduring extended working hours. Over 88% of workers exceed the standard eight-hour workday, with 33.46% working more than 12 hours daily. These findings align with research indicating that labor-intensive industries in rural areas often exploit workers' economic vulnerabilities, leading to excessive working hours and adverse health outcomes (Foo, 1994; Mehrotra & Biggeri, 2005; Chen et al., 2023). Prolonged working hours are associated with physical and mental health risks, including fatigue, stress, and chronic illnesses (Rivera et al., 2020; Spurgeon et al., 1997; Dembe et al., 2005; Caruso, 2024). Moreover, the lack of adequate rest periods and workplace protections undermines workers' overall productivity and well-being (Salvagioni et al., 2017; Shaukat et al., 2020). Labor policies must address these issues by enforcing regulations on working hours, ensuring fair compensation, and promoting occupational health and safety standards.

Migration for work is a defining characteristic of this community, with 68.98% of respondents having moved to the area for employment in auto rice mills. Migration reflects the economic pull of industrial activities and the limited livelihood opportunities in workers' native regions. This finding resonates with studies that identify rural-urban migration as a coping strategy for economic hardships and a means of accessing better employment prospects (Bhattacharya, 1993; Selod & Shilpi, 2021; Singh & Basu, 2020; Frayne, 2004). However, migration presents significant challenges, including social dislocation, inadequate living conditions, and limited access to support systems. The lack of government or non-governmental organization (NGO) support, ranked as the most severe problem in this study, underscores the need for comprehensive migration policies. These should include the provision of affordable housing, social services, and integration programs to support migrant workers and their families (Wen & Hanley, 2016; Huang & Ren, 2022).

The ranking of problems highlights critical barriers to workers' well-being and productivity. The lack of credit facilities and livelihood capitals were identified as significant challenges, reflecting the precarious financial situation of many respondents. Access to credit is a well-documented enabler of economic empowerment, allowing individuals to invest in income-generating activities and improve their living standards (Yeasmin et al., 2023; Khan et al., 2020; Pailman et al., 2024). Strengthening microfinance initiatives, particularly those tailored to the needs of low-income workers, can address this gap. Food insecurity and inadequate clothing also emerged as pressing issues, with many workers struggling to meet basic needs. This finding aligns with studies showing that low-income workers in rural industries often face multiple deprivations, exacerbated by irregular income and rising living costs (Satterthwaite & Tacoli, 2024; Biosca et al., 2024; Dodman et al., 2023). Addressing these challenges requires a multi-faceted approach, including wage reforms, food subsidies, and social welfare programs. The relatively lower ranking of societal acceptance problems and children's education issues suggests that these challenges, while present, are less acute than others. However, they remain important for long-term socio-economic integration and community cohesion. Initiatives that promote inclusive practices and support

educational access for workers' children can contribute to breaking cycles of poverty and exclusion.

The correlation analysis reveals significant relationships between workers' intentions to remain in villages and various socio-economic and occupational factors. Physical factors, such as living conditions and infrastructure, were strongly correlated with retention. Poor housing and inadequate amenities often drive workers to seek opportunities elsewhere (Rosenfeld & Kalleberg, 1990; Jinno & Yasuoka, 2024; Akram, 2024). Investments in rural infrastructure, including housing, transportation, and utilities, can create more attractive living conditions and reduce outmigration (Javed et al., 2024; Rahman et al., 2024). Social factors, including community relationships and societal attitudes, also play a crucial role. Positive social interactions and a sense of belonging encourage workers to stay, while exclusionary practices can push them away. Studies have shown that fostering social cohesion and promoting inclusive community practices can enhance workers' satisfaction and retention (Lubis, 2024; Buga, 2024; Jejeniwa et al., 2024). Educational and cultural factors, though moderately impactful, highlight the importance of access to schools and cultural integration. Providing quality education and cultural amenities can improve workers' quality of life and long-term attachment to rural areas (Guo, 2024; Kanakis et al., 2019; Velu & Anuradha, 2024). Occupational factors, such as job satisfaction, salary, and workplace conditions, were the most significant determinants of retention. Workers who feel valued, adequately compensated, and satisfied with their roles are more likely to remain in rural areas. This finding underscores the importance of fair labor practices, employee engagement, and opportunities for professional growth (Parveen et al., 2017; Rad et al., 2009). Welfare factors, including access to essential services like water, electricity, healthcare, and internet connectivity, also strongly influenced retention. Improved welfare provisions can enhance workers' quality of life and promote long-term settlement. Policies aimed at expanding rural services and amenities can address these needs effectively (Howden-Chapman et al., 2017; Njiru & Letema, 2018; Ahmad et al., 2022). Personal and family factors, such as family influence and ties to the village, were also significant. Workers with strong family support and community ties are more likely to stay, reflecting the importance of social networks in shaping migration decisions (Frayne, 2004; Selod & Shilpi, 2021; Akram, 2024). The findings of this study highlight critical socio-economic and labor challenges that demand targeted policy interventions aligned with the United Nations Sustainable Development Goals (SDGs). To address educational disparities and enhance workforce skills, policies should focus on expanding access to quality education and vocational training (SDG 4). Gender-sensitive initiatives are essential to empower women and promote economic equity, contributing to gender equality (SDG 5). Labor reforms that ensure fair wages, regulated working hours, and improved occupational safety are crucial for fostering decent work and economic growth (SDG 8). Investments in rural infrastructure, including housing, transportation, and utilities, can enhance accessibility and support sustainable industrialization (SDG 9). Addressing food insecurity and promoting nutrition programs aligns with achieving zero hunger (SDG 2), while ensuring access to clean water, sanitation, and energy underpins healthier communities (SDG 6 and SDG 7). Social protection systems must be strengthened to reduce inequalities and provide support for vulnerable groups, including migrants (SDG 10). Efforts to retain rural populations through diversified livelihoods, affordable housing, and community development align with building sustainable cities and communities (SDG 11). Lastly, fostering partnerships among government, private sectors, and NGOs ensures the effective implementation of these policies, driving progress across multiple SDGs (SDG 17). These integrated strategies not only address pressing issues but also pave the way for inclusive and sustainable development in rural areas.

Conclusion

This study explored the socio-demographic, economic, and occupational factors influencing the lives and work patterns of rural communities, with a specific focus on auto rice mill workers. This study distinctly contributes to the understanding of rural dynamics in Bangladesh by focusing on the socio-demographic and economic factors influencing auto rice mill workers' migration and their intentions to stay in rural areas, highlighting significant socio-economic hardships and the need for targeted policy interventions. The findings revealed a predominantly male-headed workforce with modest educational attainment and a significant reliance on migration for employment. Extended working hours and insufficient amenities highlight the economic pressures and labor-intensive nature of their livelihoods. Key factors influencing workers' intentions to remain in villages include physical conditions, social cohesion, education, cultural influences, and welfare provisions, each demonstrating a strong correlation with retention rates. Policies emphasizing skill development, infrastructure improvements, and educational access could significantly enhance the socio-economic conditions of these communities. Furthermore, addressing challenges like limited credit facilities, inadequate government support, and access to basic services remains crucial to reducing vulnerabilities. Despite its contributions, this study has limitations. The scope is geographically confined to a

specific rural community, which may limit the generalizability of findings to other regions. The cross-sectional nature of the data also restricts the ability to capture long-term trends or causal relationships. Additionally, the study relies on self-reported data, which may introduce bias. Future research should adopt a longitudinal approach to understand evolving socio-economic dynamics and examine the effectiveness of implemented policies. Expanding the geographical scope to include diverse rural contexts would enhance the robustness of findings and provide comparative insights. Investigating the gender-specific impacts of migration and labor conditions could also uncover unique challenges faced by women in similar settings. Moreover, integrating qualitative methods could deepen the understanding of personal and cultural influences on workforce retention and development. By addressing these gaps, future studies can contribute more effectively to creating inclusive policies aligned with the Sustainable Development Goals (SDGs), particularly those related to decent work, economic growth, and reduced inequalities.

Reference

Agasty, M. P. (2021). Determinants of internal rural-urban migration in Odisha: A case study. Indian Journal of Economics and Development, 17(2), 361-368.

Ahmad, B., Rabbani, M. G., Shilpa, N. A., Haque, M. S., & Rahman, M. N. (2022). Diversification of Livelihoods and Its Impact on the Welfare of Tribal Households in Dinajpur District of Bangladesh. *Bangladesh Journal of Agricultural Economics*, *43*(1), 85-98.

Akram, N. (2024). Internal Migration in Pakistan: Some Socio-Economic Determinants and Significances. *The Journal of Developing Areas*, *58*(2), 73-89.

Al-Maruf, A., Pervez, A. K., Sarker, P. K., Rahman, M. S., & Ruiz-Menjivar, J. (2022). Exploring the factors of farmers' rural–urban migration decisions in Bangladesh. Agriculture, 12(5), 722.

Amin, M. A., Islam, M. A., Jelane, A. K., & Sumaia, U. (2024). Examining factors affecting labor force participation: Global economic analysis. *HISTORICAL: Journal of History and Social Sciences*, *3*(2), 96-109.

Arintyas, A. P. R. D. A. (2024). Women, agriculture, and villages: A community of empowerment study to achieve wellbeing and sustainable development. *Journal of Agrosociology and Sustainability*, *2*(1), 1-16.

Balasubramanian, P., Ibanez, M., Khan, S., & Sahoo, S. (2024). Does women's economic empowerment promote human development in low-and middle-income countries? A meta-analysis. *World Development*, *178*, 106588.

Banu, B., Hossain, M. M., Haque, M. S., & Ahmad, B. (2021). Effect of microfinance adoption on rural household income in selected Upazila of Kushtia District of Bangladesh. *Bangladesh Journal of Multidisciplinary Scientific Research*, *3*(1), 24-32.

Basu, S., & Islam, M. A. Socioeconomic Impact of Rural-Urban Migration in Bangladesh: An Econometric Analysis.

Bhattacharya, P. C. (1993). Rural–urban migration in economic development. *Journal of economic surveys*, *7*(3), 243-281.

Bhuwania, P., Mukherji, A., & Swaminathan, H. (2024). Women's education through empowerment: Evidence from a community-based program. *World Development Perspectives*, *33*, 100568.

Biosca, O., Bellazzecca, E., Donaldson, C., Bala, A., Mojarrieta, M., White, G., ... & Morduch, J. (2024). Living on low-incomes with multiple long-term health conditions: A new method to explore the complex interaction between finance and health. *PloS one*, *19*(6), e0305827.

Buga, L. (2024). High Retention Hr Systems: Bridging Employee Wellbeing And Organizational Commitment For Sustainable Success. *Review of Economic Studies & Research Virgil Madgearu*, *17*(1).

Caruso, C. C. (2014). Negative impacts of shiftwork and long work hours. *Rehabilitation Nursing Journal*, *39*(1), 16-25.

Chen, M., Huang, X., Cheng, J., Tang, Z., & Huang, G. (2023). Urbanization and vulnerable employment: Empirical evidence from 163 countries in 1991–2019. *Cities*, *135*, 104208.

Dembe, A. E., Erickson, J. B., Delbos, R. G., & Banks, S. M. (2005). The impact of overtime and long work hours on occupational injuries and illnesses: new evidence from the United States. *Occupational and environmental medicine*, *62*(9), 588-597.

Dhillon, A., & Meier, K. J. (2022). Representative bureaucracy in challenging environments: Gender representation, education, and India. *International Public Management Journal*, *25*(1), 43-64.

Dodman, D., Sverdlik, A., Agarwal, S., Kadungure, A., Kothiwal, K., Machemedze, R., & Verma, S. (2023). Climate change and informal workers: Towards an agenda for research and practice. *Urban climate*, *48*, 101401.

Foo, L. J. (1994). The vulnerable and exploitable immigrant workforce and the need for strengthening worker protective legislation. *Yale Law Journal*, 2179-2212.

Frayne, B. (2004). Migration and urban survival strategies in Windhoek, Namibia. *Geoforum*, *35*(4), 489-505.

Garikipati, S. (2008). The impact of lending to women on household vulnerability and women's empowerment: evidence from India. *World development*, *36*(12), 2620-2642.

Ghimire, A., & Hofer, T. (2019). The role of economic incentives in migration decision-making: Evidence from rural Nepal. International Migration, 57(4), 134-150.

Guo, K. (2024). The Dilemma and Countermeasure research of Guangxi Rural Develppment: Empirical Evidence Based on Field Investigation. *Frontiers in Business, Economics and Management*, *14*(2), 144-149.

Hafiz, H. (2024). The law of geographic labor market inequality. *University of Pennsylvania Law Review*, *172*(5), 1183.

Hanif, M. A., Islam, M. M., & Ahmed, M. B. (2020). Factors affecting rural-urban migration of agricultural laborers. Fundamental and Applied Agriculture, 5(1), 116-123.

Horwitz, F. M., & Jain, H. (2011). An assessment of employment equity and broad based black economic empowerment developments in South Africa. *Equality, Diversity and Inclusion: An International Journal*, *30*(4), 297-317.

Hossain, M. Z., Khan, M. O. A., & Ahmed, J. U. (2016). Determinants of rural-urban migration in Bangladesh including its consequences for origin households and urban amenities. Res Rev J Stat, 5, 47-61.

Howden-Chapman, P., Siri, J., Chisholm, E., Chapman, R., Doll, C. N., & Capon, A. (2017). SDG 3: Ensure healthy lives and promote wellbeing for all at all ages. *A guide to SDG interactions: from science to implementation. Paris, France: International Council for Science*, 81-126.

https://bangladesh.iom.int/news/world-grows-281-million-migrants-bangladesh-6th-largest-migrant-sending-country

https://www.thedailystar.net/business/economy/news/signs-reverse-migration-villages-economic-struggle-persists-3541576

https://www.thedailystar.net/news/bangladesh/agriculture/news/change-food-habit-reduce-rice-consumption-agriculture-minister-2205186

https://www.thedailystar.net/news-detail-206220

Huang, Y., & Ren, J. (2022). Moving toward an inclusive housing policy?: Migrants' access to subsidized housing in urban China. *Housing Policy Debate*, *32*(4-5), 579-606.

Islam, S., Papia, M. J., & Yesmin, S. (2022). The Rural-Urban Migration and its Socio-Economic Consequences: A Study on the Rayerbazar Area of Dhaka City. International Journal of Publication and Social Studies, 7(1), 12-18.

Javed, M. S., Nisar, U., Warsi, S. H., Billah, M. M., & Karkkulainen, E. A. (2024). Mapping The Disparities Between Urban And Rural Areas In The Global Attainment Of Sustainable Development Goals, Economic And Social Aspects Of Global Rural-Urban Migration. *Educational Administration: Theory And Practice*, *30*(6), 2052-2064.

Jejeniwa, T. O., Mhlongo, N. Z., & Jejeniwa, T. O. (2024). AI solutions for developmental economics: opportunities and challenges in financial inclusion and poverty alleviation. *International Journal of Advanced Economics*, *6*(4), 108-123.

Jejeniwa, T. O., Mhlongo, N. Z., & Jejeniwa, T. O. (2024). Diversity and inclusion in the workplace: a conceptual framework comparing the USA and Nigeria. *International Journal of Management & Entrepreneurship Research*, *6*(5), 1368-1394.

Jinno, M., & Yasuoka, M. (2024). Immigration policy in a two sector model. *Hitotsubashi Journal of Economics*, *65*(1), 51-64.

Kanakis, K., McShane, C. J., Kilcullen, M. L., & Swinbourne, A. L. (2019). "It's the people that keep me here": Exploring the role of community attachment in increasing length of residency. *Journal of rural studies*, *70*, 19-25.

Khan, M. I., Alharthi, M., Haque, A., & Illiyan, A. (2023). Statistical analysis of push and pull factors of migration: A case study of India. Journal of King Saud University-Science, 35(8), 102859.

Khan, T. A., Khan, F. A., Violinda, Q., Aasir, I., & Jian, S. (2020). Microfinance facility for rural women entrepreneurs in Pakistan: An empirical analysis. *Agriculture*, *10*(3), 54.

Khanam, M., Pervez, A. K. M., & Rahman, M. M. (2024). Farmers' Insights on the Migration from /Rural to Urban Areas in Bangladesh. Asian Research Journal of Arts & Social Sciences, 22(10), 1-16.

Kitole, F. A., & Genda, E. L. (2024, May). Empowering her drive: Unveiling the resilience and triumphs of women entrepreneurs in rural landscapes. In *Women's Studies International Forum* (Vol. 104, p. 102912). Pergamon.

Khan, M. A. R., Uddin, M. M., & Sarker, R. (2021). Socio-economic conditions of rice-mill workers: A study on Sherpur district in Bangladesh. *International Journal of Research in Human Resource Management, 3*(1), 51–57. https://doi.org/10.33545/26633213.2021.v3.i1a.62

Lubis, M. (2024). The Role of Communication and Employee Engagement in Promoting Inclusion in the Workplace: A Case Study in the Creative Industry. *Feedback International Journal of Communication*, *1*(1), 1-15.

Majumder, S. C., & Rahman, M. H. (2023). Rural–urban migration and its impact on environment and health: evidence from Cumilla City Corporation, Bangladesh. GeoJournal, 88(3), 3419-3437.

Mannan, M. A., Nuruzzaman, M., Bari, M. S., & Rahman, M. S. (2022). Impact of Rice Mill Pollution on Surrounding Environment: A Case Study in Sadar Upazila, Dinajpur, Bangladesh. Asian Journal of Research in Agriculture and Forestry, 8(4), 88-96.

Mehra, R. (1997). Women, empowerment, and economic development. *The Annals of the American Academy of Political and Social Science*, *554*(1), 136-149.

Mehrotra, S., & Biggeri, M. (2005). Can industrial outwork enhance homeworkers' capabilities? Evidence from clusters in South Asia. *World Development*, *33*(10), 1735-1757.

Mudimba, P. C. (2020). Trapped in a'Pitiless Zone Where the Different Patriarchies Meet'! A Glimpse into the BaTonga Rural Women's Daily Struggles versus Gender Equality, Binga, Zimbabwe. *JL Pol'y & Globalization, 101*, 74.

Njiru, C. W., & Letema, S. C. (2018). Energy poverty and its implication on standard of living in Kirinyaga, Kenya. *Journal of Energy*, *2018*(1), 3196567.

Olmsted, J. C. (2024). Care labor, intergenerational equity, and (social) sustainability. *Review of Social Economy*, *82*(1), 51-75.

Pailman, W., Caprotti, F., Bobbins, K., & de Groot, J. (2024). The informality-energy innovation-finance nexus: Sustainable business models for microgrid-based off-grid urban energy access. *Energy Research & Social Science*, *118*, 103749.

Parveen, M., Maimani, K., & Kassim, N. M. (2017). Quality of work life: The determinants of job satisfaction and job retention among RNs and OHPs. *International Journal for Quality Research*, *11*(1), 173.

Pfeffer, F. T. (2008). Persistent inequality in educational attainment and its institutional context. *European sociological review*, *24*(5), 543-565.

Rad, A. M. M., & De Moraes, A. (2009). Factors affecting employees' job satisfaction in public hospitals: Implications for recruitment and retention. *Journal of General Management*, *34*(4), 51-66.

Rahman, M. N., Saleheen, M. M., Ahmad, B., El Fadili, H., Sharifuzzaman, S. A., Sohel, M. S., ... & Azim, S. A. (2024). Transforming landscapes: Decoding the impact of universities on urbanization using advanced modeling and perception analysis. *Plos one*, *19*(10), e0302362.

Rivera, A. S., Akanbi, M., O'Dwyer, L. C., & McHugh, M. (2020). Shift work and long work hours and their association with chronic health conditions: a systematic review of systematic reviews with meta-analyses. *PloS one*, *15*(4), e0231037.

Rosenfeld, R. A., & Kalleberg, A. L. (1990). A cross-national comparison of the gender gap in income. *American Journal of Sociology*, *96*(1), 69-106.

Salvagioni, D. A. J., Melanda, F. N., Mesas, A. E., González, A. D., Gabani, F. L., & Andrade, S. M. D. (2017). Physical, psychological and occupational consequences of job burnout: A systematic review of prospective studies. *PloS one*, *12*(10), e0185781.

Sarker, T., Roy, R., Yeasmin, S., & Asaduzzaman, M. (2024). Enhancing women's empowerment as an effective strategy to improve food security in rural Bangladesh: A pathway to achieving SDG-2. *Frontiers in Sustainable Food Systems*, *8*, 1436949.

Satterthwaite, D., & Tacoli, C. (2014). Seeking an understanding of poverty that recognizes rural–urban differences and rural–urban linkages. In *Urban livelihoods* (pp. 52-70). Routledge.

Selod, H., & Shilpi, F. (2021). Rural-urban migration in developing countries: Lessons from the literature. *Regional Science and Urban Economics*, *91*, 103713.

Sharma, M. P., Singh, B., & Anju, P. (2024). Unemployment After Education: Analyzing Causes, Consequences, And Solutions. *NOLEGEIN-Journal of Human Resource Management & Development*, *7*(1), 13-18.

Shaukat, N., Ali, D. M., & Razzak, J. (2020). Physical and mental health impacts of COVID-19 on healthcare workers: a scoping review. *International journal of emergency medicine*, *13*, 1-8.

Singh, C., & Basu, R. (2020). Moving in and out of vulnerability: Interrogating migration as an adaptation strategy along a rural–urban continuum in India. *The Geographical Journal*, *186*(1), 87-102.

Spurgeon, A., Harrington, J. M., & Cooper, C. L. (1997). Health and safety problems associated with long working hours: a review of the current position. *Occupational and environmental medicine*, *54*(6), 367-375.

Tama, R. A. Z., Ying, L., Happy, F. A., & Hoque, M. M. (2018). An Empirical Study on Socio-economic status of women labor in rice husking mill of Bangladesh.

Thelma, C. C. (2024). Civic Education and National Development: A Comprehensive Analysis of Zambia. *Asian Journal of Education and Social Studies*, *50*(6), 170-190.

Tikly, L., & Barrett, A. M. (2011). Social justice, capabilities and the quality of education in low income countries. *International journal of educational development*, *31*(1), 3-14.

Tong, T., Ye, F., Zhang, Q., Liao, W., Ding, Y., Liu, Y., & Li, G. (2024). The impact of labor force aging on agricultural total factor

productivity of farmers in China: Implications for food sustainability. *Frontiers in Sustainable Food Systems*, *8*, 1434604.

Velu, N., & Anuradha, A. (2024). Heritage Education and Livelihood Satisfaction in Indian Rural Communities: Towards Sustainable Development. *Qubahan Academic Journal*, *4*(3), 557-578.

Wen, Y., & Hanley, J. (2016). Enhancing social support for migrant families: A case study of community services in a Shanghai urban village and implications for intervention. *Asian Social Work and Policy Review*, *10*(1), 76-89.

Yeasmin, R., Hossen, M., Azad, F., Devnath, S. K., Shoikot, S. H., & Ahmad, B. (2023). Effect Of Mobile Money on The Saving Behavior of Low-Income Household: Evidences from Dinajpur District of Bangladesh. *Journal of the Bangladesh Agricultural University*, *21*(2), 168-179.

Lakens, D. (2022). Sample size justification. *Collabra: psychology*, *8*(1), 33267.

VanVoorhis, C. W., & Morgan, B. L. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in quantitative methods for psychology*, *3*(2), 43-50.

Ritchie, J., Lewis, J., Elam, G., Tennant, R., & Rahim, N. (2003). Designing and selecting samples. *Qualitative research practice: A guide for social science students and researchers*, *2*, 111-145.

Asiamah, N., Mensah, H., & Oteng-Abayie, E. F. (2017). General, target, and accessible population: Demystifying the concepts for effective sampling. *The qualitative report*, *22*(6), 1607-1621.

Mohajan, H. K. (2020). Quantitative research: A successful investigation in natural and social sciences. *Journal of economic development, environment and people*, *9*(4), 50-79.

Almalki, S. (2016). Integrating Quantitative and Qualitative Data in Mixed Methods Research--Challenges and Benefits. *Journal of education and learning*, *5*(3), 288-296.

DeVellis, R. F., & Thorpe, C. T. (2021). *Scale development: Theory and applications*. Sage publications.

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Frontiers in public health*, *6*, 149.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological bulletin*, *125*(2), 276.

Clark, A. E., & Oswald, A. J. (1994). Unhappiness and unemployment. *The economic journal*, *104*(424), 648-659.

Todaro, M. P. (1969). A model of labor migration and urban unemployment in less developed countries. *The American economic review*, *59*(1), 138-148.

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*, 431-466.

UNDP (2019). Population Growth: Implications for Human Development. Gul Awan Printers, Islamabad, Pakistan.

Gatti, R. (2020). *The Human Capital Index 2020 update: human capital in the time of COVID-19*. A. Kraay (Ed.). World Bank Group.