

Where and Why Do Timorese Workers Migrate? Evidence from an Augmented Gravity Model and a South Korea Case Study

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ABSTRACT

This study investigates the factors that influence international labor migration from Timor-Leste, with a focus on South Korea under the Employment Permit System. An extended gravity model was employed using bilateral migration data for 29 destination countries from 2000 to 2024 to assess the impact of economic size, geographic distance, trade relations, and migration policy regimes on migration flows. Migration is significantly influenced by political factors, such as formal recruitment channels and visa availability, and a positive correlation is observed between migration arrangements and bilateral exports. Furthermore, primary survey data of 250 Timor-Leste migrant workers in South Korea provide micro-level insights into employment outcomes, remittance patterns, and migration motivations. The findings confirm that sectoral recruitment driven by household economic demand and demand in the manufacturing and fishing sectors is a key driver, supported by Korea's open institutional structure. The policy implications of this study highlight the need for stronger labor governance, better skill development, and diversification of migration routes to ensure safe and productive mobility.

Keywords: Timor-Leste, labor migration, gravity model, Employment Permit System, South Korea

INTRODUCTION

International migration remains a pressing concern for both policymakers and scholars. As a key component of globalization, migration intersects with labor markets, human rights, and global development (Castles, 2010). However, governments often face a dilemma: While their economies benefit from migrant labor, political pressures drive them to regulate migration. This tension necessitates international cooperation and shared responsibility in designing migration policy. Empirical research generally supports the idea that the effects of immigration on native labor markets are modest. For example, Friedberg and Hunt (1995) conclude that “the effect of immigration on the labor market outcomes of natives is small.” Similarly, the National Academy of Sciences report, *The New Americans: Economic, Demographic, and Fiscal Effects of Immigration* (Smith & Edmonston, 1997), supports the view that immigration has only a minor impact on native workers' wages.

In Timor-Leste, migration plays a vital role in addressing labor market challenges. Given persistently high unemployment and limited job creation at home, sending workers abroad has become a crucial strategy to alleviate domestic labor pressures. In addition to providing employment, international migration contributes to the country's foreign exchange reserves and improves the living standards of families through remittances.

Timor-Leste is one of the world's smallest economies, with a gross domestic product (GDP) of only USD 2 billion in current price (International Monetary Fund, 2020) and a total population of 1,341,737 (Instituto Nacional de Estatística Timor-Leste, IP, 2022). Its domestic market share is naturally small, which has caused the country to experience substantial migration flows since its independence in 2002. These flows include both international and internal migration, reflecting ongoing economic hardship, demographic shifts, and development gaps. Key factors in migration include high youth unemployment, poor infrastructure in rural areas, and vulnerability to climate-related shocks. At the same time, people are drawn to urban and international destinations by the promise of better amenities, higher wages, and greater personal

security (International Labour Organization, 2014).

This broader labor migration trend can be better understood by looking at the main destination countries for Timorese workers. A significant number of Timorese citizens migrate abroad, with the most popular destinations being Australia, Indonesia, South Korea, Portugal, and the United Kingdom. Most of this migration is driven by the search for employment, particularly in sectors such as manufacturing, agriculture, fisheries, and domestic labor. As noted above, limited job opportunities in Timor-Leste and the prospect of higher wages abroad are key motivating factors.

Table 1 shows the number of Timorese migrant workers across three time periods (2010–2014, 2015–2019, and 2020–2024) in the top five destination countries. The data reveal a steady increase in migration overall, from 36,043 in 2010–2014 to 41,189 in 2020–2024. Indonesia consistently hosted the highest number of Timorese migrants, increasing from 20,346 to 23,681 from 2010–2014 to 2020–2024. Australia remained stable, with only slight fluctuations, while South Korea, Portugal, and the United Kingdom experienced moderate growth. Figure 1 illustrates this for Year 2024.

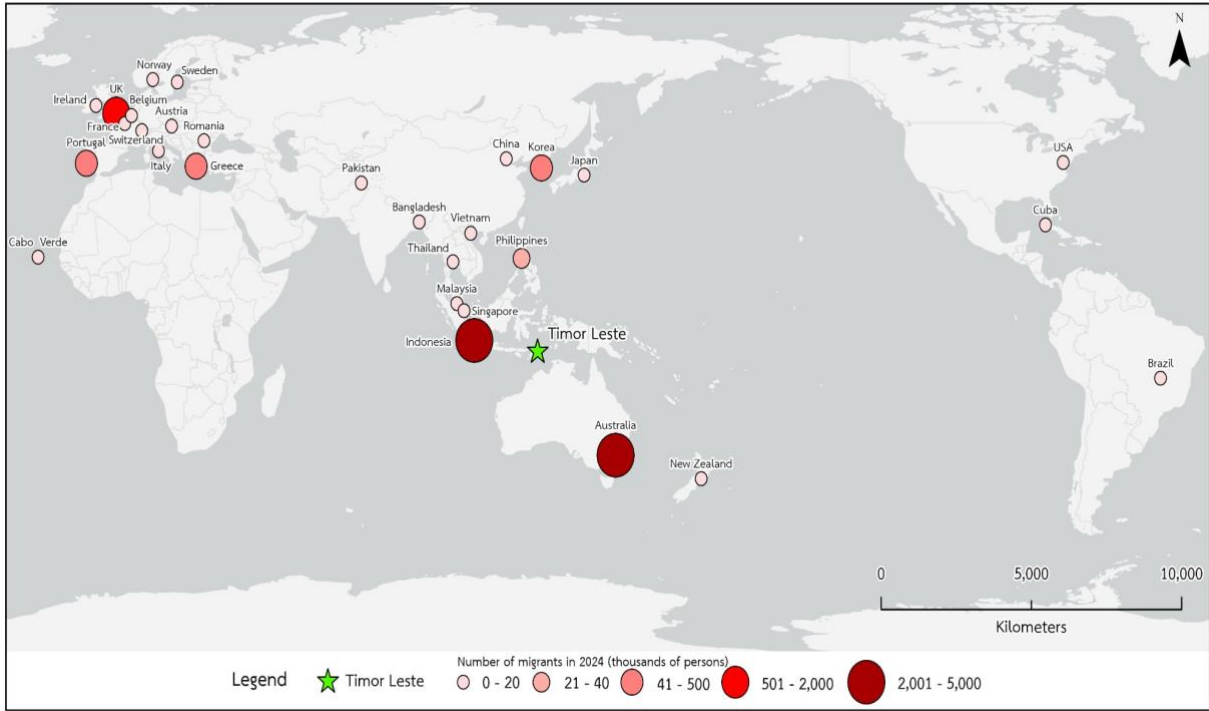
Australia introduced a seasonal labor mobility pilot program in 2008 to address workforce shortages in the horticultural sector and promote regional development in Pacific Island Countries (PICs). Initially, Kiribati, Papua New Guinea, Tonga, and Vanuatu participated, followed by countries such as Nauru, Samoa, the Solomon Islands, Tuvalu, and Timor-Leste (Richmond, 2014). Under this program, Timorese workers receive training in hospitality and tourism before departing for Australia and, upon arrival, undergo additional on-site training and work in rural areas, particularly in the accommodation and travel sectors. It also has the so-called Pacific Australian Labor Migration (PALM)

Indonesia similarly remains a popular destination due to visa-free access and the ease of land border crossing. Despite their geographical proximity, Indonesia, Australia, and Timor-Leste have very different levels of economic development. Timor-Leste borders Indonesia's East Nusa Tenggara province, while Darwin, Australia, is the nearest major foreign city.

Table 1
Number of Timorese Migrant Workers by Destination Country and Period

Destination	2010–2014	2015–2019	2020–2024
Australia	10,580	10,000	10,555
Indonesia	20,346	22,525	23,681
Portugal	1,516	1,717	1,969
South Korea	1,537	2,040	2,197
United Kingdom	2,064	2,470	2,787
Total	36,043	38,752	41,189

Figure 1
Number of Timorese Migrants in 2024 by Destination Country



Portugal has also been a popular destination, particularly following the 2021 Community of Portuguese Language Countries (CPLP) mobility agreement, which took effect in 2022. This agreement eased visa procedures for Timorese citizens, allowing visa-free travel to Portugal for up to 180 days. Additionally, many Timorese are eligible for Portuguese citizenship due to historical colonial ties, which further simplifies access to Portugal and the broader Schengen Area.

Finally, while the United Kingdom previously allowed short-term visa-free visits for Timorese nationals until July 19, 2023, this policy changed

due to concerns about increasing numbers of irregular entries and fraudulent EU Settlement Scheme claims. As a result, Timorese citizens now require a visa unless they hold Portuguese citizenship and passports. The Timorese migration to the United Kingdom has sparked debates around labor displacement, working conditions, and migrant integration, echoing concerns raised by Taran and Geronimi (2003).

A large number of migration flows to Australia and Indonesia can be understood from a geographical perspective, while flows to Portugal and the United Kingdom see more of an institutional approach. Then, how about South

Korea? It is not as close to Australia and Indonesia in terms of geographical proximity, nor does it have a visa-free policy.

Just like Acemoglu et al. (2002), this study also finds an answer from an institutional approach. In fact, South Korea's structured employment pathways have made it a more attractive option, and Timorese workers are drawn to the country for its safe and legal labor migration policies. South Korea's Employment Permit System (EPS), introduced in 2004, allows low-skilled foreign workers to be legally employed. Workers who pass the EPS Korean-language test (EPS-KLT) can apply for jobs through the EPS, which aims to support small- and medium-sized enterprises facing labor shortages. The system also ensures equal labor rights for foreign and domestic workers. It serves as a unique institutional model emphasizing interstate recruitment, standardized contracts, and protection from excessive intermediary fees, which contrasts sharply with market-oriented or employer-driven systems.

In particular, the EPS positively contributes to lowering migration costs and standardizes placement procedures, thus addressing labor shortages. For Timorese migrants, South Korea offers opportunities in manufacturing, agriculture, and fisheries. Higher wages help workers support their families and improve living standards back home. Many workers return with new skills and experiences, and some are eligible for re-entry after five years. This cooperation contributes to reducing unemployment in Timor-Leste and enhances workforce capacity. It is interesting to find that, even though Timor-Leste maintains development partnerships with Japan and China, geographically as proximate as South Korea, these countries are not major destinations for Timorese workers in terms of migration.

The Global Compact on Migration, the ILO Fair Recruitment Initiative, and the ASEAN Negotiations on Strengthening Labor Protection Measures for Temporary Migrant Workers emphasize the need for safe, orderly, and regular migration routes. Concerns about labor standards in so-called "3D work"—dirty, dangerous, and difficult (or inhumane) work—have led to growing calls for stricter enforcement of equal treatment laws, increased oversight, and improved living conditions for foreign workers in Korea. By integrating these perspectives, this

study reinforces its position in current political and academic debates. It highlights the importance of focusing on Korea as a unique, organized, and growing migratory destination for workers from Timor-Leste.

Despite the significant increase in literature on international migration, empirical evidence on the impact of political, economic, and institutional factors on migration in small post-conflict countries like Timor-Leste remains limited. Much of the existing research relies on descriptive approaches, while empirical models, such as gravity models, are rarely used to measure or explain migratory patterns in Timor-Leste. Following this, this study addresses this gap and contributes to the existing literature by combining macro-level modeling with micro-level survey data. That is, it analyzes the motivations behind Timorese workers' decisions to migrate empirically using an extended gravity model framework, focusing on South Korea as a destination, alongside field data on Timorese workers in South Korea. In conducting the analysis, the study asks:

1. What key factors influence Timorese workers' decisions to migrate abroad?
2. How do economic, institutional, and socio-cultural drivers shape migration flows and motivations, particularly toward South Korea under the Employment Permit System (EPS)?

To address these objectives, this study employs a combination of quantitative methods, using both secondary and primary data sources. Secondary data on international migration trends were sourced from the World Bank, International Organization for Migration (IOM), International Monetary Fund (IMF), and Timor-Leste's national agencies. Primary data were gathered through field surveys conducted among Timorese workers in South Korea, which included questions on demographics, economic status, employment background, migration experiences, and plans.

This paper is structured as follows. The next chapter reviews the migration policies of both Timor-Leste and South Korea. Chapter 3 discusses the model, data collection, and methodology, while Chapter 4 presents the empirical findings and survey results. Lastly, Chapter 5 concludes with policy implications.

LITERATURE REVIEW

Migration Policies of Timor-Leste and South Korea

Timor-Leste

Through the Seasonal Worker Program (SWP), individuals of Timor-Leste and nine Pacific Island Countries (PICs) are permitted to work in regional Australia for six to nine months in "low-skilled" jobs, usually harvest labor. Since the SWP's founding in 2012, both the number and percentage of Timorese have increased: Timorese comprised over 13 percent of the 12,000 participants in the SWP by 2018–2019, making them the third-largest contributor after Vanuatu and Tonga (Lawton, 2019).

The Australian Government and Timor-Leste's Secretariat of State for Training and Employment Policy (SEFOPE) oversee both options in the Seasonal Worker Programme (SWP) and the Pacific Labor Scheme (PLS), which were merged in 2022 under the new Pacific Australia Labor Mobility (PALM) scheme (Howes, 2022). Under the PALM program, migrant workers are protected by Australia's strict labor regulations, including those about minimum wage standards, housing, and decent working conditions. As a result, Timorese workers feel more secure, and the program is viewed more favorably by the community.

According to data from the Australian government, as of May 31, 2022, there were 157 Timorese Pacific Labor Scheme (PLS) employees in Australia. Since 2012, 446 Timorese nationals have taken part in the most well-known Seasonal Worker Program (SWP). In 2022, the Department of Home Affairs reported that 492 Timorese nationals were temporarily residing in Australia. Bridging visa holders are generally former SWP employees who chose to file for temporary protection visas to benefit from the unrestricted employment rights that are normally provided to them while their claims are evaluated, which may take up to three years (Wasuka, 2020).

Notably, the SWP has an intriguing function in Timor-Leste's labor economy and national consciousness: Although there are not many Timorese engaged overall, this is not accurately

represented in the public discourse, where references to "picking fruit in Australia" are common. The on-the-job/off-the-job concept of this program, which involves participants working in Australia for a while before returning to Timor-Leste, has been warmly welcomed. In contrast to distant places that necessitate extended stays, like Korea or the UK, this approach enables participants to continue earning foreign currency while keeping ties to their homeland.

South Korea has signed 14 Memoranda of Understanding (MOUs) with sending nations in recent years. In the past few years, Indonesia has signed MOUs with Malaysia twice and has also entered MOUs with Korea, Taiwan, Japan, Australia, the United Arab Emirates, Jordan, Kuwait, Qatar, and Syria. According to *Asian Migrant News* (2006), a significant MOU was signed between Malaysia and Bali in 2006, establishing Bali as a key hub for the recruitment and export of Indonesian migrant workers. Such agreements generally include terms seen in long-term employment agreements, including provisions for employment contracts, grievance procedures, pre-departure training, and worker selection activities. This clarifies regulations and prevents irregular labor agencies from breaking them.

The Migration choices in Timor are indicative of a larger regional trend. According to McWilliam (2015), in 2020, most Timorese workers were going to Europe (primarily Portugal and the United Kingdom), Australia, and South Korea. According to Wigglesworth (2017), about 19,000 Timorese obtained Portuguese passports and relocated to the UK in search of employment. A smaller group, roughly 3,000 by 2018, took part in three-year work placements through South Korea's Employment Permit System (Curtain, 2023).

South Korea

Since its inception, South Korea has developed into a popular international migration destination, with over 2,500 foreigners living there at the moment, making up roughly 4.87% of the country's total population (Ministry of Justice, Republic of Korea, 2021). Driving forces like labor migration have historically emerged in South Korea, a country notable for its swift salary hikes, the growing labor shortage in SMEs, the

odd limitations imposed during the 1988 Seoul Olympics, and the signing of the Ryu-Ryu Agreement. Significant increases in illegal working migrants and nearby development have resulted from relaxation of entry criteria for visitor systems that draw foreigners and the streamlining of immigration procedures (Martin et al., 2006).

In 2004, South Korea implemented the Employment Permit System (EPS) to provide opportunities to citizens of low-income countries with few job possibilities and high rates of unemployment to work in the country. Through government-to-government partnership, the EPS has created a standardized method for hiring temporary foreign workers. Furthermore, according to its framework, the system allows companies in the manufacturing, construction, fish breeding, agriculture, and animal breeding sectors to hire personnel from nations with which South Korea has MOUs. With these bilateral agreements, the EPS efficiently lowers migration costs and standardizes employment placements, addressing labor shortages in critical industries. In particular, Timor-Leste's unemployment rate was reduced by the, whose objectives were "to tackle unemployment, provide technical training, and develop the personal and professional skills of the Timorese workforce" (Wigglesworth 2017). Notably, the Korean government covers the preparation expenses for the EPS system, which is a major contributor to making South Korea an attractive destination.

Despite the abundance of real-world and policy-based case studies, three gaps remain in the current research landscape. First, there is a lack of a comprehensive empirical framework that integrates primary research findings on Timor-Leste with secondary bilateral data. Second, modern gravity analysis techniques, such as incorporating policy variables and properly handling zero migration flows, are rarely applied. Third, instead of adopting a consistent comparative approach, key destination regions (South Korea, Portugal, the United Kingdom, and Australia) are analyzed piecemeal. This study fills these gaps by estimating an extended gravity model using bilateral migration data and integrating the results with a field survey of Timorese workers in South Korea. This integrated approach deepens our understanding

of Timor-Leste's migration system from both a theoretical and policy perspective.

METHODOLOGY

This study proposes an augmented gravity model to analyze the determinants of Timorese labor migration. The model is specified as follows:

$$\begin{aligned} \ln mig_{Njt} = & \beta_0 + \beta_1 \ln gdp_{jt} + \beta_2 \ln pgdp_{jt} + \\ & \beta_3 \ln distance_{Nj} + \beta_4 border_{Nj} + \\ & \beta_5 visa_{Nj} + \beta_6 \ln oda_{Njt} + \\ & \beta_7 \ln exp_{Njt} + \beta_8 \ln imp_{Njt} + \varepsilon_{Njt} \end{aligned}$$

In this model, $\ln mig_{Njt}$ is the log-transformed number of Timorese permanent migrant workers (N) working abroad (j) at time (t), which serves as a dependent variable. The explanatory variables are as follows:

$\ln gdp_{jt}$ is the log of the gross domestic product (GDP) of the destination country (j) at time (t).

$\ln pgdp_{jt}$ is the log of the per capita GDP of the destination country (j) at time (t).

$\ln distance_{Nj}$ is the log-transformed air distance between Timor-Leste (N) and the destination country (j), which is a proxy of migration costs.

$border_{Nj}$ is a dummy variable equal to 1 if Timor-Leste (N) shares a border with the destination country (j).

$visa_{Nj}$ is a dummy variable equal to 1 if the destination country (j) offers a visa-free policy for citizens of Timor-Leste (N), as is the case with Portugal and the United Kingdom.

$\ln oda_{Njt}$ denotes the logged value of official development assistance (ODA) flows received by Timor-Leste (N) from the destination country (j) for a given year (t), following Ortega and Peri (2013), Mayda (2010), and Docquier et al. (2007).

$\ln exp_{Njt}$ refers to the log-transformed export volume from Timor-Leste (N) to the destination country (j) for a given time (t).

$\ln imp_{Njt}$ denotes the log-transformed import volume from the destination country (j) to Timor-Leste (N) for a given time (t).

To address the issue of varying measurement units across variables, all variables except for dummy variables are expressed in log form.

The panel dataset includes 21 years of data for 29 countries: Australia, Austria, Bangladesh, Belgium, Brazil, Cabo Verde, China, Cuba, France, Greece, Indonesia, Italy, Ireland, South Korea, Japan, Malaysia, Pakistan, New Zealand, Norway, the Philippines, Portugal, Romania, Singapore, Sweden, Switzerland, Thailand, the United Kingdom, the United States of America, and Vietnam. The studied period is 2000 to 2024, broken into five periods: 2000–2004, 2005–2009, 2010–2014, 2015–2019, and 2020–2024.

The panel dataset includes several key variables that capture institutional, migration-related, geographical, and economic characteristics. Instrumental variable estimates include the population and GDP (in thousands of US dollars) of the destination countries, based on World Bank data. The World Bank's GDP per capita, which is expressed in USD thousands, accounts for per-capita wealth. The GDP and per capita GDP data utilized in this analysis are only available in current prices, despite the prevailing preference to use constant prices to account for inflation (Oh & Prasai, 2012). This study used GPS coordinates to calculate the shortest possible distance, known as the orthodromic distance, between Dili, the capital of Timor-Leste, and each destination country. This distance is expected to hinder migratory flows.

Two dummy variables were used to reflect geographic and policy-related factors. According to the Migration Policy Institute (Migration Policy Institute [MPI], 2020), If Timor-Leste and the destination country share a border, the value of the 'border' variable is 1. Similarly, if Timorese citizens can enter the destination country without a visa, the value of the 'visa' variable is 1. Remittances, reported by households and calculated annually in US dollars, and the EPS (Employment Permit Programme) participation rate, a binary variable indicating whether a worker is registered in the Korean employment permit system, represent institutional and micro-level characteristics, respectively. Bilateral trade is measured as imports from the destination country and exports from Timor-Leste to that country. These values are provided by the IMF in millions of US dollars.

Finally, to account for development cooperation, we multiplied the flows of official development assistance (ODA) from the destination country to Timor-Leste. These flows are reported in millions of USD and come from the Organisation for Economic Co-operation and Development [OECD] (2020). Each variable's expected sign is in line with theory: Distance is predicted to harm migrant flows, but GDP, GDP per capita, border, visa, EPS participation, remittances, exports, imports, and ODA are all expected to have a positive impact.

Regarding the methods used, starting with a pooled ordinary least squares (OLS) model, an instrumental variables (IV) regression is employed, followed by a Tobit model. This study uses IV regression to address endogeneity issues. Specifically, because there might be reverse causality between GDP and the error term, using OLS can give biased and inconsistent results. To solve this, population is used as an instrument for GDP, following McCallum (1995). As population is highly correlated with GDP but assumed to be unrelated to the error term, it can function as a valid and exogenous instrument. Finally, the random-effect Tobit model is also considered to account for the censored nature of the data, providing consistent and unbiased estimates when the dependent variable includes many zero values, which is the case here (Kim & Oh, 2012). Furthermore, in cases where zero migration flows frequently occur, filtering the dependent variable using a Tobit model is also considered.

In addition, a field survey was conducted among East Timorese migrants working in South Korea. Field studies often reveal family strategies, labor market conditions, and individual preferences that are not reflected in macroeconomic data (Bryman, 2016; Creswell & Creswell, 2018). This essential dataset integrates the impact of migration at the microeconomic level, allowing for a deeper interpretation of the econometric conclusions.

The survey was conducted with 250 participants from July to August 2025. Because there is no formal, publicly available method to sample Timorese workers abroad, a snowball sampling technique was used within the Employment License System (EPS) and the network of Timorese community organizations. As Singleton and Straits (1999) describe, the process of

referral sampling, also known as snowball sampling, involves a chain of referrals: After locating members of the target population, they are asked for the names and addresses of other members of the target population, who are then contacted and asked to name additional individuals, and so on. As such, this type of sampling is useful for assessing migrant populations that are geographically distant or hard to reach (Noy, 2008) and is based on the fact that members of the target demographic frequently know one another. To reduce response errors and language barriers, participants completed an anonymous, self-administered questionnaire in Tetum. The initial pilot test refined the wording to ensure clarity and reliability (DeVellis, 2017).

The questionnaire consisted of structured questions on demographic data (age, gender, education, marital status), migrants' working conditions (current industry, salary, type of contract, previous employment status), economic and non-economic factors motivating migration, remittance amounts, frequencies, and frequency of remittances sent from the country of origin, and family decision-making obligations (family and financial support). To avoid unnecessary technical reporting, only variables directly related to our research question were included in the empirical analysis. By providing contextual information about migrants' employment outcomes and remittance patterns, the questionnaire insights strengthen the empirical results and help interpret gravity model estimates beyond macro-level correlations.

This mixed methodology combined longitudinal data with self-reported motivations and constraints to increase construct validity (Tashakkori & Teddlie, 2010). However, it presents some limitations: Snowball sampling reduces sample representativeness, reliance on migrant networks can create networks related to work experiences and income, and self-reported professional history can be influenced by social desirability bias. Despite these limitations, this study provides insightful micro-level data that deepen our understanding of the factors influencing migration and life experiences of Timorese migrant workers in Korea—factors that are not easily identifiable in secondary data.

RESULTS

The empirical findings from two complementary components are presented in this chapter: (1) a survey of 250 Timorese workers in South Korea and (2) the gravity model estimations utilizing bilateral panel data on Timorese migration to 29 destination countries (2000–2024). Table 2 presents the OLS, IV, and Tobit estimations, which confirm that Timor-Leste's migration pattern follows the prediction of the Gravity Model, with a positive coefficient for GDP and a negative coefficient for distance. In particular, a 10% increase in the GDP of a destination country leads to a 2.3–3% increase in migration flows, while a 10% increase in a country's distance from Timor-Leste leads to a decrease in migration flows of 15–25%. This is the result of a combination of weak social networks, information friction, and travel costs. Physical proximity is crucial for a small migrant-sending country like Timor-Leste.

The model is further strengthened by adding border and visa dummy variables (OLS2, IV2, Tobit2). Similar to proximity-based migration, Australia–Indonesia border proximity shows a significant positive effect in the OLS and IV models. However, the coefficient estimates in the Tobit model are neither significant nor statistically relevant, suggesting that the lack of migratory flows may have influenced the results. The fictitious visa exemption variables, representing Timor-Leste's privileged access to Portugal and indirect access to the United Kingdom, often generate significant benefits. The magnitude of the coefficients (ranging from 4.8 to 5.2) indicates that visa exemptions significantly increase expected migratory flows, highlighting the important role of administrative openness in shaping migratory patterns. This is in line with Timor-Leste's linguistic and historical ties with Portugal and, in the past, with the United Kingdom, which facilitated entry into the country.

For various historical, economic, and social reasons, many Timorese choose to live and work in Portugal and the UK. Timor-Leste's close historical ties to Portugal, as a nation that was a Portuguese colony for more than 400 years, are a primary cause. Because of this relationship, many Timorese speak Portuguese and have been able to acquire Portuguese citizenship in certain instances. With their citizenship, they

were able to live and work anywhere in the European Union, including the UK, until Brexit. Given this status, many Timorese decided to migrate to the United Kingdom, seeking more employment options and better pay.

The third column in Table 2 from each method (OLS3, IV3, and Tobit3) presents results for the augmented models where ODA, exports, and imports are added. It should be noted that only exports are a significant variable with positive coefficients; a 10% increase in exports from Timor-Leste is associated with an approximately 2% increase in migration. This indicates that not only the economic size of a destination country but also its commercial ties with Timor-Leste matter when Timorese are deciding to which country to migrate.

Although both official development assistance (ODA) and import volume are included in these models, it is unclear how they affect the results. In the pooled ordinary least squares (OLS) and instrument variables (IV) models, both variables have positive coefficients in the Tobit model, which may suggest a selection effect in nations that have historically been linked to migration. As a result, imports and ODA do not appear to consistently influence migratory patterns. When combined, these findings highlight the structural distinctions between Timor-Leste, a sending nation, and Korea, a receiving nation that actively welcomes migration through deeper economic links. In contrast, Jang et al. (2025) conclude that trade and ODA has a significant impact on migration to South Korea.

The differences in estimates using the Tobit, IV, and OLS methods suggest that the gravity model is sensitive to various specifications. The strength of the underlying gravity variables (GDP and geographic distance) across the estimators suggests a persistent underlying association between economic size, physical isolation, and migration behavior. However, the significant differences in the coefficients related to border and visa policies in the censored and linear models highlight the importance of appropriately

controlling for zero migration flows in the estimation methods.

Why South Korea?

This study provides in-depth analyses for South Korea using a snowball sampling survey, a non-probability sampling method that relies on social networks among respondents. This method was chosen because it can access scattered or hidden populations typically connected through social networks. According to Singleton and Straits (1999), the process involves a chain of referrals, proceeding as follows: After members of the target population are located, they are asked for the names and addresses of other members of the target population, who are then contacted and asked to name additional individuals, and so on. It is premised on the fact that members of the target demographic frequently know one another. In network sampling, persons who are first called to screen a probability sample of the general population are then asked to identify people in the target population who are socially related to them (for example, a friend, neighbor, coworker, or relative).

The snowball sampling and network sampling methods are particularly effective in reaching hidden or hard-to-reach populations, such as undocumented migrants, informal workers, and minority communities, because social ties among members tend to be close and familiar. In this context, approaching respondents through referrals or personal networks increases respondents' trust in the researcher, which is essential for obtaining valid and honest data. Moreover, these techniques facilitate faster and more cost-effective data collection compared to traditional probabilistic methods, especially when a suitable sampling frame is not available. As explained by Biernacki and Waldorf (1981), snowball sampling is not only efficient but also enables a deeper understanding of the social dynamics in respondents' networks.

Table 2*Regression Results for Bilateral Migration Flows Departing from Timor-Leste*

Variable	OLS1	OLS2	OLS3	IV1	IV2	IV3	Tobit1	Tobit2	Tobit3
Ln _{gdp}	0.300*** (-0.109)	0.249*** (-0.079)	0.299* (-0.158)	0.312*** (-0.108)	0.258*** (-0.077)	0.288* (-0.152)	0.004 (-0.228)	0.148 (-0.160)	0.005 (-0.177)
Ln _{pgdp}	-0.236 (-0.220)	-0.357** (-0.161)	0.469 (-0.591)	-0.234 (-0.214)	-0.660** (-0.155)	0.479 (-0.532)	-0.264 (-0.325)	-0.335 (-0.231)	1.208* (-0.438)
Ln _{distance}	-2.021*** (-0.296)	-1.516*** (-0.346)	-2.616*** (-0.841)	-2.011*** (-0.289)	-1.504*** (-0.336)	-2.615*** (-0.726)	-1.864*** (-0.587)	-1.333*** (-0.488)	-2.623** (-1.106)
Border		3.164*** (-0.228)	0.167 (-2.066)		3.175*** (-0.682)	0.164 (-1.787)		3.797*** (-1.281)	-0.266 (-2.385)
Visa		4.846*** (-0.411)	4.889*** (-0.219)		4.841*** (-0.350)	4.882*** (-0.990)		4.959*** (-1.328)	5.218*** (-0.259**)
Ln _{oda}			-0.001 (-0.104)			-0.004 (-0.096)			0.259** (-0.065)
Ln _{exp}			0.199** (-0.089)			0.201** (-0.083)			0.129** (-0.035)
Ln _{imp}			0.002 (-0.033)			0.002 (-0.291)			-0.038 (-0.015)
Constant	19.403*** (-2.745)	15.931***	14.880***	19.278***	15.793***	14.936***	21.723***	15.212***	8.650

Note. OLS, IV, and Tobit, respectively, stand for ordinary least squares, instrumental variable, and Tobit analyses. The dependent variable is the log-transformed number of migrants from Timor-Leste. *, **, and *** refer to the significance level at 10%, 5%, and 1%, respectively. The first three columns refer to the pooled OLS; the second three refer to two-stage least squares, where $\ln_{\text{population}}$ has been used as an instrumental variable of $\ln_{\text{gdp}}$; and the last three refer to panel Tobit (random effect). White heteroskedasticity-consistent standard errors are in parentheses.

This study's survey targeted Timorese workers residing in South Korea and was largely divided into four sections: personal information and demographics, migration experiences and motivations, economic status and employment details, and plans, including how long they had worked as migrant workers and their main reasons for migration. The questionnaire is provided at the end of the paper.

The empirical results support the gravity model's main assumptions: Migration is favored by economic attractiveness, measured by GDP, while distance exerts a negative effect. However, the significant positive coefficient of the dummy variable "visa" indicates that institutional structures and policies can significantly modify these relationships. In this context, South Korea's

Employment Permit System (EPS) has become a political instrument to minimize administrative conflicts and "effective distance" between Korea and Timor-Leste. Despite the geographical distance between the two countries, EPS minimizes practical difficulties for migration through transparent hiring procedures, standardized contracts, and guaranteed work outcomes. This structured regulatory environment supports the gravity model, which emphasizes institutional facilitation as the main determinant of migration. This model translates the potential for economic growth into effective migration. Our analysis of South Korea's economic growth potential demonstrates that governmental capacity and policy accessibility overcome geographical limitations, increasing economic attractiveness and making South

Korea an attractive tourist destination despite its geographical distance.

Responses to the "Why South Korea" survey reveal several distinct trends regarding the factors that push Timorese workers to migrate to South Korea. Government cooperation was cited by most respondents as the main facilitating factor, particularly between the governments of South Korea and Timor-Leste (through SEFOPE). Some participants repeatedly emphasized that they were able to operate in South Korea "because the two governments collaborate" or "through the government." This suggests that institutional factors, rather than impulsive or individually planned migration, are the main drivers of migration to South Korea. The

Employment Permit System (EPS) seems to be the main reason for this motivation, as it formalizes the routes for transferring workers between the two countries.

Another recurring issue was economic opportunity. Interviewees frequently mentioned "good pay," "good government opportunities," and "lack of jobs in my country." According to these statements, Timor-Leste does not offer many local job opportunities, while South Korea is perceived as a country with stable jobs and higher wages. Thus, migration is often seen as a way to improve living conditions and reduce poverty.

Table 3

Summary of Questionnaire Respondents

Category	Variable	%	Interpretation for Research Questions
Demographics	Male	96.8%	Reflects EPS recruitment into physically demanding sectors
	Age 25-34	67.6%	Core productive age group; matches labor-demand pull factors
Education and Skills	Senior high school	90.8%	Aligns with EPS skill/language requirements; supports "middle-migrant" profile
Migration and Motivation	Primary motive: Family financial needs	72.0%	Strongly supports economic household push factors
	Lack of domestic job opportunities	44.0%	Shows structural push factors consistent with gravity and labor-scarcity links
Sector of Employment	Manufacturing	59.6%	The sector with the highest EPS labor shortages matches Korean GDP and trade pull factors
	Fisheries	34.8%	Labor-intensive, high-demand sector driving migrant absorption
Income and Remittances	Income: KRW 2-3 million/month	72.0%	Confirms strong economic pull to Korea (macro-GDP effect)
	Remit 50-75% of income	52.0%	Indicates strong household reliance on migration
Working Conditions	Work > 60 hrs/week	64.4%	Reflects labor-intensive sectors that drive migrant demand
Integration	Language barrier	73.2%	Shows friction costs not captured by the gravity distance variable
Future Plans	Intend to continue working in Korea	95.2%	Indicates strong net benefits and sustained demand

Note. Field Survey 2025

Our findings highlight that most Timorese migrant workers in South Korea are young men with a high school education who migrate mainly to seek better financial opportunities and support their families. Although they face challenges, such as long working hours and language barriers, most work in the manufacturing or fishing sectors, regularly sending money home and expressing satisfaction with their jobs. Additionally, most plan to continue working in South Korea, which demonstrates the success and stability they have achieved during their migration.

More specifically, Table 3 shows that 96.8% of the respondents are male. As Korea's EPS recruitment focuses on physical labor in sectors like manufacturing and fisheries, most recruits are men. Additionally, Timorese cultural norms may also restrict female mobility, as its domestic policies and societal norms tend to associate women with domestic roles. In rural areas, traditional gender expectations often designate women as primary caretakers, which may limit opportunities for overseas employment. Families are also less willing to let daughters go abroad out of fear for their safety, particularly regarding harassment or exploitation in a male-dominated industry (International Labour Organization [ILO], 2014). Furthermore, Timorese women's opportunities to participate in these programs are limited by their lack of access to technical training and Korean-language learning, which are prerequisites for EPS selection. Timorese women's participation in international labor migration is lower than that of men due to gender disparities in education and vocational training, as well as the burden of domestic responsibilities traditionally assigned to women. Both governments and communities still tend to see migration as a male issue, especially when the work involves physical effort and high risk.

As previously noted, Korea's EPS is structured around industries with labor shortages, such as manufacturing, fisheries, and agriculture, as such industries are incredibly labor-intensive and face stigmas associated with them being '3D' jobs (dirty, dangerous, difficult). Korea also expresses preferences for male workers, as Korea believes they are physically stronger and more resilient for working longer hours. In addition, they are less likely to request leave for familial obligations such as maternal leave (Kim & Oh, 2012).

Table 3 also reveals that most respondents (59.6%) work in the manufacturing sector. Only 5.6% of workers are employed in agriculture, while the fishing sector employs 34.8%. These results indicate that the manufacturing industry offers the most employment opportunities for Timorese migrant workers in Korea, likely due to the increased demand for labor and an improved recruitment system provided by the EPS. On the other hand, two factors may contribute to the low participation rate in the agricultural sector: the number of contracts available and a lack of interest in this sector among Timorese workers.

In terms of education, 90.8% of migrant workers from Timor-Leste reported senior high school as their highest level of education. While the EPS targets "low-skilled" labor, individuals must also meet minimum thresholds in language, health, and basic aptitude, including literacy, numeracy, and the ability to navigate Korean work adaptation. As a result, the EPS often targets high school graduates (Respicio, 2023). Meanwhile, those who have attained university or higher education often find domestic employment or seek more prestigious migration channels than those provided by the EPS. This reflects the middle-migrant paradox (de Haas, 2019), where migration systems unintentionally stratify labor and select those at the intersection of these two ends

Regarding age, the survey results indicate that most migrant workers from Timor are in the productive age group, specifically, between 25 and 34 years old, indicating that the majority of Timorese migrant workers in Korea are young adults, the most economically and physically active age group for jobs in the formal sector, such as industry and fishing.

In terms of location, the cities hosting the most migrants from Timor-Leste are as follows: Daegu (43), Gwangju (38), Tongyeong (29), Jeju (19), and Busan (17). As the EPS places foreign workers in industries with worker shortages, with industrial work and fishing being among the largest industries facing worker shortages (Center for Global Development [CGD], 2023), industrial zones such as Daegu and coastal fisheries such as Tongyeong, Jeju, and Busan see the largest influx of migrant workers. These regions suffer from chronic labor shortages due to the lack of youth who accept such physically taxing, low-status positions. The government also

intentionally diverts migrants away from Seoul to avoid spatial concentration and prefers to distribute the foreign labor force across rural areas that are underpopulated and aging.

Table 3 also indicates that most Timorese migrant workers in South Korea are single, representing 58.8% of respondents, while 41.2% are married. Regarding employment status, 46.6% are regular workers who entered through formal legal channels, such as the EPS program; 26% were reintegration workers, meaning people who had previously worked in Korea and returned through authorized mechanisms; and 27.6% were considered illegal workers, which refers either to those who overstayed their visas or migrated outside of formal agreements. These data suggest that most migrants are young, single, and rely on organized pathways to find employment, although a significant portion remain undocumented.

Our findings regarding migrants' duration of stay are as follows: 47.6% have stayed for 3–5 years, which matches Korea's EPS limit of a three-year initial contract and two extensions, and afterward, legal stay is limited unless a marriage or special visa is acquired. Migrants enter on an E-9 visa with the EPS, which is valid for three years (Ministry of Employment and Labor [MOEL], 2022). Employers can apply for two consecutive one-year extensions, and after reaching this maximum, workers are prohibited from re-entry unless they acquire a different visa with marriage or employer sponsorship under E-7.

Regarding reasons to migrate, family needs were the most frequently cited, accounting for 72% of respondents, or 180 people. This indicates that many Timorese migrants prefer to earn money for their family members. The second most common reason was the lack of job opportunities in their country of origin, which was cited by 44%, or 110 respondents, indicating a lack of economic opportunities in Timor-Leste.

Additionally, 35.2%, or 88 respondents, noted that general economic issues, such as the need to increase income or alleviate poverty, were important factors. A small proportion of migrants stated that they were motivated by educational reasons or new work experience (18.6%).

Overall, this information indicates that the primary factors influencing the decision to migrate to South Korea are economic issues and family responsibilities. In a similar vein, McWilliam

(2015) pointed out that most Timorese see labor migration as a means of supporting their families, given the scarcity of jobs and economic opportunities in Timor-Leste. Thus, the South Korean work program is considered a safer legal alternative.

Regarding why migrants chose Korea over other East Asian countries or European countries, the predominant factor was the bilateral MOU between the two countries that has been in effect since 2009 and has enabled the structured deployment of Timorese laborers into EPS sectors. In addition, EPS wages are typically higher than those for other Southeast Asian options, as they are formalized via Korea's minimum wage and contract system (Wigglesworth, 2017). According to our survey data on Timorese migrant workers' monthly income in South Korea, the majority make between KRW 2,000,000 and KRW 3,000,000. This income level is the most prevalent for Timorese workers under the EPS program, with 180 people, or 72% of respondents. A lower percentage, 20.4% (51 people), reported that they make more than KRW 3,000,000 a month, which might be due to longer workdays or overtime.

South Korea's Employment Permit System (EPS) is also extremely transparent and clear in terms of its quotas, especially in contrast to the unpredictable and slow permit systems of Japan and China, which have not developed a formal agreement with Timor-Leste. Migrants report that Korea's process from application to departure takes less than a year, which is significantly shorter than that for other East Asian countries or European routes. For Portugal specifically, despite Timor-Leste's colonial history, most citizens do not hold Portuguese passports. Additionally, because European migration systems require high-skilled qualifications or citizenship, Timorese labor migrants find it easier to migrate to other countries.

Notably, South Korean popular culture, which includes K-dramas, K-pop, and Korean cuisine, also known as the Hallyu wave, positively shapes migrants' perceptions of Korea, elevating Korea's appeal as a workplace and a place to live (Kang, 2023). Indeed, people's migration objectives and decisions are frequently influenced by the media and entertainment industries' romanticized portrayals of life in the destination nations.

Significant non-economic reasons for migration include the Korean media's portrayal of Korea as a modern, safe, and culturally rich nation for many young people in Southeast Asia and developing nations.

Our findings also demonstrate that most Timorese migrant workers in South Korea (86%, or 215 respondents) regularly send money back to their country. This confirms the strong economic link between migrant workers and their families and the importance of remittances as the main reason for migration. Meanwhile, 13.2% (33 respondents) said they sent money occasionally; this could be due to changes in personal expenses, unstable income, or changing family needs.

Similarly, more than half of Timorese migrant workers in South Korea send a significant portion of their income home. Specifically, 52%, or 130 respondents, reported that they sent between 50% and 75% of their monthly income to their families in Timor-Leste, which demonstrates the strong financial commitment of migrant workers to supporting their families, often prioritizing the needs of their smaller groups. Carling (2008) explain how the decision to send money is influenced by a combination of selfish impulses and social expectations, including the requirement to help one's family.

Regarding hours worked per week, our survey results indicate that most Timorese migrant workers in South Korea work many hours a week, often more than their usual workload. Specifically, 35.6% of respondents (89 people) reported working more than 70 hours per week, while 28.8% of respondents (72 people) reported working between 60 and 70 hours. These numbers indicate that over 64% of the workers surveyed work long hours. This is likely due to increased demand in manufacturing, fishing, and other labor-intensive sectors; indeed, manufacturing, agriculture, and fishing are among the industries where workers usually work past the hours that are permitted. Today, many Timorese migrant workers rely, at times, on extraordinary cash, in addition to financial obligations and group obligations, to send money. This practice raises concerns about workers' rights, fatigue, and the work–life balance issues that are commonly faced by migrant workers in physically demanding jobs (Baek et al, 2024). According to a prior study, this tendency is

widespread among Korean migrant laborers (International Labour Organization [ILO], 2014).

Lastly, the survey results reveal that the vast majority of Timorese migrant workers working in South Korea feel adequately prepared to perform their assigned duties, as 85.6% of the 214 respondents reported having received sufficient training to perform their duties. This implies that they are effectively equipped with the required abilities through pre-departure or on-the-job training made available through the EPS system. Despite a high level of job preparation, however, language remains a significant barrier in everyday life. Approximately 73.2% of the respondents (183) reported that they had difficulty speaking Korean, while only 26.8% (67) reported no difficulty. This implies that even if most workers receive training for certain positions, many nevertheless deal with more general communication issues in their day-to-day interactions with others, the healthcare system, and public services. These results highlight the importance of job-specific training as well as practical Eastern culture and language training in improving the overall integration and well-being of migrant workers (Min et al., 2023).

According to the gravity model, international migration patterns are significantly influenced by structural factors such as the destination country's economic size, geographical distance, trade relations, and labor and visa policies. Survey results and sectoral data suggest that these macroeconomic changes are also reflected in individual decisions. First, destination countries with a high GDP generate large remittances due to high wages and high labor demand, providing strong economic incentives for migration. Second, the concentration of Timor-Leste's workers in the fisheries and industry sectors coincides with the shortage of workers in these sectors. Third, migrants face significant challenges, including administrative barriers, geographical distance, increased transportation costs, and language barriers.

Finally, programs such as the Employment Permit System (EPS), which use sector-specific recruitment methods, reveal that Timor-Leste's main trading partners often serve as simultaneous employers, as shown by the correlation between bilateral migration and export flows. Econometric findings and fieldwork support the theoretical foundations of the extended

gravity model, consistently showing how family-level livelihood strategies and macroeconomic opportunities interact to drive Timor-Leste's migration.

A further interview with migrants from Timor-Leste in South Korea and their families allowed for a deeper understanding of their circumstances. They came with an E-9 visa, but in most cases, it had already expired or they had run away from the system, making them undocumented workers, and their families had come to Korea on a tourist visa or also with an E-9 visa, which had also already expired. Most of them had originally come to Korea in the fishing industry, but due to the harsh conditions and discriminatory bosses, all ended up leaving the sector to work in manufacturing, and in that process, they ended up leaving the EPS system, thereby becoming vulnerable undocumented workers without legal protection, including minimum wage and national health insurance.

CONCLUSION AND RECOMMENDATIONS

This study uses an extended gravity model and new survey data on Korean workers to identify the factors driving Timorese migration. The results validate the main mechanisms that migration-gravity theory predicts: Greater geographic distance decreases migration flows, but larger destination economies draw more migrants. Mobility patterns are further shaped by trade linkages, border proximity, and visa regimes. According to this data, Korea is a unique case where administrative and informational barriers to migration have been significantly reduced, thanks to the systematic institutional environment created through the EPS, in addition to economic factors. This interpretation is supported by research showing that remittance demand, reliable employment channels, and high-income influence migrants' decisions.

The recommendations of the short-term program include improving the Ministry of Labor and Employment's (EPS) contract monitoring and labor protection procedures, strengthening skills development to meet labor market demands in specific sectors, and improving Korean language

and culture education before departure. Given the high reliance on remittances, policies to reduce the costs of these remittances and increase financial literacy would further contribute to the well-being of families. The Korea Human Resources Development Service (SEFOPE) could collaborate with Korean employment agencies to reduce costs associated with informality and ensure transparency in recruitment activities.

Longer-term strategic implications include managing labor migration in Timor-Leste. Vulnerabilities arising from reliance on a single route can be mitigated by diversifying destination countries, investing in local skills development, and establishing a consistent national labor migration policy. As South Korea develops its policy on foreign workers in the 3D (processing) industry, Timor-Leste can negotiate more comprehensive skills partnerships, strengthen vocational training, and explore migration opportunities for semi-skilled workers.

There are several caveats. The survey's representativeness is limited by the use of snowball sampling and it would be desirable if the survey could be expanded to other major destinations countries, like Portugal and Australia. Other empirical methods could also be employed for robustness check. All of these will be reserved for further studies.

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APPENDIX

Questionnaire on Timorese Labor Migration

Section A. Demographic and Personal Information

Question number	Questions	Response type
A1	What is your age?	☐ ≤20 ☐ 20-24 ☐ 25-29 ☐ 30-34 ☐ 35-39 ☐ 40-44 ☐ 45 and over
A2	What is your Sex?	☐ Male ☐ Female ☐ Others
A3	What is your highest level of education?	☐ Junior high school ☐ Senior high school ☐ Undergraduate
A4	What is your marital status?	☐ Single ☐ Married ☐ Divorced
A5	What is your category of workers?	☐ Regular worker ☐ Re-entry ☐ Illegal worker
A6	In which city are you working?	
A7	Duration of stay?	☐ 0-2 years ☐ 3-5 years ☐ 6-8 years ☐ 9 and over years

B. Migration experience

Question number	Questions	Response type
B1	Were you employed before migrating?	☐ Yes ☐ No
B2	Country of your most recent migration	
B3	Have you ever worked overseas before?	☐ Yes ☐ No If Yes, where: _____
B4	What are your main reasons for migrating? (multiple choice)	☐ Economic ☐ Family ☐ Education ☐ To gain new work experience ☐ Due to a lack of job opportunities in your home country.
B5	What are your main reasons to choose South Korea, in particular, over other countries?	Open-ended
B6	Why didn't you choose Japan or China?	Open-ended
B7	Many of the Timorese people went to work in Europe. Why didn't you go to work in Portugal and the UK?	Open-ended

C. Economic status and Employment details

Question number	Questions	Response type
C1	What is your monthly income?	☐ KRW 500.000 – 1,000.000 ☐ KRW 2,000,000 – 3,000.000 ☐ > KRW 3,000.000
C2	Did you send money back to your country?	☐ Yes ☐ No
C3	How much of your income do you send money back home?	☐ 0% ☐ 1-25% ☐ 25-50% ☐ 50-75%
C4	How many hours do you work per week?	☐ 45-55 hours ☐ 56-65 hours ☐ 66-75 hours ☐ >= 76 hours

Question number	Questions	Response type
C5	What type of job are you working?	☐ Agriculture ☐ Fisheries ☐ Manufacture ☐ Domestic workers
C6	Do you receive adequate training for your job?	☐ Yes ☐ No
C7	Do you face any language barriers in daily life?	☐ Yes ☐ No

D. Future Plans and Suggestions

Question number	Questions	Response type
D1	Do you plan to continue working as a migrant worker?	☐ Yes ☐ No
D2	Do you feel your current job helps you achieve your goals?	☐ Yes ☐ No
D3	What suggestions do you have for improving the experience of migrant workers in South Korea?	Open-ended

This survey has been conducted in July, 2025. A further in-depth interviews were also conducted on the 13th December, 2025 in Daegu, Republic of Korea.