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Up-skilling Thai repatriation workers for Malaysian palm oil agricultural sector: a labour migration strategy under the IMT-GT framework

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Malaysia's palm oil industry is facing a severe labor shortage, estimated to cost the industry US\$4.6 billion annually. Meanwhile, Thailand's southern border provinces (Yala, Pattani, and Narathiwat) are experiencing significant unemployment among returning migrant workers. This research explores how similar challenges can be addressed through complementary solutions within the frameworks of the ASEAN Economic Community (AEC) and the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT). Using qualitative research methods, data collection included in-depth interviews, focus group discussions, and document analysis. The informants were divided into three groups: 12 central and local government officials; 60 Thai repatriation workers residing in the three southern border provinces; and 8 Malaysian entrepreneurs owning palm oil plantations and factories located near the Thai-Malaysian border. The study examines the required labor skills for Malaysian palm oil plantations, the readiness of Thai workers, and the potential social and economic impacts of labor migration. The results indicate that 60% of the returning Thai workers in the sample group expressed a strong interest in working in the palm oil industry. The study found significant wage disparities (THB 15,000 per month in Malaysia compared to THB 4,000–5,000 in Thailand), potentially generating an average annual remittance of THB 120,000. However, the research identified several major obstacles, including outdated bilateral agreements, inadequate training infrastructure, and a lack of certification systems. Based on these findings, the research proposes a five-module training curriculum integrating theoretical instruction (40%) with 4–6 weeks of practical field training (60%), aligned with Malaysian standards and the IMT-GT framework. Policy recommendations emphasize the need to improve memoranda of understanding, sector-specific frameworks, certification systems, and monitoring mechanisms. Analysis suggests that effective implementation of this model could address Malaysia's labor shortage, create significantly higher-paying employment opportunities for Thai workers, and contribute to peacebuilding in conflict-affected regions.

KEYWORDS

IMT-GT, labor migration, repatriation workers, skills development, Thailand-Malaysia

1 Introduction

Palm oil cultivation is an important agricultural commodity for the economies of Indonesia, Malaysia, and Thailand. Indonesia is a leader in the global palm oil industry, accounting for about 60% of the market, while Malaysia is the second-largest producer, with a market share of 25% (Malaysian Palm Oil Board, 2024; Dharmapalan et al., 2024). Malaysia's palm oil industry, the world's second-largest producer with an estimated cultivated area of 5.87 million hectares and an annual output of 19.5 million tons, is facing a severe labour shortage that threatens its sustainability. The Malaysian palm oil industry relies heavily on foreign labor, with migrants accounting for 70%–80% of the plantation workforce (Kaur, 2014). Research on the palm oil industry has shown its vulnerability to fluctuations in labor supply. Production forecasts and profit models consistently identify labor availability as a key variable affecting improved yield and harvest efficiency (Euler et al., 2017). The labor-intensive nature of key operations – particularly fresh fruit bunch (FFB) harvesting and field maintenance – limits the sector's ability to replace labor capital. The persistent labor shortage results in an estimated US\$4.6 billion in annual economic losses from unharvested fruit (Crowley, 2020). Increasingly, local workers in Malaysia are avoiding plantation work, perceiving it as physically demanding, socially unacceptable, and with limited career advancement opportunities—a characteristic commonly referred to as “3D work” (dirty, difficult, dangerous) (Suhana et al., 2022; Abdullah et al., 2016). This structural characteristic makes understanding labor dynamics essential for both industry sustainability and policy formulation.

Labor migration between Thailand and Malaysia is an important element of the widely accepted but not yet sufficiently studied Southeast Asian migration system. Historical models reflect economic inequality and socio-cultural connections, particularly in border areas where ethnic and religious ties spread across the country (Liow, 2009; Joll, 2010). The southern province of Thailand (Yala Pattani Narathiwat) shares a border with the northern state of Malaysia. Studies of Thai-Malaysian labor migration indicate diverse motivations and patterns of movement. Huguet and Punpuing (2005) provided a comprehensive analysis of Thai labor migration to Malaysia, noting that agriculture, construction, and service sectors were the main sources of employment. Their results showed that migration from southern Thailand differs from that of other Thai regions, with a higher proportion of Malay-Muslim workers and stronger family and community networks that facilitate movement and settlement. Wage differentials are a major driver of migration economics. Studies consistently show that Malaysian wages for comparable jobs are three to four times higher than Thai wages, creating a powerful incentive for cross-border employment (Chalamwong and Prugsamat, 2009). These differentials persist at all skill levels, although the absolute wage gap has widened for higher-skilled jobs. Remittances from Malaysian employment are an important source of income for Thai border communities, with a multiplier effect on the local economy through consumption and investment (Osaki, 2003). Adams and Page (2005) estimated that a 10% increase in per capita remittances would reduce poverty by 3.5%, with education and health being the main spending sources.

The intersection of severe labor shortages in Malaysia's palm oil industry and the employment challenges faced by Thailand's southern border provinces presents both dilemmas and emerging opportunities (Namburi and Raksudjarit, 2024). Historical patterns of cross-border

labor movement, combined with post-COVID-19 unemployment challenges in Thailand's southern border provinces, create opportunities for systematic labor cooperation (Seedama and Sirisunhirun, 2019; Directorate of Security Policy and Plan, Office of the National Security Council, 2022; Government Public Relations Department, 2023). Thai workers repatriated during the COVID-19 pandemic face limited local employment opportunities due to regional security issues that hinder substantial investments. Meanwhile, Malaysia's oil palm plantations are facing labor shortages, despite offering wages three to four times higher than Thailand's current labor costs (International Labour Migration, 2024). The convergence of severe labor shortages in Malaysia's palm oil industry and the unemployment challenges facing Thailand's southern border provinces presents both inexhaustible conditions and potential opportunities. However, there are various barriers to facilitating efficient labor mobility. First, a large number of potential Thai workers lack the skills needed to grow palm oil, particularly in harvesting methods and the use of modern equipment (International Labour Organization, 2023). Second, existing labor agreements between Thailand and Malaysia, established more than a decade ago, need to be updated to effectively address current challenges (Kaur, 2018). Third, systematic training programs that combine theoretical knowledge with practical skills development are still significantly lacking in development in the southern border provinces (Dongnadeng et al., 2022).

Thailand and Malaysia have a unique relationship as neighbors and members of the Association of Southeast Asian Nations (ASEAN), bound by geographical proximity, cultural ties, and a more integrated economic framework within ASEAN. Both countries are committed to achieving the ASEAN Economic Community (AEC), which aims to facilitate the movement of goods, services, investment, and skilled labor, and the free movement of capital across the region (Association of Southeast Asian Nations, 2015). In addition to the broader ASEAN framework, Thailand and Malaysia have also developed additional bilateral and subregional cooperation mechanisms to address specific labour mobility needs and economic development challenges. The Indonesia-Malaysia-Thailand Economic Triangle Project (IMT-GT), established in 2013, is an important sub-regional cooperation framework aimed at accelerating economic development in the least developed border areas of the three countries (Asian Development Bank, 2017). IMT-GT covers 14 provinces in southern Thailand, eight states in northern and peninsular Malaysia, and 10 provinces in Sumatra, Indonesia. The IMT-GT Implementation Blueprint 2022–2026 provides an institutional framework for facilitating economic integration, including provisions on labor mobility and skills development (Centre for IMT-GT Subregional Cooperation, 2022). However, empirical research examining how IMT-GT mechanisms specifically facilitate labor migration for plantation employment remains limited.

Although there is extensive research on labour migration and regional cooperation frameworks, as mentioned above, many important research gaps remain unaddressed in the context of labour migration between Thailand and Malaysia. Firstly, although existing research documents patterns of migration common to Thailand and Malaysia (Huguet and Punpuing, 2005; Chalamwong and Prugsamat, 2009), there is a sector-specific analysis of the labour needs of the palm oil industry and the skill-matching approaches of potential Thai transnational workers from relatively limited southern border provinces. Second, although human capital theory has been widely applied to the study of migration, its application in conflict-affected regions, where traditional assumptions about a stable economic environment

and educational infrastructure do not hold, has not yet been sufficiently explored. Third, existing research on the regional labour mobility frameworks (ECOWAS, MERCOSUR) primarily focuses on formal institutional structures but provides insufficient empirical evidence on how sub-level cooperation mechanisms, such as IMT-GT, can be implemented to facilitate semi-skilled labour migration. Fourthly, while the importance of skills certification for migrant workers is acknowledged (Organisation for Economic Co-operation and Development, 2020; International Labour Organization, 2021), a practical and specifically designed training curriculum model for the agricultural sector within the IMT-GT framework is still lacking. Finally, the link between labor migration, skills development, and peacebuilding in conflict-affected regions has been theoretically discussed (Collier and Hoeffler, 2004), but empirical verification through sector-specific case studies in Southeast Asia is still needed.

2 Research objective

This research aims to assess the essential workforce competencies required by Malaysian palm oil plantation owners for both their plantation and factory operations. Second, it assesses the readiness and propensity of repatriated Thai workers from the southern border provinces to work in this sector. Third, it examines the economic and social implications associated with promoting Thai labor migration into the Malaysian palm oil industry. Finally, it supports policy recommendations to facilitate legal labor migration within the Indonesia-Malaysia-Thailand Trilateral Economic Zone, leading to a more efficient regional labor mobility mechanism.

3 Theoretical framework

3.1 The theory of human capital

Human capital theory provides a fundamental understanding of the role of education, skills development, and training in enhancing individuals' productivity and economic value in the labor market. First formulated by Becker (1964) and Schultz (1961), the theory views knowledge, skills, and abilities as forms of capital accumulated through conscious investment in education, vocational training, and work experience. These investments increase labor productivity, raise wages, create employment opportunities, and enhance overall economic mobility (Barro, 2013). In the context of labor migration, human capital development is particularly important, as migrants often face structural disadvantages, skills mismatches, and limited training opportunities in their host country (Chiswick and Miller, 2007). From a human capital perspective, targeted training, such as vocational skills development, language training, digital literacy programs, and skills-based certifications, is considered a strategic investment that enhances migrant workers' productivity, competitiveness, and mobility toward higher-value employment (Becker, 1993; Sweetland, 1996).

This study extends traditional human capital theory by examining three context-specific characteristics that call for theoretical adjustments. Firstly, the environment of conflict and human capital formation. The southern border provinces of Thailand face persistent

security challenges that fundamentally alter the dynamics of human capital accumulation, unlike the stable economic environments where traditional theories apply. Conflict-affected areas have experienced limited local investment opportunities, thus reducing the return on education (International Crisis Group, 2017); The interruption of educational infrastructure hindered the establishment of early human capital; At the same time, uncertainty causes high risks in employment decision-making and psychological obstacles to skill investment; These conditions require a reinterpretation of human capital investment—not only to improve productivity, but also to reduce conflicts; Overseas job opportunities are an option to avoid domestic economic stagnation, while remittances create peace benefits through families (Collier and Hoeffler, 2004; Justino, 2012).

Secondly, Informal Labor Markets and Skill Transferability, traditional human capital theory emphasizes formal educational qualifications and certified skills. However, labor migration in Southeast Asia largely occurs through informal channels, where skill recognition arises from demonstrably proven competence rather than formal certification; training occurs through apprenticeships and on-the-job learning; wages reflect bargaining power and network access, along with skill level; and legal status significantly impacts human capital returns (Lindquist et al., 2012). This informality requires an expanded theoretical framework to incorporate “practical human capital,” skills demonstrated through performance but lacking formal certification (Hall, 2011). The training program proposed in this research addresses this gap through a certification system that provides formal recognition of practical competence.

Thirdly, Asymmetric Bilateral Relations and Bargaining Power. Labor migration between Thailand and Malaysia occurs under unbalanced power relations due to the following factors: Regulations in the destination country unilaterally dictate the working conditions of migrant workers; the bargaining power of the source country remains limited, even as a labor supplier; individual migrant workers lack collective bargaining mechanisms; and information imbalances favor employers and intermediaries. These power imbalances mean that investment in human capital may not fully translate into increased wages if institutional frameworks do not adequately protect workers' rights (Ruhs and Martin, 2008). Therefore, effective skills development requires complementary institutional reforms to address these power imbalances, which the IMT-GT framework can facilitate through its multilateral governance structure.

This study demonstrates that the predictability of human capital theory—measurable returns on systemic skill investments—is evident even in the challenging context of conflict, informality, and power imbalances, but institutional reinforcement is required. Specifically, skills training must be integrated with certification mechanisms that connect the formal and informal sectors—the IMT-GT regional governance framework providing the institutional infrastructure to generate returns on human capital investments. Migration strategies for human capital accumulation and local opportunities remain crucial under the constraints of conflict.

3.2 Comparative regional labor corridors

Regional labor mobility frameworks demonstrate differing institutional designs to address similar challenges in skills development, labor protection, and economic integration. The ECOWAS (Economic Community of West African States) Agreement on Free Movement allows citizens to enter, reside, and establish businesses in member

states. This framework is characterized by a gradual transition from visa exemptions to the right to establish businesses, limited success due to weak enforcement and persistent informal migration, minimal requirements for skills certification or training coordination, and an emphasis on political integration rather than economic labor management (Adepoju et al., 2010).

The MERCOSUR group in South America has developed a Residence Agreement (2002) to facilitate labor mobility within the region, including the following measures: nationals of member states are granted temporary residence rights for 2 years based solely on their nationality. There are established pathways that allow individuals to obtain permanent residence. The agreement upholds the principles of equal treatment in working conditions for all residents. However, the agreement still faces implementation challenges and offers limited scope for skill development (Acosta and Freier, 2015).

Compared to ECOWAS and MERCOSUR, the IMT-GT cooperation framework has the following distinctive features. The framework focuses on economically underdeveloped border regions at the sub-regional level rather than on entire countries. It uses sector-specific approaches that enable targeted intervention, such as in palm oil, tourism, and halal products. The primary focus is on prioritizing economic development over political integration. The framework allows for flexible implementation, including bilateral agreements within the tripartite cooperation framework. It also explicitly integrates skills development and training coordination into its work plan. However, the IMT-GT cooperation framework also has limitations. It lacks binding legal frameworks compared to ECOWAS protocols. There has been limited progress in achieving mutual skill certification. The framework primarily focuses on the movement of highly skilled labor, neglecting semi-skilled and low-skilled workers. It also relies heavily on national political will for implementation. This comparative analysis reveals that successful regional labor mobility requires balancing comprehensiveness with implementability. ECOWAS's ambitious free movement remains largely unimplemented, while MERCOSUR achieved greater practical progress through more modest, enforceable commitments. IMT-GT's sector-specific, subregional approach offers a pragmatic middle ground potentially applicable to palm oil labor migration.

3.3 Migration governance and regional institutions

Understanding the role of IMT-GT in labor migration requires consideration within the broader context of migration governance theory, particularly the concepts of multi-level governance (Jurje and Lavenex, 2014), informal institutions, and policy diffusion. Migration governance operates at multiple levels: global (ILO Conventions), regional (ASEAN), sub-regional (IMT-GT), bilateral (Thailand-Malaysia Memorandum of Understanding), and local (provincial-level implementation). Scholten (2020) states that effective migration governance requires coordination at these various levels, each addressing different challenges. At the global level, normative principles and standards are established. At the regional level, framework agreements and political obligations are formed. At the sub-regional level, context-based implementation mechanisms are adopted. At the bilateral level, specific implementation procedures are determined. At the local level, service provision and integration are carried out.

IMT-GT as a “Linking Institution Beyond Multilevel Governance.” Although the literature on multilevel governance (Hooghe and Marks,

2003; Scholten, 2020) identifies challenges in vertical coordination, there is a lack of theory on the necessary horizontal and vertical linkages within a fragmented migration system. This research therefore presents the concept of a “linking institution,” an intermediate structure serving three distinct functions absent in both regional frameworks and bilateral agreements: Vertical translation: Translating abstract ASEAN obligations into sector-specific protocols (e.g., palm oil labor standards) without formal treaty amendments; Horizontal coordination: Facilitating the dissemination of trilateral policies in cases where bilateral agreements create regulatory fragmentation (Thailand-Malaysia MOU 2003, 2013 versus Indonesia-Malaysia Agreement); Experimental governance: Enabling pilot projects (certification systems, training modules) with less political risk than ASEAN-level reforms, creating a “regulatory testing ground” for innovation (Sabel and Zeitlin, 2012).

Unlike Rüländ's (2014) “informal institutionalism,” which emphasizes process flexibility, the linkage institutional framework prioritizes functional positioning—strategic occupancy of governance gaps. This is important because regional frameworks (ASEAN) create norms but lack enforcement; bilateral agreements provide enforcement but create disunity; linkage institutions (IMT-GT) enable coordinated action without relying on supranational authority. Recent research on migration adaptation Zetter and Ruauel (2016) and Betts et al. (2022) show that migration governance in vulnerable contexts requires “adaptive institutions” capable of responding to fluctuating security, economic, and demographic changes. The informal structure of the IMT-GT enables adaptability—such as adapting training content to the changing needs of the palm oil industry or to security conditions in southern Thailand—which is impossible under rigid bilateral treaties.

3.4 Migration for adaptation

Recent research has adapted a new concept of migration from conflict zones, not just displacement, but as an adaptive lifestyle strategy (Black et al., 2011; McLeman, 2018). This perspective is consistent with the “migration for adaptation” framework that has emerged from climate and conflict studies. Gemenne and Blocher (2017) and Adger et al. (2020), which states “Migration for adaptation” involves purposeful mobility to distribute sources of income and reduce the vulnerability of households. Skills investment becomes adaptability—training increases flexibility in dealing with an uncertain labor market. Remittances serve as a recovery mechanism—transferring resources to conflict-affected households while maintaining local relationships. In the context of Southern Thailand, labor migration to Malaysia represents a peacebuilding model based on employment (Justino et al., 2013), an economic opportunity that reduces the incentive to recruit labor into conflict while simultaneously avoiding permanent displacement. This differs from forced migration or refugee frameworks because it maintains decision-making power: migrants retain control over their migration decisions. Cyclicity: Cross-border ethnic relations facilitate continued repatriation. Skills mobility: Investment in human capital remains valuable in both origin and destination contexts. Crucial integration: This adaptive-migration perspective explains why traditional human capital theories need revision. In conflict environments, investment in skills serves two purposes: increasing productivity (a traditional return) and building household resilience (an adaptive return). This proposed IMT-GT training framework quantifies this by issuing transferable certificates valid regardless of the laborer's location, thereby promoting adaptive

migration over permanent displacement. Recent empirical research by [Onder et al. \(2024\)](#) on Sub-Saharan conflict zones and [Koser and Martin \(2020\)](#) on prolonged displacement support this. This demonstrates that formal skills certification systems significantly improve adaptability by enabling migrants to move between the informal and formal sectors as stability and economic conditions change.

3.5 Theoretical contributions of this study

This study’s theoretical contributions emerge through iterative alignment between conceptual frameworks and empirical findings (see [Table 1](#)):

Theoretical Synthesis: The convergence of conflicting contexts, informal labour markets, and bilateral power imbalances creates regulatory gaps that neither regional frameworks and bilateral treaties can adequately address. Linkage institutions implemented through adaptive migration governance will be the missing infrastructure for investing in human capital to deliver returns in a fragile and out-of-system environment. The concept’s framework extends beyond Southeast Asia to any migration route characterized by the fragility of the country of

origin. Unofficial destination countries and bilateral power imbalances (e.g., Central America-Mexico, Sahel-North Africa, Myanmar-Thailand).

4 Methodology

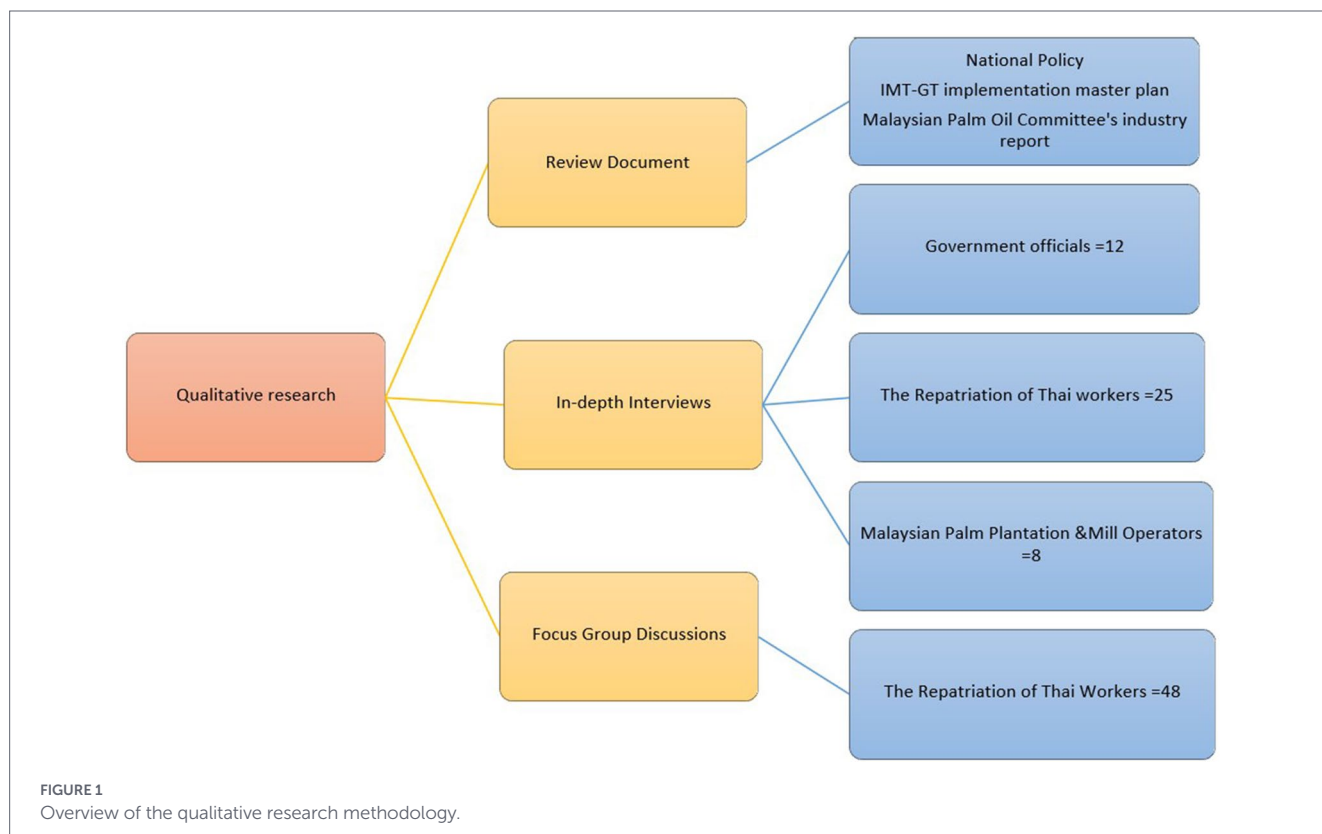
This investigation employed a qualitative research framework and multiple data collection methods to gain a deep understanding of the phenomenon. A qualitative approach was considered most appropriate given the exploratory nature of the research and the need to capture complex perspectives from diverse stakeholder groups ([Figure 1](#)).

4.1 Population and study sample

The sample for this study comprised three primary stakeholder groups, each selected using purposive sampling to ensure the inclusion of well-documented case studies. The first group consisted of 12 government officials representing various relevant agencies. This

TABLE 1 Integrated theoretical framework and empirical application.

Theoretical component	Empirical manifestation	Analytical integration
Modified human capital theory	Workers report skills underutilization due to lack of certification	Training program design incorporates certification mechanisms bridging formal-informal sectors
Bridging institution framework	Bilateral MOUs fail to address training standardization	IMT-GT positioned as trilateral coordination mechanism for sector-specific protocols
Migration as adaptation	Remittances used for conflict mitigation, not just consumption	Skills training framed as resilience-building, not merely productivity enhancement



group included representatives from the Department of Labour, the Foreign Workers Administration Office, the Labour Offices of Yala, Pattani, and Narathiwat provinces, and the Provincial Labour Skills Development Institute. Each official presented unique insights from their jurisdiction and administrative roles. The second group consisted of Thai workers who had returned to Thailand, gathered through both individual interviews ($n = 25$) and focus group discussions ($n = 48$). The selection focused on individuals who had previously worked in Malaysia across various economic sectors and currently resided in the three southern border provinces. The sample reflected the region's demographic diversity, with the majority identifying as Thai-Malaysian (78%) and a smaller proportion as Thai-Buddhists (22%). Participants were aged between 22 and 54 years (average age 35.6 years) and comprised 68% male and 32% female. Work experience in Malaysia spanned various sectors, including oil palm plantations, construction, manufacturing, and services. Educational levels varied, with the majority having completed secondary education.

The third group consisted of Malaysian oil palm plantation entrepreneurs. The study involved eight participants, including plantation managers in Kedah, Perlis, and Perak, as well as supervisors of palm oil factories. These palm plantations ranged in size from 50 to 500 hectares and were located within a 100-kilometer radius of the Thai-Malaysian border. All participants had at least 5 to 15 years of experience working with Thai labor. To identify Malaysian respondents, the researchers used snowball sampling, as there was no official database listing palm plantation operators that employed Thai workers. Initial contacts were made through provincial labor offices in Thailand, and subsequent participants were selected through internal industry referrals. This approach allowed access to knowledgeable and experienced stakeholders on both sides of the border (see Table 2).

4.2 Data collection method

First, the analysis of research documents involves an in-depth review of documents related to labor migration and the palm industry. The main documents include the national policies of Thailand and Malaysia, including bilateral labor agreements in 2003 and 2013. The analysis also

covers the strategic documents from the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT), especially the implementation master plan from 2025 to 2026. The Malaysian Palm Oil Committee's industry report covers the period from 2026 to 2030 and provides an in-depth analysis of current industrial development. Therefore, the review includes academic literature focusing on labor migration.

In-depth, semi-structured interviews were the primary qualitative tool for gathering sensitive perspectives from each stakeholder group. Interviews were conducted in Thai or Malay, depending on the participant's preference, and all interviews were professionally audio-recorded (with consent) and transcribed for accuracy. The interviews explored topics tailored to each group. Workers were asked about their previous experiences in Malaysia, the skills they considered most important, and the challenges they faced. Employers discussed their desired abilities and compared Thai workers to other workers. Government officials were asked about key obstacles to legal labor migration and which policy changes they considered most effective. For reproducibility, the interview questionnaires covered key issues for all stakeholders, including skills and training needs, economic factors such as wages and remittances, policy and regulatory issues, social and cultural influences, and the role of institutional frameworks such as IMT-GT and bilateral agreements. For Focus Group Discussions, six groups were conducted with returning Thai workers in the three southern border provinces, with two groups in each province. Each group consisted of 6–10 participants, making the discussions lively yet manageable. Moderated discussions, using a structured approach, encouraged participants to share their experiences working in Malaysia, the challenges and coping strategies they developed, perspectives on training needs, employment preferences, and the broader impact of migration on their communities.

4.3 Data analysis

Qualitative data analysis was conducted using a systematic thematic analysis approach, as described by Braun and Clarke (2006). This process unfolded over several structured phases, each contributing to a comprehensive understanding of the data. The analysis began with

TABLE 2 Participant demographics by stakeholder group.

Stakeholder group	Sample size	Sampling method	Key characteristics
1. Government officials	12	Purposive	Representatives from: <ul style="list-style-type: none"> • Department of Labour • Foreign Workers Administration Office • Provincial Labour Offices(Yala, Pattani, Narathiwat) • Provincial Labour Skills Development Institute
2. Thai repatriation workers	- Individual interviews: 25 - Focus groups: 48	Purposive	<ul style="list-style-type: none"> • Age: 22–54 years • Gender: 68% male, 32% female • Ethnicity: 78% Thai-Malaysian, 22% Thai-Buddhist • Previous work sectors: Oil palm plantations, construction, manufacturing, services • Education: Majority secondary education • Location: Three southern border provinces
3. Malaysian employers	8	Snowball	<ul style="list-style-type: none"> • Locations: Kedah, Perlis, Perak (within 100 km of Thai-Malaysian border) • Plantation sizes: 50–500 hectares • Experience with Thai labor: 5–15 years

familiarization, during which the researchers reviewed all transcripts and noted initial patterns. In the coding phase, data were systematically labeled using NVivo 12 software, both deductive and inductive codes. Any coding discrepancies were discussed, and the framework was refined before coding the remaining data. Themes were then developed from the coded data and refined through review. Finally, several key themes were identified. Prominent themes identified: Skills requirements (technical, physical, supervisory), Readiness factors (previous experience, transferable skills, motivation), Economic considerations (wage differentials, remittances, household impacts), Policy barriers (outdated agreements, certification gaps, training infrastructure), Social impacts (status, family wellbeing, community development), and Gender dimensions (mobility constraints, access to training, family responsibilities).

Data from multiple sources (interviews, group discussions, documents) were systematically compared to enhance reliability. Consistent findings across sources strengthened confidence in the results, while divergent outcomes prompted an in-depth analysis of contextual factors underlying the differences.

4.4 Ethical considerations

The Institutional Research Ethics Committee of Walailak University approved this research methodology. Before participating in interviews or group discussions, all participants provided informed consent. Throughout data collection, analysis, and reporting, strict confidentiality and anonymity were maintained. Participants were informed of their rights to withdraw from the study at any time without any consequences. Data were securely stored, and access was restricted solely to the research team.

5 Results

5.1 Labor skills requirements in Malaysia's palm oil sector

5.1.1 Plantation level

Firstly, cultivation capabilities must have a comprehensive understanding of optimal distance, seed selection, and maintenance protocols; secondly, field maintenance, including fertilizer use, weed management, pest control, and irrigation system monitoring. Third, harvesting operations must be specialized in identifying ripe fruit bunches, using special cutting tools (especially blades mounted on Cantas poles designed for tall palm trees), and harvesting fruit clusters.

Required technical expertise includes operating harvesting trucks and transport equipment. Workers must demonstrate safe driving practices on the orchard landscape, use appropriate loading methods to avoid damage to the fruit, and establish logistics plans. In addition, physical endurance and high temperature tolerance are necessary. Because the workers usually harvest FFB between 1 and 1.5 tons per day in tropical weather.

5.1.2 Field operations

Field supervisors require higher-level skills than those required for entry-level positions. Supervisors must have a comprehensive

understanding of all aspects of field operations to provide effective supervision and training. Essential management skills include work planning, task allocation, labor planning, and production level tracking. Additionally, efficient resource management involves overseeing inventory, planning equipment maintenance, and implementing quality control procedures. Employers emphasize the importance of supervisors having at least 3 to 5 years of experience in palm plantation management. This foundation enables supervisors to make informed decisions about optimal harvest times, respond effectively to pest outbreaks, and improve workforce strategies. Supervisor positions typically require a secondary education or equivalent technical certification.

5.1.3 Mill factory operations labor level

Workers are responsible for operating machinery involved in the transportation of fresh fruit (FFB), sterilization processes, and oil extraction processes. Basic skills include knowledge of machine operations, adherence to safety protocols, and the ability to troubleshoot basic problems. Educational requirements for these positions are relatively minimal, typically requiring a secondary education or a technical-vocational qualification; however, workers must demonstrate mechanical ability and the ability to follow complex operational sequences. Key skills include operating forklifts to transport fresh fruit, inspecting conveyor systems, and performing quality checks at various stages of production. Workers must have a thorough understanding of sterilization times, compression methods, and cleaning processes. Basic maintenance skills also enable workers to perform routine equipment cleaning and minor repairs.

5.1.4 Mill factory operations supervisor level

Supervisors must hold an engineering degree or an equivalent technical qualification. Basic competencies cover managing rice mill operations, including production scheduling, quality assurance, and efficiency improvement. Expertise in occupational health and safety is essential, covering hazard identification, emergency response, and compliance with legal requirements. Supervisors need in-depth knowledge of oil extraction processes and a thorough understanding of the chemical and physical principles involved in oil separation and purification. Advanced mechanical expertise enables supervisors to effectively diagnose equipment malfunctions, manage repairs, and implement preventative maintenance programs. Process improvement skills aim to increase oil extraction rates while maintaining quality standards and minimizing waste generation.

5.2 Readiness and interest of Thai repatriation workers in palm oil sector

5.2.1 Level of interest and motivation

Research findings indicate that among repatriation workers, there is a high level of interest in employment opportunities in the palm oil sector, particularly among those with prior experience in palm oil, rubber, or fruit orchard plantations. These individuals exhibit a strong desire to resume such roles. This group accounts for approximately 60% of the surveyed repatriation workers.

In contrast, a group from non-agricultural industries showed greater caution. Common concerns include the difficulty of

working on palms, challenges in remote areas, and related skills shortages. About 25% of workers expressed interest under certain conditions. Depending on the availability of state support mechanisms, such as training programs, transport assistance, and clear legal protections, the remaining 15% expressed little interest, citing family burdens or other job opportunities as contributing factors.

5.2.2 Current skills assessment

A large number of repatriated workers lack expertise in palm-growing operations. However, the majority of this workforce has transferable skills available. About 70% of these individuals come from rural backgrounds, and with basic agricultural knowledge, including crop cultivation, pesticide use, and seasonal planning, nearly 40% of the workforce acquired mechanical skills through experience in motorcycle or car maintenance. These basic skills provide a strong platform for targeted skill development initiatives. Key skill deficiencies include specific techniques for harvesting palm oil, particularly the safe use of cutting tools at height, as well as the operation of machinery such as forklifts and transport vehicles. Workers generally lack an understanding of the palm oil growth cycle, optimal harvest times, and quality assessment criteria.

5.2.3 Gender dimensions in skills and readiness

Women accounted for 32% of the interview participants but showed lower readiness to work in the palm oil industry (45% expressed high interest, compared to 68% of men). They reported lower readiness to work in the palm oil industry, with only 45% expressing high interest, compared to 68% of men. Their participation was more focused on factory operations than on fieldwork, and household responsibilities often limited their ability to attend training programs. Constraints on mobility, stemming from childcare duties and cultural norms, also posed significant barriers to cross-border migration for women.

In terms of skills, women specialize in tasks that require precision, such as fruit picking, quality control, and processing. Despite these strengths, they tend to be less confident in labor-intensive tasks, such as forest climbing, heavy lifting, or long-term field work. Female participants generally have higher levels of education. By 25%, they reported having a vocational education or higher, compared to 15% of men. Although most of these studies were in non-agricultural fields, women also reported better Malay proficiency, often as a result of cross-border family networks.

Family mobility and dynamism significantly affect women's migration opportunities. Married women with children face greater obstacles, with 80% considering childcare a primary limitation compared to only 30% of married men. Support from extended families, particularly from mothers or mothers-in-law, increases women's migration opportunities. Single women face fewer family obstacles but have greater concerns about safety and living conditions. Furthermore, cultural expectations, especially those of Malay Muslim families, raise greater concerns about unmarried daughters migrating alone.

One major barrier to training access is the inflexibility of program schedules. Standard training programs typically require full-day participation, a demand that clashes with women's domestic responsibilities and makes regular attendance challenging.

The location of training sites presents another challenge. These sites are frequently far from participants' homes and often require

overnight stays, a situation many women find difficult due to family obligations and safety concerns. The lack of childcare during training further excludes women from participating. Without childcare support, many women cannot attend training sessions, even if they are interested and available.

One female participant explained: "I want to work in Malaysia, the money is much better. But I have three children, the youngest is only 5 years old. How can I leave them for 4–6 weeks of training, then go to Malaysia for months? My husband can go because I take care of the children. If training had childcare, if there were shorter modules, maybe I could participate."

5.3 Economic and social value analysis

5.3.1 Comparison of income and remittances

The economic assessment indicates significant income disparities relevant to employment opportunities in Malaysia. Local wages in Thailand's Southern Border Province average between 4,000 and 5,000 Baht per month for similarly skilled individuals. In contrast, palm plantation workers in Malaysia earn a minimum of 15,000 Baht per month, including overtime, which represents a 3-fold increase in income. The annual salary is approximately 180,000 Baht, which is significantly higher than the domestic earning capacity. On average, workers send between 8,000 and 10,000 baht per month to their families, totaling approximately 120,000 baht per year. These remittances are an important source of household income, supporting extended families of 5 to 7 members on average. Remittances help improve housing conditions, invest in children's education, and access quality healthcare. The remaining income is allocated to expenses in Malaysia, resulting in workers saving approximately 60,000 baht per year.

5.3.2 Cost-benefit analysis for workers

Migration is influenced by several economic factors beyond mere wage comparisons. For many workers, the journey begins with very high upfront costs, which include the cost of essential documents such as passports and medical certificates. And a work permit, which typically costs around 3,000–5,000 baht, adds an additional 1,500–3,000 baht to the cost of travel to Malaysia, while the initial settlement costs—including deposits, food, and basic necessities—require an additional 2,000–4,000 baht for those using intermediary services. Agent fees range from 5,000 to 15,000 baht, bringing the total initial investment to between 11,500 and 26,000 baht. Despite these costs, Malaysia's high income-generating potential makes migration an attractive option. On average, workers reported that their monthly net income increased by 8,000 to 10,000 baht after deducting living expenses. This means that for those who can afford their initial expenses, it usually takes one and a half to 3 months to break even. After that, workers can earn a net profit of 96,000 to 120,000 baht per year, demonstrating the significant economic incentives that migration offers.

However, several risk factors may impact these returns. Job security is crucial, as short-term contracts or seasonal work can shorten the income-generating period. Health issues leading to premature repatriation, threats of deportation for undocumented migrant workers, and fluctuations in the exchange rate between the Malaysian ringgit and the Thai baht are all significant risks. Unexpected expenses, such as medical emergencies or family crises, can also disrupt the expected financial

path. As one participant reflected, “The first time I went to Malaysia, I borrowed 20,000 baht for expenses and agent fees after 2 months of work. I paid the refund. After that, I was able to send home money every month. Even though all the expenses were paid, I received them. However, these benefits are not guaranteed for everyone. Especially for those using informal migration channels, formal training and certification programs are designed to reduce such risks, supporting a safer and more profitable migration experience.

5.4 Widespread socio-economic impact

5.4.1 Job creation and economic opportunity

Job creation is a crucial foundation for stability and growth in Thailand’s conflict-affected southern border provinces. In these regions, security challenges have hampered local investment, making it difficult for new businesses to emerge and for existing ones to expand. This results in limited employment opportunities, particularly for those with limited formal education—68% of study participants reported their highest level of education to be secondary school. The situation is exacerbated among young people, with unemployment rates for the 15–24 age group ranging from approximately 15% to 20%, significantly higher than the national average of 6%. In such a constrained environment, palm oil cultivation provides a stable and satisfactory source of income for individuals who might struggle to find stable employment elsewhere.

The positive impact of job creation extends beyond individual households. Legal employment, particularly for young people, will greatly reduce the risk of young people being drawn into armed groups. Stable employment remains a safer and more predictable alternative to informal and unstable work. Many people in these provinces have to accept that there is no work to do. In addition, the stories of successful transnational workers can also inspire others in the community to develop skills and promote a culture of aspiration and self-development. When new jobs are created, they also stimulate the demand for related services, such as transport, remittances, and communications, which help create a stronger and more flexible economic structure for the entire region.

5.4.2 Skills transfer and human capital development

Labor relocation is an effective catalyst for skills transfer and human capital development in southern border provinces. When working abroad, migrants gain practical experience in advanced agricultural techniques, such as precision agriculture and integrated pest management, giving them expertise that is often unavailable locally. They can use sophisticated machinery, and this skill is easily transferable in a variety of agricultural and industrial areas. Access to quality assurance systems means they have learned to maintain industry-wide standards and procedures and to build a strong workplace safety culture, with an emphasis on continuous use of protective equipment and on raising awareness of hazards.

The benefits of these acquired skills extend beyond individual workers as they return home. Returning migrants introduce advanced agricultural practices to their communities of origin, often leading to improvements in productivity and efficiency. Many use the new expertise and accumulated savings to launch small farming businesses, further stimulating the local economy. Their practical knowledge

positions them as non-trainers and consultants, allowing them to share their skills with neighbours and relatives. In some cases, the returnees’ enhanced skills and broader perspective prepare them for leadership or supervisory roles within local organizations.

As one government official said, “Migration does not mean that we will lose skilled personnel. These workers come back with the skills, money, and experience our province needs. They become agricultural entrepreneurs, train others, and have a broader perspective. This is the development of human capital without the government having to pay for training. This model of migrant return brought to the aid of the home community supports the assumption of “the arrival of skilled personnel,” which suggests that the opportunity to relocate can ultimately promote the accumulation of human capital in the country of origin (Bongers et al., 2018, 2021).

5.4.3 Social status and family wellbeing

Beyond economic benefits, stable and fairly paid employment abroad brings significant social advantages to migrant workers and their families. Success overseas often elevates the social standing of returnees, making them respected breadwinners and more attractive partners. Increased household income empowers them to take on greater roles in family decision-making and serve as positive role models for future generations. Regular remittances strengthen family security by improving financial stability, living conditions, nutrition, and access to medical care. Importantly, these funds enable families to invest in education, allowing children to pursue longer studies, receive tutoring, and attend better institutions. Children of migrant workers benefit from reduced work pressure, uninterrupted learning, and, in some cases, opportunities for higher education. Remittances also help families start small businesses and invest in health, supporting long-term mobility and broader aspirations for future generations.

5.4.4 Gender social impacts

Migration significantly transforms gender roles and dynamics. For men, working abroad often enhances their status as primary breadwinners and may lead to greater independence, though prolonged absence can strain marital relationships and reduce family involvement. For women left behind, they assume more financial responsibilities and decision-making power, gaining independence but also facing increased stress. For migrant women, migration brings economic empowerment and broader aspirations but also risks such as workplace exploitation and family separation. Many returning women use their experiences and savings to start businesses and exert greater influence in their home countries. As one woman explained, “When my husband worked in Malaysia for 3 years, I handled everything – the money, the children, the house repair. I became stronger and more confident. When he came back, I did not just want to go back to the old way where he made all the decisions.” However, these changes are often coupled with enduring traditional expectations about women’s roles in the home. Gender shifts underscore the need for gender-equal support services, including counseling, legal assistance, and skills training, to help women cope with the challenges and opportunities that migration brings.

5.4.5 Role of migration intermediaries

Migration between Thailand and Malaysia is significantly influenced by various intermediaries, including licensed agencies, informal

brokers, community coordinators, and family networks. These intermediaries assist with job information, legal documentation, travel arrangements, and matching workers with employers, but their fee structures vary. Licensed agencies charge fees from both workers and employers, while informal brokers often impose high direct fees. However, this system exposes migrants to various risks, such as misinformation, excessive fees, passport confiscation, debt, contract manipulation, unauthorized wage deductions, and even abandonment. These vulnerabilities underscore the need for stronger oversight and protection within the intermediary networks.

Focus group discussions revealed diverse experiences with migration intermediaries, reflecting both supportive and exploitative situations. Some participants reported positive encounters, noting that agents who helped process the proper work permits were placed in a trustworthy position and continued to check in after employment. Others described more neutral experiences, where agents charged exorbitant fees – often around 10,000 THB – but provided essential assistance. This was the case for approximately 45% of respondents. However, a significant minority, around 25%, reported negative outcomes: some agents demanded fees up to 15,000 THB and had unreliable salaries or other conditions. These participants found themselves in a position where they were paid less than expected.

5.5 Training curriculum

The proposed training program has been meticulously developed to address the specific skill gaps found among migrant laborers and the needs of palm oil industry employers. This comprehensive program is structured into five specialized modules, designed to enhance both foundational and technical skills necessary for effective and safe work performance. The first module, “Fundamentals of Palm Cultivation and Maintenance,” spans 40 h and covers key topics such as palm biology, planting techniques, fertilization, weed and pest management, irrigation, and safe handling of agricultural chemicals. Participants will gain a solid foundation in the science and best practices of palm cultivation, setting the stage for advanced skills development.

The second unit explained harvesting technology and the operation of equipment for more than 60 h. Trainees learn to identify ripe fruit bunches using visual and tactile cues, operate and maintain harvesting tools safely, and adjust methods according to palm height. The course focuses on reducing fruit loss, adhering to production standards, following appropriate harvesting and management procedures, and prioritizing personal safety. Mechanical operations and vehicles are the core of the third unit, with a total of 40 h of guidance covering harvesting vehicle operation, loading and unloading procedures, daily equipment maintenance, and identification of workplace hazards. In addition, basic logistics planning has been put in place to prepare workers.

Finally, the fifth module focuses on workplace rights, cultural adaptation, and communication, and lasts 20 h to familiarize workers with Malaysia’s labor law, labor contracts, and complaint mechanisms. The module also develops Malaysia’s basic skills and financial knowledge in the workplace, including banking and remittance management. The module also includes health, safety, and emergency procedures to ensure that workers are ready to live and work abroad. The course aims to combine theoretical classroom teaching (40%) with field training (60%), and full-time students can complete four to six internal intensive courses totaling 200 h.

Upon completion of the training, participants will receive a comprehensive certificate specifying their specialized expertise, the training

institution, assessment results (including both theoretical and practical components), and compliance with Malaysian occupational standards and the IMT-GT framework. The certificate is bilingual (Thai and Malay or English), digitally verifiable, and recognized by employers in Malaysia and by relevant government agencies of both countries. This mobility enables workers to leverage their qualifications for opportunities in other agricultural sectors. Employers highly value such credible certifications, as noted by a palm oil plantation manager: “If I know a worker has undergone recognized training and passed assessments, I am happy to hire them immediately with a higher starting salary. A strong certification reduces risks and costs in talent recruitment.” This reflects the importance of a robust, transparent, and widely recognized certification system.

5.6 Policy impacts and recommendations

5.6.1 National level

The Southern Border Provinces Administrative Center (SBPAC), in conjunction with the Ministries of Labour, Interior, and Foreign Affairs, should urgently revise the outdated 2013 Memorandum of Understanding (MOU) on labour migration between Thailand and Malaysia. The current MOU is too broad and fails to address the specific needs of sectors such as the palm oil and construction industries, leaving many workers unprotected. Health checks are ineffective, law enforcement is weak, and there is no coordinated system for skills certification or training. The revised MOU should include sector-specific employment frameworks, streamlined health checks, stronger labour protection (including fair wages, housing, working hours, and complaint mechanisms), and skills certification to support career advancement. Effective monitoring and alignment with the Thailand-Malaysia Growth Triangle (IMT-GT) framework are also crucial.

The political challenges include Malaysia’s concerns about domestic employment, the complexity of Thailand’s civil service system, resistance from employers seeking to hire informally, and distrust from labor rights groups. To overcome these obstacles, the agreement should be presented in a mutually beneficial manner for both countries, starting with small pilot projects, involving key stakeholders early on, and aligning with existing reforms. High-level political support and the utilization of IMT-GT mechanisms will enhance the likelihood of successful negotiations and implementation, even in a complex environment.

5.6.2 Policy roadmap and implementation framework

Current training programs for Thai migrant workers suffer from critical gaps that this proposal addresses (see [Table 3](#)):

This is the first tripartite sector-specific certification system designed for informal agricultural workers, under the IMT-GT framework, bridging the gap between ASEAN’s professional labor cooperation agreements and bilateral migrant worker programs that lack skills standards.

Phase 1: foundation building (months 1–12)

This phase will lay the foundation for a bilateral migrant worker certification program between Thailand and Malaysia. A joint Thai-Malaysian certification working group will be led by SBPAC and the Malaysian Palm Oil Board, with support from labor and palm oil

TABLE 3 Enhanced policy roadmap structure.

Existing initiatives	Limitations	This Curriculum’s innovation
Department of Labour’s Pre-Departure Orientation (PDO)	Generic content (2–3 days), no sector-specific skills, no certification recognized by Malaysian employers	Sector-specific modules (120 h palm plantation operations), bilateral certification co-designed with Malaysian Palm Oil Board (MPOB)
Provincial skills development centers	Focus on domestic employment, Thai-language only, no migration context	Cross-border curriculum with Bahasa Malaysia language training, Malaysian labor law, cultural adaptation modules
Private recruitment agency training	Profit-driven, minimal quality control, no post-placement support	Non-profit institutional delivery through government centers, mandatory 6-month post-employment tracking
ASEAN Mutual Recognition Arrangements (MRAs)	Limited to 8 professional occupations (engineers, nurses, etc.), excludes agricultural/plantation workers	MRA for informal sector workers—creates certification pathway for occupations excluded from formal ASEAN frameworks
Malaysia’s FWCMS (Foreign Workers Centralized Management System)	Administrative registration only, no skills verification	Integrated certification—training completion linked directly to work permit issuance, verified skills documentation

authorities. It will be formally established with clear requirements, quarterly meetings, and a joint budget. Three rounds of consultations with government, employers, workers, training institutions, and civil society will ensure strong stakeholder participation. Targeted groups and workshops will verify that diverse input is gathered and address potential resistance from Malaysian palm oil plantation owners. Certification will be designed to boost productivity and will start as a voluntary pilot program. Thai and Malaysian institutions will jointly develop the curriculum, which will include 80 h of technical training and 40 h of interpersonal skills training, and will offer modular sub-certifications for specific competencies. Certification standards will be jointly designed, emphasize practical skills, and use blockchain for portability and security.

Training centers will be established in Yala (Thailand) and Perlis (Malaysia). Each will have training plots, dormitories, and digital laboratories. The investment and operating budgets will be combined. Draft bilateral MOUs will cover mutual recognition, quotas, minimum wages, complaint mechanisms, and job-matching platforms for initially certified workers. Key outcomes include an operational working group, validated curricula, well-equipped training centers, draft MOUs, and migration baseline data. Risks, such as political instability and funding shortages, will be addressed by integrating the agreement into the IMT-GT framework and seeking support from ASEAN and international partners. Phase 1 lays the foundation for comprehensive and sustainable institutional support, ensuring the project’s feasibility and readiness for future phases.

Phase 2: pilot implementation (months 13–24)

During this phase, provincial labor offices will select 500 Thai workers from southern provinces using a transparent and ethical process. Intensive training will be divided into two groups. Each group will receive practical farm work, classroom learning, and digital modules, led by certified, bilingual trainers experienced in Malaysia. A 75% pass rate is required for certification. Certificates will be issued both digitally (via a joint Thai-Malaysian database) and as physical cards. SBPAC and civil society partners will coordinate support, providing pre-departure legal and financial training, bilingual hotlines, legal assistance in Malaysia, and post-return skills certification. A web/SMS employer-matching platform will connect certified workers with verified Malaysian employers offering higher wages and

registered contracts. SBPAC will support job placement, travel subsidies, and orientation. Measures such as wage verification, unannounced inspections, and mandatory contract registration will help prevent exploitation. Progress will be tracked through post-employment surveys and regular workplace visits. University teams will conduct mid-term evaluations. Digital systems for job applications, certification, and complaint reporting are managed by government IT partners. Digital skills training will be integrated into the curriculum.

SBPAC leads the coordination, provincial offices manage recruitment and certification, and civil society organizations (Migrant Workers Rights Network, Tenaganita) provide support and monitor workers. Building on these roles, several possibilities are considered: risks such as low employer participation, worker turnover, and weak law enforcement will be addressed through incentives, in-training allowances, flexible schedules, and bilateral verification protocols. As a result of these combined efforts, the expected outcomes include training 500 workers (over 400 certified), placing over 320 workers in Malaysia, a robust digital system, mid-course assessments, and no reports of serious exploitation.

Phase 3: expansion and institutionalization (months 25–36)

This phase will focus on finalizing and ratifying the amended Memorandum of Understanding between Thailand and Malaysia. It will incorporate lessons learned from the pilot project to strengthen wage formulas, certification types, and labor protections. The agreement will be integrated into the institutional system through the IMT-GT. The Thai-Malaysian Joint Committee and the Civil Society Committee will conduct annual reviews and oversight. Training operations will scale up to certify 2,000–3,000 workers each year, with additional centers in Pattani, Narathiwat, Kedah, and Perak. Personnel will come from the top-performing trainers in the pilot project. Funding will be shared by the government, employers, and development partners. Quality will be ensured through compliance with ISO standards and annual external audits. All stakeholders are encouraged to collaborate closely to ensure the timely implementation and long-term sustainability of these measures.

A public awareness campaign will be launched, reaching potential workers, employers, and the public through radio, social media, and community meetings to promote the benefits of certification. A permanent monitoring system will track key indicators, including migration flows, wage increases, and labor disputes, with transparent

reporting. Sector expansion will be streamlined by initiating coordinated planning for construction, manufacturing, and service sectors, supported by a targeted feasibility study. IMT-GT will integrate this model into its regional framework, support repeatability on other migration routes, and host a certification registry. SBPAC and Malaysian ministries will lead, with support from training centres, employers, IMT-GT, and independent regulatory bodies. Sustainability will be ensured by cost-sharing models and policy integration. Rigorous certification and periodic recertification will prevent certification inflation. Geopolitical risks will be managed by diversifying labor sources and supporting local economic development.

Expecting outcomes: Legally binding memoranda of understanding; multiple training centres; thousands of certified workers; reduced informal migration; higher wages; IMT-GT certification; and broad dissemination of research findings.

Additional Critical Considerations: Worker Protection Mechanisms.

The core of the Thailand-Malaysia joint certification program is to ensure strong protection for workers at all stages of the employment process. The program integrates pre-employment protection measures into the working period and aims to solve the vulnerabilities that migrant workers often face through a specific implementation system.

- 1 Pre-employment safeguards are in place to protect workers before they actually start work. All employment contracts must be of the same standard and use government-approved forms, available in both Thai and Malay, to ensure workers fully understand their rights and duties. Legal verification of these contracts will be included in the pre-travel training courses. To provide workers with the knowledge to consider fair terms and identify potential violations, to prevent recruitment abuse, the program imposes strict restrictions on recruitment fees: certified workers will not be charged any fees. Since the employer is responsible for all recruitment costs, breaches of this rule will be severely punished. In addition, mandatory health and accident insurance, as well as repatriation coverage, will be a prerequisite for employment to ensure that workers and families are protected from unexpected event.
- 2 During employment, various measures will be implemented to ensure ongoing protection and support. Wage protection is a top priority. All wages must be paid directly into bank accounts. This minimizes risks associated with cash payments. Quarterly wage audits will be conducted to verify compliance and detect underpayments or discrepancies. Workers will have easily accessible channels to report complaints. These include a 24-h hotline supported by the embassy's labor attaché and legal clinics operated by civil society organizations. Oversight will be strengthened through a two-way monitoring system. When a complaint is filed, the relevant authority must conduct an investigation within 48 h, based on risk. In addition, random audits will be conducted on at least 10% of employers every quarter to deter non-compliance and maintain accountability.
- 3 The enforcement mechanism is designed to be both deterrent and remedial. Employers found to violate the program's standards may face a range of penalties, including removal from the certification system, fines, loss of tax benefits, and, in serious cases, human trafficking, criminal prosecution. For

workers seeking justice, Malaysia's Emergency Labour Court will expedite dispute resolution, while Thailand's specific legal aid fund and compensation mechanism will provide additional support. Recognizing the past challenges of weak enforcement in both countries, the program introduces a novel solution: accountability at the IMT-GT (Indonesia-Malaysia-Thailand Growth Triangle) level, including annual compliance rankings and peer pressure to maintain high standards and promote continuous improvement.

By embedding these multi-layered protection mechanisms into the certification program, this initiative aims not only to elevate the standards for migrant workers but also to foster a culture of transparency, fairness, and shared responsibility across borders.

5.6.3 Gender-responsive program design

Designing programs that take gender into account is critical to ensuring that women receive equal opportunities and benefits in migration and training programs. Flexible training options should be available, including diverse schedules, on-site child care, convenient site access, and online learning. To accommodate women's household responsibilities, tailored training courses can address women's roles in factory operations, leadership, and entrepreneurship, and family-friendly migration policies, such as coordinating the supply of housing for spouses, providing shelter for children, conducting periodic country visits, and promoting employer-supported childcare, as well as women's participation and family solidarity. Security measures should include gender-segregated housing, women's support networks, and gender-sensitive complaint systems. Finally, the project should strengthen women's economic empowerment by providing financial and legal knowledge, supporting business development, and facilitating integration.

To track outcomes related to gender equality, projects should collect and analyze gender-specific data on participation, education levels, employment, and satisfaction, and adjust policies accordingly. Implementation requires gender-equality personnel training, consultations with female workers, partnerships with women's organizations, and dedicated funding for gender-equality needs.

5.6.4 Regional level policy

To further strengthen the IMT-GT framework, labor mobility should be a primary focus, requiring dedicated working groups, clear inclusion in strategic plans, targeted budgets, and sector-specific procedures, starting with pilot projects in palm oil. IMT-GT coordination should be improved by expanding personnel expertise, increasing engagement with Ministries of Labour, and strengthening linkages with the ASEAN Committee on Migrant Workers. Joint monitoring and key pilot projects will demonstrate successes and establish standards for replication. Knowledge sharing—through meetings, research, and publications—will disseminate best practices across member states and sectors. By prioritizing labor mobility, IMT-GT can transcend infrastructure and trade toward broader regional development.

To ensure policy coherence, IMT-GT initiatives should align with ASEAN frameworks by advocating for new Mutual Recognition Arrangements in agriculture, aligning with migrant worker rights

agreements, and sharing successful models in ASEAN forums. This approach enhances legitimacy, access to resources, and scalability across the region.

5.6.5 Comparative learning and south-south cooperation

Knowledge exchange with other regional labour migration routes can accelerate policy development by building on successful models and avoiding common mistakes. From the ECOWAS Group of Southeast Asian countries, one can learn about the challenges and practical achievements of implementing the free movement protocol. As well as the West African Migration Route Skills Development Programme, MERCOSUR's experience with residency agreements, labour protection, and the balance between regional and continental frameworks provides valuable lessons for supporting migrants and monitoring reforms in the Group's countries. GCCs such as Kafala System Changes provide in-depth insights into wage protection, electronic payment systems, and effective complaints and legal support mechanisms. The Central American Migration Route provides examples of repatriation and integration programs, strategies to address the links between conflict and migration. And how to attract foreigners living abroad, knowledge sharing can be facilitated through international meetings, and education.

5.6.6 Research and evidence priorities

To strengthen the empirical database and support continuous improvement, the following research priorities are recommended:

Longitudinal studies: Tracking groups of trained workers and their households over several years to assess employment, income, remittances home, family well-being, and women's empowerment, including control groups to measure project impacts.

Mixed-methods impact assessment: Integrating quantitative data (employment, wages, working conditions) with qualitative research (case studies, participatory observation), economic modeling, and participatory assessments relevant to migrants and their families.

Integration Studies in Host Countries: Assess how the Malaysian community receives Thai workers; analyze the impact on the local labour market; study social cohesion; and monitor institutional responses in education and healthcare.

Potential and aspirations of migrants: Explore the broader motivations of migrants. Experiences on rights and voices, the impact of family evictions, and long-term goals.

Gender-specific research: focusing on women's migration experiences, the impact on abandoned families, changing gender roles, and the impact of migration on women's empowerment and independence.

Intermediary Ecosystems Research: mapping and analyzing formal and informal intermediaries; evaluating the effectiveness of regulations; identifying best practices and obstacles in ethical recruitment; and exploring digital platforms for direct job matching.

6 Discussion

6.1 Human capital theory and cross-border labor migration

The findings of this study provide robust empirical support for the core proposition of human capital theory: that systematic investment

in skill development yields measurable economic returns for both individuals and society. The recorded wage disparity—from 4,000–5,000 baht per month to 15,000 baht per month—demonstrates the economic value derived from accumulating human capital through targeted training (Becker, 1993; Schultz, 1961). However, this research also reveals significant extensions and refinements to the traditional human capital theory when applied to the context of cross-border labor migration under challenging conditions.

This research confirms that conflict environments, informal labor markets, and power imbalances necessitate modifications to classical models while maintaining core concepts, as follows:

6.1.1 Verification of the conflict environment

The research confirms that in conflict-affected regions (southern provinces of Thailand), limited local investment restricts returns on domestic education. Migration creates alternative pathways for human capital to generate returns, with remittances providing “peace benefits” through household economic security, extending Collier and Hoeffler's (2004) argument on economic opportunity to the relationship between migration and development.

6.1.2 Dynamics of the informal market

The persistence of informal migration channels (despite legal channels) and the role of intermediaries demonstrate that the informal labor market contributes to the devaluation of human capital. The lack of prior formal certification meant workers' skills were not recognized, leading to lower wages. Proposed certification systems fill this gap by formally recognizing practical skills.

6.1.3 Impacts of power asymmetry

Employer and intermediary control working conditions and wages, meaning that investment in human capital does not automatically translate into appropriate wage increases without institutional protection. This supports Ruhs and Martin's (2008) argument regarding the institutional coherence required for migration to benefit labor.

The research findings align with and build upon recent academic advances. Ozulumba et al. (2024) found that in the ECOWAS region, migration and remittances positively impact human capital development, and they recommended that governments support migration through bilateral agreements and coordinated training. This study puts this recommendation into practice, demonstrating how training programs can be designed and integrated into bilateral frameworks. The World Bank's Global Skills Cooperation Programme (World Bank, 2024) emphasizes pre-transit skills development in the country of origin, transforming talent loss into talent acquisition. The five-module course with a certification system exemplifies this approach, demonstrating how systematic training creates value for both the country of origin and destination. Bongers et al. (2018, 2021) provide the theoretical basis for the talent acquisition hypothesis: opportunities for migration stimulate investment in skills in the country of origin. These research findings, which showed that 60% of the workforce expressed a strong interest in working in the palm oil industry and were willing to invest minimal time and expense in training, confirm this hypothesis. Opportunities for migration stimulate the accumulation of human capital. Bravo and Cecchini (2024) emphasize that “loss of skill,” i.e., the mismatch between migrants'

qualifications and employment, is a significant loss of efficiency. Our certification system directly addresses this problem by certifying skills, preventing skill loss through institutional mechanisms.

6.2 Regional integration and the role of institutional frameworks

This research highlights the crucial role of the Indonesia-Malaysia-Thailand Growth Triangle (IMT-GT) as a bridge between ASEAN's broader regional goals and the realities of bilateral cooperation. The focus on sub-regions within IMT-GT allows for contextually appropriate strategies, particularly on border issues such as ethnic relations and economic inequality, and enables flexible solutions to specific problems, such as those related to the palm oil industry. The IMT-GT's structure also facilitates experimentation and management of political sensitivities.

However, IMT-GT faces several significant limitations. Its informal nature results in the lack of enforcement for many initiatives. Effective labor protection requires bilateral agreements, and although migrant labor is included in the plans, practical implementation remains constrained. Additionally, resource allocation for these initiatives remains minimal. Furthermore, the focus remains on high-skilled labor migration, leaving the needs of low-skilled and semi-skilled cross-border workers largely unaddressed. Overall, while IMT-GT offers flexible and concrete cooperation, its impact is limited by informal oversight, scarce resources, and a narrow focus on skilled labor.

Compared to other regional cooperation frameworks, the IMT-GT takes a different approach to labour mobility. ECOWAS seriously promotes free movement, but weak enforcement, informal migration, limited skill coordination, and security issues have hampered its effectiveness. The MERCOSUR Residency Agreement is more practical, giving the right to mandatory residence and equal treatment, but it lacks strong skills development measures. IMT-GT stands out for its "structural sectoral focus," with a focus on sectoral and sub-regional initiatives. For example, palm oil and tourism make it possible to implement flexible and targeted interventions that can be adapted to local needs. Skills development is clearly included, although this model helps to improve operations and meet the needs of group-specific stakeholders. However, it can lead to fragmentation and often hinder large numbers of unskilled workers. However, IMT-GT demonstrates the value of flexible and context-sensitive cooperation for regional integration.

This research highlights a clear gap between ASEAN's ambitious goals for skilled labor mobility and the reality of most migrant workers, who are low-skilled or semi-skilled and largely excluded from regional cooperation frameworks. While ASEAN economic community agreements primarily benefit experts, the majority of migrant workers remain under strict bilateral arrangements, creating a "two-tiered" system. The findings confirm that subregional sector-specific initiatives like IMT-GT offer more concrete solutions for the majority of workers than broad regional reforms. Incremental progress through targeted industrial frameworks and local pilot projects is more feasible than attempting comprehensive ASEAN-wide agreements. Focusing on sector-specific and subregional approaches enables policymakers to better address disparities in labor standards and regulations, creating more accessible migration opportunities for low-skilled and semi-skilled workers.

6.3 Economic development in conflict-affected regions

This research adds to the growing body of research into the link between migration and conflict, demonstrating that work migration can play a dual role—not only creating economic opportunities but also mitigating conflict. In Thailand's southern border provinces of Yala, Pattani, and Narathiwat, ongoing low-level conflict since 2004 has resulted in thousands of deaths and persistent instability. This instability has undermined private investment and significantly reduced local employment opportunities, particularly for young people (McCargo, 2012). Economic hardship exacerbates pre-existing ethnic and religious tensions, trapping many communities in a cycle of violence and exclusion.

Traditional peacebuilding efforts in this region primarily focus on political negotiations, institutional security reforms, and transitional justice measures. While these approaches are crucial, they often overlook the economic factors underlying prolonged instability. Research indicates that policies promoting safe and legal labor migration can serve as a valuable complement to traditional peacebuilding strategies. Migration can alleviate economic distress, reduce incentives for involvement in violence, and strengthen community resilience by enabling access to employment opportunities outside conflict zones. In this way, labor migration emerges as both a vital economic pathway and a route to sustainable peace in conflict-affected areas.

Collier and Hoeffler (2004) showed that access to work helps reduce conflict by decreasing recruitment into armed groups. This research supports their view: high-wage Thai workers in Malaysia are more likely to choose legal employment than join armed groups, while remittances strengthen family security and reduce resentment. Skills acquired abroad also enhance long-term opportunities. As one official stated, lasting peace requires work, income, and hope, making work migration a crucial part of peacebuilding. Migration also expands social networks and perspectives, diverts youth from conflict, and strengthens family resilience through remittances. Together, these effects help promote stability and peace in conflict-affected areas.

7 Study limitations: methodological and contextual limitations

This research is shaped by several methodological and contextual constraints that necessarily limit the breadth and generalizability of its findings.

7.1 Sampling and representation limitations

One significant limitation arises from the use of snowball sampling to select employers in Malaysian palm oil plantations. This method, which ultimately yielded eight respondents, began through Thai provincial labor offices. This resulted in a sample biased toward employers with formal relationships with the Thai government, potentially making the study more representative of large, legally compliant plantations—environments where labor practices and regulatory oversight tend to be stronger.

This research does not include a specific industry group: informal, small-scale palm oil plantations (less than 50 hectares) that employ many undocumented Thai workers. Employers in these settings, who typically have limited interaction with government agencies, were excluded from the sample. Additionally, palm oil plantations in remote areas—beyond the 100-kilometer border studied—were not addressed. These exclusions may influence the perspectives gathered from this research, which could be more representative of better employment conditions for Thai workers in Malaysia than is generally experienced.

The consequences of this bias are clear. Reported wage rates (1,800–2,500 Ringgit/month) and working conditions may appear better than those for informal or undocumented Thai workers. Thus, the study's policy recommendations may underestimate the challenges of formalizing employment. Bias also appears in the respondents' gender. All interviewed Malaysian employers were male, reflecting farm management's gender dynamics. This one-sided view ignores female supervisors and human resource managers, who may differ in their opinions on workplace dynamics and recruitment. These missing perspectives limit the study's ability to examine gender dynamics in farm labor. In conclusion, the research notes that the findings are shaped by the sample and are incomplete. Therefore, the narratives and recommendations reflect large, male-dominated farms near the border and may not capture the realities of most Thai migrant workers in Malaysia.

7.2 Representativeness of three southern border provinces

This study focuses specifically on the southern border provinces of Yala, Pattani, and Narathiwat. This allows for the identification of key migration routes, but at the same time limits the scope of conclusions. These provinces are not only the primary source of Thai labor in Malaysian palm oil plantations, but also possess unique demographic and geographical characteristics that distinguish them from other parts of Thailand.

The majority of the sample were of Thai-Malaysian descent; 78% reported a dual cultural background and fluency in Malay. This ethnic and linguistic advantage is rare among migrants from central or northeastern Thailand, who usually lack it. Thus, the findings reflect the experiences of people already familiar with border crossings. Their Malay fluency, kinship ties, and adaptation to both societies grant bargaining power in migration. Migrants from other Thai regions, lacking these resources, likely face more obstacles in Malaysia. Geographical proximity also shapes migration in the South. Workers from border provinces migrate cyclically, often crossing daily or weekly, which blurs the line between legal and informal movement. This pattern differs from that of long-distance migrants from inland or northeastern Thailand, whose journeys require formal documentation and involve fewer, more stringent border crossings. Fluctuations in the South stem from both geography and policy.

Furthermore, the southern border context is shaped by ongoing conflict and instability, which serve as powerful economic drivers. For many, cross-border work migration is both a survival strategy and a response to insecurity—a factor virtually absent in migration narratives across other regions of Thailand. In comparison, economic migration from the northeast (Isan) is often driven by drought, chronic poverty, or a lack of local

employment, not by violence or political instability. These regionally specific factors have a tangible impact on the study's findings. The prevalence of informal migration and reliance on ethnic or family networks, evident in this sample, stems from the unique social structures and environments of the southern provinces. Applying these patterns to migrants from non-border and non-Malaysian-speaking areas may be misleading, as their experiences may be more vulnerable and have fewer support structures. In conclusion, while the southern provinces are central to Thai-Malaysian labor migration, the realities recorded here cannot be considered representative of the broader Thai workforce in Malaysia.

7.3 Data collection constraints in conflict-affected areas

The ongoing insurgency, which began in 2004, has created significant obstacles to accessing research. Fieldwork was consequently limited to district capitals and provincial towns. Due to ongoing security threats, rural villages, particularly in high-risk areas like Pattani and Narathiwat, were virtually inaccessible. This geographical limitation may have led to the neglect of the most economically vulnerable and disadvantaged workers, whose experiences are underrepresented in the research findings. Time constraints further restricted participation. All interviews were conducted only during the daytime and completed before the recommended curfew of 6:00 p.m., making it impossible for the study to reach workers with irregular schedules or those who deliberately avoided daytime appearances due to legal or personal risks.

7.4 Language and translation issues

The multilingual nature of the interviews—conducted in Thai, Malay, and occasionally English—introduces layers of complexity and bias. Translation poses a persistent challenge, particularly when interviewing Malaysian employers who frequently employ specialized agricultural terminology. Subtle nuances and contextual meanings expressed in Malay may be diminished or entirely lost when translated into Thai or English for analysis, undermining the credibility of the research findings. The linguistic landscape becomes even more complicated by language switching. Many Thai-Malay respondents frequently alternate between Thai and Malay, sometimes within the same sentence. This fluid switching requires interviewers and interpreters to make real-time judgments about meaning, increasing the risk of unintended shifts in the intent or emphasis of responses.

Literacy barriers also affect the quality and depth of collected data. Those with limited formal education, particularly those with no higher than primary school, often struggle to answer abstract policy questions. Their answers are frequently shorter, less detailed, and sometimes miss the true intent of more complex questions. To ensure quality, all interviews are recorded and transcribed by experts.

7.5 Additional significant limitations

Time and long-term limitations – cross-sectional design cannot establish causal relationships, is affected by seasonal variation, and lacks long-term follow-up.

Sample size and statistical limitations – a small sample size makes multivariate analysis impossible. Target group dynamics (social needs bias), minority population (32% women vs. 40% of the workforce).

Reliability of economic data – self-reported wages may be biased by inaccuracies in recall, social desirability bias, currency confusion, and a lack of employer verification.

Scope of sector and stakeholder engagement – focus on palm oil limits data transferability; lack of voices from various groups (labor brokers, host communities, Malaysian officials, Thai families).

Generalizability Beyond Research Period research timeframe – 2024-2025 timeframe (post-COVID recovery, Malaysia's political transition, IMT-GT policy evolution).

Ethical limitations regarding data depth – protection of vulnerable populations limits inquiries into illegal activities, human trafficking, and child migration, making the data descriptive.

8 Conclusion

Based on empirical research, this study proposes a possible approach comprising five key components: a five-module training curriculum integrating theoretical instruction (40%) with practical field training (60%), designed to align with Malaysian professional standards and potentially accredited under the IMT-GT framework; an analysis suggesting that amending the Memorandum of Understanding between Thailand and Malaysia to address current challenges would be beneficial; recommendations include incorporating labor protection mechanisms, establishing sector-specific frameworks, defining training requirements and wage protection standards, and implementing monitoring mechanisms to track training rates, employment outcomes, wages, working conditions, and worker satisfaction; at the national level, coordination between the administrative centers of the southern border provinces and relevant ministries appears necessary for negotiating agreement renewals; while at the local level, collaboration between provincial skills development institutes in Yala, Pattani, and Narathiwat provinces and Malaysian employers could facilitate the implementation of training programs. This research contributes to extending human capital theory to cross-border contexts by demonstrating how mid-level institutions such as IMT-GT can bridge the gap between regional agreements and practical implementation, promoting understanding of the relationship between skills and migration, and suggesting that job placement can be a mechanism to address security issues in conflict-affected areas if implemented effectively. This model has the potential to generate three benefits: addressing Malaysia's significant labor shortages in key economic sectors. Creating significantly higher-paying employment opportunities for Thai workers from disadvantaged regions, and supporting peace and development efforts in Thailand's conflict-affected southern border provinces.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by this study was conducted in accordance with the Declaration of Helsinki and was approved by the Human Research Ethics Committee of Walailak University (approval number: WU-EC-PO-3-056-66). All participants provided written informed consent prior to their participation in the study. The research involved semi-structured interviews with Thai government officials at the regional level, local labor agency staff, Thai workers who had previously worked in Malaysia, and Malaysian palm oil entrepreneurs operating in the Thai-Malaysian border region. Additionally, focus group discussions were conducted with Thai Repatriation workers who had worked in Malaysia and Thai workers interested in working in Malaysia. Prior to data collection, all participants were informed about the purpose of the study, the voluntary nature of their participation, their right to withdraw at any time without consequences, and the measures taken to ensure confidentiality and anonymity. Verbal consent was deemed appropriate given the nature of the research and was approved by the ethics committee. All data were handled confidentially, and identifiable information was removed during the analysis and reporting phases to protect participants' privacy. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

PD: Funding acquisition, Visualization, Project administration, Resources, Validation, Formal analysis, Supervision, Data curation, Investigation, Writing – original draft, Writing – review & editing, Methodology, Conceptualization, Software. KH: Investigation, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declared that Generative AI was not used in the creation of this manuscript.

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