

# ISSUES ON FOREIGN LABOURERS PRODUCTIVITY ON GREEN BUILDINGS IN SELANGOR, MALAYSIA

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## ABSTRACT

*Malaysia is Asia's largest net labour importer, suggesting that the construction sector is significantly reliant on foreign labour, primarily from Nepal, Indonesia, Vietnam, and Bangladesh. Foreign labourers are needed to fill labour shortages caused by locals' reluctance to seek jobs in the construction sector. The demand for green buildings escalates the demand for foreign labour. However, there are criticisms of the performance of green buildings on account of accidents on sites, poor workmanship, and project delays. Hence, this research investigates the nature of foreign labourers in the construction of green buildings. In 2021, a total of 100 surveys were administered during the construction of the green building in Selangor, yet only 80 were returned, resulting in an 80% response rate. Based on the results, it is found that the industry's reliance on foreign immigrants arose because of its labour-intensive and dirty, hazardous, and difficult nature, which discourages the locals. The results of the test of goodness of fit for the impact of foreign labourers on the construction of green buildings. The results revealed that all the constructs were statistically significant. Results also found that poor communication leads to accidents, language barriers, a lack of understanding, and poor workmanship badly impacting the projects. Furthermore, a lack of knowledge and education reduces the green building's productivity. Not all foreign labourers are very well experienced in green building construction due to the new concept that they never heard of before in their countries.*

**Keywords:** *Construction; Efficiency; Immigrants; Site Operatives; Sustainability Development.*

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## **1. INTRODUCTION**

Several studies have proven the benefits of green construction. Reduced Greenhouse Gasses (GHG) emissions, enhanced occupant health, and increased labour productivity are only a handful of the benefits of green buildings (Wong, 2021). Green buildings are designed and operated in such a way that the overall environmental effect of the built environment is as minimal as possible. However, despite this impressive performance of the green building, the productivity of the green building construction is low. Furthermore, a lack of knowledge of green technologies and technical challenges might not only delay the project yet result in higher prices through rework. Mahat et al., (2019), Hwang et al., (2017), Pan (2018), and Shinde and Hedao (2017) discovered the essential elements affecting the productivity of green buildings by comparing the likelihood, impact, and criticality of the parameters to traditional projects. The government of Malaysia encourages the supply and demand of green buildings to achieve sustainable development goals (Shafiei, et al., 2017). The primary obstacles to producing green buildings include inadequate knowledge and skills, inadequate precise laws and regulations, inadequate awareness and dedication, and inadequate sustainability components (Ministry of Energy, Green Technology and Water (KeTTHA), 2017).

The future of the construction sector depends on the systemic integration of digitisation, sustainability, and workforce, as Olanrewaju et al. (2023) explained. However, the construction and maintenance of green buildings often require specialised skills and knowledge, which may not be readily available in the local labour market. As a result, many construction companies in Malaysia have turned to foreign labour to fill these skill gaps. However, there is a lack of research on how productive foreign labourers are in the context of green building construction and maintenance. Factors such as language barriers, cultural differences, and unfamiliarity with local building codes and practices may impact their productivity and overall effectiveness on the job.

Foreign labourers employed as construction workers are currently considered a trend, owing to a labour shortage, their eligibility to work, and the availability of cheap foreign labour from neighbouring countries. Therefore, this research aims to investigate productivity and foreign labour engagement in the construction of green buildings. According to the Green Building Index 2020, Selangor has the greenest building projects registered in Malaysia, with 340 compared to the other states. Research on the productivity of foreign labour in the context of green buildings is needed to understand the potential benefits and challenges of using foreign labour and to identify strategies for optimising productivity and ensuring the long-term sustainability of green buildings. In this research, foreign labourers and foreign workers mean the same and are used interchangeably.

## **2. LITERATURE REVIEW**

The demand for sustainable buildings is anticipated to rise in Malaysia. This calls for a workforce that is skilled and knowledgeable which might not always be obtainable locally. The nation has therefore been depending on immigrant employees. However, language difficulties, cultural differences, lack of skill, and a lack of training and certification could all have an impact on how productive and effective they are at work. To ensure that sustainable building practices are implemented, it is imperative to investigate the proficiency of foreign labourers in green building construction in

Malaysia. In the following sections, the impacts of the productivity of foreign labourers in the delivery of green building projects have been discussed.

## **2.1 IMPACTS OF FOREIGN LABOUR ON THE PRODUCTIVITY IN THE GREEN BUILDING PROJECT**

There are some negative effects of foreign labour on the productivity of green construction projects.

### **2.1.1 Increase in the Number of Accidents on the Job Site**

One of the most ignored aspects of a building project is construction site safety. Because of inadequate communication between site supervisors and foreign labourers, the number of accidents at the site is increasing. The significant obstacle between contractors and foreign labourers is the language barrier, which can be a major challenge. Foreign labourers often face challenges in comprehending discussions during toolbox meetings, especially regarding PPE, site laws, and regulations. As a result, when foreign labourers fail to recognise the necessity of safety, they risk catastrophic harm or permanent disability. According to the DOSH report, there were a total of 222 construction incidents in Malaysia in the year 2020. A lack of safety management resulted in the death of 58 workers and the permanent disability of four others (Salleh et al., 2020). Because the labourers worry about being fired or sent back home, migrant workers are less likely to complain about unsafe working conditions. They also frequently fail to report injuries out of fear of retaliation and because they cannot afford to take time off. Furthermore, migrant workers are often assigned more hazardous responsibilities compared to local workers. They also face growing pressure to complete tasks quickly and efficiently, leading to the use of shortcuts due to work fatigue (Shepherd et al., 2021).

### **2.1.2 Language Barrier among Foreign Labourers**

Language barriers are a common problem in Malaysia among construction site operatives. Over 80% of these workers are foreigners from countries such as Indonesia, Bangladesh, Pakistan, Myanmar, Thailand, and India. However, the official language on construction sites is Malay, the national language, which most workers are not fluent in. This often leads to communication barriers between foreign operatives and local supervisors or senior site officers. The consequences of these language barriers include mistakes, errors, reduced productivity, and psychological issues among the workers. These psychological issues, such as fear of making mistakes, shyness, anxiety, lack of confidence, and lack of motivation, further impede the ability of foreign labourers to communicate effectively (Ne'Matullah et al., 2021). The impact of this on green construction is huge. For example, green construction often involves the use of advanced technologies and sustainable practices that require precise implementation. Miscommunication due to language barriers can lead to improper installation or use of these technologies, reducing their effectiveness and potentially causing project failures.

### **2.1.3 Lack of Knowledge, Training, and Inexperience of Unskilled Foreign Labourers Leading to Poor Productivity**

According to Abdul-Rahman et al. (2012), excessive reliance on foreign labour will cause the economy and social equilibrium to be upset, as well as a reduction in productivity. According to Jamalulil et al. (2022), a rise in labour productivity is advantageous to the country, the labourers, employers, and consumers. Regrettably, the productivity of

foreign workers is a major problem for the Malaysian construction industry. This occurs because of the inexperience and incompetence of foreign labourers, which could affect the general productivity of green building projects. In addition, a few of them lack sufficient training in their respective trades and are incapable of completing the work as specified. Moreover, the contractor's use of inexpensive, unskilled foreign labourers to address the labour shortage.

#### **2.1.4 Decrease in the Quality of the Work**

The quality of the work is determined by the experience and skills of the workers on the job site, not by the presence of foreign or local labour. One of the most serious issues facing the construction industry in green building projects is the influx of unskilled immigrant workers, as skilled labour is critical to project success. As a result, inadequate labour productivity is a primary factor influencing project quality in every construction business (Rahim et al. 2011; Jamadi, 2012). In the Malaysian construction industry, however, unskilled immigrant labour is one of the most inefficient labour types, negatively hurting project quality. Because of their lack of education, foreign employees can have an impact on the quality of work because they are inexperienced or lack an understanding of sustainable or green building methods and criteria. Most of them have rudimentary construction knowledge only (Fateh et al., 2022). As a result, it may have an impact on the outcomes of projects, and this will influence Malaysia's economic and long-term growth (Anderson, 2020). Foreign labourers need to work extended hours which is about 14 to 16 hours for low-income compared to the local labourers also affects their workmanship in green construction (Priya & Kumar, 2018).

#### **2.1.5 Delay in the Project or Work**

Due to their limited education, foreign employees may contribute to a decline in work quality by virtue of their inexperience and lack of familiarity with sustainable building methods or green building methods and criteria. As a result, it may have an impact on the outcomes of projects that result in significant losses or problems for the sector because of their inappropriate work methods. As a result, it may have an impact on the outcomes of projects that result in significant losses or problems for the sector because of their inappropriate work methods, thereby, this will influence Malaysia's economic and long-term growth (Yee et al., 2017).

#### **2.1.6 Lack of Importance towards Safety in the Construction Industry**

The main concern about safety culture issues at construction sites would be the negative attitudes and poor behaviour of the foreign labourers. Most construction workers did not follow safety procedures at work because of their irresponsibility, attitude, and ignorance of safety issues. Because they are accustomed to surviving in a strange land, most foreign labourers working in construction have low knowledge of safety. Most foreign labourers believe that following safety procedures is a burden that will limit their range of motion. Due to their laziness and bad safety mentality, workers may not always avoid risks even though they are trained (Zulkeflee et al., 2022).

### **3. METHODOLOGY**

The purpose of this research is to investigate productivity and labour engagement in the construction of green buildings. The project managers, safety officers, staff, site operatives, and others at the construction projects in Selangor are the targeted

respondents. Approximately 100 questionnaires were sent out via email and WhatsApp, yet only 80 were returned, resulting in an 80% response rate. Google Forms were used due to this research being conducted around July to September 2021 during the Covid-19 pandemic. The information contained in this report was collected in an online survey, comprised of quantitative questions. This research used a literature review and a survey questionnaire to achieve its aim. Primary data were collected through survey questionnaires. The respondents were selected based on convenience sampling. As Olanrewaju and Idrus (2020) explained, convenience sampling is appropriate for research with a limited timeframe and cost. There are three sections in the questionnaire. Section A is for the respondent's demography, Section B is for the factors of hiring a higher number of migrant workers to the industry, and Section C is for the impacts of the foreign labourers on the productivity in the green building projects. The constructs were measured on a five-point Likert scale, where 1= strongly disagreed, 2 = disagreed, 3= Not sure, 4 = strongly agree, and 5 = strongly agreed. The level of agreement or disagreement was estimated by means and the standard deviation. Therefore, the factors that have the highest mean score were considered as the most influential factors. The survey instrument was designed based on a literature review (Abdul-Aziz et al., 2018; Gaur, 2019; Abdul-Aziz, 2001; Olanrewaju et al., 2019; Abdul-Rahman et al., 2012; Pan et al., 2019; Olanrewaju et al., 2017), and input from site operatives and the authors' experiences. A pilot study was conducted involving three stakeholders that have experience with foreign labourers in the Malaysian construction industry. The analyses involved descriptive and diagnostic analyses. The computed statistical tests were the one-way test, reliability tests, and mode. All collected data were analysed using IBM SPSS 25. The t-test was conducted to examine whether each of the factors affects hiring foreign labour or not and whether the factor impacts the productivity of foreign labourers.

## **4. RESULTS AND DISCUSSION**

A total of 100 forms were administered. However, only 80 responses were received. Although the research data were collected in 2021, however, they are still relevant for current practice because of stakeholder confirmation, practice consistency, the longevity of industry norms, the absence of exogenous factors, the ongoing relevance of the issues, the short time elapsed since data collection, and expert opinion have all indicated that no significant changes can be justified. The questionnaires were prepared in dual language, English and Malay language to ease the understanding of the foreign labourers. The administration of questionnaires in both English and Malay to foreign labourers engaged in green building construction projects in Malaysia is justified based on various factors such as language accessibility, inclusivity, improved communication, adherence to ethical standards, response accuracy facilitation, cultural sensitivity, legal and regulatory compliance, and pragmatic concerns.

### **4.1 RESPONDENTS PROFILE**

A total of 80 respondents, comprising 53 males, and 23 females were respondents to the survey. The selection of the respondents consists of professionals and site operatives who are working on green building construction projects due to their first-hand experience, varied viewpoints, thorough understanding, real-world relevance, stakeholder engagement, knowledge transfer, practical implications, and increased credibility. The respondents comprised 23 civil engineers, 17 site operatives, 14 quantity surveyors, seven

contractors, six M&E engineers, five developers., four architects, three project managers, and a sub-contractor participated in this research. Most of the respondents have one to five years of experience at the site. A 79% of the respondents have a master's degree as their highest qualification. In total, the data were collected from 20 ongoing green building projects.

#### 4.1.1 Impacts of Foreign Labourers on Productivity

Table 1 shows the results of the test of goodness of fit for the impacts of foreign workers on the construction of green buildings. The Kaiser's Measure of Sampling Adequacy for the expectations was significant  $\chi^2(36) = 836.445, p < 0.001, N = 0.949$ . To interpret, the data were collected from those with near similar experiences or in the same population. The validity of the data ranges from 0.658 to 0.879. The reliability for the constructs is 0.968. The critical level was set at 3.5. The df for ranges is either 78 or 79. The results revealed that all the constructs were statistically significant.

Table 1: Results of t-test and standard error mean on the impacts of foreign workers on green building construction

Factors	Test Value = 3.5					
	T	DF	Sig. (2-Tailed)	95% Confidence Interval of the Difference		Std. Error Mean
				Lower	Upper	
Accidents increase at the site due to poor communication between the site supervisors and foreign workers	3.34	79.0	0.00	0.19	0.76	0.14
The biggest barrier between the contractors and foreign workers is the language.	2.25	79.0	0.03	0.04	0.61	0.14
The foreign workers fail to understand the safety importance which leads to serious injuries such as permanent disability.	2.63	78.0	0.01	0.08	0.61	0.13
Unskilled foreign labour is one of the unproductive labour types in the Malaysian construction industry which impacts the quality of the project.	7.43	79.0	0.00	0.50	0.87	0.09
Foreign workers can impact the quality of work due to their unskilled or lack of knowledge about green building methods and the requirements because of lack of education.	2.66	79.0	0.01	0.10	0.68	0.15
Lack of knowledge by foreign workers about the industry and improper work skills affect the outcome of the project.	2.90	79.0	0.01	0.13	0.72	0.15

Factors	T	DF	Sig. (2-Tailed)	Test Value = 3.5		Std. Error Mean
				95% Confidence Interval of the Difference		
				Lower	Upper	
A lack of experienced foreign workers with specific skills will cause the project delayed.	3.07	79.00	0.00	0.15	0.70	0.14
Poor labour productivity is the major significant part influencing delay in projects in the construction industry	6.54	79.00	0.00	0.42	0.78	0.09

Figure 1 displays the summary of the measurement of the negative impacts of foreign labour on the construction of green buildings.

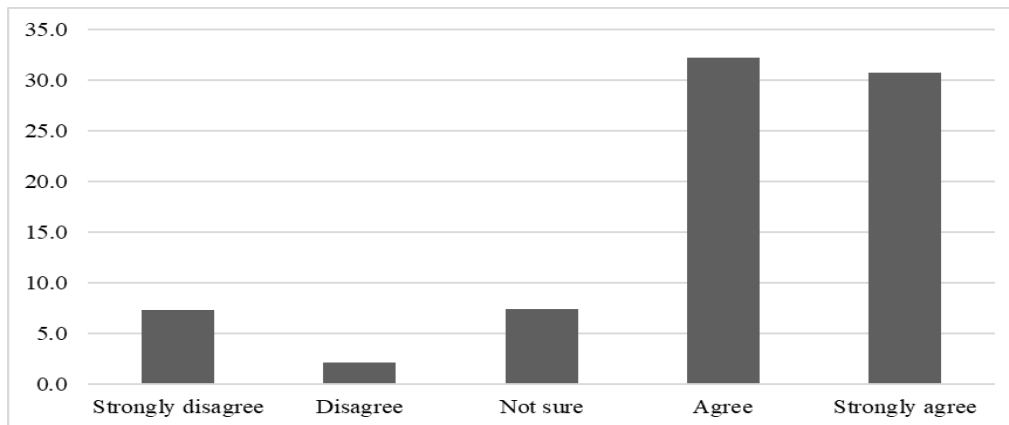


Figure 1: Summary of measurements of the negative impact of foreign workers on green building sites

Approximately 13% of the respondents disagreed or strongly disagreed that foreign workers have an impact on the construction of green buildings. However, while 9% are not sure, about 80% agreed that foreign workers have an impact on the productivity of the construction of green buildings. Table 2 presents the descriptive analysis of the impact of foreign workers on green building construction. As would be expected, if the labour lacks the needed competency, it will lower the site productivity and will ultimately affect the quality and cost of the projects. Considering the distinctive nature of the green building and the absence of prior experiential knowledge, it is anticipated that the costs will be even higher. This is regardless of the less of mechanisation. There may be language and cultural barriers for foreign workers in Malaysia's construction sector from nearby nations such as Indonesia and Bangladesh, as opposed to local labour. This may make it difficult to comprehend the requirements of green building construction and to communicate effectively. This will impact the dynamic between supervisors, construction managers, project managers, and site operatives.

The specifications and design requirements are largely in English, Russian, and Chinese, which dominate the supply of green materials and components. The Malaysian construction sector has yet to translate information into the local languages. The health and safety requirements and compliance of green building construction are high. Deductively, the foreign workers have not been able to meet the safety requirements which results in accidents. This may not be surprising because green buildings emphasise

prefabrication (i.e. IBS), the materials and components to be large and possibly also heaving. The foreign workers fail to understand the safety importance which can lead them to serious injury such as or permanent disability obtained the first rank with 3.848 mean and 1.788 standard deviations followed by the outcome of projects that caused the industry a huge loss or problems because of their incorrect method of works obtained the second rank with 4.000 mean and 1.322 standard deviations. Some of them do not even have a valid green card to work at the site, this card will be obtained once the labourers successfully attend the safety training conducted by the Construction Industry Development Board (CIDB). As the labourers are brought to the different sites daily, they feel attending safety training is not worth their time as they will face different situations at different sites.

Some of the labourers do not even have valid papers such as work permits and passports to work in Malaysia. If the contractor, consultant, and client are not satisfied with the workmanship of the final output they need to hack back the completed structure and re-do it. This will increase the time and eventually will delay the completion of the project. Lack of knowledge by foreign workers about the industry and improper work skills which can have to affect the outcome of the project obtained the third rank with 3.923 mean and 1.301 standard deviations. Most of the workers do not get formal training or education in their origin country on the technology used in green buildings. Poor labour productivity is one of the major significant parts influencing delay in the project in every construction industry obtaining the last rank with 4.100 means and 0.821 standard deviations.

Table 2 shows that not all foreigners are very well experienced in green building construction due to the new concept that they never heard of before in their countries.

Table 2: Descriptive analysis of impacts of foreign labourers on productivity

Descriptions	Standard Deviation	Mean	Rank
Unskilled foreign labour is one of the most unproductive labour types in the Malaysian construction industry which impacts the quality of the project.	0.828	4.188	8
Poor labour productivity is one of the major significant parts influencing delays in the project in every construction industry.	0.821	4.100	9
The outcome of projects that cause the industry a huge loss or problems because of their incorrect method of work.	1.322	4.000	2
The number of accidents increases at the site because of poor communication between the site supervisors and foreign workers.	1.273	3.975	6
A lack of experienced foreign workers or a lack of workers with specific skills will cause the project behind or be delayed.	1.240	3.925	7
Lack of knowledge by foreign workers about the industry and improper work skills can affect the outcome of the project.	1.301	3.923	3
Foreign workers can impact the quality of work due to their unskilled or lack of knowledge about sustainable or green building methods and the requirements because of their lack of education.	1.302	3.888	4
The foreign workers fail to understand the safety importance which can lead them to serious injuries such as permanent disability.	1.778	3.848	1
The biggest barrier between contractors and foreign workers is the language.	1.290	3.825	5



Emphasis on the green features in building construction is still very low, therefore, the idea of the green concept is still very new for many contractors. Most of the workers do not get formal training or education on the technology used in green buildings. Unskilled labourers need to be well trained before they can produce a good quality of work. Most of the time, the on-the-job training is not sufficient to get the required skills before they can work on the actual projects. If the contractor, consultant, and client are not satisfied with the workmanship of the final output they need to hack back the completed structure and re-do it. This will increase the time and eventually will delay the completion of the project. Poor communication occurs at times due to the different cultures and different local dialects used in Malaysia such as Mandarin, Cantonese, Malay, and others. Foreign labourers will take some time to get used to the local dialect. The Malay language is the formal language in Malaysia hence if the foreign labourers cannot converse in this language, they will have difficulty in reading and understanding the safety rules and regulations. Foreign labourers do not wear their Personnel Protective Equipment (PPE) on site which can protect themselves and reduce the severity of the injuries if an accident occurs. Generally, labourers on-site will only use their PPE when there is an inspection or site visit by authorities. If there is an accident on-site, it will also delay a project because work on-site cannot be started immediately due to the investigation process on the accident will be carried out to identify the root cause of the accident.

## **5. CONCLUSIONS AND RECOMMENDATION**

This study delves into the crucial labour factors involved in the construction of green buildings. The use of foreign workers in green building projects has raised worries about Malaysian construction businesses' efficiency. Due to the lack of experience and language barriers, foreign labourers are contributing to an increase in site accidents, jeopardising the safety and quality of green building construction. Furthermore, poor labour productivity is one of the most significant factors influencing project delays in every construction business, which can result in large losses or problems due to the wrong work methods. To improve the quality of green building construction, the government must tighten the rules on recruiting foreign labourers in the construction industry. Even though the government has begun to impose different restrictions on the hiring of foreign labours in recent years for a variety of reasons, including prioritising local workers and legalising certain groups of undocumented workers in the country, the number of foreign labourers is still excessive. The implications of this research highlight how crucial it is to address labour issues while developing green buildings to improve output in terms of quality, safety, and productivity. The government must devise strategies to limit foreign labour recruitment while also balancing the labour shortfall, particularly in the construction industry. The government might also make green building principles and safety rules mandatory for new and existing foreign workers. To minimise language hurdles, construction firms can engage a translator or train senior international labourers.

It is important to investigate how the productivity of foreign labourers negatively affects green buildings in Malaysia, for several reasons. It assists in highlighting issues and potential areas of development, guaranteeing that green construction initiatives fulfil their sustainability objectives. Additionally, it influences practice and policy, which improves the management of the foreign workforce and produces better results for green buildings. In the end, this research has the potential to further sustainable building techniques generally and to realise the financial and environmental advantages of green buildings.

The results of this research may be used to create focused training initiatives, better management techniques, and practical regulations that will raise the standard, sustainability, and output of green construction projects. However, due to the COVID-19 pandemic and some restrictions on physical meetings, the data collection process was constrained, resulting in a sample size of only 80 respondents for this project. Additionally, because this research was only conducted in Selangor, the results may be not generalisable to the entire Malaysian construction industry. Further research should survey foreign labourers considering the same or an extension of the survey, hence, more studies with larger samples are needed to be conducted in the other states.

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## 7. REFERENCES

- Abdul-Aziz, A.-R. (2001). Foreign workers and labour segmentation in Malaysia's construction sector. *Construction Management and Economics*, 19(8), 789–798. doi:10.1080/01446190110072022.
- Abdul-Aziz, A.-R., Umar, A. A. & Olanrewaju, A. L. (2018). South Asian migrants and the construction sector of the Gulf. In M. Chowdhury and S. I. Rajan (Eds.), *South Asian Migration in the Gulf*, (pp.165-189). <https://doi.org/10.1007/97833197182179>.
- Abdul-Rahman, H., Wang, C., Wang, C., Wood, L. C., & Low, S. F. (2012). Negative impact induced by foreign workers: evidence in Malaysian construction sector. *Habitat International*, 36 (4), 433–443. doi:10.1016/j.habitatint.2012. 03.002.
- Anderson, J.T. (2020). Managing labour migration in Malaysia: foreign workers and the challenges of “control” beyond liberal democracies. *Third World Quarterly*, 42(1), 86-104, <https://doi.org/10.1080/01436597.2020.1784003>.
- Department of Statistics of Malaysia (2020). Population and Demography. Retrieved from [https://www.dosm.gov.my/v1/index.php?r=column/ctwoByCat&parent\\_id=115&menu\\_id=L0pheU43NWJwRWVVSzklWdzQ4TlhUUT09](https://www.dosm.gov.my/v1/index.php?r=column/ctwoByCat&parent_id=115&menu_id=L0pheU43NWJwRWVVSzklWdzQ4TlhUUT09) on February 2, 2022.
- Fateh, M. A. M., Mohamed, M. R., & Omar, S. A. (2022). The involvement of local skilled labour in Malaysia's construction industry. *Frontiers in Built Environment*, 8, 1-13. <https://doi.org/10.3389/fbuil.2022.861018>.
- Gaur, M.P. (2019). Assessment of socioeconomic status among different state level male team game players of Lucknow. *International Journal of Economic Perspectives*,13(1), 17–23. <https://ijeponline.org/index.php/journal/article>.
- Jamadi, M.A. (2012). *Foreign Labour Employment in Construction Project*. [Masters Thesis]. Universiti Teknologi Malaysia. <http://eprints.utm.my/29838/5/>
- Hwang, B., Zhu, L., & Ming, J. T. T. (2017). Factors affecting productivity in green building construction projects: The case of Singapore. *Journal of Management in Engineering*, 33(3), 04016052. doi: 10.1061/(ASCE)ME.1943-5479.0000499.
- Mahat, N.A.A., Adnan, H. Yusuwan, N.M. & Maisham, M. (2019). Productivity improvement strategies in green construction project: Formulation of a theoretical framework. *IOP Conf. Series: Earth and Environmental Science*, 385, 012067, (pp. 1-8). DOI: 10.1088/1755-1315/385/1/012067.
- Ministry of Energy, Green Technology and Water (KeTTHA) (2017). Green Technology Master Plan Malaysia 2017-2030 (GTMP), Ministry of Energy, Green Technology and Water (KeTTHA), Putrajaya, Malaysia.
- Jamalulil, S. N. N. S., Hussin, S. N., Salleh, N. M., Kamar, I. F. M., & Rizam, K. N. (2022). High dependency on foreign workforce in Malaysian construction industry. *International Journal of Academic Research in Business and Social Sciences*, 12(9), 412 – 418. doi: 10.6007/IJARBS /v12-i9/14488.

- Ne'Matullah, K. F., Lim, S.P. and Roslan, S.A. (2021). Investigating communicative barriers on construction industry productivity in Malaysia: An overview. *International Journal of Evaluation and Research in Education (IJERE)*, 10 (22), 476-482. doi: 10.11591/ijere.v10i2.21163.
- Olanrewaju, A., Tan, S. Y., & Kwan, L. F. (2017). Roles of communication on performance of the construction sector. *Procedia engineering*, 196, 763-770. doi: 10.1016/j.proeng.2017.08.005.
- Olanrewaju, A., Tan, S.Y., Lee, J.E. & Mine, N. (2019). Identification and establishment of weightage for critical success factors in sustainable affordable housing: An interactive approach. In Olanrewaju, A., Shari, Z. and Gou, Z. (Eds.), *Greening Affordable Housing*. (2<sup>nd</sup> ed. pp. 1-34). Taylor & Francis Group. doi: 10.1201/b22317-14.
- Olanrewaju, A. & Idrus, A. (2020). What is determining affordable housing shortages in the greater Kuala Lumpur, Malaysia?. *Property Management*, 38(1), 52-81. doi: 10.1108/PM-05-2019-0025.
- Olanrewaju, A., Anavhe, P.J. & Chen, H.C. (2023). Disputes and claim management during the COVID-19 crisis: The lessons learned. *Journal of Legal Affairs and Disputes Resolution in Engineering and Construction*. 15(1). 1-11. doi: 10.1061/JLADAH.LADR-843.
- Pan, W., Chen, L. & Zhan, W. (2019). PESTEL analysis of construction productivity enhancement strategies: A case study of three economies. *Journal of Management in Engineering*, 35(1), 05018013. <https://www.researchgate.net/publication/328063709>.
- Pan, W. (2018). Rethinking construction productivity theory and practice. *Built Environment and Project Assest Management*, 8(3), 234-238. <https://doi.org/10.1108/BEPAM-07-2018-125>.
- Hamid, A.R.A., Singh, B., Yusof, A.M. & Abdullah, N.A.M. (2011). *The employment of workers at construction sites*. 2<sup>nd</sup> International Conference on Construction and Project Management (IPEDR). Singapore. <https://www.researchgate.net/publication/264623080> The Employment of Foreign Workers at Construction Sites.
- Salleh, N.M., Lop, N.S., Mamter, S.&Abidin, Z.Z. (2020). Preliminary survey on availability of local skilled construction workers at construction sites. *International Journal of Academic Research in Business & Social Sciences*. 10(3), 618-632. doi: 10.6007/IJARBS/v10-i3/7077.
- Salleh, N.M., Mamter, S., Lop, N.S. Kamar, I.F.M. & Hamdan, N. A.M. (2014). *The escalating of numbers of foreign workers in construction site*. MATEC Web of Conferences 15 (01026), 1-6. DOI: 10.1051/mateconf/20141501026.
- Shafiei, M.W.M., Abadi, H. & Osman, W.N. (2017). The indicators of green buildings for Malaysian property development industry. *International Journal of Applied Engineering Research*, 12(10), 2182-2189. <http://www.ripublication.com>.
- Shinde, V.J. & Hedao, M.N. (2017). A review on productivity improvement in construction industry. *International Journal of Engineering Technology Science and Research (IRJET)*, 4(11), 210-215. <https://www.irjet.net/archives/V4/i11/IRJET-V4I1136.pdf>.
- Shepherd, R., Lorente, L., Vignoli, M., Nielsen, K. & Peiro, J.M. (2021). Challenges influencing the safety of migrant workers in the construction industry: A qualitative study in Italy, Spain and the UK. *Safety Science*, 142, 1-15. <https://doi.org/10.1016/j.ssci.2021.105388>.
- Wong, S.Y., Low, W.W., Wong, K.S. & Tai, Y.H. (2021). Barriers for green building implementation in Malaysian construction industry. *IOP Conferences Series: Materials Sciences and Engineering*, 1101, 1-7. doi: 10.1088/1757-899X/1101/1/012029.
- Yee, K.C.W.H., Rahim, A. & Zahari, H.Z.A. (2017). Foreign worker's composition at construction site. *Journal of Advanced Research Design*. 30(1). 12-21.
- Zulkeflee, A.A., Faisol, N., Ismail, F. & Ismail, N.A.A. (2022). Safety compliances enhancement: foreign labours behaviour in the Malaysian construction site. *Journal of Construction in Developing Countries*, 27(1), 153–171. doi: 10.21315/jcdc2022.27.1.9.