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“Rethinking Built Environment: Towards a Sustainable Future”



Organiser:
**Research, Industrial Linkages, Community
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Co-organiser:
**Department of Built Environment Studies & Technology (JABT),
Faculty of Architecture, Planning & Surveying (FSPU)**

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Construction Labour's Productivity Indicator to the Project Success: A Literature Review

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Abstract

The productivity of labour is an extremely critical project performance measurement tool used in the construction industry. How good the productivity is on site will largely impact the overall performance of a project. Construction industry is well known for its labour-intensive activities, as this industry relies heavily on the skills of its workforce. Majority of the construction activities are based on labour performance. Thus, contractors must use all available knowledge, expertise, and management skills in order to improve project performance. However, it has been noticed that at construction sites, contractors have ignored the productivity of their labours and its effects on the overall productivity. Following that situation, this research was conducted to identify the factors that affect the productivity of construction labour and to find out the impacts of construction labour's productivity to the project performance. Therefore, literature review is carried out as a research methodology to achieve the research objectives. The result indicates that manpower, management, motivation, and project factors are the most important factors that affect the productivity of construction labour. Besides that, time, cost, and quality are the major impacts of construction labour's productivity to the project performance. Hence, this research posits that it is essential to highlight the factors and impacts of construction labour's productivity in the construction industry to improve the project performance in the future.

Keywords: *Labour's Productivity; Project Success;*

1.0 Introduction

Nowadays, the construction industry faces several challenges related with the labour's productivity. This industry is recognised as labour intensive as it relies more on human efforts. Labour is the most complicated resource and usually becomes the most difficult to manage. According to The Internal Labour Organization (ILO), a construction worker is a part of a construction team that performs several basic jobs on construction sites that require physical labour. This statement is explained by Fakhri, A., & Marrouch, W. (2014) as they work on many and different construction projects, doing a variety of jobs ranging from the simple to the complex. Thus, their productivity became one of crucial factors that affect the overall physical progress of any construction project

Following that situation, it is vital to gain more understanding on the labour's productivity in the construction industry. Kim, G, et al (2013) cited that productivity is one of the most significant factors influencing the overall performance of any organisation. It was supported by Kazaz et al. (2016) that labour productivity will give a significant impact on the time, cost, and quality of a construction project. In other words, the labour productivity is one of the key indicators to complete a project successfully.

As such, for the purpose of writing, the author will concentrate more on the factors and impacts of labour's productivity on the construction project performance.

1.1 Productivity in Construction Industry

Many terms are used to define productivity. Traditionally, productivity can be defined as the ratio of the output that is produced to the inputs used to produce the outputs (Coelli et al., 2005). It is commonly referring to the efficient use of resources such as labour, capital, materials, energy, and information in the production of various goods and services. However, in the context of labour's productivity, it can be defined as the ratio between the units of work accomplished (i.e., outputs quantify) and the hours of work (i.e., inputs for labours) (Enshassi et al., 2007; Ghoddousi & Hosseini, 2012).

Two (2) most important measures of labour productivity are the effectiveness with which labour is used in the construction process and the relative efficiency of labour doing what is required to do at a given time and place (Dozzi, 1993). Therefore, labour productivity is also known as workforce productivity and extremely a vital performance measurement tool within the construction industry.

2.0 Literature Review

2.1 Factors That Affect the Productivity of Construction Labour

The factors that affect the productivity of construction labour have been identified and classified by several researchers from different countries as represented in the previous studies.

In Malaysia, Kadir M.R.A. et al. (2006) characterised the ranking of criteria affecting labour's productivity as their study critical factors were: technology, human or labour, management and external. Makulsawatudom et al. (2004) found that lack of material, incomplete drawings, incompetent supervisors, lacks tool and equipment, labour absenteeism, poor communication, instruction time, poor site layout, inspection delay and rework, are the most critical factor that affect the labour's productivity in Thailand.

Besides that, Soekiman et al. (2011) revealed that various factors affecting labour productivity in Indonesia and shortlisted the following as most significant: Lag of materials, Delay in arrival of material, Unclear instruction to labour, labour strikes, financial difficulties, higher absenteeism of labour, no supervision method, supervisor's absenteeism, lag of equipment and design change. While Jarkas & Bitar (2012) carried out a survey in Kuwait and their finding factors were: clarity of technical specification, extent of variation/change orders during execution, coordination level among various design disciplines.

In addition, AynurKazaz et al (2008), identified nine main factors that affecting labour's productivity in Turkey: Quality of site management; Material management; Amount and on payment; Planning; Supervision; Site layout; Work discipline; Occupational education and training; Working at similar activities, based on relative importance index method. Based on a survey in the USA, there are five significant problems that impede productivity are non-effective management programs, material management and safety programs (Dixit et al., 2017).

Further, Berks (2017) mentioned that in Jordan, the most affecting factors are poor planning, poor site management, materials shortage, equipment shortage, and labour shortage. In Cambodia, Durdyev and Mbachu (2018) clarifies the five substantial factors affecting productivity are poor planning, poor labour supervision, ineffective communication, and inadequate construction methods. Shoar and Banaitis (2019) also mentioned an unrealistic schedule, delay in salary payment, and workforce overtime became factors affecting labour's productivity in Lithuania.

Lim & Alum (1995) indicated top factors affecting construction labour productivity in Singapore include, difficulty in the recruitment of supervisors, difficulty in recruitment of workers, high rate of labour turnover, absenteeism at the worksite, and communication problems with foreign workers, whereas, Mahamid et al. (2013) stated that factors of rework, lack of communication, financial status of the owner, labour experience, lack of materials which have a significant impact on labour productivity in the Palestine construction industry.

Lastly, based on results study conducted by Jarkas et al. (2014) in Qatar exposed that the top five factors affecting construction labour productivity are lack of financial incentive schemes, slow

decision-making process by owners, remuneration scale, delay in responding to requests for information, and shortage of skilled labour force, while Ghoddousi et al. (2015) shown that factors of amount of remuneration, work satisfaction, timeliness of remuneration, ethical behaviour of manager, promotion opportunities which have the most effect on productivity in Iranian construction projects (Ghoddousi et al., 2015)

Based on comprehensive literature cited above, it can be summarised that factors that affect productivity of construction labour can be grouped into four (4) categories, namely: manpower factors, management factors, motivation factors and project factors. Table 1. below classified all factors discussed into categories mentioned.

Table 1. Factors that affect the productivity of construction labour

Categories	Factors	Sources
Manpower factors	Absenteeism	Makulsawatudom et al (2004), Soekiman et al (2011), Lim & Alum (1995)
	Work discipline	AynurKazaz et al (2008)
	Labours' experience and skills	Mahamid et al. (2013), Makulsawatudom et al (2004)
Management factors	Communication	Mahamid et al. (2013), Durdyev and Mbachu (2018), Makulsawatudom et al (2004), Soekiman et al (2011), Lim & Alum (1995)
	Lack of supervision	Soekiman et al (2011), AynurKazaz et al (2008), Durdyev and Mbachu (2018)
	Financial	AynurKazaz et al (2008), Shoar and Banaitis (2019), Mahamid et al. (2013), Soekiman et al (2011)
	Rework	Makulsawatudom et al (2004), Mahamid et al. (2013)
	Working overtime	Shoar and Banaitis (2019)
	Availability of materials	Makulsawatudom et al (2004), Mahamid et al. (2013), Berks (2017), Jarkas et al. (2014)
	Material management	Dixit et al. (2017), AynurKazaz et al (2008), Soekiman et al (2011)
	Construction method	Durdyev and Mbachu (2018)
	Site management	AynurKazaz et al (2008), Berks (2017), Makulsawatudom et al (2004), Soekiman et al (2011), Shoar and Banaitis (2019)
Motivation factors	Availability of equipment/tools	Makulsawatudom et al (2004), Soekiman et al (2011), Berks (2017)
	Availability of labour	Berks (2017)
	Timeline of numeration	Jarkas et al. (2014), Ghoddousi et al. (2015)
	Promotion	Ghoddousi et al. (2015)
	Amount of numeration	Ghoddousi et al. (2015)
Project factors	Work satisfaction	Ghoddousi et al. (2015)
	Incentive scheme	Jarkas et al. (2014)
	Design changes	Jarkas & Bitar (2012)
	Changes order	Jarkas & Bitar (2012)

2.2 Impacts of Construction Labour's Productivity to the Project Performance

Productivity mainly depends on the labour's efforts and performance. According to the Mahamisd et al. (2013), labour productivity plays a major role in determining the success of any construction industry. Normally, the construction process always results in relatively high costs and construction labour are crucial issues in the construction phase. Labour cost contributes between 20% and 50% of the total project cost, and the most effective way to reduce this cash outflow is by the improvement of labour's productivity.

A low level of productivity is risky and will cause inflationary pressure, social conflicts, and mutual suspicion of the nation's economy (Shoar and Banaitis 2019). It was further supported by Ashebir Alyew (2020) that lower work rate or productivity results in poor labours' performance, ultimately affecting project quality. Inadequate closeout procedures can lead to the failure of a construction project. Hence, by acknowledging the factors affecting construction worker productivity, every responsible party may resolve issues at an early stage. The parties involved will get to save time and avoid any slightest chance of cost overruns (Masrom et al., 2015). In addition, the effect of the

factors on productivity may vary from task to task. Although some factors could have similar influences on the productivity of several tasks, their rate of impact on productivity may be different (Kazaz and Ulubeyli, 2007).

3.0 Conclusion

Fundamental knowledge on the construction labour's productivity during the construction project execution can be substantial saving in time and cost. Believe it or not, construction labourers have a key role in improving the construction process. They are a part of construction parties who have existed from the initial stage until the completion of the project. By identifying all possible factors and impacts of construction labour's productivity on the construction industry can help this industry to develop more strategies to reduce inefficiencies as well as to effectively manage construction labour forces.

References

- A. Soekiman, K. S. Pribadi, B. W. Soemardi, R. D. Wirahadikusumah. (2011) Factors Relating to Labour Productivity Affecting the Project Schedule Performance in Indonesia. *Procedia Engineering* 14, 865-873.
- Abdul Kadir, M. R., Lee, W. P., Jaafar, M. S., Sapuan, S. M., And Ali, A. A. (2005). Factors Affecting Construction Labour Productivity For Malaysian Residential Projects. *Struct. Surv.*, 23 (1), 42–54.
- Jarkas, A. M., & Bitar, C. G. (2012). Factors Affecting Construction Labor Productivity in Kuwait. *Journal of Construction Engineering and Management*, 138(7), 811–820. [https://doi.org/10.1061/\(asce\)co.1943-7862.0000501](https://doi.org/10.1061/(asce)co.1943-7862.0000501)
- Ashebir Alyew. (2020). A Study on Factors Affecting Labour Productivity on Construction Projects in Wolaita Zone, Ethiopia. *International Journal of Engineering Research and Technical Research*, 8(12), 817–822.
- Aynur Kazaz, Ekrem Manisali, Serdar Ulubeyli. (2008). Effect of Basic Motivational Factors on Construction Workforce Productivity in Turkey, *Journal of Construction Engineering and Management*, 14(2), 95- 106
- Bekr G.A. (2017). Study of significant factors affecting labour productivity at construction sites in Jordan: site survey. *Journal of Engineering Technology (JET)*, 4(1).
- Coelli, T. J., Rao, D. S. P., O'donnell, C. J., & Battese, G. E. (2005). An introduction to efficiency and productivity analysis. Springer Science & Business Media.
- Dixit, S., Mandal, S. N., Thanikal, J. V., & Saurabh, K. (2019). Evolution of studies in construction productivity: A systematic literature review (2006–2017). *Ain Shams Engineering Journal*, 10(3), 555–564. <https://doi.org/10.1016/j.asej.2018.10.010>
- Durdyev S, Mbachu J. (2018). Key constraints to labour productivity in residential building projects: Evidence from Cambodia. *Int J Constr Manage*. 18(5):385–393.
- Enshassi, A., Mohamed, S., Mustafa, Z. A., & Mayer, P. E. (2007). Factors affecting labour productivity in building projects in the Gaza Strip. *Journal of Civil Engineering and Management*, 13(4), 245–254.
- Fakih, A., & Marrouch, W. (2014). Who Hires Foreign Domestic Workers? Evidence from Lebanon. *The Journal of Developing Areas*, 48(3), 339-352.
- Ghoddousi, P., Poorafshar, O., Chileshe, N., & Hosseini, M. R. (2015). Labour productivity in Iranian construction projects. *International Journal of Productivity and Performance Management*, 64(6), 811–830. <https://doi.org/10.1108/IJPPM-10-2013-0169>
- Ghoddousi, P., & Hosseini, M. R. (2012). A survey of the factors affecting the productivity of construction projects in Iran. *Technological and Economic Development of Economy*, 18(1), 99–116. <https://doi.org/10.3846/20294913.2012.661203> [Taylor & Francis Online], [Web of Science ®], [Google Scholar]
- Kazaz, A., Ulubeyli, S., Acikara, T., & Er, B. (2016). Factors Affecting Labour Productivity: Perspectives of Craft Workers. *Procedia Engineering*, 164(June), 28–34.

- Kazaz, A., & Ulubeyli, S. (2007). Drivers of productivity among construction workers: A study in a developing country. *Building and Environment*, 42(5), 2132–2140. <https://doi.org/10.1016/j.buildenv.2006.04.020>
- Kim, G. H., & Shin, Y. (2013). Comparison of the Factors Improving Construction Productivity between Korean and Chinese Labourers in Korea. *Applied Mechanics and Materials*, 256, 3016–3019.
- Lim, E. C., & Alum, J. (1995). Construction productivity: Issues encountered by contractors in Singapore. *International Journal of Project Management*, 13(1), 51–58. [https://doi.org/10.1016/0263-7863\(95\)95704-H](https://doi.org/10.1016/0263-7863(95)95704-H)
- Mahamid, I.A., Al-Ghonamy, A., Aichouni, M. Major factors influencing employee productivity in the KSA public construction projects. *International journal of civil and environmental engineering* 2013 14(1), 16–20
- Makulsawatudom, A., Emsley, M., & Sinthawanarong, K. (2004). Critical factors influencing construction productivity in Thailand. *The journal of KMITNB*, 14(3).
- Shoar S, Banaitis A. (2019). Application of fuzzy fault tree analysis to identify factors influencing construction labour productivity: a high-rise building case study. *J Civil Eng Manage*. 25(1):41–52.

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Tuan,

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Sekian, terima kasih.

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