

FACTORS CAUSING DELAYS IN THE CONSTRUCTION INDUSTRY IN THE CITY OF AL-ABYAR, LIBYA

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Abstract: This study focuses on determining the factors contributing to project delay in general and identified the top ten factors that lead delays in in the city of Al-Abyar, Libya. Data was collected through questionnaire survey, 73 questionnaires were sent out to project managers, contractors and consultants in the above-mentioned city, of these only 62 completed questionnaires were returned and analyzed, yielding a response rate 85%. As results, these factors are lack of skilled labour, poor communication and coordination, contractor's poor site management, mistakes during the construction stage, equipment availability and failure and problems with subcontractors. Several strategies to mitigate these factors were recommends, such as providing regular meetings and clear communication channels can achieve effective communication and coordination. These recommendations can provide practical insights for practitioners and policymakers in the construction industry to mitigate the impact of cost overruns and delays.

Keywords: Causes, delay, construction project, industry, Libya

1. Introduction

Quite number of studies have been done on the factors that contributed to causes of delays in construction Projects. Fashina et al. (2021) investigated the significant factors that influence delays in construction projects in Hargeisa, using the road and building projects as a baseline. Through a questionnaire survey with 51 critical delay factors that are categorized into seven major groups, data were collected from 51 construction stakeholders selected based on simple random sampling from the different construction companies. Their study showed that delay in honoring payment progressively, underestimation or overestimation of the project cost, and delay in the approval of major changes in the work scope were ranked as the three major causes of delays in construction projects in Hargeisa. Al-Ghaflly (1995) discussed the delay in public water and sewage projects. Important causes identified are financial problems, changes in the design and scope, delay in making decisions and approvals by owner, difficulties in obtaining work permit, and coordination and communication problems. Durdyev and Hosseini (2020) systematical reviewed prior studies published on construction project delays (CPD) between 1985 and 2018. The findings from their study revealed a total number of 149 factors that influence CPD were identified from 97 selected articles. The ten most common CPDs identified by the authors are weather/climate conditions, poor communication, lack of coordination and conflicts between stakeholders, ineffective or improper planning, material shortages, financial problems, payment delays, equipment/plant shortage, and lack of experience/qualification/competence among project stakeholders, labor shortages and poor site management. Tariq and Gardezi (2023) generated a review study on the delays and conflicts for construction projects and their mutual relationship and they found that among the top five identified global causes of D&Cs, the common causes were (1) financial problems on behalf of the owner, (2) change orders/ variations, and (3) lack of communication/ poor relationship. Elziny et al. (2016) conducted a comprehensive review study to identify the causes of disputes and their resolution techniques. Their study provides an insight towards the optimal resolution

of conflicting issues occurring in construction projects. Derakhshanfar et al. (2019) reviewed 46 articles on delay risks in a systematic analysis aimed at developing risk terms and classifying risks in construction projects. A study by Assaf et al. (1995) summarized main causes of delay in large building construction projects in Saudi Arabia and they identified approval of shop drawings, delays in payment to contractors and the resulting cash problems during construction, design changes, conflicts in work schedules of subcontractors, slow decision-making and executive bureaucracy in owner's organizations, design errors, labour shortage and inadequate labour skills as the most important causes of delay. Alrasheed et al. (2023) aimed to identify causes of delays and rank them based on their impact on project objectives within the Kuwaiti construction industry. They revealed that among the prominent factors exerting influence on construction project delays in Kuwait are contractor site management competence, various subcontractor problems such as coordination, selection, and competence, as well as defects in design quality such as mistakes, errors, and incompleteness. Additionally, delays attributed to contractual clauses and procedures, challenges within the construction material supply chain, and complexities related to labor availability were also identified as significant in the context of Kuwait's construction industry. Ogunlana et al. (1996) studied the delays in building project in Thailand, as an example of developing economies. They concluded that the problems of the construction industry in developing economies can be nested in three layers: problem of shortages or inadequacies in industry infrastructure, mainly supply of resources; problems caused by clients and consultants; and problems caused by incompetence of contractors. Kaming et al. (1997) studied influencing factors causing delay on high-rise projects in Indonesia. The most important factors are design changes, poor labor productivity, inadequate planning, and resource shortages.

Assaf et al. (1995) surveyed the causes of delay in large building construction projects in the Eastern Province of Saudi Arabia as seen by contractors, architect/engineers and owners. They found that the most important causes of delay included approval of shop drawings delays a payment to contractors and the resulting cash-flow problems during construct design changes, conflicts in work schedules of subcontractors, slow decision making and executive bureaucracy in the owners' organizations, design errors, labour shortage and inadequate labour skills. Kaming et al. (1997) identified many variables that have an impact on construction time and cost overruns on high-rise projects in Indonesia. They found that cost overruns occur more frequently and are thus a more severe problem than time overruns on high-rise construction in Indonesia. The predominant factors influencing cost overruns are material cost increases due to inflation, inaccurate materials estimating and degree of project complexity. Ogunlana et al. (1996) studied the delay in building project in Thailand, as an example of developing economies. They concluded that the problem of the construction industry in developing economies can be nested in three layers: Problem of shortage or inadequacies in industry infrastructure, mainly supply of resources. Mezher and Tawil (1998) surveyed randomly selected owners, contractors and architects from Lebanon to find out the main causes of delays from the pre-identified causes and their groups. They found that owners had more concerns with regard to financial issues; contractors regarded contractual relationships the most important, while consultants considered project management issues to be the most important causes of delays. Akogbe et al. (2013) generated a study on the causes of construction delay in developing countries and they sated that the development and maintenance of planning, coordinating, controlling, organizing, motivating program resources, and supervising the component projects are amongst the top cause's significant factors. Kazaz et al. (2012) examined the causes of time extensions in the Turkish construction industry and together with their levels of importance. According to the obtained results, factors like design and material changes, delay of payments and cash flow problems were found to be the most predominant factors. In terms of importance levels of factor groups, financial factors were found to be the first group, while environmental factors were the least effective group. Extraneous causes of delay identified were inclement weather, acts of nature, and labour disputes (Kazaz et al., 2012; Hussin & Omran, 2011; Nachatar et al., 2011). Kumaraswami and Chan (1998) also surveyed the causes of construction delays in Hong Kong as seen by clients, contractors and consultants, and examined the factors affecting productivity. The survey revealed differences in perceptions of the relative significance of factors between the three groups, indicative of their experiences, possible prejudices and lack of effective communication. Research conducted by Frimpong et al. (2003) revealed that financing, natural

conditions and materials-related factors contributed mainly to the delay of groundwater projects in Ghana and so on. Mansfield et al. (1994) studied the causes of delay and cost overrun in construction projects in Nigeria. The results showed that the most important factors are financing and payment for completed works, poor contract management, changes in site conditions, shortage of material, and improper planning. Odeh and Battaineh (2002) studied causes of construction delay in Jordan. Owner interference, inadequate contractor experience, financing and payments, labour productivity, slow decision making, improper planning, and subcontractors are most important factors. In Afghanistan, Niazi and Painting (2017) stated construction cost overruns are the most substantial problem (facing all parties to a project; suppliers, subcontractors, main contractors and clients). They found that the key critical causes that potentially result in construction cost overruns in Afghanistan were corruption, delay in progress payment by owner, difficulties in financing project by contractors, security, change the order by the owner during construction and market inflation. Long et al. (2004) studied the problems on large construction projects Vietnam. They grouped the problems in five major factors (incompetent designers/contractors; poor estimation and change management; social and technological issues; site related issues; and improper techniques and tools). Sambasivan and Soon (2007) identified 10 most important causes of delay in construction projects. They are contractor's improper planning, contractor's poor site management, inadequate contractor experience, inadequate client's finance and payments for completed work, problems with subcontractors, shortage in material, labor supply, equipment availability and failure, lack of communication between parties, and mistakes during the construction stage. Omran et al. (2010) conducted a study on delays factors in construction projects development in Klang Valley, Malaysia. The findings from this paper shown that owner's slow in decision making was perceived to be the most significant factor and main causes to the project delays. Besides that, the contractor is deemed the main contributor to the project delays in Malaysia construction industry. It is assumed by all of the respondents that the contractor should be responsible for any delays at the construction stage, which is considered as the most critical stage in governing the project delays. In order to mitigate the project delays, awarding bids to the right and experience contractor was suggested to be the utmost effective solution in resolving those contractor's related delay factors (Omran et al., 2012; Omran, 2015; Omran et al., 2023; Omran et al., 2016; Ellafi, 2010). Tumi et al. (2009) conducted a survey to identify some of the most important causes of delays in construction projects in Libya. Six main causes are improper planning, lack of effective communication, design errors, shortage of supply i.e. steel, concrete, etc, slow decision making and financial issues. Omran et al. (2012) conducted a study on the factors that enhance performance of the projects, as well as the factors that lead to the delay of projects in construction firms in the city of Khartoum in Sudan. She used a questionnaire survey and targeted the consultants, contractors and project managers only in the private sector. Omran et al. (2023) found the most factors that cause construction delays were contractor improper planning, inadequate contractors experience, client's finance and payments, mistakes during the construction and lack of communication between parties. Fugar and Agyakwah-Baah (2010) investigated the causes of delay of building construction projects in Ghana to determine the most important according to the key project participants. All major stakeholders agreed that the top ten most important factors causing delay in Ghana are: delay in honoring payment certificates, underestimation of the cost of project, underestimation of complexity of project, difficulty in accessing bank credit, poor supervision, underestimation of time for completion of projects by contractors, shortage of materials, poor professional management, fluctuation of prices/rising cost of materials, and poor site management. Sweis et al. (2008) studied the causes of delay in residential projects in Jordan and concluded that financial difficulties faced by the contractor and too many change orders by the owner are the leading causes of construction delay. Abd El- Razeq et al. (2008) in a similar study in Egypt found that the most important causes of delay are financing by contractor during construction, delays in contractor's payment by owner, design changes by owner or his agent during construction, partial payments during construction, and non-utilization of professional construction/contractual management. Assaf & Al-Hejji (2006) identified 56 main causes of delay in Saudi large building construction projects and their relative importance. Based on the contractors surveyed the most important delay factors were preparation and approval of shop drawings, delays in contractor's progress, payment by owners and design changes. From the view of the architects and engineers the cash problems during construction,

the relationship between subcontractors and the slow decision-making process of the owner were the main causes of delay. However, the owners agreed that the design errors, labour shortages and inadequate labour skills were important delay factors. Pourrostan and Amiruddin (2011) conducted a study to identify the main causes and consequences of delay in Iranian construction projects. The results showed delay can lead to many negative effects such as time and cost overrun, disputes, arbitration, total abandonment and litigation. Therefore, this study is aimed at determining the most important factors that could cause construction project delay in the construction industry in Al-Abyar city; and to propose some strategies to improve the performance of projects those are enhanced by the project team.

2. Research Method

The questionnaire method was chosen because it can reach a widely distributed population of managers (Burns, 1994). This research is focused on the factors influencing project delay in the city of Al-Abyar, Libya. Questionnaires, which total to 73, accompanied by cover letters, were sent out to project managers, contractors and consultants in the above-mentioned city. In the end, 62 completed questionnaires were returned. The sample included many construction companies, consulting companies and building system companies. The questionnaires were distributed among main contractors, consultants, and project managers who are connected with the construction projects. The questionnaire consisted of two sections, the first section covers the respondents' background where it includes four general questions, which are the position, type of your working company, year of establishing the company, and type of the project involved in. The second part was concerned on the factors that causing construction delay. In this section, 10 factors which are the most important factors that could cause a construction project delay are listed. The rating scales for this section has to grade each criterion with 1 = strongly disagree and 5 = strongly agree and the respondents were asked to choose their right choice by providing (O) on the exact answer. The analysis was focused on the data collected via questionnaire and from the various sources mentioned in the previous section. All data were analyzed using the SPSS software (Version 23.0). The alpha level was set at 0.05 to determine statistical significance. The returned questionnaires were analyzed using statistical tests such as frequencies, and Relative Importance Index (RII) was also used to rank the importance factors that cause of delays. Kometa et al. (1994) used the relative importance index method to determine the relative importance of the various causes and effects of delay. The same method was adopted in this study within various respondents. The five-point Likert scale was converted to relative importance index for each factor, which made it possible to cross-compare the relative importance of each of the factors as perceived by the respondents. The relative importance index (RII) was calculated using the following statistical expression (Lim & Alum, 1995):

$$RII = \frac{4n_1 + 3n_2 + 2n_3 + 1n_4 + 0n_5}{4N} \quad (0 \leq RII \leq 1)$$

When N= Total number of respondents, 4= Highest weighted score (0, 1, 2, 3, 4) on scale of agreement whereas n1= number of respondents for strongly agree, n2= respondents for agree, n3= respondents for neutral, n4= respondents for disagree, and n5= respondents for strongly disagree on factors that influence project performance and cause of construction delay.

3. Results and Discussion

3.1 Background of the respondents

Based on the analysis, Table (1) shows that 32 respondents (51.6%) occupy a contractor position while 30 respondents (48.8%) occupy a project manager. Thirty-five (56.5%) of the respondents are working in engineering companies, 22 (35.5%) of the respondents are working in project management companies, only 5 (8.1%) are working in contractors' companies. 48.8% work in companies that have been established in the construction industry for 1 to 5 years. This is followed by 32.3% for companies

that have been established for 6-10 years. It has been seen that respondents were basically involved into types of projects. These are buildings (45.2%) and heavy engineering (54.8%).

Table 1. Respondents' Background

Items	Percentage
Type of Respondents	
Project Manager	48.4%
Contractor	51.6%
Consultant	-
Type of Working Company	
Contractor company	8.1%
Project Management company	35.5%
Engineering company	56.5%
Years of establishment of companies in the construction industry	
1-5 years	48.4%
6-10 years	32.3%
11-15 years	6.5%
16-20 years	12.9%
Type of the involved project	
Buildings	45.2%
Heavy engineering	54.8%

3.2 Ranking the construction project delay factors

The relative importance index (RII) was calculated for each cause to identify the most significant causes. The causes were ranked based on RII values from the ranking assigned to the most important causes of delays in the construction industry within Al-Abyar city. Table (2) gives the ranking of causes based on the responses of all respondents (project managers, engineers, consultants, and contractors). As results, RII analysis provided the ranking of these factors in terms of their priorities. It can be seen that the five most important causes of construction delays based on RII are "labour supply" and "lack of communication between parties" were ranked as the factor number one ($RII=0.580$). These are critical factors in contributing delays where similar findings are consistent with Assaf and Al-Hejji (2006) found that shortage of labours is the caused delay problem in the construction industry in Saudi Arabia and similar observation is being reached by Sambasivan and Soon (2007) when studies causes and effects of delays in the Malaysian construction industry. They proved that labour supply on the top list of priorities factors in causing delay in the construction in the Malaysian context. Similarly, Ogunlana et al. (1996) reached the same fact that labourer's shortages caused a delay in the construction industry in Thailand. However, other studies by Al-Khalil and Al-Ghafly (1999) in Saudi Arabia, Faridi and El-Sayegh (2006) in Jordan had also proved that this factor is a major cause of project delay in their countries. Speaking about on the 1st ranked factors of "lack of communication between parties" previous study by Sambasivan and Soon (2007) found lack of communication a big reason for causing delay in the construction industry in Malaysia. This finding is in agreement with what the findings by Walker and Vines (2000) where they found that team communication effectiveness and teamwork was ranked the second caused delay factor in the construction context in Australia. The current study has found that the factor "contractor's poor site management" was ranked as the second factor ($RII=0.540$) in the city of Al-Abyar. With no doubt, this is an important factor for causing delay and in agreement with finding by Chan and Kumaraswamy (1998) who studies the causes of delay in construction industry in Hong Kong. However, Chan and Kumaraswamy (1998) and Teo et al. (2009) found poor site management and supervision is the highest ranked factor in their studies. This finding is in the line with what Faridi and El-Sayegh (2006) in UAE. They found that poor supervision and site management amongst the five ranked factors that contributed to delay in the construction Industry in UAE. Interestingly, similar

finding by Long et al. (2004) was similar to what the previous and current studies reached where it found that poor site management and supervision was on the top causes factors of construction delay in Vietnam. In addition, such finding can also be in the line with Frimpong et al. (2003) finding. Frimpong et al. (2003) found that poor contact management in Ghana was caused delay for construction projects. The next factor that has been found by the current study is, “mistakes during the construction stage” where it has been ranked as the third delaying factor ($RII=0.524$) within the city of Al-Abyar. El-Razek et al. (2008) concluded from their study that design changes by owner or his agent during construction stage was proved as the third delay factors in the construction industry in Egypt. The fourth factor has been proved by this current was “equipment availability and failure” ($RII=0.504$). In fact, equipment is an important resource that is necessary to construction and inadequate equipment can cause low work efficiency or even suspend construction activities. Mahamid et al. (2011) studied on delay causes in road construction projects and found shortage in equipment was the fifth most critical delay cause in the West Bank while the fifth factor was “inadequate contractor’s experience” and “problems with subcontractors” with $RII=0.495$. With regard to inadequate contractor’s experience factor, it is indeed a major cause of construction delay. Experience of contractors affects both technical and management capacities of contractors. Previous study by Hatush and Skitmore (1997) was recognized this factor as a main criteria for prequalification. Sambasivan and Soon (2007) revealed that inadequate contractor experience was the third most important cause of construction project delay in Malaysia. This finding is also supported by Lo et al. (2006) when they found that inexperienced of contractor was the fourth important cause of construction project delay in Hong Kong.

Table 2. Ranking the construction delay factors

Factors	RII	Ranking
Contractor’s improper planning	0.483	6
Contractor’s poor site management	0.540	2
Poor contractor experience	0.495	5
Client’s finance and payments for completed work	0.399	8
Problems with subcontractors	0.459	5
Shortage in materials supply	0.483	7
Labour supply	0.580	1
Equipment availability and failure	0.504	4
Lack of communication between parties	0.580	1
Mistakes during the construction stage	0.524	3

4. Conclusion

This study intends to determine the most important factors that could cause construction project delay in the construction sector in Al-Abyar city. In-depth literature review on the causes of delay in the construction industry was screened and identified. A semi-structured questionnaire was used to collect data. Seventy-three (73) sets of questionnaires were distributed to selected project managers, consultants and contractors. Of these, only sixty-two (62) questionnaires were received back and analyzed. A relative importance index method was employed to rank the causes of cost overrun. It was found that the most important five causes that lead to construction delay. These five causes were (1) labour supply and lack of communication between parties, (2) contractor’s poor site management, (3) mistakes during construction, (4) equipment availability and failure as well as mistakes during the construction stage, and (5) inadequate contractor’s experience. In summary, the aim of this study was successfully achieved by identifying the important factors that causes delays in the construction projects in the selected city. The findings require for urgent attention to improve the Libyan construction industry with these causes’ factors and the government should develop a transparent strategy to avoid such delay in the future.

References

- Fashina, A.A., Omar, M.A., Sheikh, A.A., & Fakunle, F.F. (2021). Exploring the significant factors that influence delays in construction projects in Hargeisa, Heliyon, 7, <https://doi.org/10.1016/j.heliyon.2021.e06826>
- Al-Ghafly M.A. (1995). Delays in the construction of public utility projects in Saudi Arabia”, Master thesis, CEM Dept., KFUPM, Dhahran, Saudi Arabia.
- Durdyev, S., & Hosseini, M.R. (2020). Causes of Delays on construction projects: a comprehensive list, *International Journal of Managing Projects in Business*, 13, 20-46.
- Tariq, J., & Gardezi, S.S.S. (2023). Study the delays and conflicts for construction projects and their mutual relationship: A review, *Ain Shams Engineering Journal*, 14, 1-14, <https://doi.org/10.1016/j.asej.2022.101815>
- Elziny, A.A., Mohamadien, M.A., Ibrahim, H.M., & Abdel Fattah, M.K. An expert system to manage dispute resolutions in construction projects in Egypt, *Ain Shams Engineering Journal*, 7(1): 2016, pp. 57–71. doi: <https://doi.org/10.1016/j.asej.2015.05.002>.
- Derakhshanfar, H., Ochoa, J.J., Kirytopoulos, K., Mayer, W., & Tam, V.W.Y. (2019). Construction delay risk taxonomy, associations and regional contexts: a systematic review and meta- analysis, *Engineering, Construction and Architecture Management*, 26(10): 2364–2388.
- Assaf, S.A., Kalil, M., & Al-Hazmi, M. (1995). Causes of delay in large building construction projects, *Journal of Management in Engineering*, 11(2): 45-50.
- Alrasheed, K., Soliman, E., & Albader, H. (2023). Systematic review of construction project delays in Kuwait, *Journal of Engineering Research*, 11, 347–355. <https://doi.org/10.1016/j.jer.2023.08.009>
- Ogunlana, S.O., Promkuntong, K., & Jearkjirm, V. (1996). Construction Delays in Fast-Growing Economy: Comparing Thailand with Other Economies, *International Journal of Project Management*, 14(1): 37-45.
- Kaming, P.F., Olomolaiye, P.O., Holt, G.D., & Harris, F.C. (1997). Factors influencing construction time and cost overruns on highrise projects in Indonesia. *Construction Management and Economics*, 15, 83-94.
- Mezher, T.M., & Tawil, W. (1998). Causes of Delays in the Construction Industry in Lebanon, *Engineering Construction and Architectural Management Journal*, 5(3): 251-60.
- Akogbe, R. K. T., Feng, X., and Zhou, J. (2013). Importance and ranking evaluation of delay factors for development construction projects in Benin, *KSCE Journal of Civil Engineering*, 17(6): 1213–1222.
- Kazaz, A., Ulubeyli, S., & Tuncbilekli, N.A. (2012). Causes of delays in construction projects in Turkey. *Journal of Civil Engineering and Management*, 18(3): 426–435.
- Hussin, A.A., & Omran, A. (2011). Implication of Non-Completion Projects in Malaysia, *ACTA Technica Corviniensis-Bulletin of Engineering*, 4(4): 29-38.
- Nachatar, J.S., Hussin, A.A., Omran, A. (2011). Frustration of Contract in the Malaysian Construction Contract Management, *Annals of the Faculty of Engineering Hunedoara*, 9(3): 85-90.
- Kumaraswamy, M.M., & Chan, D.W.M. (1998). Contributors to construction delays, *Construction Management and Economics*, 16(1): 17–29.
- Frimpong, Y., Oluwoye, J., & Crawford, L. (2003). Causes of Delay and Cost Overruns in Construction of Groundwater Projects in a Developing Countries, Ghana as a case study, *International Journal of Project Management*, 21, 321-326.
- Mansfield, N.R., Ugwu, O.O., & Doran, T. (1994). Causes of delay and cost overruns in Nigeria construction projects, *International Journal of Project Management*, 12(4): 254-260.
- Odeh, A.M., & Battaineh, H.T. (2002). Causes of construction delay: traditional contracts, *International Journal of Project Management*, 20, 67-73.
- Niazi, G.A. & Painting, N. (2017). Significant Factors Causing Cost Overruns in the Construction Industry in Afghanistan, 7th International Conference on Engineering, Project, and Production Management, *Procedia Engineering*, 182, 510 – 517.
- Long, D.N., Ogunlana, S.O., Quang, T. & Lam, K.C. (2004). Large Construction Projects in Developing Countries, a Case Study from Vietnam, *International Journal of Project Management*, 22, 553-561.

- Sambasivan, M., & Soon, W.Y. (2007). Causes and effects of delay in Malaysia construction industry, *International Journal of Project Management*, 25, 517-526.
- Omran, A., Ling, O.A., Pakir, A.K., & Ramli, M. (2010). Delay Factors in Construction Projects Development: The Case of Klang Valley, Malaysia, *International Journal of Economic Research*, 2(2): 2010.
- Omran, A., Salma, A., & Pakir, A.K. (2012). Project Performance in Sudan Construction Industry: A case study, *Academic Research Journals*, 1(1): 55-78.
- Omran, A. (2015). Determining the Factors Affecting the Performance of Construction Projects in Libya, *Journal of Academic Research in Economics*, 7(2): 211-219.
- Omran, A., Salleh, M.S.H. & Abdelwahab, O.G. (2023). Determining Factors Causing Time and Cost Overruns of Construction Projects in Malaysia, *Design, Construction, Maintenance*, 3, 179-186.
- Omran, A., Bamidele, O., & Baharuddin, A.H.B. (2016). Causes and effects of incessant building collapse in Nigeria, *Serbian Project Management Journal*, 6(1): 13-26.
- Tumi, S.H., Omran, A., & Pakir, A.H.K. (2009). Causes of Delay in Construction Industry in Libya, the International Conference on Economics and Administration, Faculty of Administration and Business, University of Bucharest, Romania ICEA – FAA Bucharest, 14-15th November.
- Fugar, F.D.K., & Agyakwah, B.A.B. (2010). Delays in building construction projects in Ghana, *Australasian Journal of Construction Economics and Building*, 10(1/2):103-116.
- Sweis, G., Sweis, R., Abu Hammad, A., & Shboul, A. (2008). Delays in construction projects: The case of Jordan, *International Journal of Project Management*, 26(6): 665-674.
- Abd El-Razek, M.E., Bassioni, H.A., & Mobarak, A.M. (2008). Causes of delays in building construction projects in Egypt, *Journal of Construction Engineering and Management*, 134(11): 831-841.
- Assaf, S., & Al-Hejji, S. (2006). Causes of Delay in Large Construction Projects, *Journal of Project Management*, 24(4): 349-357.
- Pourroostam, T., & Ismail, A. (2011). Significant Factors Causing and Effects of Delay in Iranian Construction Projects, *Australian Journal of Basic and Applied Sciences*, 5(7): 450-456.
- Lim, E.C., & Alum, J. (1995). Construction productivity: issues encountered by contractors in Singapore, *International Journal of Project Management*, 13(1): 51-58.
- Burns, R. (1994). Interdisciplinary Teamed Instruction: Development and Pilot Test, Charleston, WV: Appalachia Educational Laboratory.
- Kometa, S.T., Olomolaiye, P.O., & Harris, F.C. (1994). Attributes of UK Construction Clients Influencing Project Consultants' Performance. *Construction Management and Economics*, 2, 433-43.
- Assaf, S.A., & Al-Hejji, S. (2006). Causes of delay in large construction projects, *International Journal of Project Management*, 24(4): 349-357.
- Al-Khalil, M.I., & Al-Ghafly, M.A. (1999). Important Causes of Delays in Public Utility Projects in Saudi Arabia. *Construction Management and Economic*, 17(5): 641-655.
- Faridi, A.S., & El-Sayegh, S.M. (2006). Significant factors causing delay in the UAE construction industry. *Journal of Construction Engineering & Management*, 24(11):1167-1176.
- Walker, H.T., & Vines, M.W. (2000). Australian multi-residential project construction time performance factors, *Construction Engineering & Architecture Management*, 7(3): 278-284.
- Teo, S.P., Omran, A., & Pakir, H.K. (2009). Material Wastage in Malaysian Construction Industry. *International Conference on Economic and Administration*, Faculty of Administration, University of Bucharest, Romania, pp. 257-264.
- Mahamid, I. (2011). Risk matrix for factors affecting time delay in road construction projects: owners' perspective, *Engineering, Construction and Architectural Management*, 18(6): 609-617.
- Hatush, Z., & Skitmore, M. (1997). Evaluating contractor prequalification data: selection criteria and project success factors, *Construction Management and Economics*, 15(2):129-47.
- Lo, T.Y., Fung, I.W., & Tung, K.C. (2006). Construction delays in Hong Kong civil engineering projects, *Journal of Construction Engineering & Management*, pp.636-649. doi: 10.1061/(ASCE)0733-9364(2006)132:6(636).