



UNIVERSITI PUTRA MALAYSIA

***DEVELOPMENT OF RISK MANAGEMENT FRAMEWORK IN
MALAYSIAN LANDSCAPE PROJECT***

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LANDSCAPE PROJECT**

By

ADAM ARULDEWAN S.MUTHUVEERAN

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

October 2020

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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October 2020

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The nature of landscape projects that is dynamic, complex, fast-tracked, and with subjective outcome exposes the projects to a high degree of risk. This project risk could potentially become a critical issue that hinders the project from achieving its objectives. Risk management widely practised to systematically manage project risk, which could adversely affect the project outcome. However, many landscape projects in Malaysia do not manage risk effectively, and no formal risk management is applied. This scenario denotes the presence of a gap in risk management practices in the landscape architecture field in Malaysia. Hence, this research aimed to explore the risk management application in Malaysian landscape project management. In achieving this aim, the research determined past project issues' controllability, analysed the current management of project risk, and formulated a risk management application framework. This research employed qualitative research along with exploratory research purpose. Findings from the literature review synthesised to formulate a conceptual framework for the risk management application. The fieldwork data collection completed through an in-depth interview with landscape architectural expert and case study to completed landscape project review. Along, a focus group discussion employed to validate the conceptual framework. Then, the collected data were analysed using content and thematic analyses.

The findings suggest that the past project issues are controllable earlier but occurred due to an ineffective practice to manage it. Project risk not managed systematically according to the suggested process whereby risk process practised incompletely, ineffectively integrated into project lifecycle and limited risk tools and techniques used. The practised impaired by an unavailable formal risk management application. Hence, the research recommends developing a conceptual framework with a specific framework integrating risk process into the project lifecycle. The framework theoretically improves the landscape architecture body of knowledge. Practically it provides a much-needed guide for Malaysia's landscape architects in managing their project risk. This practice towards

achieving the project objectives, thus enhance project performances that subsequently contribute to the country's landscape aspiration.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PEMBANGUNAN KERANGKA PENGURUSAN RISIKO PROJEK LANDSKAP MALAYSIA

Oleh

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Oktober 2020

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Sifat projek landskap yang dinamik, kompleks dan subjektif mendedahkan projek kepada tahap risiko yang tinggi. Projek yang berisiko ini berpotensi menghalang projek untuk mencapai matlamat objektifnya. Aplikasi pengurusan risiko telah digunakan secara meluas untuk mengurus risiko projek dengan sistematik dari membantutkan pencapaian objektif projek. Malangnya, banyak projek landskap di Malaysia tidak menguruskan risiko dengan efektif, selain tiada aplikasi pengurusan risiko rasmi diamalkan. Ini menandakan terdapat jurang antara aplikasi pengurusan risiko dalam bidang skop senibina landskap di Malaysia. Justeru itu, kajian ini bertujuan untuk meneroka aplikasi pengurusan risiko dalam pengurusan projek landskap di Malaysia. Untuk mencapai matlamat ini, kajian ini mengenal pasti kadar kawalan isu projek terdahulu, menganalisa amalan mengurus risiko projek terkini dan merangka strategi aplikasi pengurusan risiko. Kajian kes bersifat kualitatif digunakan untuk mencapai matlamat kajian. Kajian dari literatur dirumuskan untuk membina kerangka konseptual untuk strategi aplikasi pengurusan risiko. Pengumpulan data dari lapangan melalui temubual dengan pakar arkitek landskap dan kajian kes terhadap projek landskap yang siap. Seterusnya, perbincangan kumpulan fokus dijalankan bagi pengesahan kerangka konseptual. Data yang terkumpul dianalisis menggunakan pendekatan *content analysis* dan *thematic analysis*.

Dapatan kajian ini mencadangkan bahawa isu projek boleh dikawal pada awalnya namun berlaku kerana amalan yang tidak berkesan untuk menguruskannya. Risiko projek tidak diuruskan secara sistematik mengikut proses yang disarankan di mana proses risiko dipraktikkan secara tidak lengkap, ketidakberkesanan integrasi ke dalam kitar hayat projek projek dan teknik pengurusan risiko yang terhad. Amalan ini terjejas oleh aplikasi pengurusan risiko yang tidak tersedia. Oleh itu, kajian mengesyorkan pembangunan kerangka konseptual yang mengintegrasikan proses pengurusan risiko ke dalam kitar hayat projek landskap. Kerangka kerja secara teori meningkatkan pengetahuan seni bina landskap. Secara praktikal ia memberikan panduan yang sangat diperlukan untuk arkitek

landskap Malaysia dalam menguruskan risiko projek mereka. Amalan ini untuk mencapai objektif projek, dengan itu meningkatkan prestasi projek yang seterusnya menyumbang kepada aspirasi landskap negara.



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LIST OF ABBREVIATIONS

APM	Association For Project Management
AS/NZS	Australia/New Zealand Standards
ASLA	American Society Of Landscape Architects
BS IEC	British Standard International Electrotechnical Commission
BSI	British Standards Institution
CIDB	Construction Industry Development Board
CMGD	Certificate Of Making Good Defects
CSA	Canadian Standards Association
DOSM	Department Of Statistics Malaysia
FMEA	Failure Modes And Effects Analysis
GDP	Gross Domestic Product
HAZOP	Hazard And Operational Studies
ICE	Institution Of Civil Engineers
IEEE	Institute Of Electrical And Electronics Engineers
IFLA	International Federation Of Landscape Architects
ILAM	Institute Of Landscape Architects Malaysia
ISCO	Industry Standards Committee On Organizational Management
ISO	International Organization For Standardization
KLCH	Kuala Lumpur City Hall
KLSP2020	Kuala Lumpur Structure Plan 2020
LAA2050	Landscape Architecture Agenda 2050
LPRM	Landscape Project Risk Management
MLAA	Malaysia Landscape Architecture Award

NLD	National Landscape Department
NLP	National Landscape Policy
NSDC	National SME Development Council
OGC	Office Of Government Commerce
PGC2025	Putrajaya Green City By 2025
PMAJ	Project Management Association Of Japan
PMBOK	Project Management Body Of Knowledge
PMI	Project Management Institute
PRAM	Project Risk Analysis And Management Guide
PRINCE2	Projects In Controlled Environments
QMS	Quality Management System
RAMP	Risk Analysis And Management For Projects
RMM	Risk Maturity Model
SEA	Strategic Environmental Assessment
SFA	Strategic Focus Areas
SMEs	Small And Medium Enterprises
TIA	Traffic Impact Assessment
VE	Value Engineering
VO	Variation Order

CHAPTER 1

INTRODUCTION

1.1 Introduction

According to the United Nations (2019), the world population will increase to 9.8 billion in 2050 from the current 7.5 billion, while according to the Department of Statistics Malaysia (DOSM), the projected Malaysian population will reach 44 million by 2050 from the current population of 32.6 million in 2019. Regarding urbanisation, the proportion of the urban population in Malaysia increased progressively from 10.0% in 1911 to 28.4% in 1970, 62.0% in 2000, 71.0% in 2010, 74.7% in 2015, and 77.1% in 2019 (DOSM, 2019; Huzeima et al., 2016; Worldometers, 2019). The proportion of the country's urban population is forecasted to reach 90% by 2050 as the country is transforming into an urbanised nation (The Star Online, 2018). The increase in Malaysia's urban population, together with aggressive industrial and economic growth, has caused rapid development of the urban areas. This population growth is concentrated in the main conurbations of Malaysia, especially its capital city, Kuala Lumpur. Kuala Lumpur is the national capital of Malaysia and also its largest city. The city covers an area of 243 km² and had an estimated population of 1.7 million in 2016, which makes it the most populated city in the country (DOSM, 2019).

1.1.1 An Insight into Landscape Project Management

The rapid growth of urban populations requires not only economic and social adjustments but also changes in the way the urban landscape is developed and managed (Fabbri & Biancamano, 2019). With massive urbanisation and an increase in the projected world population in the next 30 years, it is believed that there will be greater pollution, and we will experience escalating climate change phenomena, food security issues, and lack of space (Chee & Neo, 2019). Agricultural and natural forest land is being transformed into industrial, commercial, residential, and recreational areas to meet the urban and industrial growth. The population increment has affected green areas where severe loss and degradation of urban green spaces has adversely affected the important ecosystem, which will eventually affect humans' quality of life (Gairola & Noresah, 2010; Yang et al., 2016). The increasing urbanisation and human population growth during recent decades have resulted in significant loss of habitats in the urban landscape (McKinney, 2002) and caused many environmental problems, such as a reduction of green spaces and ecosystem deterioration (Ebbensgaard, 2017; Lee et al., 2005). This scenario has left a substantial impact on Malaysia's urban areas especially concerning population pressures and environmental implications.

As mentioned in Christensen (2005), Cowan (2005), Kendle et al. (2000) and Worpole & Greenhalgh (1996), *urban landscape* is defined as open spaces and sites that are protected including urban parks, open green spaces, and green networks in urban areas.

The Urban Parks Forum (2001) and Yang et al. (2016) posited that the urban landscape makes substantial direct and indirect contributions to urbanites in terms of wealth, wellbeing, and social and life experience. It enhances the relationship between man and nature in cities (Yang et al., 2016). Urban landscape provides recreational opportunities and enjoyment which promote a healthier lifestyle (Ebbensgaard, 2017; J. White et al., 2002). The urban landscape has roles and functions in five aspects, namely environmental, economic, physical and psychological, social, and cultural (Osman, 2005). Therefore, as an urban area is developed it should respect the functioning of its environment and its urban landscape. Urban landscape should not be seen as a mere leftover space in the urban setting, but more than that, as functional and beneficial to the urban dwellers with the aim of providing them with better quality surroundings and a better quality of life (Zhang, Tang, He, & Chen, 2018). Proper planning and development of urban landscape can fulfil the demanding urban development needs (Ebbensgaard, 2017). Hence, a more effective and efficient urban landscape outcome is needed to ensure that these aims are achieved.

To balance the effect of urban development activities, the country has put efforts into landscape planning programmes. The landscape architecture profession emerged following the need to plan and manage complex urban landscape due to the urbanisation pressure (Ackerman et al., 2019; Garmory et al., 2007). Landscape architects are responsible for delivering a sustainable built landscape environment through proper landscape planning and management (Cook & VanDerZanden, 2011; Favetta & Laurini, 2006). They are broad thinkers, playing an increasingly important role in addressing the great issues of urban landscape (Ebbensgaard, 2017). They deliver urban landscape projects to meet the national landscape development and aspiration planned for the future. Efforts have been made by National Landscape Department (NLD) with the help of Institute of Landscape Architects Malaysia (ILAM) and other individuals, professionals, and experts to formulate a Landscape Act and National Landscape Policy (NLP) for the country (NLD, 2016). The act and policies will be used collectively to guide, control, and monitor landscape developments in the country (Yusof & Johari, 2012). The Landscape Act is crucial to safeguard the landscape architecture profession and delivery of landscape projects.

Landscape Architecture Agenda 2050 (LAA2050) was introduced by the ILAM president for 2016–2018 and it comprises the vision and 10 Strategic Focus Areas (SFA) required to drive the landscape architecture profession forward. The Landscape Bill will be part of the eighth focus area of LAA2050, outlined as “*SFA08 Best Practice - The practicing landscape architecture firms should increase productivity through an organized structure which promotes high efficiency, enhanced best practice standards and quality control in delivering the services*” (LAA2050, 2017). Landscape architects should implement the best practices and work proactively in deciding the process for managing project risk. It is crucial to apply risk management into landscape project management to safely deliver and complete landscape projects according to clients’ needs and expectations. Therefore, risk management becomes a necessity in ensuring the quality of landscape projects and protecting landscape architects over possible litigation consequences, as defined in the eighth focus area in delivering quality landscape services.

1.1.2 Litigation Consequences due to Mismanaged Risk

The construction industry faced with more risk and uncertainty past 10 years as project stakeholders demanding, expecting more and placed responsibility to construction organisation. They less willing to accept risk without proper compensation and more likely to engage in litigation move when things go wrong (Flanagan, 2003; Flanagan et al., 2003). Similarly, litigation consequences are likely to happen in landscape projects. Schatz (2003) provided empirical evidence that safety risk, particularly irreparable harm, permanent injury, and death caused by negligence and failure to meet the standards of minimum competence leads to litigation consequences. Capouya et al. (2012) added that landscape architects often face several challenges from design, human resources, contracts, collection, insurances and legal support that are likely to lead to litigation risk. According to Flanagan et al. (2003), revealed research carried out by insurance companies suggests purchase of professional indemnity insurance for the design-related party in construction industry increased caused by the higher incidence of claims. Meanwhile, according to Godi and Sibelius (2012), as professional indemnity insurance is likely to be used to settle project disputes, landscape architects are subjected to more litigation risks as project liability continues to increase due to the following factors:

- 1) Society and project stakeholders become more litigious
- 2) Landscape architects embark on new scopes of work and take a bigger responsibility in projects
- 3) The practice of transferring risk to landscape architects
- 4) Early pre-contract protection moves by clients
- 5) Requirement to accept indemnification and consequential damage clauses in contracts
- 6) Movement away from “fair to all parties” contracts to one-sided protection
- 7) Willingness to accept a sick project (time constraint, limited budget, unfair contract clauses, and scope creep) to stay in business
- 8) Design and build contract projects that contain high uncertainty and risk
- 9) Non-standard project management practices

In the past ten years, several accidents have been reported upon the completion of urban landscape projects in Malaysia. Hasan, Othman, and Ismail (2018b) noted that cases related to hazard to trees have been increasing over the years in Malaysia. These accidents caused injuries, deaths, property damage and eventually litigation actions, as described in Table 1.1 and depicted by the newspaper cut-outs in Figure 1.1.

Table 1.1 : Accidents in Urban Landscape Areas

Date	Accident Description	Source
1 January 2009	An 18 years' old teen was electrocuted to death upon leaning at a lamp post at the KLCC Park during a New Year's Eve celebration. The father of the teen sued the KLCC Park maintenance firm as a defendant over his son's death, claiming negligence in ensuring that their lamp posts were safe and not posing safety threats to park visitors. The plaintiff sought RM15,152 in special damages, RM3mil in general damages, and RM2mil in other damages, with interest and costs.	The Star (2009)
4 January 2010	Two car passengers were killed and another seriously injured when the car they were travelling in crashed into a tree in Taiping. The car driver was hospitalised with serious head injuries.	The Star Online (2010)
7 March 2012	An 8 years' old child played at a playground at Taman Bestari Indah, Johor Bahru. A moving see-saw hit his chin, causing severe injury to his tongue and heavy bleeding. The child went home before seeking medical treatment. The injury caused difficulty to talk and eat.	Harian (2012)
21 March 2012	A 20-year-old man died when he was flung out of a car into a ditch after the vehicle he was driving crashed into a teak tree at Km66.2 of the North-South Expressway (southbound) near Pendang, Alor Setar. Two others passenger in the car were injured and given treatment at Sultanah Bahiyah Hospital.	Post (2012)
14 August 2012	A matured <i>Tembusu</i> tree crushed to nine cars at parking area in Taman Tasek Seremban.	Sinar Harian (2012)
4 June 2014	One vehicle was crushed under a tree in Kuantan when the weather was good. Kuantan Municipal Council (MPK) verified that the tree fell due to a rotten central trunk.	Berita Harian (2014)
2 September 2014	Two teenagers died after the motorcycle they rode was crushed under a fallen tree at Pintasan Road, Kuantan. A roadside tree suddenly fell and crushed the victims and their motorcycle during good weather with no rain or strong winds.	Sinar Harian (2014)
30 Jan 2015	A man was crushed to death under a falling tree at a food stall in Banting. The tree toppled over during heavy winds and crushed the deceased.	Malay Mail (2015)
9 April 2015	A 35 years' old truck driver died due fallen trees on the road. The two passengers of the truck were not seriously injured.	Sinar Harian (2015)
8 May 2015	Four vehicles were crushed under a big tree at Landai Road, Pudu Plaza, Kuala Lumpur.	Berita Harian (2015)
10 July 2015	Seven cars were damaged due to fallen trees at Sultan Abdul Halim and Sultan Badlishah Road in Alor Setar, Kedah. The incident occurred during heavy rain with strong winds causing many tree branches to fall on cars.	Sinar Harian (2017)
4 May 2017	A form 4 student died after he was hit by falling tree branches when riding his motorbike along a road at Taman Desa Ayer Molek, Melaka. This incident triggered the Minister of Urban Wellbeing, Housing and	NSTP (2017)

	Local Government, Tan Sri Noh Omar to state that the local authority can be penalised for negligence in not maintaining the road side trees although specific tree maintenance guidelines was already produced by NLD	
30 June 2017	A family of six that was on a trip to Langkawi got involved in an accident when crashed into some trees along the highway, causing two deaths, one person fractured his right leg and another had light injuries. The accident happened at KM 6 of the Kuala Perlis-Changlun Expressway at about 8 pm.	The Star (2017)
5 March 2018	A newly married couple was injured by a fallen tree near KLCC. The 25-year-old wife informed that she was considering taking legal action against the relevant authorities upon her husband's recovery from his injuries.	Buzz (2018)
5 July 2018	A year five pupil was killed while her friend was severely injured after a tree fell on a motorcycle during a storm in Felda Jenderak Selatan, Kuala Krau, Kuantan.	Bernama (2018)
2 October 2018	A golfer was injured when a tree crashed onto his buggy at a golf course. The victim, who was playing at a golf course near Jalan Bukit Kiara, suffered minor injuries.	Online (2018b)
26 November 2018	A 15-year-old girl died in a freak playground accident in Kepong, Kuala Lumpur. She was sitting on a swing for disabled and wheelchair users at a park when her head became trapped in the structure.	Online (2018a)
23 October 2019	A pedestrian woman was killed when heavy rain and strong winds caused a tree to fall on her in front of University of Malaya's (UM), Kuala Lumpur, main gate. Three cars that were nearby were also damaged.	The Star Online (2019)
7 November 2019	A child was injured and suffered a huge gash on his forehead after a double pendulum exercise station at a playground in Kluang, Johor fell onto him. The child was hospitalised.	World Of Buzz (2019)



Figure 1.1 : Reported Accidents in Urban Landscape Areas

A study by Schatz (2003) reviewed 40 litigation cases throughout the years 1959–2003, covering physical injuries, property damages, and financial losses, as detailed in Appendix A. The research revealed that the number of litigation cases increased from the year 1959 to 2003, as illustrated in Figure 1.2. Schatz (2003) forecasted that the litigation implications will continue to increase due to project complexity and litigious society, as supported by Godi and Sibelius (2012).

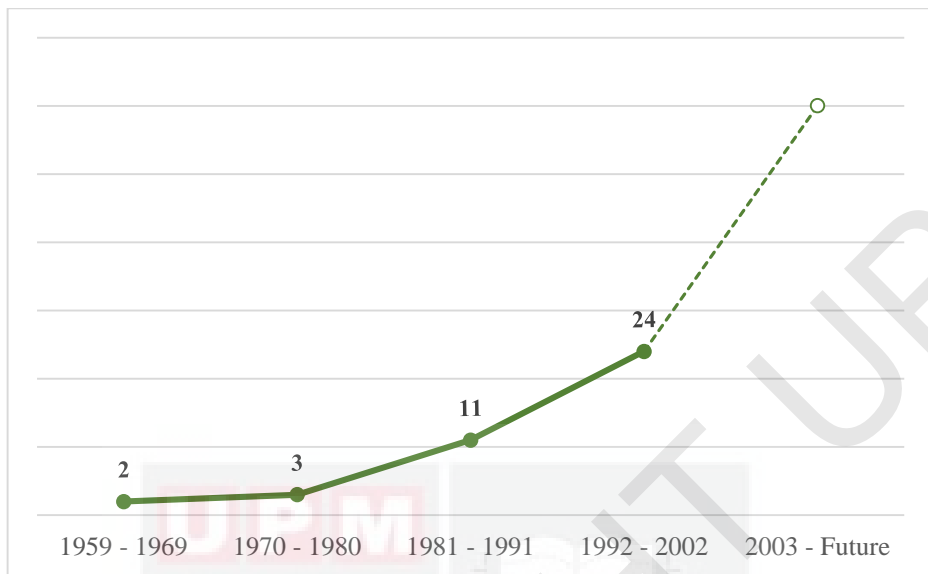


Figure 1.2 : Actual and Forecasted Litigation Cases in Urban Landscape (1959–2002)

(Source : Godi and Sibelius (2012) and Schatz (2003))

The reviewed litigation cases revealed the causes and consequences of the incidents. The research further attempted to identify the possible risks that a project fails to anticipate. Then it suggested potential treatments for the risks to understand the controllability aspect of the incidents, as detailed in Appendix A. The research identified that 24 out of 40 incidents were caused by negligence on the part of the landscape architects or designers, and eight cases were due to contractors' error. The litigation cases caused a hefty financial burden to compensate for losses, impaired business reputation, and forced businesses to shut down. Moreover, 33 of the identified risks from the 40 litigation cases are related to safety, design, and technical risk error that caused the incidents to happen. This scenario suggests that landscape architects hold a big responsibility for incidents that happen due to their design and technical specification output. Lastly, the research posited that all the identified risks can be treated by avoiding, mitigating, or transferring the risk. Evidence from the studied litigation cases signifies the need for a system to detect the potential risks of accidents taking place and managing them early.

Current landscape project practices depend heavily on professional indemnity insurances to protect against project litigation consequences. Landscape projects also face the risks caused by others and heavily depend on their information to study the potential risks (Williams, 2019). Some landscape architects are forced to sign a disproportionate contract, exposing them to the risk of litigation challenges (Godi & Sibelius, 2012). According to Schatz (2003), professional landscape architects possess sound technical knowledge that enables them to determine appropriate situations to warn of latent risk and employ mitigation techniques. Nevertheless, an effective risk management practice is needed to enable them to plan and manage project risk effectively.

1.1.3 Risk Management in Landscape Project Management

Landscape projects share similar risks with other construction projects due to their complex and dynamic nature (AS/NZS 4360:2004, 2004; Taofeeq et al., 2020). Khan, Liew, and Ghazali (2014) asserted that a risk management standard should have various ranges of applications in various industries, including the construction industry. Landscape project is grouped under the construction industry as they face similar risks, namely design and product liability; environmental issues; human, animal, and plant health; occupational health and safety; operation and maintenance systems; project management; public risk and general liability.

Under the traditional procurement route, landscape architects have to ensure that all the risks related to design works are properly managed and controlled. However, according to Fadzil et al. (2017), due to certain reasons, such measures of proper design risk management vary from one project to another in Malaysia. Hamzah Abdul-Rahman and Chen Wang (2015) added that different risk management practices will have different effects on the project outcome. According to Jusoff et al. (2008), the risks associated with design works have not been well studied in Malaysia. Landscape projects are yet to have any formal risk management application in managing their project risks effectively. Thus, risk management needs to be promoted among the design practitioners in the Malaysian construction industry in order to deal effectively with the project risk so that the project will be successful.

The design risk will be embedded into the standard contractual regulation, where the designer and landscape architects will be responsible for the plan and design they produce (Khan et al., 2014). To minimise the design risk, Kerzner (2009a) posited that the design process must reflect a sound design policy and proper construction practices, which are integrated into production, operation, and support throughout the project lifecycle. One of the most common project risks faced in landscape projects is the transition from design to construction error. Chapman and Ward (2003) and Kerzner (2009a) asserted that a project organisation should integrate the risk process into the project lifecycle process. Kerzner (2009a) added that the integration will automatically embed the risk management practice into organisation culture and business process.

Construction projects in Malaysia are experiencing schedule and time overruns due to ineffective risk management practices (Fadzil, Noor, & Rahman, 2017; Goh & Abdul-Rahman, 2013; Hamzah Abdul-Rahman & Chen Wang, 2015; Razi, Ali, & Ramli, 2020). Several Malaysian construction projects that suffered damages and losses could have avoided such occurrences if proper risk management was administered (Jusoff, Yusuwan, Adnan, & Omar, 2008; Adnan & Rosman, 2018; Razi et al., 2020). Landscape architects are subject to professional regulation indemnity for substantial physical injury and harm to property caused by their professional service (Schatz, 2003; Williams, 2019). Ansah, Sorooshian, Mustafa, and Duvvuru (2016) emphasised that even a small or simple project could encounter problems due to the involvement of two different parties. Nevertheless, while project managers cannot predict the future, they can

anticipate the project risk that is inherent in a project and manage it before the consequences materialise (Ansah et al., 2016; Tserng et al., 2009).

1.1.4 Need for Risk Management Application in Malaysian Landscape Project

As discussed in Capouya et al. (2012), Godi (2016), Godi and Sibelius (2012), and Schatz (2003), since frequent project risk and litigation consequences happen in landscape project undertakings, a proper risk management application is needed to manage project risk effectively. A risk management application is significant because an informal risk management practice will fail to provide useful risk information for project management (Farooq et al., 2018; Goh & Abdul-Rahman, 2013; Loosemore & Cheung, 2015). A sufficient and clear illustration of the risk management application framework is needed for the proper execution of projects (Razi et al., 2020). Project management researchers asserted that risk management is an integral part of the organisational process and not just as a set of tools and techniques (Adnan, Jusoff, et al., 2008; Adnan & Rosman, 2018; AIRMIC et al., 2002; Flanagan et al., 2003; Kululanga & Kuotcha, 2010).

Putting risk management in place will improve the project performance (Ansah et al., 2016; Razi et al., 2020; Ward & Chapman, 2003) through a systematic process of identifying, analysing, and treating risk in order to achieve the project objectives (PMI, 2017). The integration of the risk process into landscape project management should adapt the best suited risk management standards and guidelines.

For instance, the internationally recognised International Organization for Standardization (ISO) 31000:2018 Risk Management Standard has various applications for different industries where it can be applied in project activity, design, and product liability. The standard encompasses environmental issues; wellbeing of humans, flora, and fauna; occupational safety and health; operational system; maintenance systems; procurement system; project management; public risk; and general liability (ISO 31000:2018, 2018). It suits Malaysia's landscape project management which consists of various dynamic and complex activities (Ansah et al., 2016; Garmory et al., 2007). Many activities and complex projects are exposed to various project risks (HB 436:2004, 2005; MS ISO 31000:2010, 2010). According to Goh and Abdul-Rahman (2013), different project risks arise in different stages of a project lifecycle. During the initial stage of a project, a higher level of uncertainties would generate a higher level of risk. It contributes to higher costs of managing the risk compared to the later stages of the project's timeline (PMI, 2017). The absence of project information and data at the initial stage of a project causes a high level of risk related to quality, cost, and time. The risks may increase throughout the construction stage of the project. Hence, according to Mohamed, Abd-Karim, Roslan, Mohd Danuri, and Zakaria (2014), the project risk should be forecasted and managed at an early stage to enable the organisation to take necessary actions to avoid it from happening or to reduce the risk consequences.

Under the traditional procurement direction, the landscape architect that assumes the role of the lead designer in a landscape project has to ensure that all the risks related to the design works are properly managed and controlled. However, according to Williams (2019) and supported by Jusoff, Rashid, and Adnan (2008) and Marcelino-Sádaba, Pérez-Ezcurdia, Echeverría Lazcano, and Villanueva (2014), the proper management of risks varies in different organisations and is commonly not structured or formatted especially in managing design-related risk in a landscape architectural practice.

Furthermore, in Malaysia, the small and medium enterprise (SME) construction firms often do not practise comprehensive risk management but rather depend solely on contractual agreements and transferring risk to other parties (Adnan, 2008; Fadzil et al., 2017; Omer et al., 2019). This practice merely avoids risk. Some landscape architectural organisations also adopt this practice. Early observations indicate that the biggest challenge in implementing risk management in Malaysia's landscape projects is that there is no formal risk management guidelines and standards to be applied. Project risks are often not managed carefully and do not follow the structured procedures due to a lack of knowledge of risk management and its implementation, besides a lack of awareness of its benefits. Hence, a development of risk management framework in Malaysia landscape project is much needed to accommodate the nature of landscape project practices.

1.2 Early Observations

The author gained knowledge of landscape architecture during his bachelor's degree and project management during his master's degree study, which made him a suitable candidate for this research topic. The author has more than fifteen years of industry experience in managing various landscape projects and found that the projects often encountered various project issues and did not fully achieve the planned objectives. Despite the ability to anticipate project risk at the early development stage and careful planning and precautions to control the risk, project issues still occur throughout the project lifecycle. The project risks that become project issues consequently affect the project outcomes. The most common project issues faced by the author are constant changes in design by clients, late payment, project delay, compromised project quality, late approval by the local authorities, inappropriate time allocation, extremely inclement weathers, contractors' default, and site accidents. Subsequently, these project issues compromise the ability of the project to achieve their time, cost, and quality objectives.

Based on the projects that the authors were involved in, observed that there is no formal management tool or system to anticipate risk and to prevent it from materialising or reduce its impact. Although most project risks can be predicted, no structurally planned actions allocated to prevent the risks from materialising. Malaysian landscape architects tend to wait for the risk to materialise and treat it according to their best experience and knowledge. They often depend on basic measures such as tender contract detailing, professional indemnity insurance, and contractors' credibility to perform to protect a project from its risk consequences. Hence, the above observations and scenarios had

prompted the author to search for an appropriate framework in managing landscape project risks.

A risk management application identified as the most appropriate system for managing the landscape project risk. A risk management application directly related to the landscape architecture scope has not been extensively discussed in literature nor practised (Capouya et al., 2012; Godi & Sibelius, 2012; Schatz, 2003). The author observed that no formal risk management is practised in the landscape project management in the country.

1.3 Problem Statement

Landscape projects in Malaysia are exposed to a high degree of risk and face a significant amount of uncertainties. The projects are often faced with several challenges, namely inadequate manpower, insufficient skills and expertise, lack of knowledge, a low budget, lack of interest, inadequate tools and equipment, poor quality of planting materials, insufficient landscape personnel training, and poor civil awareness and attitude (Ackerman et al., 2019; Antrop, 2005; Hussain & Byrd, 2012; Hussein, 2014; Ibrahim, Rahman, & Tahir, 2009; Jansson & Lindgren, 2012; Osman, 2005; Wang, 2018; Yang et al., 2016).

These challenges pose risks that will become project issues, thus affecting the project quality, cost, time, scope, and objectives (Farooq et al., 2018; Loosemore & Cheung, 2015; Mills, 2007; PMI, 2017). The findings from the author's early observations and a preliminary pilot study revealed that landscape architects have the ability to predict the project issues. They also have the ability to suggest control measures to prevent the predicted project issues from happening. Despite their ability, the project issues continue to occur due to poor reaction in controlling the issues. Landscape projects are the core business for a landscape architecture company. Failure to meet the project objectives will affect the organisation's financials, operation, culture, and business reputation.

Landscape architects face a greater risk as liability increases in today's industrial complexity (Meijering et al., 2015). This liability risk is due to several factors, namely, landscape architects are holding bigger roles in certain projects, increase in the project scope, society being more litigious, adoption of new contractual systems, and higher client expectations (Godi & Sibelius, 2012; Schatz, 2003). As discussed in subsection 1.1.2, several accidents were reported in the news concerning the Malaysian urban landscape field that caused injuries, deaths, and property damages. The review of 40 litigation cases in Schatz (2003) relating to the urban landscape field suggests that landscape architects hold a big responsibility, as they face great litigation consequences when an incident happens. This finding signifies the risk held by landscape architects over the litigation consequences that will have a huge impact on the organisation's finance and ruin the business reputation (Capouya et al., 2012; Godi & Sibelius, 2012).

As litigation becomes more likely to settle disputes on design and construction, landscape architects are being subjected to new risks that require careful attention to avoid substantial time, costs, and litigation efforts (Flanagan et al., 2003; Godi, 2016; Godi & Sibelius, 2012). Rather than waiting for project issues and litigation consequences to happen, there is a need to manage the potential hazards and project issues beforehand. Project issues can be avoided or the consequences reduced if the project risk is predicted and treated earlier.

A suitable management system is needed to manage a project risk before it potentially becomes a project issue later. Although a professional landscape architect possesses excellent design and technical knowledge, a management system is needed to systematically warn them of potential risks, quantify the consequences, and determine appropriate actions to control the risks with the best available tools and techniques. A risk management application that involves the process of identifying, analysing, and responding to the project risk is identified as the most appropriate system in delivering successful project outcomes. Risk management is beneficial for projects in enhancing the project performance through precise and systematic management of project risks (Cooper, Grey, Raymond, & Walker, 2005; Hillson, Grimaldi, & Rafele, 2006; Ward & Chapman, 2003) and integration into the project management process (APM, 2012; PMI, 2017). Several studies of risk management benefits by Abdul-Rahman, Wang, and Sheik Mohamad (2015), Jusoff, Yusuwan, Adnan, and Omar (2008), Kang, Fazlie, Goh, Song, and Zhang (2015), Mills (2007), PMI (2017), and Ward and Chapman (2003) provide an understanding of the risk management application in projects. Risk management is viewed as improving the chances of achieving the project objectives and providing better control over the future outcomes of the project.

Risk management is not widely practised or unsystematically managed in the Malaysian construction industry including landscape projects (Adnan, Rahmat, et al., 2008; Adnan & Rosman, 2018; Fadzil et al., 2017) due to the lack of knowledge and awareness of its benefits, causing reluctance towards its adoption (Siang & Ali, 2012; Takim, 2005). In Malaysia's construction projects, risk management is adapted differently and based on company policies, allocation of resources, and nature of the projects (Fadzil et al., 2017). Companies generally adapt simple, quick, reasonable, and inexpensive methods to identify the project risk instead managing it as a whole process (Adnan, 2008; Adnan & Rosman, 2018; Lyons & Skitmore, 2004; Siang & Ali, 2012). Several authors (e.g., Adnan et al., 2008; Adnan & Rosman, 2018; Fadzil et al., 2017; Goh & Abdul-Rahman, 2013; Hamzah Abdul-Rahman, Chen Wang, 2015; Jusoff, Yusuwan, et al., 2008; Kang et al., 2015; Mohamed et al., 2014) attempted to detail out the challenges and limitations of implementing risk management and identify the reasons for those problems in Malaysia's construction projects.

Specific to the Malaysian landscape project context, the findings from a preliminary pilot study revealed that the biggest challenge in implementing risk management is there is no formal risk management guidelines and standards to be applied. Landscape architects manage their risk by depending on contract management clauses, buying a basic professional indemnity insurance, and transferring the risk to other parties. Frequently,

landscape architects depend heavily on other project parties to study and inform them of the potential risks. Risk is not managed comprehensively and not following the suggested process due to the lack of knowledge and awareness of its benefits.

The risk management application for a landscape project is different from other industries, such as engineering, which commonly uses an actuarial approach (Godi & Sibelius, 2012). Landscape projects require a high degree of intuition to manage the project risk because of the nature of the projects with multiple ambiguities and uncertainties concerning ecological, environmental, cultural, and social elements (Meijering et al., 2015). Risk conception and risk management practices in landscape vary due to the different stakeholders' values, needs, assumptions, concepts, and concerns (Capouya et al., 2012; Godi & Sibelius, 2012).

Since landscape projects are dynamic, complex, and fast tracked, the risk management application is to be integrated into the landscape project management as a single process (Arashpour et al., 2016; Kohlmeyer & Visser, 2004). Such a combination of processes should make it easy for landscape architects to practise it. This is to address the fast-tracked and highly demanding landscape architecture as the landscape architects do not need to focus on two processes separately (Meijering et al., 2015). According to Project Management Institute (PMI), such an integration is to be practised concurrently and throughout the project lifecycle to avoid process redundancy (PMI, 2017).

The research gap is identified by understanding the current problems faced in landscape projects and suggesting the solutions to achieve an ideal situation, as illustrated in Figure 1.3 below.

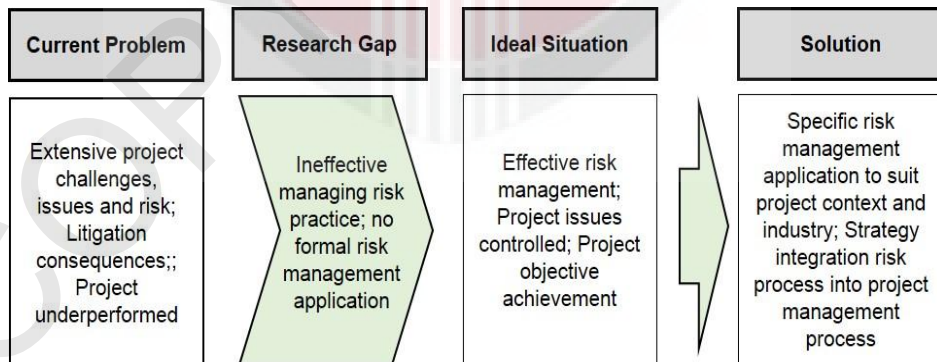


Figure 1.3 : Research Gap

This research attempts to response to these issues and the need for a risk management application for Malaysian landscape projects. The main research question is:

1. How is risk being managed and risk management being applied in Malaysia's landscape projects?

To answer this exploratory question, a study was conducted to bridge the gaps in the current project situation, the way that project risk is being managed, and the formulation of the risk management application framework. To help bridge the gaps, this research sought to answer the following research questions:

1. What are the most common project issues occurring in landscape projects?
2. What are the practices for managing the project risk in relation to the project issues?
3. How does a risk management application in landscape projects help to control the project issues?

1.4 Research Aim and Objectives

The principal aim of this research is to integrate a risk management application into the Malaysian landscape projects. To achieve the research aim, the following objectives have to be attained:

1. To determine previous landscape project issues and their controllability levels.
2. To analyse the current risk management practice and its relationship with landscape project issues.
3. To formulate a framework enabling the integration of risk management application in landscape project management

1.5 Scope of the Research

Acknowledging that landscape management covers a wide range of activities and complexities, this research limited its scope to the application of risk management in landscape projects management. The focus on landscape project practice in Malaysia is due to time and resource limitations.

The geographical context of the research is the landscape projects in the central region of Peninsular Malaysia, specifically in Klang Valley, as it is the most populated and urbanised area in Malaysia. The research focused on urban landscape projects due to the urbanisation effects and concerns on the future compounding impacts. Furthermore,

landscape architecture practice organisations and landscape projects mostly situated within this central region. Hence, sufficient fieldwork data could be collected with ease.

The research scope is also limited to the search for a risk management application for landscape project management in Malaysia. This research intended to consider and then suggest a framework for integrating the risk process into the landscape project lifecycle. It includes describing in detail the risk conception, implementation of a risk management system, and risk tools and techniques.

Focus on risk management application in landscape project management within project lifecycle from definition, planning, design, procurement, construction, defects liability period (DLP), maintenance and handing over phase. It is excluded extended project lifecycle context from project benefits realisation and landscape operational maintenance and management. Nevertheless, the significances of the application go beyond to the extended project lifecycle.

1.6 Research Significance

This research attempts to produce theoretical and practical contributions to landscape project management. This research has some potential significance in the following areas:

1. The body of knowledge
2. Landscape architecture professional practice
3. Urban landscape project management in Malaysia

1.6.1 The Body of Knowledge

Theoretically, the research is committed to improving the landscape architecture body of knowledge through the understanding and application of risk management. A conceptual framework for risk management application in landscape projects developed in this research. A generic framework developed as a combination of the various processes available to suit the local landscape industry.

1.6.2 Landscape Architecture Professional Practice

Practically, the contribution of the research includes providing insights into how landscape professionals currently understand and implement risk management. In doing so, the research investigated the issues faced in landscape projects due to unmanaged risk and developed a structure to explain the current understanding of risk management. The developed conceptual framework and the application will guide landscape

professionals in managing project risks effectively. Decision making over project risk management will be more feasible and accurate, thus enhancing the project performance and reducing project issues.

1.6.3 Urban Landscape Project Management in Malaysia

The landscape project outcome will enhance the urban environment, thus improving urban dwellers' wellbeing in economic, physical, psychological, social, and cultural aspects. This scenario will subsequently contribute to the country's landscape aspiration to create sustainable cities that have favourable impacts on the society, economy, and nation.

1.7 The Thesis Structure

This research is presented in six chapters. The thesis structure is outlined in Figure 1.4. Chapter 1 introduces the research, providing a detailed explanation of its subject. It includes the author's early observations, statement of the problem, as well as the research questions, aim, and objectives. It also discusses the scope and significance of the research.

Chapter 2 presents the literature review to provide an overview of the landscape field and landscape management. It encompasses the scope, current development, and professional entities associated with the landscape field, including landscape project management, significance, challenges, and issues. The chapter reviews the risk management practice in general project application including risk and risk management definitions, landscape project risk management, an overview of the project risk management approaches, and the process extracted from various standards and guidelines. The chapter also explains the overall risk management maturity.

Chapter 3 sets up the conceptual framework for the research based on the literature review, aimed at finding the best framework to integrate risk management into project management. It looks at the management of project risk in the landscape, examines the selected risk management standards, and reviews in-depth the framework for integrating the risk process into the project lifecycle process. Finally, it combines the variables and findings, as then formulates the preliminary conceptual framework that integrates the risk management application into landscape project management.

Chapter 4 discusses the research methodology. It covers the development of the research strategy and the four-stage research process, namely preliminary research, fieldwork and data collection, data analysis, and reporting.

Chapter 5 reports on the research results and analysis. The first part of the chapter reports the findings from in-depth interviews on the project management process. It investigates the achievement of project objectives and controllability of project issues. Then the chapter reports the current project risk management practice, risk management, and conceptual framework. The second part of the chapter reports the findings from a review of completed landscape projects. It investigates the project performances, issues, causes, and effects. Then it reports the case study' project risk register, risk process practice, and risk management practice. The third part of the chapter reports findings from a focus group discussion on conceptual framework validation. The fourth and last part of the chapter presents a discussion of the main findings extracted from in-depth interviews and the case study.

Chapter 6 concludes the research. The chapter provides a summary of the main findings. It also provides research recommendations, limitations, and suggestions for future research. Finally, it ends the thesis with the research contributions and final remarks.

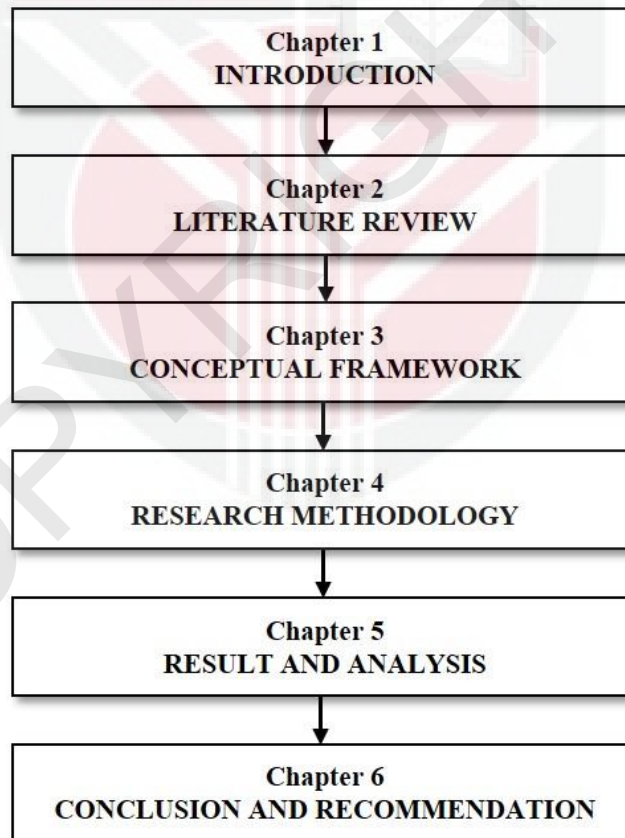


Figure 1.4 : Thesis Structure

REFERENCES

- Abd-Karim, S. B. (2014). *The Development Of An Empirical-Based Framework For Project Risk Management*. University of Manchester.
- Abd El-Karim, M. S. B. A., Mosa El Nawawy, O. A., & Abdel-Alim, A. M. (2015). Identification And Assessment Of Risk Factors Affecting Construction Projects. *HBRC Journal*, 13, 202–216. <https://doi.org/10.1016/j.hbrj.2015.05.001>
- Abdul-Rahman, H., Wang, C., & Mohamad, F. S. (2015). Implementation of Risk Management in Malaysian Construction Industry: Case Studies. *Journal of Construction Engineering*, 2015(1), 7. <https://doi.org/10.1155/2015/192742>
- Abrams, C. (1971). The Language of Cities: A Glossary of Terms. *The Viking Press*, 44. <https://doi.org/10.2307/2576824>
- Ackerman, A., Cave, J., Lin, C. Y., & Stillwell, K. (2019). Computational Modeling For Climate Change: Simulating And Visualizing A Resilient Landscape Architecture Design Approach. *International Journal of Architectural Computing*, 17(2), 125–147. <https://doi.org/10.1177/1478077119849659>
- Adnan, H. (2008). An Assessment of Risk Management in Joint Venture Projects (JV) in Malaysia. *Asian Social Science*, 4(6), 99–106. www.ccsenet.org/journal.html
- Adnan, H., Jusoff, K., & Salim, M. K. (2008). The Malaysian Construction Industry's Risk Management in Design and Build. *Modern Applied Science*, 2(5), 27–33. www.ccsenet.org/journal.html
- Adnan, H., Rahmat, M. N., & Mazali, N. F. N. (2008). Risk Management Assessment for Partnering Projects in the Malaysian Construction Industry. *Journal of Politics and Law*, 1(1), 76–81. www.ccsenet.org/journal.html
- Adnan, H., & Rosman, M. R. (2018). Risk management in Turnkey projects in Malaysia. *WSEAS Transactions on Business and Economics*, 15, 35–43.
- AIPM. (2008). *AIPM Professional Competency Standards for Project Management - Part A* (1.01, Issue November). Australian Institute of Project Management.
- AIRMIC, ALARM, & IRM. (2002). *A Risk Management Standard* (2002nd ed.). The Association of Insurance and Risk Managers (AIRMIC), ALARM The National Forum for Risk Management & The Institute of Risk Management (IRM). www.theirm.org
- Akintoye, A. S., & MacLeod, M. J. (1997). Risk Analysis and Management in Construction. *International Journal of Project Management*, 15(1), 31–38. [https://doi.org/http://dx.doi.org/10.1016/S0263-7863\(96\)00035-X](https://doi.org/http://dx.doi.org/10.1016/S0263-7863(96)00035-X)

- Algahtany, M., Alhammadi, Y., & Kashiwagi, D. (2016). Introducing a New Risk Management Model to the Saudi Arabian Construction Industry. *Procedia Engineering*, 145(480), 940–947. <https://doi.org/10.1016/j.proeng.2016.04.122>
- Ansah, R. H., Sorooshian, S., Mustafa, S. Bin, & Duvvuru, G. (2016). Assessment of Environmental Risks in Construction Projects: A Case of Malaysia. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 752–763.
- Antrop, M. (2005). Why Landscapes of the Past Are Important For the Future. *Landscape and Urban Planning*, 70(1–2), 21–34. <https://doi.org/10.1016/j.landurbplan.2003.10.002>
- APM. (2006). APM Body of Knowledge. In *Reprinted 2006, 2007 (twice), 2008 (three times), 2009 (twice)* (5th ed.). Association for Project Management. <https://doi.org/10.1080/10894160.2010.508411>
- APM. (2010). Project Risk Analysis and Management Guide. In APM Risk Management Specific Interest Group (Ed.), (*reprinted 2007, 2009, 2010*) (2nd ed.). Association for Project Management.
- APM. (2012). APM Body of Knowledge. In *APM Body Of Knowledge* (6th ed.). Association for Project Management. <https://doi.org/10.1080/10894160.2010.508411>
- Arashpour, M., Wakefield, R., Lee, E. W. M., Chan, R., & Hosseini, M. R. (2016). Analysis of interacting uncertainties in on-site and off-site activities: Implications for hybrid construction. *International Journal of Project Management*, 34(7), 1393–1402. <https://doi.org/10.1016/j.ijproman.2016.02.004>
- AS/NZS 4360:1999. (1999). *Australian Standard - Risk management* (Joint Technical Committee OB/7 – Risk Management (Ed.)). Standards Australia.
- AS/NZS 4360:2004. (2004). AS/NZS 4360/2004 Risk Management. *Computer Law*, 38. [https://doi.org/10.1016/S0267-3649\(02\)01108-1](https://doi.org/10.1016/S0267-3649(02)01108-1)
- ASLA. (2019). *American Society of Landscape Architects*. What Is Landscape? <https://doi.org/10.7551/mitpress/10405.001.0001>
- Auld, G. W., Diker, A., Bock, M. A., Boushey, C. J., Bruhn, C. M., Cluskey, M., Edlefsen, M., Goldberg, D. L., Misner, S. L., Olson, B. H., Reicks, M., Wang, C., & Zaghoul, S. (2007). Development of a Decision Tree to Determine Appropriateness of NVivo in Analyzing Qualitative Data Sets. *Journal of Nutrition Education and Behavior*, 39(1), 37–47. <https://doi.org/10.1016/j.jneb.2006.09.006>
- Baker, E. (2007). You've got way too many issues! *PMI® Global Congress 2007-North America*, 1–6. <https://www.pmi.org/learning/library/project-risk-management-issues-management-7267>

- Bandara, W. (2006). Using NVivo as a research management tool: A case narrative. *Quality and Impact of Qualitative Research: QualIT 2006, Proceedings of the 3rd International Conference on Qualitative Research in IT and IT in Qualitative Research*.
- Basit, T. N. (2003). Manual or Electronic: the Role of Coding in Qualitative Data Analysis. *Educational Research*, 45(2), 143–154. <https://doi.org/10.1080/0013188032000133548>
- Baten, J. (2016). *A History of the Global Economy: 1500 to the Present* (1st ed.). Univeristy of Cambridge. www.cambridge.org
- Ben-David, I., & Raz, T. (2001). Integrated approach for risk response development in project planning. *Journal of the Operational Research Society*, 52(1), 14–25. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-0034818337&partnerID=40&md5=d0ce1b043c5d22ec6fd8701a844a4dd8>
- Bennet, L. F. (2003). *The Management of Construction: A Project Lifecycle Approach* (1st ed.). Butterworth Heinneman.
- Bernama. (2018). *Student killed by falling tree in freak motorcycle accident. 5th July 2018*. <https://www.malaymail.com/news/malaysia/2018/07/05/student-killed-by-falling-tree-in-freak-motorcycle-accident/1649123>
- Bogdan, R., & Knopp, S. (2003). Qualitative Research for education. *Qualitative Research*. <https://doi.org/10.1177/1468794107085301>
- Bogner, A., Littig, B., & Menz, W. (2009). Interviewing Experts. In *ECPR Research Methods*. Palgrave Macmillan. <https://doi.org/10.1057/9780230244276>
- Boyatzis, R. (1998). Thematic Analysis and Code Development. In *Transforming Qualitative Information*.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Braun, V., & Clarke, V. (2012). Thematic Analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Pante, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2: Research designs: Quantitative, qualitative, neuropsychological, and biological* (Vol. 2, pp. 57–71). American Psychological Association.
- BS 31100:2008. (2008). *Risk management - Code of practice* (1st ed.). British Standards Institution (BSI). www.bsigroup.com/standards
- BS 31100:2011. (2011). *Risk management - Code of practice and guidance for the implementation of BS ISO 31000* (2nd ed.). British Standards Institution (BSI). https://doi.org/10.1007/SpringerReference_2887

- BS 6079-1:2010. (2010). *Project Management – Part 1: Principles And Guidelines For The Management Of Projects* (3rd ed.). British Standards Institution (BSI). www.bsi-group.com/standards
- BS 6079-2:2000. (2000). *Project Management - Part 2: Vocabulary* (P. management Technical Committee MS/2 (Ed.); 11015 Corrigendum No. 1; 3rd ed.). British Standards Institution (BSI). www.bsi-group.com/standards
- BS 6079-3:2000. (2000). *Project Management - Part 3: Guide To The Management Of Business Related Project Risk* (P. M. Technical Committee MS/2 (Ed.); 1st ed.). British Standards Institution (BSI). www.bsi-group.com/standards
- BS IEC 62198:2001. (2001). *Project Risk Management - Application Guidelines* (Management Systems Sector Policy and Strategy Committee (Ed.); No. 3; 1st ed.). British Standards Institution (BSI).
- BS ISO/IEC 16085:2006. (2006). *Systems and software engineering - Life cycle processes - Risk management* (T. C. IST/15 (Ed.)). British Standards Institution (BSI).
- BS ISO 31000:2009. (2009). Risk management — Principles and guidelines. In R. management Technical Committee RM/1 (Ed.), *Bs Iso 31000:2009* (1st ed.). British Standards Institution (BSI). <https://doi.org/10.1080/08982112.2013.814508>
- Bugayenko, Y. (2019). *Cause + Risk + Effect*. Orsk.com. <https://www.yegor256.com/2019/05/14/cause-risk-effect.html>
- Buzz, W. of. (2018). Couple Injured by Fallen Tree Near KLCC Jus Couple Injured by Fallen Tre KLCC Just Got Married Yest. *5th March 2018*, 1–12. <https://www.worldofbuzz.com/couple-injured-fallen-tree-near-klcc-just-got-married-yesterday/>
- Cambridge. (2019). *Cambridge Dictionary*. Cambridge Dictionary. https://dictionary.cambridge.org/dictionary/english-malaysian/risk_1
- CAN/CSA-Q850-97. (2002). *Risk Management: Guideline for Decision-Makers: Vol. Raffirmd 2*. The Canadian Standards Association (CSA).
- Capouya, L., Compton, K., Dantzler, V., & Howard, L. (2012). Small Firm, Big Risk: Managing Relationships, Resources and Risk in the New Economy. *ASLA 2012 Annual Meeting and EXPO*, 1–10.
- Carbone, T., & Tippett, D. (2004). Project risk management using the project risk FMEA. *Journal of Engineering Management*, *16*(4), 1–8. <https://doi.org/10.1080/10429247.2004.11415263>

- Carr, V., & Tah, J. H. . (2001). A fuzzy approach to construction project risk assessment and analysis: construction project risk management system. *Advances in Engineering Software*, 32(10), 847–857. [https://doi.org/10.1016/S0965-9978\(01\)00036-9](https://doi.org/10.1016/S0965-9978(01)00036-9)
- Chapman, C., & Ward, S. (2003). *Project Risk Management - Processes, Techniques and Insights* (2nd ed.). John Wiley & Sons Ltd. www.wileyurope.com
- Chapman, R. J. (2012). Simple Tools and Techniques for Enterprise Risk Management. In *Simple Tools and Techniques for Enterprise Risk Management* (2nd ed.). John Wiley & Sons Ltd. <https://doi.org/10.1002/9781118467206>
- Charette, R. N. (2006). A Risk of Too Many Risk Standards? *16th Annual Int. Symposium of the International Council On Systems Engineering (INCOSE)*, 4. https://www.incose.org/practice/techactivities/wg/risk/docs/PN05_0750_Charette.Position.pdf
- Chee, C. H., & Neo, H. (2019). *5 Big Challenges Facing Big Cities of the Future* (C. H. Chee & H. Neo (Eds.)). World Economic Forum. <https://www.weforum.org/agenda/2018/10/the-5-biggest-challenges-cities-will-face-in-the-future>
- Chittoor, A. (2012). *Project Risks vs Issues*. The Project Management Social Network. <http://network.projectmanagers.net/profiles/blogs/project-risks-vs-issues>
- Christensen, A. J. (2005). *Dictionary Of Landscape Architecture And Construction*. McGraw-Hill. <https://doi.org/10.1036/0071441425>
- Christmann, G. B. (2009). Expert Interviews on the Telephone: A Difficult Undertaking. In Bogner A., Littig B., Menz W. (eds) *Interviewing Experts. Research Methods Series* (pp. 157–183). Palgrave Macmillan. https://doi.org/10.1057/9780230244276_8
- CMU/SEI-94-SR-5. (1994). *Team Risk Management: A New Model for Customer-Supplier Relationships* (Ronald P. Higuera, A. J. Dorofee, J. A. Walker, & R. C. Williams (Eds.); Issue July 1994). Carnegie Mellon University.
- Conzen, M. R. G. (1960). Alnwick, Northumberland: A Study in Town-Plan Analysis. *Transactions and Papers (Institute of British Geographers)*. <https://doi.org/10.2307/621094>
- Cook, T. W., & VanDerZanden, A. M. (2011). *Sustainable Landscape Management: Design, Construction, And Maintenance*. John Wiley & Sons, Inc.
- Cooper, D. F., Grey, S., Raymond, G., & Walker, P. (2005). *Project Risk Management Guidelines - Managing Risk in Large Projects and Complex Procurements* (B. C. International (Ed.)). John Wiley & Sons Ltd. www.wileyurope.com

- Cooper, D., & Schindler, P. (2014). *Business Research Methods* (12th ed.). McGraw-Hill.
- Cornes, D. (1989). The Concept of Design in Construction Contract Policy. *Improved Procedures and Practice*, 68.
- COSO. (2004). *Enterprise Risk Management — Integrated Framework*. Committee of Sponsoring Organizations of the Treadway Commission. <https://doi.org/10.1504/IJISM.2007.013372>
- Cowan, R. (2005). *The Dictionary of Urbanism* (1st ed.). Streetwise Press. <https://doi.org/10.1057/palgrave.udi.9000158>
- Crawford, L. (2004). Global Body of Project Management Knowledge and Standards. In P. W. G. Morris & J. K. Pinto (Eds.), *The Wiley Guide to Managing Projects* (pp. 1150–1196). John Wiley & Sons, Inc. <https://doi.org/10.1002/9780470172391>
- Crawford, L. (2000). Project Management Competence for the New Millenium. *Proceedings of 15th World Congress on Project Management*, 5.
- Creswell, J. W. (2007). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. In *Sage Publications, Inc.* (4th ed.). Sage Publications, Inc. <https://doi.org/10.1016/j.aenj.2008.02.005>
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Vicki Knight (Ed.); 4th ed.). SAGE Publications, Inc. <https://doi.org/10.1007/s13398-014-0173-7.2>
- Croucher, K., Myers, L., & Bretherton, J. (2007). *Greenspace Scotland Research Report - The Links Between Greenspace And Health: A Critical Literature Review* (Issue October). <http://greenspacescotland.org.uk/SharedFiles/Download.aspx?pageid=133&mid=129&fileid=96>
- DBKL. (2008). KL Development Control plan ,Volume 2 part 1. *Kuala Lumpur : Dewan Bandaraya Kuala Lumpur*,.
- De Oliveira, U. R., Marins, F. A. S., Rocha, H. M., & Salomon, V. A. P. (2017). The ISO 31000 Standard in Supply Chain Risk Management. *Journal of Cleaner Production*, 151, 616–633. <https://doi.org/10.1016/j.jclepro.2017.03.054>
- Denzin, N. K., & Lincoln, Y. S. (2005). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 1–32). Sage Publications Ltd.
- Dionne, G. (2013). *Risk Management: Histoy, Definition and Critique*. Interuniversity Research Centre on Enterprise Networks, Logistics and Transportation (CIRRELT).

- Dixon, M. (2000). *Project Management Body of Knowledge* (APM's Professional Board (Ed.); 4th ed.). Association for Project Management (APM). www.apm.org.uk
- DOSM. (2019). *Current Population Estimates, Malaysia, 2018-2019*. Department of Statistics Malaysia. <https://www.dosm.gov.my/v1/index.php?r=column>
- Du, L., Tang, W., Liu, C., Wang, S., Wang, T., Shen, W., Huang, M., & Zhou, Y. (2016). Enhancing engineer-procure-construct project performance by partnering in international markets: Perspective from Chinese construction companies. *International Journal of Project Management*, 34(1), 30–43. <https://doi.org/10.1016/j.ijproman.2015.09.003>
- Dwyer, B. (2016). Project management. *Systems Analysis and Synthesis*, 2014(1006), 359–384. <https://doi.org/10.1016/B978-0-12-805304-1.00020-5>
- Dyer, R. (2017). Cultural sense-making integration into risk mitigation strategies towards megaproject success. *International Journal of Project Management*, 35(7), 1338–1349. <https://doi.org/10.1016/j.ijproman.2016.11.005>
- Easterby-Smith, M., Thorpe, R., & Lowe, A. (2002). *Management Research: An Introduction* (2nd ed.). SAGE Publications Ltd. <https://doi.org/10.1177/1744987107081254>
- Ebbensgaard, C. L. (2017). 'I like the sound of falling water, it's calming': engineering sensory experiences through landscape architecture. *Cultural Geographies*, 24(3), 441–455. <https://doi.org/10.1177/1474474017698719>
- Edwards, P. J., & Bowen, P. A. (1998). Risk and risk management in construction: A review and future directions for research. *Engineering Construction and Architectural Management*, 5(4), 339–349. <https://doi.org/10.1046/j.1365-232X.1998.54072.x>
- Fabbricatti, K., & Biancamano, P. F. (2019). Circular Economy and Resilience Thinking for Historic Urban Landscape Regeneration: The Case of Torre Annunziata, Naples. *MDPI Sustainability*, 11(3391), 1–29. <https://doi.org/https://doi.org/10.3390/su11123391>
- Fadzil, N. S., Noor, N. M., & Rahman, I. A. (2017). Need of risk management practice amongst bumiputera contractors in Malaysia construction industries. *IOP Conference Series: Materials Science and Engineering*, 271(012035), 7. <https://doi.org/10.1088/1757-899X/271/1/012035>
- Farooq, M. U., Thaheem, M. J., & Arshad, H. (2018). Improving the risk quantification under behavioural tendencies: A tale of construction projects. *International Journal of Project Management*, 36(3), 414–428. <https://doi.org/10.1016/j.ijproman.2017.12.004>

- Favetta, F., & Laurini, R. (2006). Towards an efficient integration, structure and exploration of landscape architecture project information. *2006 IEEE International Conference on Multimedia and Expo, ICME 2006 - Proceedings, 2006*, 397–400. <https://doi.org/10.1109/ICME.2006.262520>
- Fellows, R., & Liu, A. (2015). *Research Methods for Construction* (W. Blackwell (Ed.); 4th ed.). John Wiley & Sons. Ltd. <http://link.springer.com/content/pdf/10.1007/b139091.pdf#page=853>
- Flanagan, R. (2003). *Managing Risk For An Uncertain Future - A Project Management Perspective* (pp. 22–32). School of Construction Management and Engineering; The University of Reading.
- Flanagan, R., Jackson, S., & Jewell, C. (2003). *The management of risk – yours, mine and ours*. The Royal Institution of Chartered Surveyors. www.rics.org
- Flanagan, R., & Norman, G. (1993). *Risk management and Construction* (Blackwell Science Ltd (Ed.); 1st ed.). John Wiley & Sons Ltd. www.blackwell-science.com
- Forum, U. P. (2001). Public Parks Assessment: A survey of local authority owned parks focusing on parks of historic interest. *Urban Parks Forum*.
- Gaidow, S., & Boey, S. (2005). *Australian Defence Risk Management Framework : A Comparative Study*. DSTO Systems Sciences Laboratory. <http://dspace.dsto.defence.gov.au/dspace/bitstream/1947/3783/1/DSTO-GD-0427>
- Gairola, S., & Noresah, M. S. (2010). Emerging trend of urban green space research and the implications for safeguarding biodiversity : a viewpoint. *Nature and Science*, 8(7), 43–49. <https://doi.org/papers3://publication/uuid/27683335-9BAF-4BF9-9C81-135D365A6E97>
- GAPPS. (2007). *A Framework for Performance Based Competency Standards for Global Level 1 and 2 Project Managers* (Issue 1.7a). Global Alliance for Project Performance Standards (GAPPS). www.globalpmstandards.org
- Garmory, N., Wunsch, C., & Tennant, R. (2007). *Professional Practice for Landscape Architects* (2nd ed.). Architectural Press. <https://doi.org/10.4324/9781315714653>
- Ghaffari, A., Gan, B., Gan, Y., & Yu, Y. (2013). Concepts of Risk In Construction Projects. *Advances in Applied Materials and Electronics Engineering Ii*, 684, 644–649. <https://doi.org/10.4028/www.scientific.net/AMR.684.644>
- Godi, D. H. (2016). *Donald H. Godi, FASLA, PLA, RCA #444 7805*. 2012–2013.
- Godi, D. H., & Sibelius, T. D. (2012). Project Risk Management: New Obstacles to Consider. *2012 - ASLA Annual Meeting Presentation, Phoenix Convention Center*, 5. <https://doi.org/10.1097/00003677-200510000-00005>

- Goh, C. S., & Abdul-Rahman, H. (2013). The Identification and Management of Major Risks in Malaysian Construction Industry. *Journal of Construction in Developing Countries*, 18(1), 19–32.
- Gould, F., & Joyce, N. (2014). *Construction Project Management* (4th ed.). Pearson Prentice Hall.
- Gray, C., & Hughes, W. (2001). *Building design management* (1st ed.). Butterworth Heinemann.
- Hackett, M., Robinson, I., & Statham, G. (2007). *The Aqua Group of Procurement, Tendering and Contract Administration* (1st ed.). Blackwell Publishing Ltd.
- Hanaizal, F. A. M., & Mansoor, M. (2019). A Review Of Project Development Stages (PLC) In Malaysian Landscape Architecture Industry. *Journal of Built Environment, Technology and Engineering*, 6(May, 2019), 42–49. <https://doi.org/ISSN 0128-1003>
- Harian, B. (2012). Hampir Putus. 7th March 2012, 15. <http://carca-marba.blogspot.my/2012/03/hati-hati-main-jongkang-jongkit-boleh.html>
- Harwood, I. A., Ward, S. C., & Chapman, C. B. (2009). A Grounded Exploration of Organisational Risk Propensity. *Journal of Risk Research*, 12(5), 563–579. <https://doi.org/10.1080/13669870802497751>
- Hasan, R., Othman, N., & Ismail, F. (2018). Factors Influencing Hazardous Street Trees at Selected City Council in Malaysia. *Asian Journal of Quality of Life (AjQoL)*, 3(12), 77–85. <https://doi.org/10.21834/ajqol.v3i12.144>
- HB 436:2004. (2005). *Risk Management Guidelines Companion to AS/NZS 4360:2004* (S. A. N. Zealand (Ed.); Issue Amendment No. 1 (December 2005)). Standards Australia International Ltd. <https://doi.org/10.1016/B978-075067555-0/50157-2>
- Hillson, D. (2000). *Benchmarking Risk Management Capability* (Vol. 1, Issue 1).
- Hillson, D. (2003). Assessing organisational project management capability. *Journal Of Facilities Management*, 2(3), 298–311. www.risk-doctor.com/0AAssessing
- Hillson, D. (2009). Managing risk in projects. *Project Management Journal*, 46(March), 84–96. <https://doi.org/10.1002/pmj>
- Hillson, D. (2012). *Project Risk Management: Past, Present And Future Views From The Chair* (Project Risk Management Specific Interest Group (APM Risk SIG) (Ed.); p. 51). Association for Project Management (APM).
- Hillson, D. (2018). *When is a Risk not Risk?* The International Association for Contract & Commercial Management. <https://journal.iaccm.com/contracting-excellence-journal/when-is-a-risk-not-a-risk>

- Hillson, D. A. (1997). Towards a Risk Maturity Model. *The International Journal of Project and Business Risk Management*, 1(1), 35–45.
- Hillson, D., Grimaldi, S., & Rafele, C. (2006). Managing Project Risks Using a Cross Risk Breakdown Matrix. *Risk Management*, 8(1), 61–76. <https://doi.org/10.1057/palgrave.rm.8250004>
- Ho, C. S., Matsuoka, Y., & Hashim, O. (2012). *Putrajaya Green City 2025 : Baseline and Preliminary Study*. 56.
- Hodder, I. (1994). The interpretation of documents and material culture. In *Handbook of Qualitative Research*.
- Holmes, D. (2017). *Stages of a Landscape Architecture Design project*. World Landscape Architecture. <https://worldlandscapearchitect.com/practice-stages-of-a-landscape-architecture-design-project/#.XLbbijAzblU>
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*. <https://doi.org/10.1177/1049732305276687>
- Hussain, N. H. M., & Byrd, H. (2012). Towards a Compatible Landscape in Malaysia: An Idea, Challenge and Imperatives. *Procedia - Social and Behavioral Sciences*, 35, 275–283. <https://doi.org/10.1016/j.sbspro.2012.02.089>
- Hussein, M. K. (2014). Users' perception towards selected recreational forest landscape maintenance in Selangor Darul Ehsan, Malaysia. *Pertanika Journal of Social Science and Humanities*, 22(4), 969–983. <http://www.pertanika.upm.edu.my>
- Huzeima, N., Hussain, M., & Byrd, H. (2016). 'Balik Kampong': Is Malaysia Facing the Trends of De-Urbanization? *International Journal of the Malay World and Civilisation*, 4(2), 35–43. <https://doi.org/10.17576/IMAN-2016-04SI2-04>
- IAPPM. (2008). A Guide to Project Management Auditing, Assessments and Recommendations Certified. In *Certified International Project Auditor (CIPA)* (1st ed.). The International Association Of Project And Program Management (IAPPM). www.iappm.org
- IEC/FDIS 31010:2009. (2009). *Risk management — Risk Assessment Techniques* (International Electrotechnical Commission (Ed.)). International Organization for Standardization (ISO).
- IEEE Std 1540-2001. (2001). *IEEE Standard for Software Life Cycle Processes - Risk Management*. The Institute of Electrical and Electronics Engineers, Inc.
- IFLA Europe. (2017). *International Federation of Landscape Architects EUROPE*. International Federation of Landscape Architects EUROPE. <https://www.iflaeurope.eu/>

- ILAM. (2018). *About Us - Institute of Landscape Architects Malaysia (ILAM)*. <http://www.ilamalaysia.org/the-profession>
- Imenda, S. (2014). Is There a Conceptual Difference between Theoretical and Conceptual Frameworks? *Journal of Social Sciences*, 38(2), 185–195. <https://doi.org/10.1080/09718923.2014.11893249>
- IPMA. (2006). ICB - IPMA Competence Baseline, Version 3.0. In G. Caupin, H. Knoepfel, G. Koch, K. Pannenbäcker, F. Pérez-Polo, & C. Seabury (Eds.), *Internacional Project Management Association* (3rd ed.). International Project Management Association.
- Ishak, M. A. M. (1992). Landscape Development in Malaysia. In *Collection of Article on Landscape Development in Malaysia*.
- ISO/TR 31004:2013. (2013). *Risk management — Guidance for the implementation of ISO 31000: Vol. PD ISO/TR*. www.iso.org
- ISO 10006:2003. (2003). *Quality management systems - Guidelines for quality management in projects* (Technical Committee ISO/TC 176 (Ed.); 2nd ed.). International Organization for Standardization (ISO). www.iso.org
- ISO 31000:2018. (2018). *ISO 31000:2018 Risk management - Guidelines* (ISO/TC 262 Risk Management (Ed.); 2nd ed.). International Organization for Standardization (ISO). www.iso.org
- ISO GUIDE 73:2009. (2009). *ISO GUIDE 73:2009 Risk management - Vocabulary* (I. T. M. Board (Ed.); 1st ed.). International Organization for Standardization (ISO). <https://www.iso.org/standard/44651.html>
- ITGI. (2007). *Framework Control Objectives Management Guidelines Maturity Models*. IT Governance Institute. [https://doi.org/10.1016/S0167-4048\(97\)84675-5](https://doi.org/10.1016/S0167-4048(97)84675-5)
- Jansson, M., & Lindgren, T. (2012). A Review of the Concept ‘Management’ In Relation To Urban Landscapes and Green Spaces: Toward A Holistic Understanding. *Urban Forestry and Urban Greening*, 11, 139–145. <https://doi.org/10.1016/j.ufug.2012.01.004>
- Jaume, B. F., & Albert, C. R. (2011). Management Of The Territory: Landscape Management As A Process. In J. B. Fàbregas & A. C. Ramos (Eds.), *6th Council of Europe Conference on the European Landscape Convention* (6th ed., Issue 13E, p. 32). Council of Europe.
- Jayasudha, K., & Vidivelli, B. (2016). Analysis of major risks in construction projects. *ARPJ Journal of Engineering and Applied Sciences*, 11(11), 6943–6950.
- Jebasingam, I. J. (2014). *Creating The Essence Of Cities: The Planning & Development Of Malaysia's New Federal Administrative Capital, Putrajaya*. www.putrajaya.net.my

- Jewell, C., Flanagan, R., & Lu, W. (2014). The dilemma of scope and scale for construction professional service firms. *Construction Management and Economics*, 32(5), 473–486. <https://doi.org/10.1080/01446193.2013.879194>
- JLN. (2008). *Garis Panduan Landskap Negara Edisi 2*. Jabatan Landskap Negara, Kementerian Perumahan Dan Kerajaan Tempatan Malaysia.
- Jones, M. L. (2007). Using software to analyse qualitative data. *Malaysian Journal of Qualitative Research*, 1(1), 64–76. [papers2://publication/uuid/F63D1D09-4501-4466-8AA0-0B9F70772ED9](https://doi.org/10.1080/144668AA0-0B9F70772ED9)
- Jusoff, K., Rashid, Z. A., & Adnan, H. (2008). Legal Framework on Risk Management for Design Works in Malaysia. *Journal of Politics and Law*, 1(2), 26–32. <https://doi.org/10.5539/jpl.v1n2p26>
- Jusoff, K., Yusuwan, N. M., Adnan, H., & Omar, A. F. (2008). Clients' Perspectives of Risk Management Practice in Malaysian Construction Industry. *Journal Politic and Law*, 1(3), 121–130. <https://doi.org/10.5539/jpl.v1n3p121>
- Kähkönen, K. (2001). Integration Of Risk And Opportunity Thinking In Projects. *Fourth European Project Management Conference, PMI Europe 2001, London UK, 6-7, June 2001*, 7.
- Kamal, E. M., Haron, S. H., Ulang, N. M., & Baharum, F. (2012). The Critical Review on the Malaysian Construction Industry. *Journal of Economics and Sustainable Development*, 3(13), 81–87.
- Kamariyah, K. (1989). Regulatory Practice in Malaysia. *An Urban Landscape Architecture Colloquium*.
- Kamarulzaman, M. (2012). Safety, Health & Environment In Project Management. *Project Management*, 11(3), 12–19.
- Kang, B. G., Fazlie, M. A., Goh, B. H., Song, M. K., & Zhang, C. (2015). Current Practice of Risk Management in the Malaysia Construction Industry - The Process and Tools/Techniques. *International Journal of Structural and Civil Engineering Research*, 4(4), 371–377. <https://doi.org/10.18178/ijscer.4.4.371-377>
- Kelly, R. (2015). *Risks and Issues – They are not the same!* Strategy Execution. <https://www.strategyex.co.uk/blog/pmoperspectives/risks-and-issues-they-are-not-the-same>
- Kendle, T., Rose, J. E., & Oikawa, J. (2000). Sustainable Landscape Management. In Benson, J. (Ed.), Roe, M. (Ed.). (2000). *Landscape and Sustainability*. London: Taylor & Francis, <https://doi.org/10.4324/9780203995785> (1st ed., p. 30). Taylor & Francis. <https://doi.org/10.4324/9780203995785>

- Kerzner, H. (2009). *Project Management: A Systems Approach To Planning, Scheduling And Controlling* (H. Kerzner (Ed.); 10th ed.). John Wiley & Sons, Inc. [https://doi.org/10.1016/0377-2217\(82\)90164-3](https://doi.org/10.1016/0377-2217(82)90164-3)
- Khan, R. A., Liew, M. S., & Ghazali, Z. Bin. (2014). Malaysian Construction Sector and Malaysia Vision 2020: Developed Nation Status. *Procedia - Social and Behavioral Sciences*, 109, 507–513. <https://doi.org/10.1016/j.sbspro.2013.12.498>
- KnowledgeHut. (2018). *What is the difference between Risk & Issues?* Management Consulting and Training. <https://www.knowledgehut.com>
- Kohlmeyer, D. K., & Visser, J. K. (2004). A Risk Management Approach For The Project Management Process. *SA Journal of Industrial Engineering*, 15(2), 79–90.
- Koppenhafer, S. (2017). *Issue vs Risk in IT Project Management*. Jeskell System, LLC. <https://www.jeskell.com/blog/it-project-management-issue-vs-risk>
- Krippendorff, K. (2004). *Content Analysis: An Introduction to its Methodology* (M. H. Seawell (Ed.); 2nd ed.). SAGE Publications. <https://doi.org/10.1017/CBO9781107415324.004>
- Kululanga, G., & Kuotcha, W. (2010). Measuring project risk management process for construction contractors with statement indicators linked to numerical scores. *Engineering, Construction and Architectural Management*, 17(4), 336–351. <https://doi.org/10.1108/09699981011056556>
- LAA2050. (2017). *Landscape Architecture Agenda 2050*. Institute of Landscape Architects Malaysia (ILAM). <http://www.ilamalaysia.org/laa2050>
- Landscape Institute. (2020). *Landscape practice*. About. <https://www.landscapeinstitute.org/about/landscape-practice/>
- Larkham, P. J., & Jones, A. N. (1991). A glossary of urban form. *Historical Geography Research Series - Institute of British Geographers*.
- Lee, K.-J., Han, B.-H., Hong, S.-H., & Choi, J.-W. (2005). A study on the characteristics of urban ecosystems and plans for the environment and ecosystem in Gangnam-gu, Seoul, Korea. *Landscape and Ecological Engineering*, 1(2), 207–219. <https://doi.org/10.1007/s11355-005-0025-x>
- Lester, A. (2017). *Project Management, Planning and Control* (7th ed.). Butterworth-Heinemann. <http://www.elsevier.com>
- Levy, S. M. (2009). *Construction Process Planning and Management: An Owner's Guide to Successful Projects* (1st ed.). Butterworth Heinemann.

- Loosemore, M., & Cheung, E. (2015). Implementing systems thinking to manage risk in public private partnership projects. *International Journal of Project Management*, 33(6), 1325–1334. <https://doi.org/10.1016/j.ijproman.2015.02.005>
- Lyons, T., & Skitmore, M. (2004). Project risk management in the Queensland engineering construction industry: A survey. *International Journal of Project Management*, 22(1), 51–61. [https://doi.org/10.1016/S0263-7863\(03\)00005-X](https://doi.org/10.1016/S0263-7863(03)00005-X)
- Maguire, M., & Delahunt, B. (2017). Doing a Thematic Analysis: A Practical, Step-by-Step. *The All Ireland Journal of Teaching and Learning in Higher Education*, 8(3), 3351–33514. <http://ojs.aishe.org/index.php/aishe-j/article/view/335>
- Malek, N. A., Abdul Malek, N., & Mariapan, M. (2009). Visitors Perception on Vandalism and Safety Issues in a Malaysian Urban Park. *Theoretical and Empirical Researches in Urban Management*, 4(4(13)), 93–107.
- Marcelino-Sádaba, S., Pérez-Ezcurdia, A., Echeverría Lazcano, A. M., & Villanueva, P. (2014). Project risk management methodology for small firms. *International Journal of Project Management*, 32(2), 327–340. <https://doi.org/10.1016/j.ijproman.2013.05.009>
- Marshall, C., & Rossman, G. B. (2011). *Designing Qualitative Research* (5th ed.). Sage Publications, Inc. http://depts.washington.edu/methods/readings/com501_marshall_the_what_of_study.pdf
- Martella, R. C., Nelson, J. R., & Marchand-Martella, N. E. (1999). *Research Methods: Learning to Become a Critical Research Consumer* (Science). Allyn & Bacon.
- Mayring, P. (2014). *Qualitative Content Analysis: Theoretical Foundation, Basic Procedures and Software Solution*. Social Science Open Access Repository (SSOAR). <https://doi.org/http://dx.doi.org/10.4135/9781446282243.n12>
- McKinney, M. L. (2002). Urbanization, Biodiversity, and Conservation. *BioScience*, 52(10), 883. [https://doi.org/10.1641/0006-3568\(2002\)052\[0883:UBAC\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2002)052[0883:UBAC]2.0.CO;2)
- McLeod, J. (2010). *Case Study Research in Counselling and Psychotherapy* (1st ed.). SAGE Publications Ltd. <https://doi.org/10.4135/9781446287897>
- McNamara, C. (2017). *Field Guide to Nonprofit Program Design, Marketing and Evaluation* (5th ed.). Authenticity Consulting, LLC.
- Meijering, J. V., Tobi, H., van den Brink, A., Morris, F., & Bruns, D. (2015). Exploring research priorities in landscape architecture: An international Delphi study. *Landscape and Urban Planning*, 137, 85–94. <https://doi.org/10.1016/j.landurbplan.2015.01.002>

- Merriam, S. B. (2009). *Qualitative Research : A Guide to Design and Implementation* (2nd ed.). Jossey-Bass, Wiley Imprint. <https://doi.org/10.1097/NCI.0b013e3181edd9b1>
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2019). *Qualitative Data Analysis : A Methods Sourcebook* (4th ed.). Sage Publications, Inc.
- Mills, A. (2007). A systematic approach to risk management for construction. *Structural Survey*, 19(5), 245–252. <https://doi.org/10.1108/02630800110412615>
- Mohamed, O., Abd-Karim, S. B., Roslan, N. H., Mohd Danuri, M. S., & Zakaria, N. (2014). Risk management: Looming the modus operandi among construction contractors in Malaysia. *International Journal of Construction Management*, 15(1), 82–93. <https://doi.org/10.1080/15623599.2014.967928>
- MS ISO 31000:2010. (2010). *Risk Management - Principles and Guidelines (ISO 31000:2009, IDT)* (Industry Standards Committee on Organisational Management (ISCO) (Ed.)). Department of Standards Malaysia. <http://www.standardsmalaysia.gov.my>
- Naoum, S. (2006). Dissertation Research and Writing for Construction Students. In *Dissertation Research and Writing for Construction Students, Second Edition* (2nd ed.). Butterworth-Heinemann. <https://doi.org/10.4324/9780080467047>
- Neuendorf, K. A. (2019). Content analysis and thematic analysis. In P. Brough (Ed.). In P. Brough (Ed.), *P. Brough (Ed.), Research methods for applied psychologists: Design, analysis and reporting* (1st ed., pp. 211–223). Routledge. <https://doi.org/10.4324/9781315517971>
- Ng, A., & Loosemore, M. (2007). Risk allocation in the private provision of public infrastructure. *International Journal of Project Management*, 25(1), 66–76. <https://doi.org/10.1016/j.ijproman.2006.06.005>
- NLD. (2011). *National Landscape Policy : Malaysia Beautiful Garden Nation* (National Landscape Department (Ed.)). Ministry of Housing and Local Government.
- NSTP. (2017). Pokok Reput Tak Diselenggara Jadi Perangkap Maut. 5th May 2017. https://doi.org/http://katu.kpkt.gov.my/uploads/keratan/file_1499483058.pdf
- OGC. (2007). *OGC Gateway™ Process Review 2: Delivery strategy*. Office of Government Commerce. www.ogc.gov.uk
- OGC. (2009). *An Introduction to PRINCE2: Managing and Directing Successful Projects*. The Stationery Office (TSO). www.best-management-practice.com
- Olechowski, A., Oehmen, J., Seering, W., & Ben-Daya, M. (2016). The professionalization of risk management: What role can the ISO 31000 risk management principles play? *International Journal of Project Management*, 34(8), 1568–1578. <https://doi.org/10.1016/j.ijproman.2016.08.002>

- Olsson, R. (2007). In search of opportunity management: Is the risk management process enough? *International Journal of Project Management*, 25(8), 745–752. <https://doi.org/10.1016/j.ijproman.2007.03.005>
- Omer, M. S., Adeleke, A. Q., & Chia, K. L. (2019). Level of Risk Management Practive in Malaysia Construction INdustry From A Knowledge-Based Perspective. *Journal of Architecture, Planning and Construction Management*, 9(1), 112–129.
- Online, T. S. (2018a). Girl , 15 , dies in freak playground accident after getting head caught in swing. *26th November 2018*, 2018–2019. <https://www.thestar.com.my/news/nation/2018/11/26/girl-15-dies-in-freak-playground-accident-after-getting-head-caught-in-swing/>
- Online, T. S. (2018b). Man injured after tree falls on golf buggy. *2nd Oct 2018*, 2018–2019. <https://www.thestar.com.my/news/nation/2018/10/02/man-injured-after-tree-falls-on-golf-buggy/> 1/2
- Osman, M. T. (2005). *Urban Landscape Management in Malaysia: In search of a Sustainable Management System*. University of Newcastle.
- Oxford. (2019). *Concise Oxford English Dictionary*. <https://en.oxforddictionaries.com/definition/risk>
- PAS 99:2006. (2006). Specification of common management system requirements as a framework for integration. In *Publicly Available Specification (PAS)*. British Standards Institution (BSI). www.bsi-global.com
- Patton. (2002). Qualitative research and evaluation methods. *Qualitative Inquiry*, 3rd, 598. <https://doi.org/10.2307/330063>
- Patton, E. (2003). The case for case studies in management research. *Management Research News*, 26(5), 60–71. http://scholarship.sju.edu/mgt_fac/169
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA : Sage. <https://doi.org/10.2307/330063>
- PD 6668:2000. (2000). *Managing Risk for Corporate Governance* (M. Robbins & D. Smith (Eds.); 1st ed.). British Standards Institution (BSI).
- PD ISO/IEC Guide 73:2002. (2002). *Risk management - Vocabulary - Guidelines for use in standards* (ISO Technical Management Board Working Group (Ed.); Vol. 3). British Standards Institution (BSI).
- Piney, C. (2012). Integrated project risk and issue management. *PMI® Global Congress 2012 - EMEA, Marsailles, France. Newtown Square, PA: Project Management Institute*, 1–8.

- PMAJ. (2005). *A Guidebook of Project & Program Management for Enterprise Innovation* (S. Ohara (Ed.); Revision 1, Vol. 2). Project Management Association of Japan (PMAJ). <http://www.pmaj.or.jp/>
- PMCC. (2002). *A Guidebook of Project & Program Management for Enterprise Innovation* (Revision 1). Project Management Professionals Certification Center (PMCC). <http://www.pmaj.or.jp/>
- PMI. (2004). *A Guide To The Project Management Body Of Knowledge (PMBOK Guide)* (PMBOK (Ed.); 3rd ed.). Project Management Institute, Inc. [https://doi.org/10.1016/0263-7863\(95\)00006-C](https://doi.org/10.1016/0263-7863(95)00006-C)
- PMI. (2008). *A Guide To The Project Management Body Of Knowledge (PMBOK Guide)* (PMBOK (Ed.); 4th ed.). Project Management Institute, Inc. <https://doi.org/10.1007/s13398-014-0173-7.2>
- PMI. (2009). Practice standard for project risk management. In *Project Management Institute, Inc. (PMI)*. <http://app.knovel.com/web/toc.v/cid:kpSPSRM002>
- PMI. (2013). *A Guide To The Project Management Body Of Knowledge (PMBOK Guide)* (PMBOK (Ed.); 5th ed.). Project Management Institute, Inc. <https://doi.org/10.1002/pmj.20125>
- PMI. (2017). *A Guide To The Project Management Body Of Knowledge (PMBOK Guide)* (PMBOK (Ed.); 6th ed.). Project Management Institute, Inc. <https://doi.org/10.1002/pmj.21345>
- Polit, D. F., & Tatano, C. (2001). Essentials of nursing research: methods, appraisal, and utilization. *Lipincott Williams and Wilkins*. <https://doi.org/10.7748/nr.13.4.91.s11>
- Post, B. (2012). Man Succumbs To Injuries After Car Crashes Into A Teak Tree. *12 March 2012*. <http://www.theborneopost.com/2015/02/15/three-sustain-injuries-after-car-crashes-into-roadside-tree/>
- Prieto Ibáñez, A. J., Macías Bernal, J. M., Chávez de Diego, M. J., & Alejandro Sánchez, F. J. (2016). Expert System for Predicting Buildings Service Life under ISO 31000 Standard. Application in Architectural Heritage. *Journal of Cultural Heritage*, 18, 209–218. <https://doi.org/10.1016/j.culher.2015.10.006>
- PRINCE2. (2017). *Managing Successful Projects With PRINCE2* (6th ed.). The Stationery Office (TSO). www.tsoshop.uk
- Purdy, G. (2010). ISO 31000:2009 - Setting a New Standard for Risk Management. *Risk Analysis*, 30(6), 881–886. <https://doi.org/10.1111/j.1539-6924.2010.01442.x>
- Qazi, A., Quigley, J., Dickson, A., & Kirytopoulos, K. (2016). Project Complexity and Risk Management (ProCRiM): Towards modelling project complexity driven risk paths in construction projects. *International Journal of Project Management*, 34(7), 1183–1198. <https://doi.org/10.1016/j.ijproman.2016.05.008>

- Quinlan, M. K. (2012). The Dynamics of Interviewing. In D.A. Ritchie (ed.), *The Oxford Handbook of Oral History*, Oxford and New York : Oxford University Press, pp 2-36 (pp. 23–36). <https://doi.org/10.1093/oxfordhb/9780195339550.013.0002>
- Rapley, T. J. (2001). The art(fulness) of open-ended interviewing: some considerations on analysing interview. *Qualitative Research*, 1(3), 303–323. <https://doi.org/10.1177/146879410100100303>
- Raz, T., & Hillson, D. A. (2005). A Comparative Review of Risk Management Standards. *Risk Management: An International Journal*, 7(4), 53–66.
- Razi, P. Z., Ali, M. I., & Ramli, N. I. (2020). Incorporation of Risk Index for Risk Response and Risk Mitigation Strategies of Public-Private Partnership (PPP) Housing Construction Project in Malaysia. *IOP Conference Series: Materials Science and Engineering*, 712, 012031. <https://doi.org/10.1088/1757-899x/712/1/012031>
- Richards, L. (1999). Data Alive! The Thinking Behind Nvivo. *Qualitative Health Research*, 9(3), 412–428. <https://doi.org/10.1177/104973299129121857>
- RMRP–2002-02. (2002). *Risk Management Maturity Level Development* (INCOSE Risk Management Working Group (Ed.); 1st ed.). International Council on Systems Engineering.
- Roe, M. H., & Roe, M. (2000). The Community and The Landscape Professional. In *Landscape and Sustainability*. J. F. Benson and M. H. Roe.
- Roziya, I. (2016). *Towards A Sustainable Landscape of Urban Parks in Kuala Lumpur, Malaysia: A Study from a Management Perspective*. University of Sheffield.
- Roziya, I., Nordin, A. R., & Osman, M. T. (2009). Developing a Soft-Scape Standard for Improving the Landscape Quality in Malaysia. *Alam Cipta*, 4(EDB), 29–36.
- Saaidin, S., Endut, I. R., Samah, S. A. A., Ridzuan, A. R. M., & Razak, N. N. A. (2016). Risk Variable On Contractor's Tender Figure In Malaysia. *Jurnal Teknologi (Sciences & Engineering)*, 2(78:5), 85–89. [https://doi.org/eISSN 2180–3722](https://doi.org/eISSN 2180-3722)
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students* (5th ed.). Pearson Education Limited. <https://doi.org/10.1017/CBO9781107415324.004>
- Schatz, A. P. (2003). *Regulation Of Landscape Architecture And The Protection Of Public Health, Safety, And Welfare* (2003rd ed.). The American Society of Landscape Architects. <https://doi.org/10.3934/publichealth.2014.1.9>
- Schilling, J. (2006). On the pragmatics of qualitative assessment designing the process for content analysis. *European Journal of Psychological Assessment*. <https://doi.org/10.1027/1015-5759.22.1.28>

- Schönfelder, W. (2011). CAQDAS and Qualitative Syllogism Logic — NVivo 8 and MAXQDA 10 Compared. *Qualitative Sozialforschung / Forum: Qualitative Social Research*, 12(1), 1–21.
- Sekaran, U. (2012). Research Methods for Business Research Methods for Business. *Research Methods for Business*. <https://doi.org/10.13140/RG.2.1.1419.3126>
- Sekaran, U. (2016). *Research Methods For Business: A Skill Building Approach* (7th ed.). John Wiley & Sons, Inc. <https://doi.org/10.13140/RG.2.1.1419.3126>
- Serpell, A., Ferrada, X., Rubio, L., & Arauzo, S. (2015). Evaluating Risk Management Practices in Construction Organizations. *Procedia - Social and Behavioral Sciences*, 194(2015), 201–210. <https://doi.org/10.1016/j.sbspro.2015.06.135>
- Sheppard, S. R. J. (2015). Making climate change visible: A critical role for landscape professionals. *Landscape and Urban Planning*, 142, 95–105. <https://doi.org/10.1016/j.landurbplan.2015.07.006>
- Shuib, K. B. (2015). Landscape Architects Professional Code Of Ethics. In *Kursus Amalan Iktisas Arkitek Lanskap 2015* (2015th ed., p. 5). Institute of Landscape Architects Malaysia (ILAM).
- Siang, L. C., & Ali, A. S. (2012). Implementation of risk management in the Malaysian construction industry. *Journal of Surveying, Construction & Property*, 3(1), 1–15. <https://doi.org/10.1155/2015/192742>
- Silverman, D. (2015). *Interpreting Qualitative Data: A Guide to the Principles of Qualitative Research* (5th ed.). SAGE Publications Ltd. <https://doi.org/10.1080/1743727X.2015.1066173>
- SME. (2013). *Guideline for New SME Definition* (Issue October 2013). National SME Development Council (NSDC). http://www.smecorp.gov.my/vn2/sites/default/files/Guideline_for_New_SME_Definition_7Jan2014.pdf
- Smith, P. G., & Merritt, G. M. (2002). *Proactive Risk Management: Controlling Uncertainty in Product Development*. Productivity Press.
- Söderholm, A., Gemünden, H. G., & Winch, G. M. (2008). Projects and programmes: Strategies for creating value in the face of uncertainty. Papers presented at EURAM 2007. *International Journal of Project Management*, 26(1), 1–3. <https://doi.org/10.1016/j.ijproman.2007.12.003>
- Sousa, V., Almeida, N. M. De, & Dias, L. A. L. A. (2012). Risk Management Framework for the Construction Industry According to the ISO 31000:2009 Standard. *Journal of Risk Analysis and Crisis Response*, 2(4), 261–274. <https://doi.org/10.1111/j.1539-6924.2010.01442.x>

- Spacey, J. (2016). *Risk vs Issue*. Simplicable. <https://simplicable.com/new/risk-vs-issue>
- Stephens, N. (2007). Collecting data from elites and ultra elites: telephone and face-to-face interviews with macroeconomists. *Qualitative Research*, 7(2), 203–216. <https://doi.org/10.1177/1468794107076020>
- Takim, R. (2005). Process Improvement of Construction Projects in Malaysia: Analysis Case Studies. *Proceedings of the 2nd Scottish Conference for ...*, 263–273.
- Taofeeq, D. M., Adeleke, A. Q., & Lee, C. K. (2020). The synergy between human factors and risk attitudes of Malaysian contractors’: Moderating effect of government policy. *Safety Science*, 121(September 2019), 331–347. <https://doi.org/10.1016/j.ssci.2019.09.016>
- Taylor, K. M. G., Nettleton, S., & Harding, G. (2003). *Sociology for Pharmacists: An Introduction* (C. Press (Ed.); 2nd ed.). Taylor & Francis Group. https://doi.org/10.4324/9780203381175_chapter_9
- Thamhain, H. (2013). Managing risks in complex projects. *Project Management Journal*, 44(2), 20–35. <https://doi.org/10.1002/pmj.21325>
- The Star. (2009). Dad sues KLCC Park maintenance firm over son’s death. 12 June 2009. <http://www.thestar.com.my/news/nation/2009/06/12/dad-sues-klcc-park-maintenance-firm-over-sons-death/>
- The Star. (2017). Two dead after car crashes into trees. 30 June 2017. <https://doi.org/http://www.thestar.com.my/news/nation/2017/06/30/two-dead-after-car-crashes-into-trees/>
- The Star Online. (2018). 5 Megatrends drive commodities in TN50. 28 Mar 2018. <https://www.thestar.com.my/news/nation/2018/03/28/5-megatrends-drive-commodities-in-tn50/>
- Tserng, H. P., Yin, S. Y. L., Dzeng, R. J., Wou, B., Tsai, M. D., & Chen, W. Y. (2009). A study of ontology-based risk management framework of construction projects through project life cycle. *Automation in Construction*, 18(7), 994–1008. <https://doi.org/10.1016/j.autcon.2009.05.005>
- Turner, J. R. (2008). *The Handbook of Project Based Management: Leading Strategic Change in Organizations* (L. S. Hager (Ed.); 3rd ed.). McGraw-Hill Professional.
- United Nations. (2019). *World population projected to reach 9.8 billion in 2050, and 11.2 billion in 2100*. Department of Economic and Social Affairs; United Nations. <https://www.un.org/development/desa/en/news/population/world-population-prospects-2017.html>
- US DoD. (2006). *Risk management guide for DoD Acquisition* (6th ed., Vol. 1). US Department of Defense (DoD). http://www.dau.mil/publications/publicationsDocs/RMG_6Ed_Aug06.pdf

- Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content Analysis And Thematic Analysis: Implications For Conducting A Qualitative Descriptive Study. *Nursing and Health Sciences*, 15, 398–405. <https://doi.org/10.1111/nhs.12048>
- Wang, Z. (2018). Evolving landscape-urbanization relationships in contemporary China. *Landscape and Urban Planning*, 171(December 2017), 30–41. <https://doi.org/10.1016/j.landurbplan.2017.11.010>
- Ward, S. C., & Chapman, C. B. (1995). Risk-management perspective on the project lifecycle. *International Journal of Project Management*, 13(3), 145–149. [https://doi.org/10.1016/0263-7863\(95\)00008-E](https://doi.org/10.1016/0263-7863(95)00008-E)
- Ward, S., & Chapman, C. (2003). Transforming project risk management into project uncertainty management. *International Journal of Project Management*, 21(2), 97–105. [https://doi.org/10.1016/S0263-7863\(01\)00080-1](https://doi.org/10.1016/S0263-7863(01)00080-1)
- Ward, S., & Chapman, C. (2008). Stakeholders and uncertainty management in projects. *Construction Management and Economics*, 26(6), 563–577. <https://doi.org/10.1080/01446190801998708>
- Ward, S., Chapman, C., & Westerveld, E. (2003). Project Risk Management. *International Journal of Project Management*, 21(2), 408. [https://doi.org/10.1016/S0263-7863\(01\)00080-1](https://doi.org/10.1016/S0263-7863(01)00080-1)
- White, J., Woudstra, J., & Fieldhouse, K. (2002). The Regeneration of Public Parks. *Urban Design International*, 6(115), 1. <https://doi.org/10.2307/1587329>
- White, M. D., & Marsh, E. E. (2006). Content analysis: A flexible methodology. *Library Trends*, 55(1), 22–45. <https://doi.org/10.1353/lib.2006.0053>
- Whitehand, J. W. R. (1984). Commercial townscapes in the making. *Journal of Historical Geography*, 10(1984), 174–200. [https://doi.org/10.1016/0305-7488\(84\)90117-8](https://doi.org/10.1016/0305-7488(84)90117-8)
- Williams, S. K. (2019). *Landscape Architecture Body of Knowledge Study Report*. www.asla.org/uploadedFiles/CMS/Education/Accreditation/LABOK_Report_with_Appendices.pdf
- Willumsen, P., Oehmen, J., Stingl, V., & Geraldi, J. (2019). Value creation through project risk management. *International Journal of Project Management*, 37(5), 731–749. <https://doi.org/10.1016/j.ijproman.2019.01.007>
- Wiltshier, F. (2011). Qualitative Social Researching With NVivo 8. *Forum: Qualitative Social Research*, 12(1), 1–8.
- Wolcott, H. F. (2002). Writing up qualitative research . . . better. *Qualitative Health Research*, 12(1), 91–103. <https://doi.org/10.1177/1049732302012001007>

- Wong, L. (2008). Data analysis in qualitative research: a brief guide to using nvivo. *Malaysian Family Physician : The Official Journal of the Academy of Family Physicians of Malaysia*, 3(1), 14–20. <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4267019&tool=pmc-entrez&rendertype=abstract>
- Worldometers. (2019). *Malaysia Population (2019) - Worldometers*. Malaysia Population (Live), Worldometer's RTS Algorithm. <https://www.worldometers.info/world-population/malaysia-population>
- Worpole, K., & Greenhalgh, L. (1996). *The Freedom Of The City* (1st ed.). Demos. <https://doi.org/10.3828/tpr.67.2.32t4n0681013j6g6>
- Wright, A., Ash, J. S., Erickson, J. L., Wasserman, J., Bunce, A., Stanescu, A., St Hilaire, D., Panzenhagen, M., Gebhardt, E., McMullen, C., Middleton, B., & Sittig, D. F. (2014). A qualitative study of the activities performed by people involved in clinical decision support: Recommended practices for success. *Journal of the American Medical Informatics Association*, 21(3), 464–472. <https://doi.org/10.1136/amiajnl-2013-001771>
- Wyk, R. van, Bowen, P., & Akintoye, A. (2008). Project risk management practice: The case of a South African utility company. *International Journal of Project Management*, 26(2), 149–163. <https://doi.org/10.1016/j.ijproman.2007.03.011>
- Yang, B., Li, S., & Binder, C. (2016). A research frontier in landscape architecture: landscape performance and assessment of social benefits. *Landscape Research*, 41(3), 314–329. <https://doi.org/10.1080/01426397.2015.1077944>
- Yin, R. K. (2014). *Case Study Research: Design and Methods* (5th ed.). SAGE Publications, Inc. <https://doi.org/10.33524/cjar.v14i1.73>
- Yin, R. K. (2016). *Qualitative Research from Start to Finish* (2nd ed.). The Guilford Press. <https://doi.org/10.1007/s13398-014-0173-7.2>
- Yusof, M., & Johari, M. (2012). Identifying Green Spaces in Kuala Lumpur Using Higher Resolution Satellite Imagery. *Alam Cipta*, 5(2), 93–106. <http://frsb.upm.edu.my/alamcipta/index.php/alamcipta/article/view/30>
- Zhang, W., Tang, X., He, X., & Chen, G. (2018). Evolutionary Effect on the Embodied Beauty of Landscape Architectures. *Evolutionary Psychology*, 16(1), 1–9. <https://doi.org/10.1177/1474704917749742>
- Zhang, Y., & Wildemuth, B. M. (2009). “Qualitative Analysis of Content.” In: B. M. Wildemuth, Ed., *Applications of Social Research Methods to Questions in Information and Library Science, Libraries Unlimited*, 1–12.
- Zubir, Z. (2015). Project Management, Maintenance And Supervision. In *Kursus Amalan Ikhtisas Arkitek Landskap (KAIAL) 2015* (Issue 7th February 2015, p. 64). Institute of Landscape Architects Malaysia (ILAM).