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VIRTUAL GO GREEN: CONFERENCE AND PUBLICATION

"Rethinking Built Environment: Towards a Sustainable Future"

Organiser:
Research, Industrial Linkages, Community & Alumni Network (PJIM&A)

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Department of Built Environment Studies & Technology (JABT), Faculty of Architecture, Planning & Surveying (FSPU)

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A Systematic Review on Best Practices of Construction Waste Management in Construction Project

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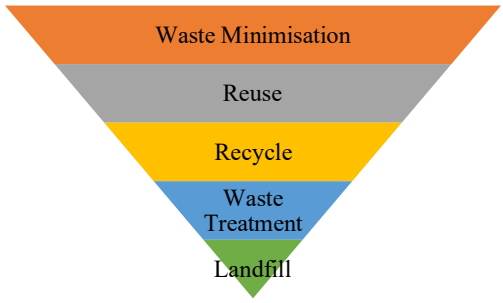
Abstract
Construction waste management is the process of preventing and diverting construction waste from landfills while utilising recyclable resources. The term best practices refers to the best option among a group of other practices developed for the aim of construction waste management. These best practices can assist construction practitioners in reducing waste in construction project. Hence this paper sets out to analyse the existing literature on best practices of construction waste management in construction project. This paper involved various research designs, and its outcomes are based on the publication standard, specifically ROSES (RepOrting standards for Systematic Evidence Syntheses). Selected articles used two leading databases namely Scopus and Web of Science and one supporting database namely Google Scholar. Based on the thematic analysis, this review has identified seven main themes namely 1) on-site practices; 2) material management; 3) procurement; 4) design; 5) regulation; 6) technology and 7) human resource management. The seven main themes have further produced 31 sub-themes. This paper offered several significant contributions for practical purposes and the body of knowledge. The findings explained the importance of implementing best practices of construction waste management towards sustainable development. This paper also provides useful information for construction practitioner in developing their waste management strategies and benchmarking their waste management performance. Furthermore the findings will also assist construction practitioners in reducing waste generated by construction activities.

Keywords: *Systematic review; construction waste; construction project; best practices; waste minimisation*

1.0 Introduction

Construction industry is one of the industry that plays a critical role in the growth of any country's socioeconomic development. This industry has been expanding rapidly particularly in developing countries. The rapid growth attributed to higher living standard, infrastructure demands, urbanization and also growth in population (Hamid et al., 2020). Consequently this industry generate a large amount of waste from the construction activities (Nagapan et al., 2012). Construction generates around 35% of the world's solid waste, which is typically disposed of in landfills or uncontrolled and inadequately places (Maués et al., 2020). Environmental impact of construction waste has gained awareness from both researchers and practitioners worldwide. In order to cope with future sustainable development, it is essential to manage and improve construction waste (Fikri Hasmori et al., 2020). Thus, implementing best practices of construction waste management in construction project apprehend to be one of the best method in minimising waste. Best practices refer to the best option of a technique, method, process, activity or incentive which has proven to be most effective in providing a certain outcome. The usual method of construction waste management is to minimise the amount of material that are disposed in landfill during construction. In the waste management hierarchy, the most ideal and desired situation in construction waste management is clearly defined in Figure 1. The waste management hierarchy illustrate an arrangement of most preferable practice to least preferable practice in the form of a pyramid. Waste management hierarchy is one method for efficiently managing construction waste and serve as an efficient instrument. (Hwang & Yeo, 2011).



(Source:CIDB Malaysia, 2015)

Figure 1. Waste management hierarchy

Globally, a number of measures have been made to minimise waste generation. However, many contractors failed to adopt appropriate waste management, resulting in construction waste mismanagement (Sin et al., 2013). Regardless of all the approaches for construction waste management, the outputs of the approaches is still far from optimum. In order to manage construction waste, there are a range of methods used. The process involves a strategy to effectively utilizing construction resources, with the aim to minimise the quantity of waste and utilizing the generated waste in the most adequate way (Fikri Hasmori et al., 2020). Hence it is essential for the construction industry to have an effective way or the best practices at site in order to minimise construction waste. Therefore, this paper sets out to analyse the existing literature on the best practices of construction waste management in construction project.

2.0 Methodology

2.1 The Review Protocol - ROSES

In this section the method used to retrieve articles related to best practices of construction waste management in construction project is discussed. The review method is based on the publication standard, specifically ROSES (RepOrting standards for Systematic Evidence Syntheses), which was designed exactly for systematic review. This publication standard is relevant and map for environment management area (Haddaway et al., 2018).

ROSES intended to encourage researchers in providing accurate information with the appropriate level of detail. Based on this review protocol, a systematic literature review is started by formulating appropriate research question for the review. The next step will be the systematic searching strategy which involves three main sub-process namely identification, screening and eligibility. The following step will be the appraisal of quality on the selected articles. This are the important steps to ensure that the selected articles are eligible to be selected for reviewed.

2.2 Formulation of Research Question

The establishment of the research question for this paper was developed using three basic elements namely population or problem, interest, and context (PICo). PICo is an instrument that aids authors to come up with appropriate research questions for the review. Three primary components were included in the review based on these elements namely best practices (Problem), construction waste management (Interest) and Construction Project (context) which formerly guide the authors to formulate its main research question. Ultimately the research question is – what are the best practices of construction waste management in construction project?

2.3 Systematic Searching Strategies

Systematic searching strategies is a technique used to screen relevant articles to be reviewed. As shown in Figure 2, the systematic searching methods strategies has three primary processes namely identification, screening, and eligibility.

2.3.1 Identification

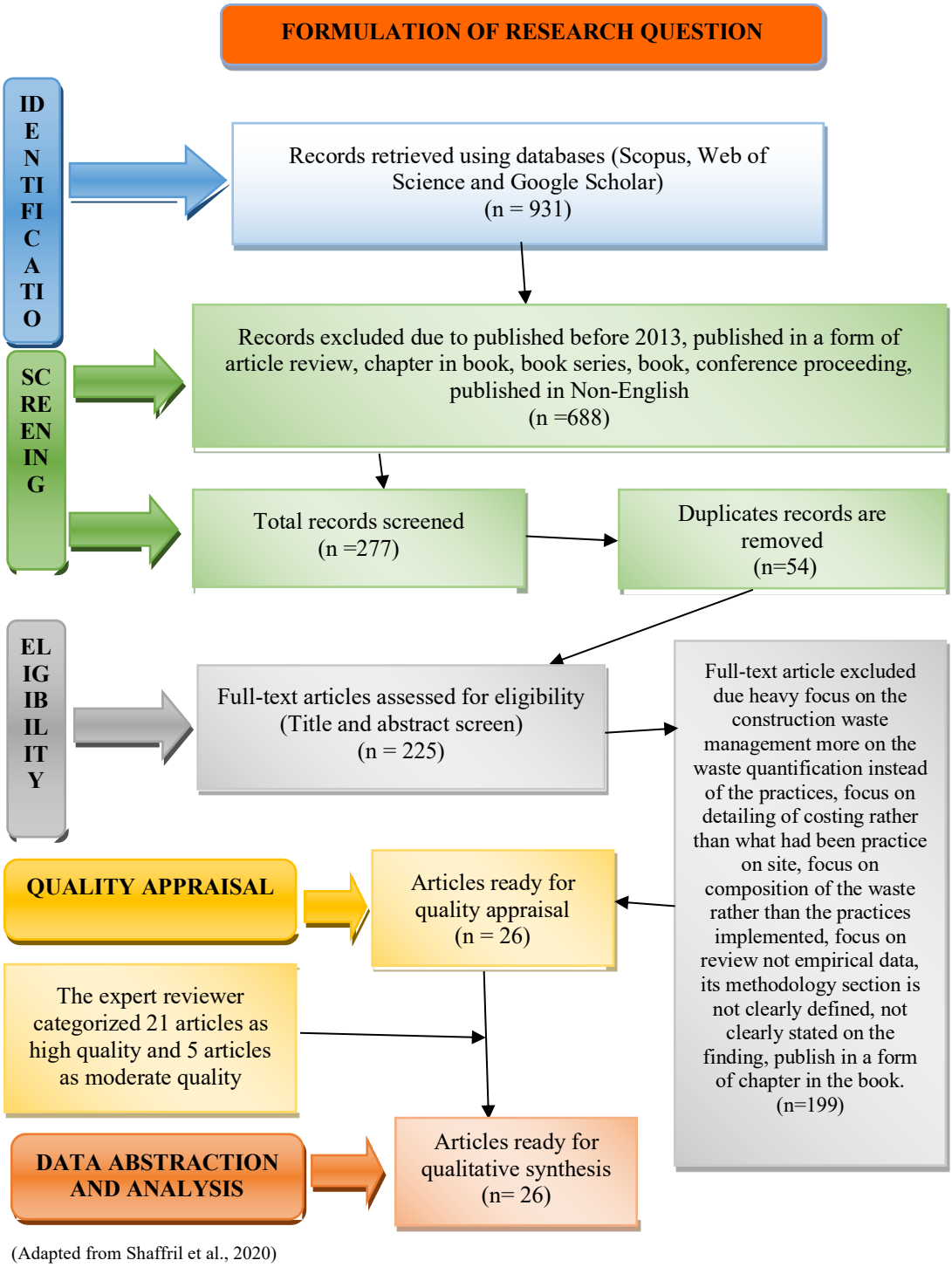
Identification is the process of searching for any synonyms, alternative word, related terms, or variations of the study's major keywords, which are, best practices, construction waste management, and construction project. The purpose is to give a selected database more choices in searching for even more related articles for the review. The keywords are created using the research question as a guide (Okoli, 2015). Meanwhile, the identification process depends on the online thesaurus, keywords used by previous study and keywords suggested by Scopus. This process has enhance the existing words and developed full search string. The searching was based on Boolean operator, phase searching, truncation, wild card and field code function through two main databases namely Scopus and Web of Science as per Table 1. Due to several advantages, these two databases have the potential to be the leading databases in a systematic literature review. Scopus is one of the largest abstract and citation databases of peer-reviewed literature from more than 7000 publishers worldwide. Whereas Web of Science includes over 100 years of comprehensive back file and citation data, established by Clarivate Analytics. Besides having a multidisciplinary focus, it also controls the quality of the articles. The third database , namely Google Scholar was selected as an additional database which acts as a supporting data in systematic literature review (Haddaway et al., 2015). The searching process in these three databases have resulted in a total of 931 articles.

Table 1. The search string

Databases	Search String
Scopus	TITLE-ABS-KEY (("construction waste" OR "construction waste management" OR "construction waste minimi*") AND ("best practi*" OR "good practi*" OR "strateg*" OR "measur*" OR "initiativ*") AND ("project" OR "site" OR "construction"))
Web of Science	TS= (("construction waste" OR "construction waste management" OR "construction waste minimi*") AND ("best practi*" OR "good practi*" OR "strateg*" OR "measur*" OR "initiativ*") AND ("project" OR "site" OR "construction"))

2.3.2 Screening

Screening is the second process where all 931 selected articles were screened based on the criteria for articles selection which is done automatically based on the sorting function available in the database. Determination of the range of period is important since it is quite difficult to review all the existing published articles (Okoli, 2015). Based on the searching process on the mention databases, it was discovered that the number of research on best practices of construction waste management in construction project has increased dramatically from 2013. On the other hand, the reason for limiting the search to 2021 is because of the searching process started in August 2021. Therefore, the timeline between 2013 and 2021 was selected for the inclusion criteria. Furthermore only articles with empirical data and published in journals were selected to ensure the quality of review. Additionally only articles published in English language are incorporated in the review to evade misunderstanding. Articles published worldwide were selected to give a broad view of the study in order to achieve the objective. Table 2 shows the inclusion and exclusion of the selected articles. This process had excluded 688 articles as they did not fit the inclusion criteria and also had removed 54 duplicated articles. Finally, only 225 articles were used for the third process which is the eligibility process.



(Adapted from Shaffril et al., 2020)

Figure 2. The flow diagram

Table 2. The inclusion and exclusion criteria.

Criteria	Inclusion	Exclusion
Timeline	2013 - 2021	<2013
Literature Type	Article Journal (empirical data)	Article review, chapter in book, book series, conference proceeding
Language	English	Non-English
Country	Worldwide	No exclusion

2.3.3 Eligibility

Eligibility is the third process where all the retrieved articles were monitored manually to ensure all the remaining articles are in line with the criteria. This process was achieved by reading the article titles and also the abstracts. Through this process it resulted in the exclusion of 199 articles due to the focus of construction waste management which was more on the waste quantification instead of the practices, focus on detailing of costing rather than what had been practice on site, focus on review not the empirical data, the methodology section section was not clearly defined, and also published in the form of chapter in book. As a result, after the eligibility process only 26 articles were selected.

2.4 Quality Appraisal

The fourth process is quality appraisal process whereby all the remaining articles were submitted to two experts for quality evaluation to ensure that the content of the articles is of high quality. The experts should rank the remaining articles into three quality categories particularly high, moderate and low (Petticrew & Roberts., 2006). The experts emphasized on the methodology and findings of the papers in order to obtain the quality ranking. The quality appraisal process need to be equally agreed by the experts in order for the articles to be included in the review. Thus, from this process the expert reviewer categorized 21 articles as high quality and 5 articles as moderate quality. At this point, all the remaining articles were eligible for the review.

2.5 Data Abstraction and Analysis

For data abstraction and analysis process, integrative review was used. This particular method accepted various research designs (quantitative, qualitative, mix-method) to be included in the review. Qualitative analysis was performed using thematic analysis to identify themes and sub themes. 26 articles were comprehensively read especially in this three sections namely abstract, result and discussion. Data abstracted were based on research question formulated. Next, thematic analysis was performed to identify the themes and sub themes. Thematic analysis is considered to be the best method for synthesizing a mixed research design (integrative) (Flemming et al., 2018). From the thematic analysis 7 main themes and 31 sub themes were finalized.

3.0 Results and Discussion

3.1 Background of the Selected Articles

The rigorous review resulted in 26 articles related to best practices of construction waste management in construction project. Based on the thematic analysis, 7 main themes and 31 sub-themes related to the objective were developed namely on site practice (10 sub-themes), material management (4 sub-themes), procurement (3 sub-themes), design (3 sub-themes), regulation (5 sub themes), technology (3 sub themes) and human resource management (3 sub themes) as shown in Table 3. Among 26 selected articles which consist of integrative review, 13 of them were quantitative studies, 5 qualitative studies and another 8 was mix method studies. Out of 26 articles, the highest number of studies were conducted in China with six studies. Followed by United Kingdom with four studies. Next, two studies were conducted in these countries namely Australia, Spain, Brazil, and Nigeria. Meanwhile the lowest number of studies accounted with one study were conducted in these 8 countries namely Ireland,

Lebanon, Costa Rica, Vietnam, Thailand, Malaysia, Sweden and Jordan. All these countries were tabulated in the world map as shown in Figure 3. Out of 26 selected articles, four were published in 2014, one in 2015, seven in 2017, three in 2018, four in 2019, five in 2020 and two articles published in 2021.

3.2 Themes and the Sub-Themes

3.1.1 On-Site Practices

The highest number of practices studied with a total of 43 practices focused on the on site practices as one of construction waste management best practices. Reuse and recycle practice was also described in the waste management hierarchy, which classifies waste in a hierarchical order of environmental impact from low to high. This practice is capable of diverting a significant amount of construction waste from landfill [Ajayi et al., 2017; Abarca-Guerrero & Leandro-Hernandez, 2017; Li et al., 2018; Omeje et al., 2020; Yu et al., 2021]. From this practice the quantity of waste generated would be minimised, resulting in improved environmental quality and significant economic advantages [Ding et al., 2018; Hao et al., 2019; Phan et al., 2019]. Waste which has not been sorted at source is difficult (or even impossible) to be recycled. Construction waste could not be minimised without proper collection and segregation of different waste types on site [Ajayi et al., 2017; Sezer, 2017; Moraes et al., 2020]. Nevertheless, by sorting and separating the waste generated it will help to prevent mixing (Abarca-Guerrero & Leandro-Hernandez, 2017). Next, proper site management resulted as key factors in construction waste practice adherence and the prevention of material waste. In a construction project, it is necessary to strengthen the on-site management of construction waste [Marinelli et al., 2014; Osman et al., 2017; Liu et al., 2020].

Attitude and behavior towards waste management is an important practice on site. Good attitude and behavior can lead to effective waste management performance in construction project [Li & Yang, 2014;Ding et al., 2018; Luangcharoenrat et al., 2019]. Furthermore, a study in Lebanon project found that the probability of having effective construction waste management practices on-site reaches 83% when workers have a positive attitude towards waste management (Bakshan et al., 2017). Meanwhile awareness was also reported to be one of the best practices on site. It is essential that construction practitioners are aware and understand the importance of construction waste management. Similar findings found in the United Kingdom, Brazil and Vietnam reported that increasing awareness and education are indispensable in improving waste effectiveness of the construction industry [Ajayi et al., 2015; de Magalhães et al., 2017; Phan et al., 2019]. A detailed planning of the site layout and location of temporary facilities will enable a project to make significant improvement by minimising waste. In addition establishing clear communication mechanisms among construction practitioner act as one of the best practice in construction project (Abarca-Guerrero & Leandro-Hernandez, 2017).

There is a lot of dirty work involved in construction. Naturally, this create a great deal of waste. Therefore one of the best practices is to keep the construction site clean, well-organised and provide space for collecting and storing construction waste at site [Gangolells et al., 2014; M. Li & Yang, 2014; Abarca-Guerrero & Leandro-Hernandez, 2017;Sáez et al., 2019]. Furthermore the next best practice used in Ireland, Costa Rica and United Kingdom is Just-In-Time (JIT) delivery in order to minimise construction waste [Marinelli et al., 2014; Abarca-Guerrero & Leandro-Hernandez, 2017; Ajayi & Oyedele, 2018]. Control and supervison from top level at site is one of the best practice that have been implemented in order to minimise waste [Bakshan et al., 2017; Luangcharoenrat et al., 2019].

Table 3. The theme and the sub-themes

Authors	Years	Study Design	On-site practice (43)										Material management (25)				Procurement (5)		
			WS	RR	GC	SL	CA	AB	AW	SC	JIT	SV	LM	MP	PSH	AMP	CP	PD	RM
1. Gangolells et al.	2014	QN					√								√				
2. M. Li & Yang	2014	QN					√	√									√		
3. Marinelli et al.	2014	MM		√							√				√	√			
4. Wang et al.	2014	QN																	
5. Ajayi et al.	2015	QL							√										
6. Ajayi et al.	2017	MM	√	√									√				√		
7. Ajayi & Oyedele	2017	MM																	
8. Bakshan et al.	2017	QN						√				√							
9. Abarca-Guerrero & Leandro-Hernandez	2017	MM	√	√	√	√	√			√	√		√		√				
10. de Magalhães et al.	2017	MM		√					√							√			
11. Osman et al.	2017	QN		√												√			
12. Sezer	2017	MM	√																
13. Ajayi & Oyedele	2018	MM		√							√			√	√	√			
14. Ding et al.	2018	QL	√	√				√				√							
15. Li et al.	2018	QN	√	√											√	√			
16. Hao et al.	2019	QL	√	√															
17. Luangcharoenrat et al.	2019	QN						√				√	√		√	√			
18. Phan et al.	2019	QN	√	√					√										
19. Sáez et al.	2019	QN								√			√	√	√				
20. Doust et al.	2020	QL												√	√				
21. Liu et al.	2020	QN											√		√				
22. Moraes et al.	2020	MM	√																
23. Olanrewaju & Ogunmakinde	2020	QN																√	√
24. Omeje et al.	2020	QN	√	√									√						
25. Sweis et al.	2021	QN													√		√		
26. Yu et al.	2021	QL	√	√	√				√										

On Site Practice

WS=Waste Segregation		AB	=	Attitude and behavior
RR=Reuse and Recycle		AW	=	Awareness
GC=Good Communication		SC	=	Space for waste collection
SL=Site Layout		JIT	=	Just in time delivery
CA=Clean working area		SV	=	Supervision

Material Management

LM	=	Logistic management
MP	=	Minimise packaging
PSH	=	Proper storage & handling
AMP	=	Appropriate material purchase

Procurement

CP	Contractual provision
PD	Proper detailing
RM	Specify recycle material

QN = Quantitative QL= Qualitative MM = Mix Method

Table 3. (Continued)

Authors	Years	Study Design	Design (14)			Regulation (23)					Technology (14)			Human resource management (17)		
			ED	CM	ME	IC	DP	SL	PN	LC	BIM	MC	PF	TR	SW	AW
1. Gangolells et al.	2014	QN	√												√	
2. M. Li & Yang	2014	QN			√	√										
3. Marinelli et al.	2014	MM														
4. Wang et al.	2014	QN			√	√						√	√	√	√	
5. Ajayi et al.	2015	QL	√		√	√	√	√		√						
6. Ajayi et al.	2017	MM														
7. Ajayi & Oyedele	2017	MM				√	√	√	√							
8. Bakshan et al.	2017	QN				√								√	√	√
9. Abarca-Guerrero & Leandro-Hernandez	2017	MM	√			√			√			√	√	√		√
10. de Magalhães et al.	2017	MM	√	√							√	√				
11. Osman et al.	2017	QN			√										√	
12. Sezer	2017	MM						√							√	
13. Ajayi & Oyedele	2018	MM											√			
14. Ding et al.	2018	QL						√					√	√		
15. Li et al.	2018	QN									√		√	√		
16. Hao et al.	2019	QL						√		√						
17. Luangcharoenrat et al.	2019	QN														
18. Phan et al.	2019	QN	√		√											
19. Sáez et al.	2019	QN											√		√	
20. Doust et al.	2020	QL	√		√											
21. Liu et al.	2020	QN				√		√					√		√	
22. Moraes et al.	2020	MM						√						√		√
23. Olanrewaju & Ogunmakinde	2020	QN	√					√				√		√		
24. Omeje et al.	2020	QN														
25. Sweis et al.	2021	QN														
26. Yu et al.	2021	QL				√			√				√			

Design
ED = Ecological design
CM = Communication
ME = Minimise design error

Regulation
IC = Incentives
DP = Design Policies
SL = Stringent legislative
PN = Penalties
LC = Landfill charge

Technology
BIM = Building Information Modelling
MC = Modular coordination
PF = Prefabrication

Human Resource Management
TR = Training
SW = Skill worker
AW = Awareness program

QN = Quantitative QL = Qualitative MM = Mix Method

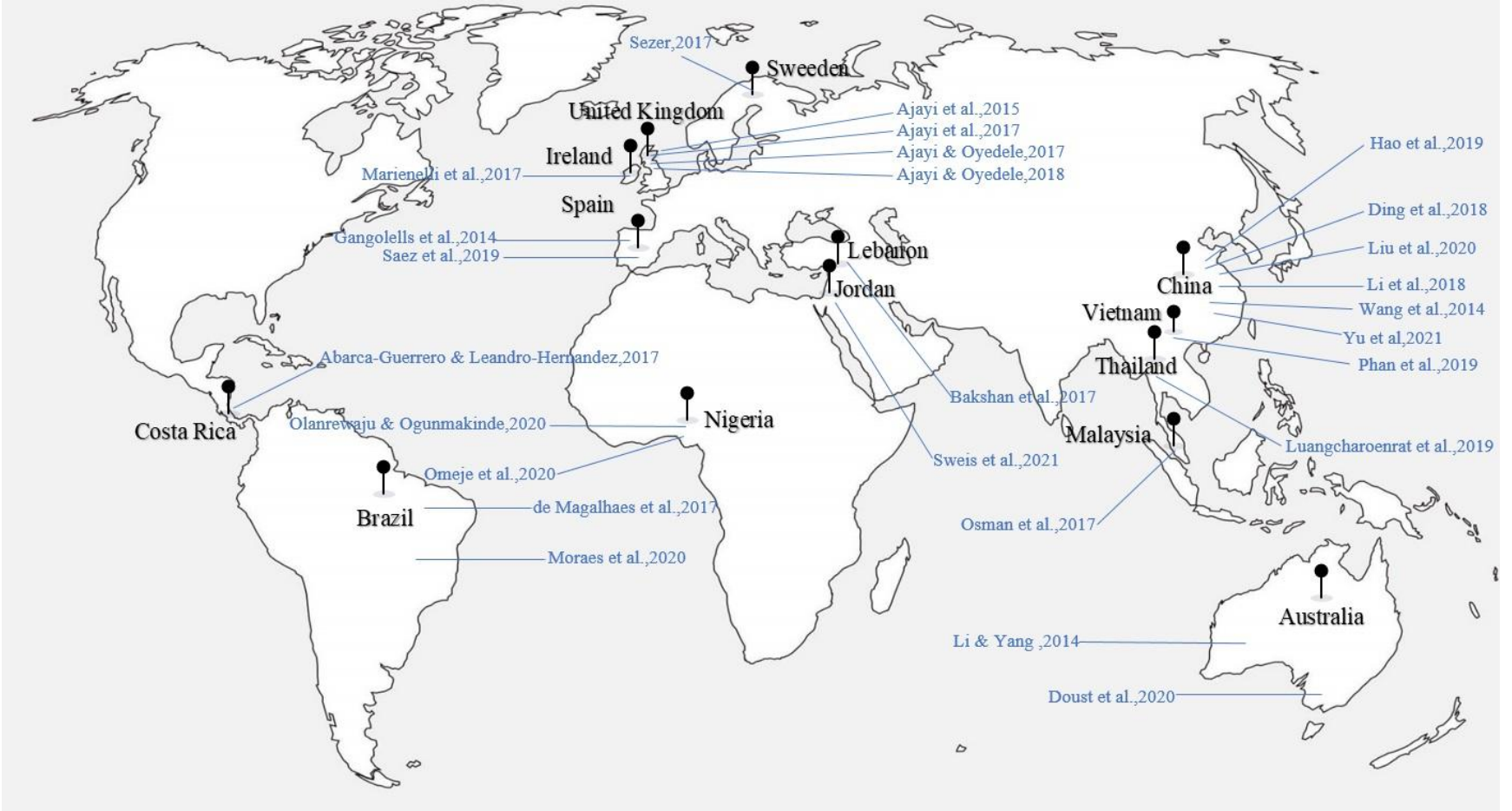


Figure 3. The countries involved in the study

3.1.2 Material Management

A total of 25 practices studied focused on the material management as one of the best practices implemented in construction project. Proper storing and handling is the highest reported with 10 studies. Correct and adequate storage of raw material is important in preventing premature damage that will lead to construction waste [Marinelli et al., 2014; M. Li & Yang, 2014; Doust et al., 2020]. In addition material management is essential which involve planning, implementing and controlling the efficient flow of the material on site. Many studies agreed that logistic management is one of the practices that need to be applied on site. It is an essential factor that entails effective planning of materials inbound and on-site materials movement and materials warehousing [Ajayi et al., 2017; Omeje et al., 2020]. Nevertheless, appropriate material purchase is vital in material management such as ordering material with the appropriate size and quantity, stock control and staging of material on site and good specification of material to avoid wrong ordering [Marinelli et al., 2014; de Magalhães et al., 2017; Osman et al., 2017; Luangcharoenrat et al., 2019]. By minimising packaging also will help in material management practice such as purchasing bulk material to reduce packaging [Sáez et al., 2019; Doust et al., 2020].

3.1.3 Procurement

A total of three sub-themes emerged under procurement theme namely contractual provision, proper detailing and specify recycle material. This theme resulted in the least number of practices studied accounted for 5 studies. Contract document need to be completed, free from error and stipulate the contractual provision for waste minimisation [Li & Yang, 2014; Ajayi et al., 2017; Sweis et al., 2021]. A study in Nigeria found that subsequently, 28% of the respondents agreed that the use of proper detailing can act as a measure to minimise waste. Proper detailing involves the provision of sufficient information on the numerous elements of the project and also specify the recycle material clearly (Olanrewaju & Ogunmakinde, 2020).

3.1.4 Design

A total of 14 practices studied reported that design is one of the best practices applied in construction waste management. Under this theme, a total of 3 sub-themes emerged namely ecological design, good communication and minimising design error. Adopting ecological design help in managing better resources and help in environmental protection. Therefore designers need to consider reusing, recycling and deconstruction elements and material while designing [Gangolells et al., 2014; Abarca-Guerrero & Leandro-Hernandez, 2017; Phan et al., 2019]. Furthermore innovative design and construction process also need to be integrated into the project (Doust et al., 2020). Equally important is design for flexibility and adaptability (Olanrewaju & Ogunmakinde, 2020). Good communication during the design stage was found to be one of the best practices. Full communication between project team and the involvement of contractor at the early design stage may prevent construction waste in the project (de Magalhães et al., 2017). Minimising design error or changes will be beneficial in managing construction waste [Ajayi et al., 2015; Osman et al., 2017; Phan et al., 2019; Doust et al., 2020].

3.1.5 Regulation

A total of 23 practices studied focused on regulation as one of the best practices applied in construction project to have good construction waste management. Incentives and stringent legislative reported with 8 studies respectively. Next, 2 studies on design policies and landfill charge. Meanwhile 3 studies focus on penalties. Incentive is a good measure to motivate construction practitioner in minimising waste. The government need to look into rewarding them for effective waste management and minimisation [Li & Yang, 2014; Ajayi & Oyedele, 2017; Bakshan et al., 2017; Liu et al., 2020; Yu et al., 2021]. Apart from that an early practice need to be made at a design stage in future waste management regulation which increased targeting of design stage policies [Ajayi et al., 2015; Ajayi & Oyedele,

2017]. Stringent legislative and rigid implementation of construction waste management was discovered to be one of the practice that need to be enforced in order to minimise waste. Thus this factor need to be taken into consideration in order to have best waste management practise [Ajayi et al., 2015; Sezer, 2017;Ding et al., 2018; Hao et al., 2019; Moraes et al., 2020; Olanrewaju & Ogunmakinde, 2020]. Penalties and fines will be charged to any company or project with poor waste performance which do not follow good practice for construction waste management. Meanwhile a study in United Kingdom and China discover that landfill charge is one of the strategies of construction waste management. Thus, the local government has to work out a reasonable landfilling charge fee to maximize its effectiveness in construction waste reduction [Ajayi et al., 2015; Hao et al., 2019]

3.1.6 Technology

A total of 14 practices studied with 3 sub themes emerged under technology theme. Prefabricated method of construction reported with 8 studies, followed by modular coordination with 4 studies and 2 studies reported using Building Information Modeling technology. Prefabrication is a manufacturing process that takes place at a specialised facility where various materials are joined to form a component part of the final installation. The use of prefabrication method in the construction project significantly reduces various construction waste [Wang et al., 2014; Li et al., 2018; Sáez et al., 2019; Liu et al., 2020;Yu et al., 2021]. However a study in Shenzhen, China in comparison with in situ traditional construction, the applications of prefabricated components maybe more complex because of the setting up of fabrication yard and transportation, vertical transportation on site, workers' training and problems in connecting components (Wang et al., 2014). BIM assist in minimising construction waste generation by improving communication to all parties involved, establishing consistent coordination among them, and minimising possible mistakes, resulting in increased efficiency in energy, resource, and material savings [Li et al., 2018; de Magalhães et al., 2017]

3.1.7 Human Resource Management

A total of three sub-themes emerged under human resource management theme namely training, skilled workers and awareness programme. This theme resulted from 17 number of practices studied altogether. Workers' awareness is mirrored in their attitude and behavior towards waste management in promoting best practices in construction project (Ajayi et al., 2015)(Bakshan et al., 2017). A study in Brazil found that there is a need to create actions aimed at raising awareness related to construction waste for the workers at a construction site. The absence of awareness campaigns and the lack of labour training in the sector will give a low impact to construction waste management (Moraes et al., 2020). With additional specific training programme for workers such as technical training on construction waste management, this will aid to minimise waste at site [Wang et al., 2014; Ding et al., 2018; Moraes et al., 2020; Olanrewaju & Ogunmakinde, 2020]. Employment of well trained workers is important in good construction waste management [Wang et al., 2015)(Sáez et al., 2019)(Liu et al., 2020]. A study in Malaysia found that employment of skilled workmen resulted the highest rank of importance in waste minimisation measure (Osman et al., 2017)

4.0 Conclusion

This systematic review has highlighted the best practices of construction waste management in construction project globally. The review method is based on the publication standard, specifically ROSES (RepOrting standards for Systematic Evidence Syntheses). The rigorous review resulted in 26 articles related to best practices of construction waste management in construction project. Based on the systematic reviews performed, seven best practices theme have been identified namely on-site practices, material management, procurement, design, regulation, technology and human resource management. These best practices were further extended to 31 sub-themes. A total of 43 studies focused on site practices which reported the highest number of studies. Followed by material management practices with 25 studies. Regulation practices with 24 studies. Next is human resource management

practice reported with 17 studies. This is followed by design and technology with 14 studies respectively. Lastly the least was procurement practice with only 5 studies.

The review explained the significance of applying best practices in construction waste management in order to achieve long-term sustainability. This paper also contains information that construction professionals can use to establish waste management strategies and compare their waste management performance.

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