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SUSTAINABLE ENVIRONMENTAL MANAGEMENT

Attitudes and behaviour towards construction waste minimisation: a comparative analysis between China and the USA

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Abstract

With the spread of the concept of sustainable development, people have gained awareness about the problem of massive illegal dumping of construction waste. In this research, a questionnaire survey was carried out in the USA and China. The results indicated the following. (1) Workers in both the countries had positive minimisation attitudes, and the attitude of Chinese construction workers was not significantly different from that of American construction workers. Furthermore, their average values were 3.9 and 4.07, respectively. (2) Business owners had a poor understanding of the obligations that should be fulfilled by contractors and construction workers, which greatly reduced (a) construction workers' and contractors' motivation to implement waste minimisation management and (b) the benefit-driven effect. (3) In terms of perceived behavioural control, Chinese construction workers had poorer minimisation technologies and knowledge than American construction workers, and it was very difficult for them to implement construction waste minimisation. The research conclusions and relevant suggestions may be used to improve the construction waste minimisation behaviour and awareness of Chinese people and promote China's construction waste minimisation management.

Keywords Construction waste · Behavioural awareness · Minimisation · Comparative analysis

Introduction

With the rapid development of China's economy, accelerated urbanisation and continuous growth of infrastructure construction, engineering construction projects have increasing demands for raw materials from natural resources. According to previous research, 40–60% of the raw materials in the world are used for engineering construction, and the construction waste associated with such projects is a major component of urban solid waste (Cole 2000). China's annual output of construction waste has reached 600 million tonnes, accounting for 30–40% of the total amount of urban garbage. China mainly adopts a landfill method to deal with construction waste, which not only takes up valuable land but also waste resources and creates environmental pollution (Liu et al. 2017). Landfilling construction waste is not a practice of sustainable development and is not conducive to the protection of China's natural environment (Pu et al. 2006; Ding et al. 2016a, b).

However, through proper treatment, construction waste can be turned into a secondary resource. Attitude and awareness are the most important elements affecting construction waste minimisation management, both of which can also affect construction waste minimisation behaviour to a certain extent. As early as 1974, Hussey and Skoyles 1974 highlighted the importance of construction workers' attitudes towards waste management and treatment. They argued that the most effective waste management method is changing people's attitudes, rather than improving technology. Zhu and Li (2011) investigated the construction waste minimisation behaviour of construction workers in Shenzhen city and concluded that construction waste is mainly caused by a failure to use resources properly and effectively.

Excessive construction waste is caused by construction workers' negative attitude towards green construction. However, multiple factors affect minimisation awareness (Lu and Yuan 2010; Ajayi et al. 2015; Bakshan et al. 2017). The

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theory of planned behaviour holds that behavioural attitude, subjective scope and perceived behavioural control are the main factors affecting behavioural intention. In other words, a more positive attitude will provide greater support to people holding a positive view of the behaviour, enhance individuals' perceived control over the target behaviour and improve their willingness to participate in the action (Begum et al. 2009; Al-Sari et al. 2012). Moreover, under a subconscious state and emotional reaction, perceived behavioural control can bypass behavioural intention and act directly on actual behaviour, and it can interact with behavioural intention to influence actual behaviour (Chu and Chiu 2003, Wang et al. 2017). Subjective scope and perceived behavioural control are also affected by different factors under different circumstances. Zhu and Li (2012) considered that the minimisation behaviour of construction workers is not simply determined by individuals' free will; rather, many other non-personal factors can impede the implementation of minimisation behaviour. Yuan and Li (2018) find that perceived behavioural control has a significant positive impact on the reduction behaviour of construction workers. At the same time, on-site management supervision and self-interest have a significant and direct positive impact on workers' behaviour awareness and reduction behaviour, based on the norm activation model and empirical research. Yuan and Wang (2018) find that awareness of consequences positively related to ascription of responsibility and also promoting participants' active engagement is effective in construction waste minimization.

The developed countries in Europe and America have more mature and in-depth theoretical research on construction waste minimisation behaviour and awareness than China, and construction workers and management personnel at construction sites in the developed countries in Europe and America achieve better results in implementing minimisation behaviour (Marzouk and Azab 2014) For example, the USA promoted green building much earlier than China; its annual output of construction waste is less than that of China's, and it has better laws and regulations regarding these areas. In the USA, there are also institutions and assessment tools to evaluate green building, such as LEED (Leadership in Energy and Environmental Design). In the American green building evaluation system, the waste discharge ratio must be controlled within 10%.

According to the theory of environmental behaviour, construction waste minimisation management behaviour refers to all the actions voluntarily taken and implemented by individuals to reduce the generation and discharge of construction waste directly make use of construction waste and reduce its adverse effects on the environment (Osmani et al. 2006; Le 1997). Construction workers and project managers play important roles in construction waste minimisation, and their awareness and attitudes determine their construction waste minimisation behaviour. This paper explores the attitude and awareness of Chinese and American construction workers and project managers towards construction waste minimisation behaviour. This research is designed to investigate the differences between construction workers' waste minimisation behaviour and awareness in the two countries and draw lessons from the successful measures taken by the USA to propose relevant suggestions for China.

Research methodology

This paper mainly adopts a literature review method and comparative analysis. (1) The literature review analyses the literature and research results of Chinese scholars with consideration given to China's situation in order to explore the cause of the poor waste minimisation behaviour and awareness of Chinese construction workers and to propose appropriate countermeasures. By analysing the literature and research results of some American scholars and examining survey results from the USA, this paper investigates the existing problems in the waste minimisation behaviour and awareness of American construction workers and the optimisation methods. (2) For the comparative analysis, questionnaire data were collected in the USA and analysed in terms of construction workers' waste minimisation behaviour and awareness.

Questionnaire design

The questionnaire used in this research was designed to be answered over the telephone or through e-mail by construction personnel who worked at sites in Syracuse, NY, with consideration given to the local situation and relevant research on waste minimisation behaviour and awareness. In addition, this research adopts the theory of planned behaviour for studying the construction waste minimisation behaviour of construction workers. The questionnaire design draws on Ajzen et al. (1985) theory of planned behaviour which assumes that individual behaviour is co-determined by behavioural intention and perceived behavioural control, while behavioural intention is affected by behavioural attitude, subjective norms and perceived behavioural control (as shown in Fig. 1). Behavioural attitude refers to the participant's perception of advantages or disadvantages of certain behaviours, people or things, liking or disliking and positive or negative evaluation (Ajzen 1991). Subjective norms refer to the social pressure encountered by a participant in the behaviour decision-making process. Perceived behavioural control is the perception of behavioural control, and it can affect a participant's behavioural driving force (Taylor and Todd 1995).

Drawing on previous literature (Chen 2008; Yuan and Sun 2016; Zhu and Li 2012; Tan 2011; Teo and Loosemore 2001; Dahlen and Lagerkvist 2010), the questionnaire on the construction waste minimisation behaviour and awareness of

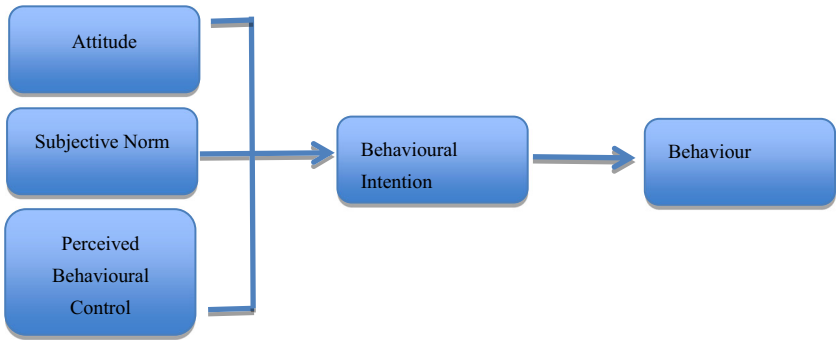

Fig. 1 Conceptual diagram of the theory of planned behaviour (Ajzen 1991)

construction workers and project managers (see Appendix) was compiled. The questionnaire adopts a 5-point Likert scale as follows: 1 'Strongly disagree/Never', 2 'Disagree/Occasionally', 3 'Undecided/Sometimes', 4 'Agree/Usually', and 5 'Strongly agree/Always'. As for the selection of a measurement index in the questionnaire design, in order to make a direct comparison with the data of The Trend of Construction Waste Minimisation Behaviour of Construction Workers in Shenzhen City by LI et al. (2015a, b), the measurement index of attitude (AB) variables was set as AB1, AB2 and AB3; the measurement index of subjective scope (SN) variables as SN6, SN7 and SN8; and the measurement index of perceived behavioural control (PBC) variables as PBC1 and PBC2. The measurement index of behavioural intention (BI) corresponded to that of actual behaviour (B). To better investigate the attitude of American construction workers, the items 'I support construction waste minimisation management' (AB4) and 'I have an obligation to implement construction waste minimisation' (AB5) were added to the questionnaire survey. To more fully explore the impacts of different factors in the subjective scope of American construction workers on waste minimisation behaviour, the questionnaire design adopted SN1, SN2 and SN3 related to government regulatory control and S4 related to the social and cultural environment. As the American construction industry has been more inclined to use energy-saving, eco-friendly recycling building materials, similar indicators were added for companies that do not use such materials. In addition, PBC3 was added as a perceived behavioural control variable to highlight the minimisation ability of American contractor companies.

Questionnaire data collection and sampling

Questionnaires were distributed at five construction sites (Table 1) in Syracuse, NY. The respondents were project managers and construction workers. The questionnaire asked for information such as the respondent's age, level of education, position and length of service, as shown in Table 2. To ensure a good response rate and credibility rate, the questionnaires were completed and returned on the spot. Of the 1616 questionnaires that were distributed, 147 completed ones were returned (response rate of 88%). China's data comes from two parts including questionnaires and literature studies. We survey in Shenzhen, Guangzhou and the Pearl River Delta region, distributing 200 questionnaires and recovering 180 copies, which achieved 90% efficiency. Meanwhile, we refer to the data of other Chinese researchers (Li et al. 2015a, b; Zhu and Li 2011, 2012; Yuan and Li 2018; Yuan and Wang 2018).

Comparative analysis

The average score of each measurement index under each variable was calculated, followed by an analysis based on the average scores. Figure 2 shows the results.

According to Fig. 2, American construction workers and relevant management have good construction waste minimisation behaviour and awareness. The majority of scores were higher than 3.5, meaning that they basically belonged to the category of 'Agree'. In addition to

Table 1 Construction sites

Place	Name of construction project	Participants	Number of distributed questionnaires	Number of responses
Syracuse	Syracuse University's Updated Campus Construction Project	Workers, project manager	32	30
New York City	Navillus Contracting Large- Scale Building	Workers	40	34
New York City	Second Avenue Subway	Workers, project manager	38	31
Syracuse	Redhouse City Centre	Workers, project manager	32	29

Table 2 Participants' basic characteristics

	20~30 years	31~40 years	41~50 years	51 years or above
Percentage	27%	39%	22%	12%
Length of service	Less than 5 years	5~10 years	10~15 years	Over 15 years
Percentage	52%	29%	11%	8%
Position	Construction workers	Management personnel at the construction site	Project manager	Other
Percentage	28%	42%	6%	23%
Degree	High school or below	Some college	Undergraduate	Postgraduate or above
Percentage	26%	12%	51%	11%

considering the weighting score, the author interviewed some local construction workers and project managers to discuss the survey data.

(1) In terms of attitude towards the theory of planned behaviour, the American construction workers and project managers had an average score of more than 4 on the measurement index, indicating the category of 'Agree'. The five measurement indexes were construction waste minimisation (AB1), construction waste minimisation can promote the benefits of the company (AB2), construction waste minimisation is consistent with the development concept of the company (AB3), China supports construction waste minimisation management (AB4) and I am obliged to implement construct waste minimisation (AB5). Most American construction workers had a supportive attitude towards construction waste minimisation behaviour.

(2) In terms of subjective scope, the scores demonstrated that the US government's relevant mandatory regulations and norms, corresponding to punitive measures, and the rules of relevant environmental departments and institutions have binding force over enterprises and companies' construction waste minimisation behaviour. The USA as a whole and the American construction industry have a strong energy conservation and environmental protection consciousness. American customers also pay more attention to waste minimisation in the construction process and consider whether a building's impact on the environment has been minimised. However, colleagues, workers and leaders have weak influence and supervision over waste minimisation behaviour in the construction process.

(3) Due to a lack of appropriate relevant norms serving as guidelines for construction waste minimisation behaviour, the weighted score of PBC was 2.02, belonging to the category 'Disagree'. This indicates that the USA has strict guidelines for waste minimisation behaviour and strong laws and regulations. The score for an individual's waste minimisation knowledge and skill was 3.58. Companies had better construction waste minimisation management conditions and ability, with a score of 4.33.

(4) The score for BI was 4.69, indicating that the construction workers and project managers had a strong waste minimisation intention.

(5) The score for actual behaviour was 3.88, which was lower than that of BI, indicating that fewer people actually implemented waste minimisation behaviour.

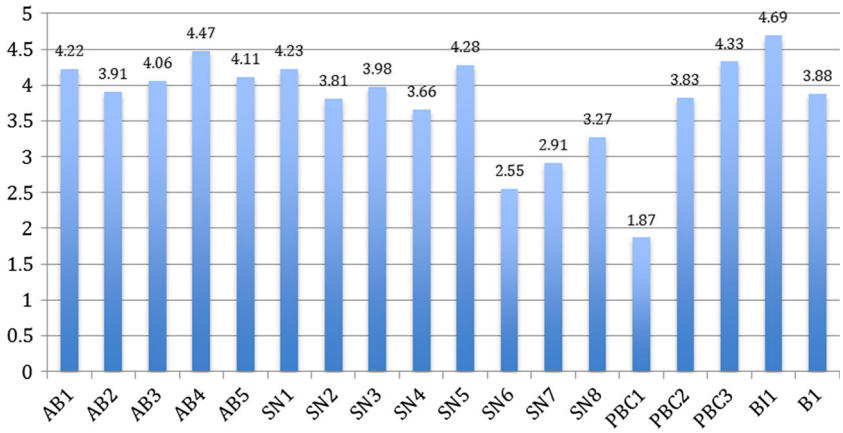

Fig. 2 Average scores of various influencing factors (full points = 5)

The construction waste minimisation behaviour and awareness among Chinese construction workers

China has issued construction waste minimisation regulations with its own minimisation technology. However, the minimisation management remains unsatisfactory and is not implemented correctly (Wu et al. 2015, 2017; Jin et al. 2017). Yuan and Sun (2016) argued that attitudes towards waste minimisation management exert the greatest impact on minimisation behaviour, followed by subjective norms. Relatively speaking, PBC has little influence. Among the various factors that affect construction waste minimisation management attitude, the most important factors are the effectiveness of relevant laws and regulations, the legal system, the government's supervision of the construction process and workers and related personnel's emission reduction awareness in the construction process (Pakpour et al. 2014). Zhu and Li (2011) studied the construction waste minimisation behaviour and awareness of construction workers and concluded that the actual behaviour of construction workers is not largely affected by their BI as expected. Instead, actions are mainly affected by PBC. To increase the probability of minimisation behaviour, stronger PBC is required.

According to Zhu and Li (2011), minimisation behaviour is affected by the following factors: lack of training, education and skill in waste minimisation; lack of strong support from proprietors and clients, namely, no interest incentives; no priority of construction waste management over other objective management; lack of restraint and guidance of powerful laws and regulations concerning construction waste management; and lack of adequate awareness of construction waste minimisation management.

Li and Zhu (2011) research revealed that the construction waste minimisation behaviour of construction workers in Shenzhen showed an upward trend after the implementation of the Regulations of Construction Waste Emission Reduction and Utilisation. Thus, it is confirmed that laws and regulations issued by the government enhance construction workers' minimisation behaviour and that improving behavioural control promotes minimisation behaviour improvement. Yet, in the Regulations, numerous requirements are not compulsory, and there is still no reward and punishment mechanism. This means that companies lack strong incentives to conduct construction waste minimisation and construction workers experience less stress than their stress before the Regulations were issued. As investigations by Tonglet and Phillips (2004) show, management personnel at the construction sites and project managers in higher positions with higher education levels understand the advantages of waste minimisation and learn about the relevant laws and regulations. However, due to tight construction periods and inadequate funds, waste minimisation fails to be implemented (Taylor and Todd 1995; Udayangani et al. 2006). Further, as operating personnel with lower education levels do not receive any training or education in minimisation and environmental protection, they lack minimisation awareness and therefore cannot practice minimisation behaviour.

For the better implementation of construction waste minimisation management, minimisation awareness must be transfused to all the levels of construction personnel, including construction workers, project managers, architects and engineers. Research by Chinese scholars on minimisation behaviour included design personnel in addition to construction workers, project managers and contractors. Although the minimisation methods developed by design personnel are of great significance, the attitudes of design personnel were shown to be unsatisfactory. Investigations into the influential factors of design personnel's minimisation behaviour showed that similar to construction workers and project managers, design personnel possess a strong willingness to carry out minimisation but rarely implement minimisation design (Wu et al. 2017). Furthermore, similar to construction workers, design personnel cannot put minimisation into practice because there is a shortage of laws, regulations and requirements in the design industry. Moreover, design personnel do not have adequate knowledge and skills for minimisation. Finally, management pays no attention to minimisation, which means that the design personnel are not driven by interest.

The construction waste minimisation behaviour and awareness among American construction workers

According to the questionnaire survey data and interviews with construction workers and relevant construction staff at the American construction sites, the participants had strong BIs concerning minimisation behaviour and basic knowledge and skills concerning minimisation. Construction workers generally enjoyed a high education level and had developed strong environmental awareness (Saunders and Wynn 2004). In high school or college, they learned about environmental protection concepts and developed the knowledge and skills of recycling, green materials and emissions reduction. However, their minimisation behaviour was relatively lower than their BI. Based on the interviews with construction workers, the inconsistency between intention and behaviours mainly originates from lack of interest incentives and strict management. Moreover, the construction workers presented no explicit attitudes regarding the question whether their coworkers and colleagues engaged in minimisation behaviour, and they had not been instructed correctly about the problem. Even managers at the construction sites paid no attention to whether construction workers practised minimisation behaviour.

Regulations and standards of construction waste minimisation management in the USA are relatively complete, and certain reward and punishment systems have been established. Enterprises and contractors are impelled to value minimisation behaviour and to improve the conditions and capabilities of construction waste minimisation management. As the American government and society advocate environmental protection, sustainable development, less energy consumption and green building, relevant regulations and standards of waste minimisation have been perfected. Correct concepts are adopted to establish regulations and technical standards which prompt the implementation of construction waste minimisation management. Apart from laws and regulations issued by the government, other institutions, associations and evaluation organisation concerned with green building present relevant requirements, such as the US Green Building Council and LEED. For a project to be recognised as green building by these institutions and associations, the building construction needs to reduce energy consumption, protect the environment, cut down pollution and save resources to the greatest degree possible (Wu et al. 2016). Moreover, the emission load of construction waste should be controlled and reduced as much as possible.

This research included field surveys of five construction projects, one of which was aimed at constructing a green building. In the interview, the project manager described that a low energy consumption design had been adopted and relevant techniques and skills, such as LP, were improved to reduce construction waste. LP is a kind of management philosophy which is conducive to waste reduction (Koskela 1992). What is more, the construction workers and related staff received optimisation training for minimisation to learn more of the relevant knowledge and skills. A rewards system was formulated so that all the construction workers would be rewarded if the emission load was controlled within a specified value. The questionnaire data of this project site showed the most satisfactory results. Moreover, the construction site had the highest scores for actual behaviour and PBC when compared to the four other sites.

The regulations and standards of construction waste minimisation put in place by the American government are complete and compulsory, and strict supervision is conducted to guarantee their effective implementation (Tam 2008). In terms of implementing sustainable development and green building, the American society and the construction industry put great emphasis on minimisation behaviour management and apply the environmental concept of sustainable development in practice of construction waste minimisation behaviour. Further, the average education level of American construction workers and project managers is high, and they have good knowledge of minimisation skills. Energy conservation and environmental protection consciousness among American purchasing groups, the whole society and the construction industry also work as an essential factor (Wu et al. 2011). According to the field interviews, this strong environmental protection consciousness urges more green buildings. Green buildings with low waste discharge and low energy consumption stimulate a stronger purchase intention in clients and proprietors. This complies more with the environmental protection concept in the USA.

Comparative analysis and conclusions

The results of this study are in line with the trends found by Li et al. (2015b) in the waste minimisation behaviour of construction workers in Shenzhen. Research data from China in 2013 were used for a comparison of Chinese and American workers. The data have a high level of comparability as well as visible reference value. Table 3 shows a comparison of the data.

In terms of attitudes, there was little difference in behaviour intention between the Chinese and American participants. The average BI was 3.9 and 4.07 in China and the USA, respectively. Participants in both countries held positive attitudes towards waste minimisation.

In subjective norms, the average scores for ‘Leaders and companies think I should manage waste minimisation’ and ‘Colleagues or co-workers think I should manage waste minimisation’ were 3.37 and 3.28, respectively, for the Chinese participants. These values were higher than those of the American participants, which were 2.91 and 2.55, respectively. The results show that the Chinese participants strongly accepted that their co-workers, colleagues and leaders around them should manage minimisation behaviour. However, for ‘Purchasers and clients think I should manage waste minimisation’, the value in the USA was 4.28, higher than that in China. This demonstrates that Chinese purchasers seldom believe contractors and construction companies should manage minimisation behaviour duties. Therefore, construction workers and contractors are less driven to implement construction waste minimisation management, and the effect of interest incentives decreases.

In PBC, all values were higher for the American compared to those for the Chinese participants. In particular, there was a great difference in the responses to ‘Whether workers have related knowledge and skills of minimisation and whether it is easy and feasible for construction companies to implement minimisation behaviour’, with the Chinese value being 2.85 and the American value being 3.83. This shows the Chinese participants had less knowledge about minimisation compared to the American participants. Therefore, it is a greater challenge for Chinese construction workers to implement minimisation.

The participants in both China and the USA had a strong minimisation behaviour intention, though it was stronger

Table 3 Comparison of the questionnaire data between China and the USA

Influential factors of minimisation behaviour and awareness	USA	China
Attitudes	4.07	3.90
Construction waste minimisation benefits companies to a certain extent.	3.91	3.69
Construction waste minimisation protects the environment to a certain extent.	4.22	4.10
Subjective scope	3.25	3.34
Purchasers or proprietors (clients) think I should manage waste minimisation.	4.28	3.37
Leaders and companies think I should manage waste minimisation.	2.91	3.37
Colleagues or co-workers think I should manage waste minimisation.	2.55	3.28
Perceived behavioural control		
Lack of guidance of proper relevant laws and regulations on waste minimisation behaviour	1.87	2.58
I have related skills and knowledge to practice waste minimisation, and it is not a challenge for me.	3.83	2.85
Behavioural intention	4.69	3.70
Actual behaviour	3.88	2.87

among the American participants. However, in the actual practice of minimisation, both countries showed lower values in comparison to BI. The value of 'actual behaviour' in China was 2.87, presenting a greater difference from the 'behavioural intention' value. The actual implementation of minimisation in the USA is approximately 1 point higher than that in China.

Conclusions

For China to improve its construction waste minimisation management, it is necessary to have support from the government, construction industry and the whole society, in addition to time and patience. The key is to apply the concept of sustainable development in the practice of minimisation behaviour. Referring to American construction waste minimisation management and considering specific problems in China, this paper presents the following recommendations:

(1) The government should issue complete and compulsory laws and regulations with a punishment mechanism. Further, supervision should be carried out to guarantee the implementation of the issued laws and regulations. To ensure the laws are enforced, the American practice of penalising companies that do not comply can be followed so that contractors will be driven to implement construction waste minimisation management.
(2) Measures should be taken to improve the level of education among construction workers, particularly regarding their knowledge and skills about minimisation. Companies and the government can offer timely training for workers to acquire minimisation knowledge and skills so that they can develop an environmental protection consciousness and apply the concept of sustainable development.
(3) To create interest incentives, enterprises and the government can formulate a rewards mechanism. As in the construction projects discussed in this paper, construction workers and contractors can be rewarded when waste discharge is controlled within a specific value. However, this is never the most fundamental solution to the problem. The key is to make the concepts of sustainable development and green building deeply rooted in people's awareness. If Chinese people value green buildings as Americans do, consumers may purchase green buildings with less waste discharge. Thus, contractors will be motivated to implement construction waste minimisation management. The government and other organisations can promote green buildings to raise awareness of the concept of sustainable development and green buildings in Chinese society as well as in the construction industry. It is expected that the concept of sustainable development can be applied to construction waste minimisation behaviour.

This paper has further improved the minimisation management theory of construction waste, providing theoretical basis and decision-making for construction waste minimisation management in developing countries. Limitations of this research should mainly concentrate on the research objects which include project managers and workers. Next, we will separate and differentiate the two parts, studying the impact of its behaviour on construction waste minimisation management, making a more detailed study.

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Appendix 1

Part 1: Basic information of respondents:

Q1 Type of enterprise:

□ Contractor □ Client/Developer □ Architectural Firm□ Government Agency

Q2 Working experience in construction field:

□ Less than 5 years □ 5–10 years □ 10–15 years □More than 15 years

Q3 Building professional

□ Construction worker □ Project Manager □ Others

Part 2:*Questionnaire on the Construction Waste Minimisation Behaviour and Awareness of Construction Workers and Project Managers*.The questionnaire adopts a 5-point Likert scale as follows: 1 'Strongly disagree/Never', 2 'Disagree/Occasionally', 3 'Undecided/Sometimes', 4 'Agree/Usually', and 5 'Strongly agree/Always'.

	Code	Measurement index	Score				
			5	4	3	2	1
Attitude (AB)	AB1	Construction waste minimisation protects the environment to a certain degree.					
	AB2	Construction waste minimisation benefits companies to a certain degree.					
	AB3	Construction waste minimisation is consistent with the development concept of companies.					
	AB4	I take a positive attitude towards construction waste minimisation management.					
	AB5	I feel obliged to conduct construction waste minimisation.					
Subjective Scope (SN)	SN1	Government compulsory laws and regulations compel companies to conduct construction waste minimisation management to a certain degree.					
	SN2	Governmental punishment for excessive emission of construction waste drives companies to implement construction waste minimisation management.					
	SN3	Waste emission requirements of related departments and associations urge waste minimisation management.					
	SN4	The whole society and construction industry have a strong energy conservation and environmental protection consciousness.					
	SN5	Purchasers and clients think I should manage waste minimisation.					
	SN6	Co-workers and colleagues think I should manage waste minimisation.					
	SN7	Leaders and companies think I should manage waste minimisation.					
	SN8	Companies encourage and support construction waste minimisation management.					
Perceived Behavioural Control (PBC)	PBC1	Lack of guidance of proper relevant laws and regulations on waste minimisation behaviour					
	PBC2	I have related skills and knowledge to practice waste minimisation, and it is not a challenge for me.					
	PBC3	Companies possess conditions and capabilities of construction waste minimisation management.					
Behavioural Intention (BI)	BI1	I intend to implement waste minimisation in the future.					
Actual behaviour (B)	B1	Within the last two years, I have taken waste minimisation measures.					

Thank You! **~End of Questionnaire~**

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