Journal of Cleaner Production 39 (2013) 1–8

Contents lists available at SciVerse ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

A SWOT analysis of successful construction waste management

Hongping Yuan

School of Economics and Management, Southwest Jiaotong University, Jin Niu District, Chengdu, Sichuan 610031, China

ARTICLE INFO

Article history:
Received 27 July 2011
Received in revised form
6 August 2012
Accepted 15 August 2012
Available online 31 August 2012

Keywords:
SWOT analysis
Construction waste management
Strategy
China

ABSTRACT

Recent years have witnessed a significant amount of construction waste as a result of rapid urbanization and large scale of construction activities in China. However, compared to many advanced western countries, very few studies have been carried out for investigating the construction waste management problems in China. This study, by conducting a strength, weakness, opportunity, and threat (SWOT) analysis, aims to help understand the status quo of construction waste management based on the particular context of Shenzhen city in south China. Data supporting the analysis are derived from multiple channels including governmental reports, waste management related regulations, literature review, and focus group meetings. The study opens a window through which major stakeholders involved can perceive the internal and external conditions of construction waste management in Shenzhen. The seven critical strategies, which are presented based on the SWOTs identified, could be useful for Shenzhen to develop and promote its future construction waste management at the strategic level.

1. Introduction

Construction waste has nowadays become a grievous problem in China due to the significant amount of construction activities on one hand and the poor construction waste management (CWM) on the other. While pursuing and maintaining a high speed of economy development, infrastructure and building construction has been playing an essential role in the Chinese arena. Particularly, in 2008, China proposed an investment plan for coping with the economic problems caused by the World Financial Crisis of 2008. In line with the program, a total amount of 4000 billion CNY (1 US$ = 6.3 CNY) was launched to stimulate the development of national economy from 2008 to 2010. In the investment, around 2500 billion CNY (accounting for 62.5%) was used for implementing construction projects, typically including development of infrastructure, railway, highway and road, airport, hydraulic engineering projects, and post-disaster rehabilitation for Wenchuan earthquake. Undoubtedly, the implementation of these projects leads to a large volume of construction waste generated throughout the country.

Nevertheless, practices of CWM and application of low-waste construction technologies in the Chinese construction sector are still at a lower level compared to those of some advanced countries, such as USA, UK and Australia (Lu and Yuan, 2010). The poor management of construction waste in China can be attributable to various aspects. For example, there is a lack of precise and detailed CWM related regulations that contractors can actually follow. Consideration for environmental management issues including CWM is not a priority when undertaking construction projects. Industry stakeholders generally lack awareness about construction waste minimization or environmental protection. Most of Chinese construction projects do not have detailed waste management plans at the project level. Construction waste generated on-site is by and large poorly managed. Furthermore, the local government does not launch long-run schemes with respect to construction waste disposal especially for landfill planning and construction (Lu and Yuan, 2010; Wang et al., 2011). All these problems demonstrate a pressing appeal for the need to ameliorate current CWM practices in order to minimize construction waste in China.

During the last decade, construction waste issues in China have attracted significant attention from researchers, thus resulting in a number of research outcomes published in various academic journals. These outcomes witnessed clearly an increasing concern about construction waste problems demonstrated by the academic community. Nonetheless, it seems that the government and the majority of industry stakeholders paid relatively less attention to these problems. Meanwhile, although existing literature covers a wide range of topics in relation to CWM, such as measures for reducing construction waste, on-site construction waste sorting, construction waste recycling and disposal, forecasting regional construction waste generation through development of various

E-mail address: hpyuan2005@gmail.com.

0959-6526/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.jclepro.2012.08.016

quantitative models (Wang et al., 2011; Hao et al., 2007; Formoso et al., 2002), there is limited research that can be used to assist in strategically planning CWM in a given region.

Generally, strategic analysis and planning of CWM at the regional level can contribute to CWM practices of a particular region in three major dimensions. Firstly, it allows the government and industry stakeholders to further their understanding of current CWM situation in the region under study. Secondly, it enables the identification of main problems that are faced by the construction industry, based on which effective measures can be presented for improvements. Finally, the analytic results can be useful information to guide the development of CWM in the region in both the short- and long-run. Therefore, this study aims at analyzing CWM at the regional level in China. A SWOT (Strength, Weakness, Opportunity and Threat) analysis approach is employed to achieve the purpose. The analysis is based on an empirical investigation of CWM in Shenzhen city of south China.

The remainder of the paper is organized as follows: Section 2 is an introduction of the research methodology adopted; Section 3 is a thorough SWOT analysis of CWM in Shenzhen; Section 4 is a framework incorporating seven critical strategies that can be used to help address the CWM problems in the region; and finally we draw the main conclusions.

2. Research methodology

The key tool used for strategically planning CWM in Shenzhen is a SWOT analysis approach, which originates from the business management discipline and has been widely applied to a broad array of disciplines. For example, by using the method, Halla (2007) conducted a strategic urban development planning based on the case of Dar es Salaam city in Tanzania and concluded that the method is stronger than the procedural or master-planning approach in planning cities. Recently, a SWOT analysis on environmental management in Greek mining and mineral industry was carried out by Nikolaou and Evangelinos (2010); the authors claimed that the results could facilitate improved environmental performance. In the discipline of waste management, an investigation on formulating strategic action plans for municipal solid waste management in Lucknow was performed; the study adopted a research method of integrating stakeholder analysis into SWOT analysis and presented a set of concrete strategic action plans for both the community and municipal corporation to improve solid waste management in that region (Srivastava et al., 2005). It is evidently demonstrated by those studies that the SWOT analysis approach is a better tool for investigating problems from a strategic perspective. Thus it is adopted in the present study to strategically analyze CWM in Shenzhen.

The research methodology used consists mainly of four parts, which is shown in Fig. 1. In the first part, the latest status quo of CWM in Shenzhen is introduced in detail by referring to information collected from two sources: one is a thorough search and examination of related government reports, CWM related regulations and studies; the other is through consulting the government department staff that are responsible for construction waste planning and management. Next, a group of research questions are formulated aiming at diagnosing the strengths, weaknesses, opportunities and threats of CWM in Shenzhen. In the third part, a detailed SWOT analysis is performed based on the research questions developed. Answers to those questions are abstracted through analyzing information obtained from a series of focus group meetings with major stakeholders concerned, which mainly include government department staff, project developers, contractors, on-site managers and engineers, and construction waste contractors. The surveyed government staff are from the Shenzhen Housing and Construction Bureau and responsible for construction waste management in the region. Other stakeholders surveyed have been involved in various construction projects and CWM activities in the past years, and thus they are knowledgeable about the CWM practices in Shenzhen. Four focus group meetings are carried out in 2011 and 2012, and each lasts 40–50 min. The main justification for involving the above stakeholders in the focus group meeting is that they have a relatively in-depth understanding of the CWM practices in Shenzhen. Although other stakeholders' opinions (such as workers) might be useful in understanding construction waste problems, their viewpoints largely focus on CWM issues at the project level instead of the regional level. Given that the major aim of this study is to investigate Shenzhen's CWM practices from a strategic perspective, CWM issues at the regional level should be the focal point. At last, based on the SWOTs identified, recommendations for improving the CWM situation in Shenzhen are presented in line with the principle of 'maximizing strengths and opportunities, transforming weaknesses to strengths, and minimizing threats'.

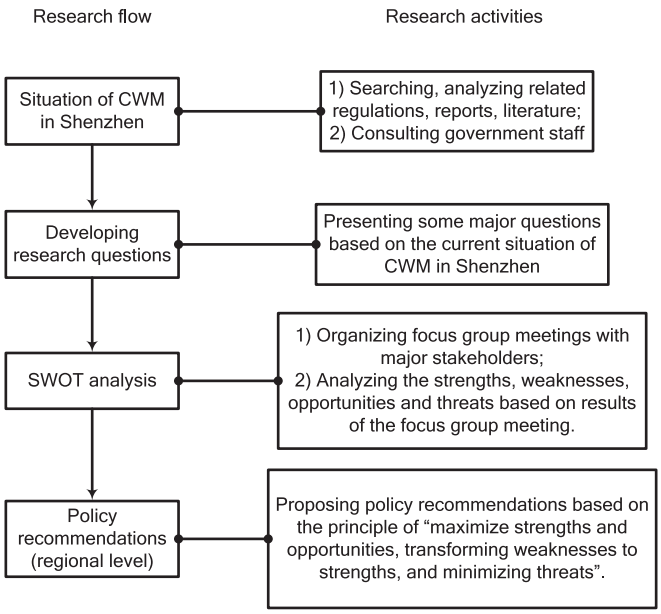

Fig. 1. Research methodology.

3. SWOT analysis of CWM in Shenzhen

3.1. Situation of CWM in Shenzhen

Shenzhen is a coastal city located in southern China adjacent to Hong Kong. It was established as a Special Economic Zone (SEZ) in 1980 under China's 'open door' policy. For many years before China officially adopted a market economy, Shenzhen was the experimental zone for China's serial economic reforms. During the past two decades, Shenzhen's economy has developed rapidly transforming itself from a small fishing village into a modern 1952 km^2 city with a population of around 8.46 million. In 2008, Shenzhen's Gross Domestic Product (GDP) was about 780.65 billion CNY with the value of the construction sector accounting for 19.75 billion CNY or 2.5% of that value (NBS, 2009). It was also reported in the statistics that the completed floor space of residential buildings, office buildings, commercial buildings and industrial buildings in 2008 was 22.10 billion m^2, 2.02 billion m^2, 3.46 billion m^2 and 5.18 billion m^2, respectively (NBS, 2009).

The large-scale construction activities that occurred in Shenzhen have produced an overwhelming amount of construction waste.