



Green and lean sustainable development path in China: Guanxi, practices and performance



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ABSTRACT

Globalisation has created both drivers and pressure for Chinese organisations to enhance their business performance as well as environmental performance. Green and lean practice is emerging as a critical approach for Chinese organisations to achieve sustainable development and improve organisational performance. By conducting empirical studies from 172 respondents on green and lean practice in different Chinese organisations, this research shows how green and lean practice affects organisational performance and how this association is affected by guanxi. The findings explain that guanxi between organisational partners improves the positive effect of green and lean practice on organisational performance. The results of this paper offer helpful insights into how managers should enhance their guanxi initiatives, in order to improve environmental and business performance over their supply chains. The paper also suggests the limitations of this research, as well as directions for future research.

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1. Introduction

Sustainable development and environmental protection are the themes of the day. According to McKinsey (2010), for most companies environmental issues have become a significant topic. Bai et al. (2015) point out that balancing environmental and economic performance has become more and more significant for organisations facing regulatory, competitive and community pressures. Success in fulfilling environmental concerns may offer new chances to create value to key business programmes as well as great opportunities for competition in today's rapidly changing business environment (Kurdve et al., 2014; Tseng et al., 2014b; Shen et al., 2013; Tseng et al., 2015).

As the largest developing country with the fastest-growing economy, the environmental issues have become even more striking in China (Zhu et al., 2005). Economy (2007) indicates that the acceptances of China into the WTO and its recent dramatic economic growth have been accompanied by serious deterioration of the environment. In order for China to continue its rapid economic

development, Chinese organisations need to initiate industrial and corporate environmental management measures (Tseng and Chiu, 2013; Bai et al., 2015). Since 1992, China has incorporated sustainable development within a basic national strategy and many Chinese manufactures have started implementing organisational approaches such as environmental management systems and cleaner production, along with green production to improve both environmental and economic performance (He et al., 2012; Zhu et al., 2005; Tseng et al., 2014a). However, ecological degradation and environmental pollution in China have continued to be serious issues and have inflicted great damage on the quality of life and economy. For many reasons the implementation of green practices measures by Chinese organisations faces severe challenges (Chow, 2008). Limited knowledge of the availability and benefits of green methods of production, for instance, leads many managers to see 'being green' as an incremental cost rather than a potential benefit, and they may not understand how their use of conventional alternatives impacts the environment. Therefore, how can Chinese firms overcome the challenges of greening their supply chain?

Lean manufacturing was initially developed in Japan, by Toyota (Herron and Hicks, 2008). Since then, it has been adopted in a wide range of industries all around the world (Garza-Reyes et al., 2012). Nowadays, lean manufacturing is considered the most influential new paradigm in manufacturing. In essence, it involves reducing inventories and lead-times, and improving productivity and

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quality (Forrester et al., 2010; Abdul Wahab et al., 2013). However, in order to respond to the growth of customer requirements for goods and services that comply with government environmental regulations, organisations have been forced to rethink how they manage their operations and processes. In this context, not only is the lean paradigm in line with organisational objectives such as profitability and customer satisfaction, but it is also being used to overcome green challenges and to improve environmental performance (Govindan et al., 2015).

Green and lean practices have been adopted by organisations in order to achieve more environmentally sound operations and to manage their relationships with suppliers in the context of supply chain management (Vais et al., 2005; Azevedo et al., 2012; Kurdve et al., 2014). The lean paradigm is perceived to reduce waste (and consequently to reduce costs), to improve quality and productivity, to ensure better use of resources and to deliver value to customers (EPA, 2007; Pakdil and Leonard, 2014). The green paradigm seeks to lower negative environmental impacts and environmental risks while eliminating waste and improving ecological efficiency (Muduli et al., 2013; Zhu et al., 2005; Tseng et al., 2015). When green and lean practices are combined, it is important to identify which of them are relevant to any particular set of operations and which require improvement (Duarte and Cruz-Machado, 2013, 2015). A number of studies have considered the relationship and investigated the effects of green and lean initiatives on organisational performance and their integration as a single combined approach (Larson and Greenwood, 2004; Dues et al., 2013; Wiengarten et al., 2013; Duarte and Cruz-Machado, 2015; Sobral et al., 2013; Garza-Reyes, 2015; Mollenkopf et al., 2010; Pampanelli et al., 2014; Mason et al., 2008; Kurdve et al., 2014). However, despite these studies, the academic literature and research exploring the impact of green and lean practice on organisational performance still remain in their early stages. In particular, no systematic study has been undertaken to identify those key green and lean practices that might make the difference between success and failure in green and lean implementation. Production managers need to understand these green and lean practices in order to be able to strategically manage their environmental and business performance.

Additionally, other organisational practices can potentially moderate the relationship between green and lean practice and organisational performance. This paper looks specifically at one such organisational practice: guanxi. Guanxi is deeply rooted in 5000 years of Chinese culture. It may work as a moderator that influences the relationship between green and lean practice and performance. Therefore, the existence or non-existence of guanxi may hinder or help the green and lean practices performance implications. According to Wong (2007), guanxi plays a vital part in Chinese organisations. It has important implications for inter-organisational and inter-personal dynamics in Chinese society and can therefore significantly affect the resources available to a firm, and its interaction with the task environment (Kao, 1993). As a result, researchers and business es have sought to examine the roles that green and lean practice, organisational performance and guanxi play in Chinese organisations, with a view to offering useful insights into how effective implementation of green and lean practices can be improved, in order to enhance environmental and business performance.

Due to the increasingly discussions concerning climate change, organisations in developing countries such as Indonesia, Malaysia, Philippines and China find themselves facing increased pressure from government and customers to do business in an environmentally responsible manner, which generally requires extra investment (Tan et al., 2014). Although many researchers point out that green and lean practice can be a catalyst for organisations to improve their environmental and business performance,

the hesitation over the green and lean practice is fuelled by the fact that there is confusion about:

- (1) What green and lean practices are?
- (2) How green and lean practices can result in better organisational performance?

This paper contributes to green and lean practice by providing a cross-sectional, large-sample measurement model to test the effectiveness of developed green and lean practices in improving Chinese organisations' environmental and business performance. Also, it shows that the different level of performance improvement is dependent on guanxi utilisation in Chinese organisations. It tests specific hypotheses, based on literature and empirical study. This paper differs from the vast majority of the green and lean literature, which focuses on the serial or simultaneous deployment of green and lean practice, this research uses the actual experience of Chinese organisations to explain relationships between green and lean practice and organisational performance. Additionally, the study finds that guanxi can encourage the preference to build relationships to enhance organisational performance.

2. Theoretical background

The literature on green and lean practice has been growing in recent years. Different aspects of green and lean paradigms have been studied; in particular, studies have examined whether the sequential or simultaneous deployment of these practices best aligns the two approaches (Diaz-Elsayed et al., 2013; Pampanelli et al., 2014; Dues et al., 2013).

In this research, we identify five sets of green and lean practices designed to achieve better organisational performance (see Table 1). These practices were developed from literature that addressed various aspects of green and lean practices, as well as input from experts, enterprises and officials involved in environmental management. First, the mindsets and attitudes of people operating a green and lean system are fundamental. Green and lean is not only about changing things, but also about changing how people think. The green and lean way of thinking often runs counter the prevailing mindset: for example, it argues that organisations should think small and flexible rather than thinking big, and that problems create opportunities to improve rather than necessitating blame (Jeyaraman and Teo, 2010). Second, strong, committed leadership is essential for successful implementation of green and lean practices, which must be driven from the top down. In a green and lean environment, leadership is about defining the values and goals of the organisation and developing strategy (Bergmiller and McCright, 2009). Literature shows that the difference between green and lean success and failure starts with leadership (Rothenberg et al., 2001). Third, employee involvement

Table 1
Green and lean practices.

Green and lean practice	Literature support
Mindset and attitude	(Jeyaraman and Teo, 2010; Dues et al., 2013; Wiengarten et al., 2013; Azevedo et al., 2012)
Leadership and management	(Bergmiller and McCright, 2009; Rothenberg et al., 2001; Sobral et al., 2013; Larson and Greenwood, 2004)
Employee involvement	(Florida, 1996; Zhu et al., 2005; Pampanelli et al., 2014; Diaz-Elsayed et al., 2013; Mason et al., 2008)
Integrated approach	(Drew et al., 2004; Garza-Reyes, 2015; Carvalho et al., 2011; Zhu and Sarkis, 2004)
Tools and techniques	(Hines et al., 2004; Srivastava, 2007; Sertyesilisik, 2014; Salleh et al., 2012; Banawi and Bilec, 2014)

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