



Building environmental sustainability: empirical evidence from Logistics Service Providers



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ARTICLE INFO

Article history:

Received 25 June 2012

Received in revised form

25 June 2013

Accepted 28 June 2013

Available online 13 July 2013

Keywords:

Environmental sustainability

Logistics

Freight transportation

Logistics Service Providers (LSPs)

ABSTRACT

Environmental sustainability has recently become more and more of a concern among both academics and practitioners. In particular logistics services operations can play a significant role in reducing the environmental burden of the supply chain. Although studies on these issues have been progressively increasing in the extant literature, still little investigation has been performed among Logistics Service Providers (LSPs). The present paper aims to fill this gap and provides the results of an empirical study on the adoption of environmental initiatives in the contract logistics industry, along with the metrics used for environmental performance measurement and the barriers and drivers that may hinder or facilitate the adoption of these initiatives. After a careful literature review, a framework was developed to identify the initiatives towards environmental sustainability with a focus on companies involved in logistics and transportation processes. The framework was applied to a set of ten LSPs by examining their environmental reporting and a sub-set of three companies was finally selected for in-depth interviews. An analysis of the environmental sustainability initiatives of primary multinational LSPs and their adoption level is presented. The present paper contributes to the knowledge of environmental sustainability for logistics and transportation and offers new insights in theory, paving the way for further research on these topics.

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1. Introduction

Environmental sustainability has recently become more and more of a concern among both academics and practitioners (Gaziulusoy et al., 2013). Even if service industries are traditionally assumed to have a small environmental impact, logistics services operations can play a significant role in Green Supply Chain Management (GSCM) (Zailani et al., 2011), reducing the environmental burden of the supply chain, especially in terms of pollution and greenhouse gas emissions, waste disposal, and others (Lin and Ho, 2008; Maas et al., in press). In this context, logistics outsourcing can be viewed as a lever to pursue environmental sustainability goals: logistics service providers (LSPs) or Third Party Logistics (3PLs) can assume a more critical role in supply chain orchestration and management towards sustainability, having the capabilities to

develop solutions for more sustainable supply chains (Evangelista et al., 2010; Anttonen et al., 2013).

Although previous studies have made significant contributions to the literature on environmental issues in a variety of industries, much still remains to be learned about managing environmental issues in logistics and among LSPs (e.g. Lin and Ho, 2008; Fürst and Oberhofer, 2012). Even if environmental performance monitoring and measurement has started to be perceived as fundamental (Cucek et al., 2012; Scipioni et al., 2012; Stechemesser and Guenther, 2012), still very few studies related to applications in the contract logistics industry are available.

This paper aims to fill this gap by providing the results of an empirical study on the adoption of environmental initiatives in the contract logistics industry. As in the study by Colicchia et al. (2011), which examined the environmental reporting of a set of manufacturing companies to assess the adoption of a number of environmental initiatives, the purpose is to provide an analysis of environmental sustainability, but with a particular focus on the logistics industry. This research also aims to examine how the environmental performance of LSPs is assessed and measured by the companies.

The paper is organised as follows. The next section outlines the theoretical background and the research questions, while the

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methodology used in the study is described in Section 3. Based on a thorough review of the literature, Section 4 illustrates the framework used to identify and assess the main initiatives towards environmental sustainability that may be adopted by companies involved in logistics and freight transportation processes. Section 5 discusses the results of the analysis of environmental reporting by companies involved in this research, and presents comparisons with the literature, while in Section 6 the insights gained through the case study analysis are presented. Section 7 offers a discussion of the study results. In the final section, conclusions are drawn, research limitations are identified, and potential directions for future research are identified.

2. Theoretical background and research questions

The subject of environmental sustainability focussing on the activities of LSPs has been gaining increasing interest. Some previous contributions discuss the impact of logistics outsourcing on supply chain sustainability (Evangelista et al., 2010; Facanha and Horvath, 2005; Jumadi and Zailani, 2010); others examine the LSPs commitment to environmental sustainability (Murphy and Poist, 2003; Zailani et al., 2011); still others attempt to analyse factors that may influence the adoption of green practices by logistics companies (Lin and Ho, 2008) or whether environmental issues represent a selection criteria when buying logistics services from companies (Wolf and Seuring, 2010).

However little attention has been paid to the adoption level of specific environmental initiatives by LSPs and the reasons, both strategic and operative, underpinning their commitment to building a sustainable supply chain.

Previous studies on GSCM have provided a number of theoretical constructs, such as stakeholder theory, stewardship theory, institutional theory (McWilliams et al., 2006). To the extent that companies engage in GSCM from both a strategic and operational point of view, their behaviour can be examined through the lens of the natural-resource-based view (NRBV) of the company (Maas et al., in press; Shi et al., 2012). This latter theoretical construct better reflects the objectives of the present study. As such, in this paper we extend past research on GSCM with a particular focus on the logistics industry by drawing on the NRBV of the company. Hart (1995) first introduced this theory. According to this study “it is likely that strategy and competitive advantage in the coming years will be rooted in capabilities that facilitate environmentally sustainable economic activity”. The author introduces two interconnected strategies for manufacturing companies that can be implemented to effectively achieve competitive advantage, i.e. pollution prevention and product stewardship. This theory has been recently adopted by Maas et al. (in press) in the context of LSPs: pollution prevention refers to LSP internal operations while product stewardship can be applied to service operations in terms of service stewardship that extend the scope of the sustainability initiatives across company boundaries. This latter strategy is thus related to the ability of LSPs to provide environmentally sound service offerings by collaborating with the other partners of the supply chain. The NRBV of the company has been successively extended by Shi et al. (2012). By drawing on the NRBV theory the authors proposed a conceptual model of GSCM that includes the following elements and the relationships among them:

- *intra-organisational environmental practices*, refer to environmental initiatives related to company “in-house” processes coherently with the pollution prevention strategy of the NRBV
- *inter-organisational environmental practices*, refer to environmental initiatives that imply collaboration and trust among

multiple supply chain members coherently with the product stewardship strategy of the NRBV

- *performance measures*, refer to environmental, operational and financial measures needed to explore the effect of environmental initiatives
- *institutional drivers*, refer to external forces that motivate companies to adopt environmental initiatives coming from regulators, the market and competitors coherently with the institutional theory.

Based on the above described scenario and according to this conceptual model, the aim of the present paper is threefold:

- First, to identify the initiatives towards environmental sustainability currently in place among LSPs, distinguishing between intra-organisational and inter-organisational environmental practices (RQ1).
- Second, to investigate the methodology used by LSPs and the areas addressed when measuring environmental performances (RQ2).
- Finally, to explore the institutional drivers behind the adoption of these initiatives by LSPs, along with their interactions with performance improvements (RQ3).

3. Methodology

To achieve the above-stated research objectives, an in-depth review of the existing literature on this topic was initially performed. For the purpose of the present study, the analysis focused on companies operating in the contract logistics industry and the environmental dimension of sustainability (Carter and Rogers, 2008) was specifically taken into account.

The following three-phase methodology was adopted (Fig. 1).

First, based on the review by previous studies, a framework was developed to identify the initiatives towards environmental sustainability at companies involved in logistics and transportation processes, distinguishing between intra-organisational and inter-organisational environmental practices. In particular the framework consists of seven macro-areas, i.e. distribution strategies and transportation execution, warehousing and green building, reverse logistics, packaging management, internal management, collaboration with customers, external collaborations. A systematic literature review approach was undertaken that allows for a more objective overview on the search results (Colicchia and Strozzi, 2012; Denyer and Tranfield, 2009). The literature review focused on scientific journal articles. The starting point for the paper search was a number of library databases (i.e. Scopus, Science Direct, ISI Web of Knowledge, Scirus and Google Scholar). The search was conducted using keywords and strings (e.g. ‘Sustainability’, ‘Green Supply Chain Management’, ‘Green logistics’, ‘3PL’) that were looked for in both the abstract and main body of the paper. We also went back to other papers by cross-referencing, thus to include potential papers that were not picked in the above-mentioned databases. This method allowed us to include contributions published in all the major logistics and transportation journals, as well as the top management journals and conference proceedings. We are therefore confident that the main contributions on this topic have been included within the framework.

Second, the framework was applied to a set of LSPs by examining their Company Environmental Reporting (CER), to assess the adoption level of each initiative. In order to compare the implementation of the proposed initiatives, the Environmental Performance Index (EPI) was computed for each of the identified macro-areas of sustainability initiatives. As suggested by Colicchia et al. (2011), the EPI for each company k can be defined as follows:

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