



Environmental sustainability practices in the transport and logistics service industry: An exploratory case study investigation



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ABSTRACT

As demand for advanced logistics services grows, third-party logistics providers (3PLs) are being requested to provide more environmentally sustainable services. This development presents 3PLs with opportunities but also challenges and concerns about how to translate green efforts into practice. The purpose of this paper is to analyse environmental sustainability initiatives undertaken by 3PLs and the factors influencing them, both positively and negatively. The research methodology used in this paper is based on two-phase approach. In the first phase, a systematic literature review on the adoption of green initiatives by 3PLs has been carried out and two research questions have been identified. In the second phase, the research questions have been addressed by a case study analysis conducted on 13 Italian transport and logistics service providers. The research has distinguished three groups of companies with slightly different environmental profiles in terms of the green initiatives implemented and the main drivers and inhibitors. The surveyed companies show a differing degree of involvement in green initiatives due to variations in the breadth of service offered and the importance attributed to environmental issues. The paper concludes with a discussion of the managerial implications of the research, particularly for the development of 3PL's green strategies.

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1. Introduction

In the 21st century, the greening of supply chains has become an increasing concern for many businesses and a major challenge for their logistics management (Zhu, Sarkis, & Lai, 2008). As a result, environmental sustainability has become a critical issue for the third-party logistics service providers (3PLs) to whom they outsource their logistics (WEF, 2009).

The supply chain role of 3PL firms evolved has substantially over the last few decades shifting from executing operational and repetitive activities toward a more complex supply chain orchestration model. The evolution of this model is the result of efforts to improve customer-supplier relationships (Esposito & Raffa, 1994; Esposito & Passaro, 1997) and continually expand the range of services offered especially into higher value-added and more technologically sophisticated services that are considered points of differentiation (Evangelista, Sweeney, & McKinnon, 2013). Over the last few years, this evolving process has included more environmentally sustainable services. An increasing number of 3PLs have started to transform their operations and strategies to be more effective from a green perspective (Zailani, Amran, & Jumadi, 2011). There are two main reasons for this trend. The first is a desire to improve customer relationships through supporting their environmental sustainability programmes (e.g., shared initiatives to

reduce the supply chain's environmental impact and increase the visibility on transport and logistics carbon emissions along the supply chain) (Evangelista, Sweeney, Ferruzzi, & Carrasco, 2010; Lammgard, 2012). From this point of view, 3PLs are expecting that environmental sustainability will soon become a selection criterion (Genovese, Koh, Bruno, & Esposito, 2013). The second reason relates to the opportunities to reduce costs (by raising energy efficiency, gaining access to subsidies, and cutting taxes) and increase sales (e.g., by improving brand perception, building consumer demand for green products, and winning new customers) (Deutsche Post DHL, 2010; van Hoek & Johnson, 2010).

In addition, environmental aspects of the transport and logistics have become a more serious concern since products are being moved over greater distances and this trend is forecast to continue (ITF, 2013). Therefore, it is necessary to make greater efforts to mitigate the negative consequences for the environment of this additional freight movement (McKinnon, 2008). This is particularly true for Italy, one of the European countries where the percentage of goods moved by road transport accounts for almost 60% of total domestic tonne-kilometres in 2011 (Ministero delle Infrastrutture e dei Trasporti, 2012). Accordingly, 3PLs are increasingly being requested to drastically reduce their externalities.

From the research point of view, most studies of environmental issues have focused on manufacturing sectors and relatively little attention has been paid to the service sectors (Foster, Scott, & Dunn, 2000; Ramus & Montiel, 2005; Ostrom et al., 2010), such as the logistics service industry in China (Lin & Ho, 2011). In addition, there is a great

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deal of uncertainty about the deployment of green strategies by 3PLs especially with respect to their justification and implementation (Evangelista, Hüge-Brodin, Isaksson, & Sweeney, 2012; Wolf & Seuring, 2010). To date, qualitative methodologies such as case studies have been rarely used in green logistics/SCM research to shed light on these issues (Evangelista et al., 2010).

The main aim of this paper is to examine two aspects of the environmental sustainability practices in 13 Italian 3PL case studies: (i) the type of green initiatives they have implemented and (ii) the barriers and drivers affecting the adoption of such initiatives.

The next section summarizes the results of a literature review on environmental sustainability in the logistics service industry. The literature review has led to the identification of two research questions. The third section outlines the methodology used for the case study analysis. The main findings of the case study investigation are presented in the fourth section. Finally, conclusions and implications deriving from the study are discussed in the fifth section.

2. Literature review and research questions

Relatively little research has been published on the sustainability strategies and actions adopted in the logistics service industry. For example, environmental sustainability issues are hardly mentioned by the some of the main literature reviews in the field of 3PL research (Maloni & Carter, 2006; Marasco, 2008; Selviaridis & Spring, 2007).

More recent papers have confirmed this view. Lin and Ho (2011), for example, argued that much still remained to be learned about environmental management in the logistics service industry. Lieb and Lieb (2010b) noted that very little attention has been given to environmental sustainability activities in the context of the third-party logistics companies. Wolf and Seuring (2010) came to a similar conclusion stating that little research was specifically dedicated to the green initiatives adopted by 3PLs. Finally, Colicchia, Marchet, Melacini, and Perotti (2013) and Perotti, Zorzini, Cagno, and Micheli (2012) noted that few papers investigated the specific environmental actions implemented by 3PLs and their reasons for trying to green supply chains.

The objective of any systematic literature review is to identify a number of key articles (mainly peer-reviewed articles) without accidentally excluding other relevant studies. In order to reach this objective, it is important to set up an effective search strategy for the selection of appropriate material. This bibliographic search was carried out for the period 2000–2013. The paper by Rondinelli and Berry (2000) was the first article published on the specific topic under investigation, and it served as a starting point for the author's analysis. The search strategy has been based on the use of two bibliographic databases: Scopus (www.scopus.com) and Web of Science (<http://apps.webofknowledge.com>). These two databases were selected because of they provide a broad coverage of management and engineering journals. To identify relevant articles, a structured keyword search was carried out. In particular, the keywords “green,” “sustainab*,” “energy efficiency,” and “CO₂ efficiency” were used in combination with “logistics service providers,” “third-party logistics,” “3PL,” “LSP,” “road freight transport,” and “road freight hauler.” A total of 198 papers were initially identified. Narrowing the search to only include items in the Social Sciences and Humanities subject area of the Scopus database and the Social Sciences subject area of the Web of Science database, the number of papers fell to 127. The output obtained from the two databases was then compared. This led to the elimination of 38 duplicate papers leaving a total of 89 papers. In a further step, two inclusion/exclusion criteria were established. The first criterion related to the inclusion of peer-reviewed journals articles published in scientific journals only. As a result, conference papers, prefaces, editorial notes, reviews, research reports, and other editorial materials, in addition to any articles from magazines or industry publications, were excluded. The second criterion involved the specific inclusion of papers with a management focus (i.e., papers with a focus on technical or political science aspects were

excluded). Taking the above two criteria into account and following consideration of the title, abstract and keywords of each paper, 32 articles were included in the final sample. These 32 articles all relate to the relationship between environmental sustainability and logistics service providers.

It was possible to classify the selected papers using two criteria: research methods used and topic areas. In terms of the research methodologies adopted, the vast majority of articles are based on quantitative methods (20 papers), with only nine papers using qualitative techniques and three proposing conceptual frameworks.

Five different topic areas were identified (see Table 1):

1. Papers dealing with factors affecting the adoption of green initiatives by 3PLs (eight articles)
2. Papers dealing with innovation and ICT tools supporting the adoption of green initiatives by 3PLs (four articles)
3. Papers examining the implementation of green initiatives and the impact on 3PLs' performance (eight articles)
4. Papers discussing energy efficiency in road freight transport companies (seven articles)
5. Papers discussing buyers' perspectives and collaboration when sourcing green 3PL services (five articles).

The following sub-sections provide an overview of the main contributions of papers in each of the five topic areas listed.

2.1. Factors affecting the adoption of 3PLs' green initiatives

The first topic area relates to papers focused on factors influencing the adoption of green initiatives by logistics service companies. In an early work, Wong and Fryxell (2004) examined the influence of stakeholders on the environmental management practices in fleet management in Hong Kong. The study found that environmental management practices among fleet managers appeared to be significantly influenced by stakeholders, and they were mainly driven by internal considerations rather than external pressures.

Lieb and Lieb (2010a) surveyed 20 CEOs of large logistics companies operating in the North American market. The findings indicate that the most important factors triggering their involvement were “the corporate desire to do the right thing” and “customer pressures.” The paper of Jumadi and Zailani (2010) highlighted the importance of customer influence on the green practices of 3PLs. They argued that customer relationships have a positive influence on the adoption of green actions in the logistics service sector in Malaysia. The work of Beskovnik and Jakomin (2010) discussed the challenging role of green logistics in Southeast Europe. They identified long-term contracts as an important driver for the implementation of green measures by logistics companies.

The survey carried out by Lin and Ho (2011) on a sample of 322 logistics service companies in China reveals that the adoption of green practices is affected by factors both internal and external to company. Their analysis indicates a number of influencing factors, such as regulatory pressures, governmental support, organizational support, and the quality of human resources, that have significantly positive influences in driving green practice. On the other hand, environmental uncertainty and the complexity of green practices act as barriers. Interestingly, the influence of customers was not found to be significant for Chinese 3PLs.

Table 1
Categorisation of the literature by topic areas.

Topic area	No. of papers
1. Factors affecting the adoption of 3PLs' green initiatives	8
2. Innovation and ICT tools supporting 3PLs' green initiatives	4
3. Green initiatives and 3PLs' performance	8
4. Energy efficiency in road freight transport companies	7
5. Buyer's perspective and collaboration	5
Total	32

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