

# SUSTAINABILITY AND INNOVATIVE LOGISTICS RELATIONSHIP WITH 3PLS PERFORMANCE IN MALAYSIA'S MANUFACTURING SECTOR

**Omotayo Adebare Awoyemi**

Department of Logistics, School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia, 06010, Sintok, Malaysia, simpletayo2008@yahoo.com (corresponding author)

**Mustakim Bin Melan**

Department of Logistics, School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia, 06010, Sintok, Malaysia, mustakim@uum.edu.my

**Hassan Mohamad Ghozali**

Department of Logistics, School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia, 06010, Sintok, Malaysia, ghozali@staf.uum.edu.my

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**Abstract:** The advent of SPV2030 and global Sustainable Development Goals (SDGs) spurred many countries into action to meet up with the national and global requirements as highlighted in the national and Global policies. Malaysia desires to achieve SPV2030, and it demands the cooperation of all sectors, including logistics, especially, Third Party Logistics companies and the Manufacturing sectors. Furthermore, it has been a great challenge to the world as the whole earth experience global warming. Therefore, all efforts are demanded to reduce or minimise the earth's warming. In line with these two important policies, SPV2030 and SDGs, this research study examines the influences of sustainability and innovative logistics on 3PLs performance in Malaysia's manufacturing sector. This study utilised a quantitative research method by preparing a good, structured questionnaire survey using systematic random sampling. About 333 copies of the questionnaire were distributed electronically, while analysis was done on 229 questionnaires, estimated as 69% of the total questionnaires. SPSS version 20 was used as software for the statistical analysis. The findings show that using innovation in green logistics as a moderation factor in the relationship between 3PLS service providers and key performance is significant. This fulfils the SPV2030 strategic thrust number 2 that Malaysia is to build resilient key new sectors. Furthermore, the findings on innovative green logistics also moderate the relationship between packaging services and operational performance, and this also fulfils a cardinal Sustainable development point goal.

## 1 Introduction

Issues of environmental preservation have become a subject of great concern for governments, people in society, business stakeholders and organisations. Environmental challenges like ozone depletion, global warming, air pollution and solid waste, and business organisations, particularly manufacturing firms, are considered major sources of environmental challenges. In Malaysia, the manufacturing sector is one of the major contributors to the economy's growth, but unfortunately, it has been the cause of environmental deterioration (DOE, 2010). This is because their line of operations yields more emissions when compared to other industries in the process of fulfilling consumers' needs (Rozar, Mahmood, [1]. This needs to be checked adequately, and a research study that deals with the green logistics of 3PLs providers is important.

Based on the growth of the global economy and the global supply chain network, the logistics network has become more ambiguous and is located distantly. The distance covers to determine the number of emissions resulting in larger environmental challenges. The affix,

"Green logistics", is a novelty, and it is connected to planning and the logistics flow by integration of modern techniques of logistics with the main focus of minimising the hazards to the environment. The logistics flow should also be to the customers' satisfaction and the organisation's goals, coupled with the main focus of reducing the influence of these actions on the environment. Hence, as a novel idea, green logistics is the organisation's potential to deliver services and products in a friendly environment along with an efficient economy.

In Malaysia, the traditional green notions are usually linked to some challenges and weaknesses. For example, an approach such as the end-of-the-pipe method does not eliminate pollutants but transforms them from one material medium to another [2]. Another issue is that the focus on green practices within an organisation may expose it to the unpleasant environmental act of other organisations within its supply chain. For example, the small supplier's eco-friendly performance can negatively impact other purchasing companies' image and performance [3,4]. Also, the stakeholders at the community level often find it difficult to make a distinction between an organisation's environmental procedure practices and its suppliers'

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Omotayo Adebare Awoyemi; Mustakim Bin Melan; Hassan Mohamad Ghozali

environmental procedure practices [2]. Therefore, investigating the moderating impact of new innovation practices in 3PLs logistics operations is necessary.

## 2 Literature review

### 2.1 Third-Party Logistics and outsourcing

The Third-Party logistics service providers (3PLs) concept is a result of the necessity to get another party to manage the task of logistics services on behalf of particular organisations. The whole thought is to allot main logistics workloads to another person who can handle it more efficiently and efficiently. That is, the manufacturer focuses more on the core competency functions and gives room for other organisations to transport their produce to the end users, the customers. As a result, many manufacturing companies have been enjoying the benefits of outsourcing logistics functions. This includes, among others, operational efficiency, enhanced service level, greater flexibility and permitting manufacturers to concentrate on their core business since the benefits of logistics and transport can be obtained [5].

Several manufacturing companies have practised 3PLs' concepts, but there is still a knowledge gap in the Face-to-Face explanation on 3PL operations among customers and suppliers. Hence, there are still rooms for efficiency enhancement and relationship marketing which could result in the long-term breakeven of both the end users and 3PL service providers.

There are several benefits from outsourcing practices as opined by past researcher such as [6], where by it was established that above 83% of the organisation engaged outsourcing system recorded a significant drop of their purchasing cost, then, more than 73% recorded transactions cost saving, while more than 60% were enable to bring down their procurement and sourcing cycles. In the research conducted by [7], this assertions was corroborated when he explained that most significant reason highlighted for sourcing is reduction of cost and that 30% of outsourcing plans were not approved for continuity because of failure to meet the targeted cost reduction level.

### 2.2 Third Party Logistic practices in Malaysia

Malaysia's determination to move in line with realising a regional hub for included logistics services will eventually serve as a boost to logistics industry. There are high level emphasis given to transport and logistics industry in the 11<sup>th</sup> Malaysia Plan (2016-2020). The strategic area of concentration are majorly on the development of logistics, transport and supply chain management sector to enhance the efficiency, performance and productivity at every local ports and series of logistics operations. Aside this, there have been allocations in a massive form to further improve the systems of information systems to back up the sector. The perception, in the offing, is to enhance Malaysia's ranking in World Bank Logistics Performance Index in the nearest future. The ranking was conducted among 160 countries and it

shows a marvellous upgrading from 2013, which was 29<sup>th</sup> position and in 2014, which was 25<sup>th</sup> position.

Likewise, in a research survey conducted by [8] in Malaysia, it is established that manufacturing company prefer the engagement of co ntract logistics and transport services whereby around 67.7% of the manufacturing companies samples in Malaysia, in this research scope, it is local operations.[8]. The concentration is differs for other countries, in which 3PLs sector is more of international standard focused[9]. As there is growth of manufacturing companies, there is a surge in the need for logistics support. All manufacturing companies, operating in Malaysia, both multinational and local companies, is mandated to experience high level development in the Asia Pacific region, and at a yearly compounded level of growth rate of 12.93%. This led to the growth of the marvellous growth in Malaysia's logistics sector. In the publication submitted by Global growth consulting company [10], it is significant to note that Malaysia is ranked among the first four in the World Logistics Sector.

### 2.3 Sustainable logistics

Sustainability was defined by Brundtland Commission from 1987 as "the development that meet the needs of the present without compromising the ability of the future generations to meet their own needs" [11]. It can be deduced from the definition that the development is mainly sustainable when environmental and social development are put side by side with economic growth. In the literature of logistics, the last years have witnessed quite an increase in the research publications related to logistics and transport industry in connection with sustainability, for instance [12,13]. The research varies from literature reviews and conceptual discussions on the interpretation of the term relatively to logistics context [13,14] to examine how decisions on various level of hierarchy within a system of logistics which may influence the sustainability system [15].

Although, it is usually argued that different parts of the triple bottom line, such as environmental, economical and social perspective [16], supposed to be put into consideration. Several researches on business is particular with environmental perspective in connection with more of the traditional economic perspective [16]. In the community of logistics, the research on the intersection has been marked green logistics [17] and research on the concern topic is about multiple logistics matters examines from the perspective of "green technology", which includes, among others, network structure [18], e-retailing [19] third party logistics service providers [20], as well as lean operations [21]. Logistics management is the section of supply chain that highlight plans, the implementation and controls the efficient, successful forward and reverse flow and goods storage, services and connected information between centre of origin and the consumption origin so as to meet the requirement of customers (CSCMP, 2011), "green logistics" can be observed as having similar

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Omotayo Adebare Awoyemi; Mustakim Bin Melan; Hassan Mohamad Ghozali

objectives while concurrently reducing environmental influence from the operations. Therefore, "green logistics" implied a system of logistics which is designed not only to be environmental friendly, but also economically efficient [22]. In this vein, "green logistics management signify organisational potentials to resource conservation, minimise waste, enhance operational efficiency, and satisfy the social expectation for the protection of the environment [23]. Therefore, this study aims to investigate influence of innovative logistics and sustainability on the 3PLs service producers. Based on literature, the following hypothesise were developed:

- H1a. Innovation on Green Logistics as a Moderating Effect on Logistics Services and Services Performance
- H1b. The degree to which sustainability is part of 3PLs and manufacturing organisation's strategy significantly influence the work amount done in the process of greening the transportation process.

**3 Methodology**

The method of research employed in this study was quantitative research study and it follows the highlighted procedure in [24].

**3.1 Data collection**

A questionnaire survey was the key data collection tools. In this study, 333 senior staffs and managers were respondents. The empirical data was gathered and collated using a web-based survey. The completed and returned questionnaire was 256 and this mark about 77% approximately.

**3.2 Findings and discussion**

**Respondents' demography**

The gender results shows that male respondents is more than female respondents. Figure 1 shows that male respondents are more than the female respondents.

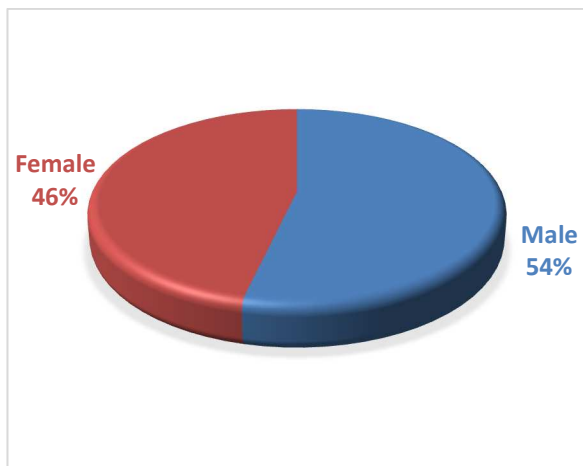


Figure 1 Respondents gender

The respondents ages are in ranges and the result shows that those respondents in the age ranges from 26-35 years while those on the ranges of 18years to 25 years recorded the second. The result is shown in Figure 2.

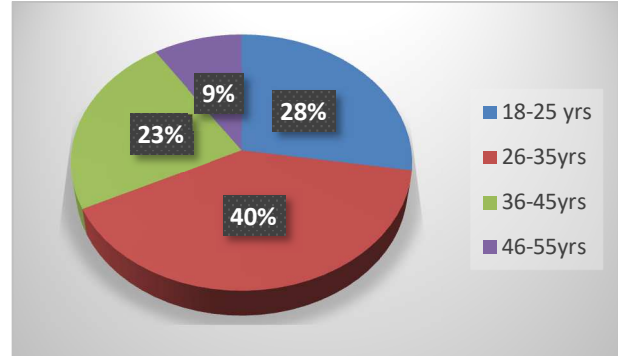


Figure 2 Respondents age ranges

The qualifications of the respondents are shown in Figure 3. More of the respondents are graduates.

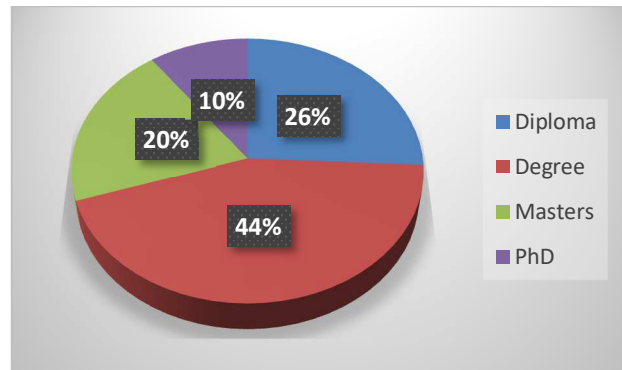


Figure 3 Respondents qualification

The individual position of respondents are shown in Figure 4. It shows that most of the respondents are others in their respective companies. Following this, are the executives of various companies. The least among the respondents are planners.

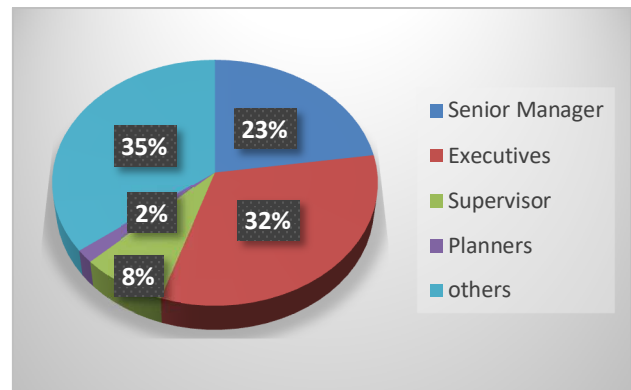


Figure 4 Respondents position

**SUSTAINABILITY AND INNOVATIVE LOGISTICS RELATIONSHIP WITH 3PLS PERFORMANCE IN MALAYSIA'S MANUFACTURING SECTOR**

Omotayo Adebare Awoyemi; Mustakim Bin Melan; Hassan Mohamad Ghozali

**4 The findings about green logistics moderations on 3PLs performance**

**4.1 Innovation on green logistics as a moderating effect on logistics services and services performance**

Table 1 shows the result of the hierarchical regression between logistics services and services performance. Thus, examining of the interaction of transportation services with innovation of green logistics revealed ( $t = -1.700$ ;  $p = 0.091$ ). This indicated that innovation of green logistics does not moderate the relationship between transportation services and services performance. Thus, the hypotheses  $H_{1a}$  is not supported. Based on the interaction terms of warehousing services innovation of green logistics, the result of the hypotheses showing ( $t = 2.588$ ;  $p = 0.010$ ). This indicated that innovation of green logistics moderate the relationship between warehousing services and services performance. Thus, the hypotheses  $H_{4b}$  was supported. In addition, examining of the interaction of inventory management with innovation of green logistics revealed this, ( $t = 2.416$ ;  $p = 0.016$ ). The result indicated that innovation of green logistics moderates the relationship between inventory management and services performance. Thus, the hypotheses  $H_{1b}$  was supported. However, examining of the interaction of packaging services with innovation of green logistics revealed ( $t = -1.183$ ;  $p = 0.238$ ). This indicated that innovation of green logistics does not moderate the relationship between packaging services and services performance.

In all the services performance considered, it can be established through the result that innovation of green logistics does not moderate the relationship between transportation services and service performance. On the other hand, it moderate the relationship between inventory management and service performance. This may be as a result of the transportation system that can be moderated by the introduced innovate green logistics whereby the vehicle used for transportation and logistics can be carbon free, hence be environmental friendly. It can assist it minimising the rate of carbon produced and emitted by the type of vehicles used in the transportation and logistics operation. This is also in compliance with the sustainable features. On the other hand, the inventory services is also moderated by the innovative green technology, whereby paperless techniques, ICT incorporations can be in the procedures. Likewise, the procedure of adequate reduction in time wastages and general wastages of services and products are part of parameter for sustainability. Whereby, they all discussed about innovation and learnin, customer integration, operational performance and business performance.

Meanwhile, it was observed that innovate green logistics does not moderate the relationship between packaging services and services performance. This relationship was not supported. This may be because the packaging process is the key responsibilities of the manufacturing company and not that of the 3PL service provider.

*Table 1 Innovation on green logistics as a moderating effect on logistics services and services performance*

Indirect Hypotheses	B	t	Sig.	Decision
Interaction Transportation-<Inn->service performance	-0.094	-1.700	0.091	Not moderated
Interaction Warehousing ->Inn->service performance	0.134	2.588	0.010	Moderated
Interaction Packaging ->Inn->service performance	-0.056	-1.183	0.283	Not moderated
Interaction inventory -> Inn -> service performance	0.124	2.416	0.016	Moderated

**5 Conclusion**

In summary, it can be deduced from the outcome of the result that interaction terms of warehousing services with innovation of green logistics indicate that innovation of green logistics moderates the relationship between warehousing services and financial performance. Also, the interaction of packaging services with innovation of green logistics showed that innovation of green logistics moderates the relationship between packaging services and financial performance. Meanwhile, the interaction of inventory management with innovation of green logistics revealed that innovation of green logistics moderates the relationship between inventory management and financial performance. All these findings about the influence of green logistics on the services and operations of 3PLS service providers shows a significant and positive impact on their performance relatives to some their operations. Hence, this is supported by past researchers outputs as this

outcome has been corroborated and juxtaposed the adoption of green practices to adoption of technological innovation process [25-27].

In line with the government policy SPV2030, this study's findings in the perspective of making innovation in green logistics as a moderating factor in the relationship between 3PLs service provider's key performance factors and green logistics in the Manufacturing industry of Malaysia. Hence, it fulfils one of the key economic growth activities or operations under strategic thrust 2 that Malaysia is to build resilient key new sectors in both renewable energy and green economy.

Likewise, with Sustainable Development Goals, this research output in innovative green logistics which moderate the relationship between packaging services and operational performance. This goes to show that the result is beneficial in the area of fulfilling one of the cardinal points of sustainable development goal, goal number 8 to

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Omotayo Adebare Awoyemi; Mustakim Bin Melan; Hassan Mohamad Ghozali

be precise. Where it was stated that SDGs promote economic growth that is sustainable with higher level of technological innovation and productivity. The goal is to attain productive and full employment with decent work for all men and women by 2030.

This study recommends that future research can look into this topic using qualitative method and also includes all the logistics and supply chains responsibilities of 3PL service providers. The performance measurement of the 3PL service providers can be taken care of in the light of green logistics.

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**SUSTAINABILITY AND INNOVATIVE LOGISTICS RELATIONSHIP WITH 3PLS PERFORMANCE IN MALAYSIA'S MANUFACTURING SECTOR**

Omotayo Adebare Awoyemi; Mustakim Bin Melan; Hassan Mohamad Ghozali

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**Review process**

Single-blind peer review process.