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Leveraging Technology for Sustainable Logistics: Logistics Performance Index in Inland Ports with Eco Strategy and Sustainable Practices

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Abstract: The growing global awareness of sustainability and the recognition of interconnectedness across the world have elevated the significance of factors such as the Logistics Performance Index (LPI), Eco Strategy, and Sustainable Performance within the logistics and transportation sectors. Environmental and social responsibilities have firmly entrenched themselves at the forefront of both public and private corporate agendas. In the context of this research, the study delves deep into the examination of sustainable practices and eco strategies that exert a discernible influence on the Logistics Performance Index. This examination is facilitated through the collection of responses from top management personnel within inland ports, shedding light on the pivotal role of sustainable strategies in optimizing logistics performance. Moreover, to harness the transformative potential of technology and further bolster sustainable practices, logistics corporations are actively embracing the development of a state-of-the-art Dry Port Measurement Toolkit (DPMT). This innovative toolkit seamlessly integrates the crucial components of the Logistics Performance Index (LPI), Eco Strategy, and Sustainable Performance practices. It offers a comprehensive approach geared toward enhancing the environmental and social dimensions of logistics operations, ultimately fostering a more sustainable and responsible logistics industry.

Keywords: *Inland port; Logistics Performance Index; Eco strategy; Eco Technology; Sustainable practices*.

1. Introduction

One definition of a dry port is a location that has cargo-handling facilities to facilitate cargo activities. Assembly service, non-permanent storage, customs processing, and distribute to various type of transportation. There are parties related with supply chain and by combining public and private infrastructure it improves their communication [1]. Inland port is another name for dry port. It is an inland intermodal terminal that has a direct link to a seaport. Cargoes can be picked up or dropped off at the intermodal terminal thanks to this arrangement. The dry port provides the same high standard of service as the ports in areas such container storage, maintenance and cleaning, and customs processing. Because of the dry nature of the port, valuable real estate near the water may be released for other uses [2].

As the volume of traffic at cargo shipping ports continues to rise, Malaysian dry ports have assumed a significant role as the expanded gates of major seaports. Lacking enough infrastructure and facilities, most of Malaysia's dry ports can only offer limited help to the neighbouring seaports. The limited number of containers processed by dry ports is indicative of this. In addition, the service provided by dry ports in Malaysia are not met the demands of the clients. The distance between dry port and seaport, the availability of road and rail system, the ease of access in seaport, connectivity to other type of transportation and poor planning[3].

A dry port that connected to seaport via rail and features multimodal facilities can increase the capacity of existing seaports by facilitating the transfer of cargo to vehicles or neighbouring warehouses. Since goods are redirected to intermodal facilities by rail, seaports situated near major cities also profit from trucks travelling through rural regions. As logistics become more streamlined, the environment benefits. Dry ports also serving the needs of the supply chain as a whole. There are several tiers of logistical activity at a dry port throughout the supply chain of any commodities [4]. Dry ports may also feature container yards, which are storage facilities for containers and may also offer customs clearance. Additional logistical operations and value-added pursuits may be included at a higher level at dry ports. Dry ports have the potential to develop into a processing hub at the most advanced levels. An industrial estate is a good illustration. When it comes to supply chain issues, close-range dry ports are useful since they deal with issues like land scarcity, traffic congestion, and environmental damage [5]. In situations when the supply chain is dispersed over a wide region, intermediate-sized dry ports serve as hubs for the many rail lines and services that make up that network [6].

Technology plays a pivotal role in sustainable logistics, optimizing operations through data analytics, automation, and real-time tracking. With advancements like IoT, blockchain, and AI, companies can reduce emissions, minimize waste,

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and enhance transparency. Embracing these innovations showcases their commitment to environmental stewardship and social responsibility in today's interconnected world. Therefore, this study tries to leverage the power of technology and further enhance sustainable practices, logistics corporations are adopting the development of a cutting-edge Dry Port Measurement Toolkit (DSMT), which combines the Logistics Performance Index (LPI), Eco Strategy, and Sustainable Performance practices.

2. Literature Review

Eco Strategy

Concerns about environmental sustainability in business have rapidly increased since the middle of the 1990s as a result of modifications to domestic and international regulations, new compliance requirements, opportunities for consistently positive relations, and rising customer and consumer expectations [7]. During the Industrial Revolution, there was massive economic progress, but there were also significant ecological consequences, such as natural disasters, air and water pollution, agricultural land degradation, war, economic and social inequity, relocation, and disease. A suitable framework for incorporating environmental issues into organizational strategic procedures has been suggested: corporate eco-strategy [8]. The "green method of operating business," often known as corporate environmentalism, is changing sectors all around the world and creating new business opportunities. Stakeholders are thus pressuring corporate managing directors to develop sustainable, social, and environmental practices [9]. The concept of "environmentally sustainable entrepreneurship" has been referred to under a variety of labels, including "sustainable entrepreneurship," "eco-entrepreneurship," "environmental entrepreneurship," and "green entrepreneurship.". All these terms refer to business owners and organizations who follow sustainable, environmentally friendly, and green operating principles and work to reduce their environmental effects [10]. The environmental aspect of sustainability is often defined as a company's capacity to manage in a way that minimises pollution and emphasises smart management of natural resources [11]. Eco-strategy implemented by organizations that bring positive impact namely as "eco-advantage" is a term used to describe sustainability with a competitive edge, where sustainability entails achieving economic success while delivering environmental and social benefits [7].

Eco-Office Activities

Challenge of environmental damage has recently gained a lot of attention. Earth's temperature has risen due to the greenhouse effect, contributing to global warming [12]. Another aspect contributing to climate change is the over usage of paper and plastic. Because more industries are using processed materials and packaging materials, environmental harm is getting worse.

Alternative eco-office measures, such as cutting back on electricity use, conserving water, managing trash using the 3Rs, reducing paper use, maintaining workplace hygiene, and managing food waste [13]. Success requires changing attitudes and behaviours, implementing new methods and making sustainability methods the norm rather than a special case used by a small group of “do-gooders” [11].

Eco-Information Technology

The development of a circular economy (CE), in which industrial procedures are based on sustainability principles including eco-friendly purchasing, reuse, recycling, and remanufacturing, is greatly aided by Industry 4.0. By incorporating circular economy principles, Industry 4.0 is a paradigm shift transforming the traditional business models used by industrial organisations. Through various emerging information, communication, and intelligence technologies, these transformative technologies compromise production flexibility, efficiency, and overall productivity [14]. Through environmental, social, technological, and economic innovation, the adoption of blockchain technology has the potential to revolutionize people's lives, businesses, and the global economy for decades. [15] suggested that the incorporation of corporate social responsibility (CSR) and green IT principles in ICT governance always implies sustainable governance; "a sustainable IT strategy should be coupled with the sustainability strategy on the scale of the organization."

Eco-Sourcing and Procurement

Eco-sourcing streamlines the conventional application process and provides total protection for individual staff members accessing sales and customer information in order to prevent loss or unauthorised access to important information [16]. By minimising the general increase in maintenance and inventory costs associated with existing conventional procedures, eco-sourcing also benefits businesses. It simplifies ordering processes, cuts down on fulfilment times, maintains user profiles, and permits customers to buy automotive products without limitation from anywhere in the world. The purchasing operations must be engaged with others in the supply chain department, and both must be exposed to the business's external environment. Pressure is generated, production performance is impacted, and ultimately, the company's overall competitiveness is affected. In reality, procurement places equal emphasis on the building's worth based on its cost and financial and environmental benefits [17]. Green purchasing has consigned concerns such as reducing waste, substituting materials with environmentally friendly sourcing, and reducing waste from hazardous products. Supplier management has become essential and necessary in establishing a green procurement strategy, as many top organizations find themselves "often

held accountable for their suppliers' environmental responsibilities" [18]. [19] discussed about green purchasing is becoming a more powerful instrument for reducing the environmental impact of consumption and advancing the advancement of clean-producing technologies.

Eco-Manufacturing and Process

Everyone involved in the manufacturing process, including engineers, plant managers, line workers, etc., can gain from using a green lens to identify cutting-edge ways to lower costs, lower risks, improve product quality, and produce other economic benefits [11]. Businesses can lower production costs, streamline the manufacturing process, lower operational risks, and better meet consumer requests with the help of green manufacturing. Green operations maintain the quality and environmental compliance of the inputs and outputs of electronics manufacturers as a cutting-edge environmental management strategy. In order to balance and increase financial performance as well as pollution reduction, green operations place an emphasis on product- and process-oriented environmental initiatives [20]. Manufacturing organisations must implement an eco-innovation strategy as they switch to sustainable production and repurpose outdated pollution control methods for a cleaner output. As part of their responsibility to protect the environment and the environment's resources, businesses, especially those that produce consumer electronics, are working to reuse, remanufacture, and recycle discarded goods [21].

Eco-Marketing and Sales

In order to meet consumer needs for performance, convenience, and affordability without having a harmful impact on the environment, green marketing comprises organising, creating, and controlling the four Ps (Product, Price, Place, and Promotion) [22]. Green marketing aims to present a product as environmentally beneficial [23]. Products that are considered green are often made from recycled materials and/or are designed for reuse, recycling, or remanufacturing. Typically, they are strong, economical in energy, and safe. Green, on the other hand, is a relative adjective that depends on the situation. Even while the product itself might not be ecologically friendly, it might have been created or distributed in a way that was. A wide range of activities is included in green marketing, including product modification, production process modifications, packaging changes, and advertising changes.

Eco-Legal and Regulatory Affairs

Both public and private sector businesses need to make sure they are following the law all the time [11]. Although this strict contribution to uniformity may appear straightforward, it may sometimes be challenging to keep in practice. Businesses must ensure they are fully compliant with the law before employing any of the more innovative practices. In other words, it's important to "be clean before you go green." In truth, companies that spend a lot of effort into enhancing their environmental reputation but do not address underlying environmental compliance issues typically run into trouble.

Environmental impact reduction initiatives are typically credited to governmental programmes, industry-led initiatives, and voluntary and regulatory standards [7]. Furthermore, organizations must recognise that while environmental legislation is crucial for achieving sustainability, it only makes up a small percentage of the fundamental legal system [24].

Eco-Accounting and Finance

Environmental accounting is a subfield of accounting. It provides reports for internal and external users, generates environmental data to assist management decisions regarding pricing, managing overhead, and capital planning, and divulges environmental data that is pertinent to the general public and the financial sector [25].

In fact, strict adherence to standard concepts and procedures can blind decision-makers to environmental risks and possibilities. The purpose of environmental accounting, a segment of modern accounting, is to provide management information to different hierarchical management levels so they can evaluate the financial impacts of implementing relevant regulations, standards, and protocols intended to support sustainable development [26].

Sustainable Practices

Depending on the context, "sustainability" might represent several concepts. The term is often used in the business world to refer to a "triple bottom line" approach to business, in which companies aspire to achieve not just great profits and economic results but also strong performance from an environmental and social aspect [11]. In order to assess a company's sustainability, its economic, environmental, and social performance, are considered [27]. The environmental aspect of sustainability is often defined as a company's capacity to operate in a way that minimises pollution and shows careful management of natural resources. For a company to truly be deemed "sustainable," all waste and emissions must be eliminated, and only materials made from renewable resources that are managed in a way that doesn't deplete the resource supply may be used. Few companies even come close to achieving this environmental aim. The social sustainability agenda addresses a variety of issues, such as workforce diversity, salaries, and training [11]. From a corporate viewpoint, the problem isn't just the considerable uncertainty of global governance's objectives; it's also the myriad of ecological worldviews and the lack of sustainability reporting, which includes the three aspects of governance and the performance of the economy, environment, and society [28]. The long-term goal of organisations, nations, and society at large is sustainability. The needs of customers, investors, and other stakeholders

necessitate ongoing improvements in environmental and social responsibility. Sustainability has occupied a central position in company plans across numerous industries and business sectors. Businesses that adopt sustainable practices aim to increase their profits, decrease their adverse effects on the environment, address social issues and show their clients and other stakeholders that they are corporately responsible [29].

Implementing management strategies that maximise shareholder value over the long term by seizing opportunities and controlling risks associated with social, environmental, and economic developments is necessary for achieving business sustainability [10], [30]. Sustainable business practices must include environmental and social concerns in corporate culture principles. Most of the operationalization of sustainable business practices takes place during management-related duties. Business practices that are sustainable improve brand value and competitiveness [31].

Logistics Performance Index (LPI)

The concept of logistics performance (LP) is multifaceted and can vary depending on the specific focus of research. Defining LP presents a challenge due to the multitude of objectives that businesses typically pursue, many of which may inherently conflict with one another [32]. However, the most widely accepted definition characterizes LP as the embodiment of both efficiency and effectiveness in action [33]. When viewed from a multidimensional perspective, logistics performance encompasses the extent to which efficiency, effectiveness, and distinctiveness are evident in the execution of logistics tasks [34]. In essence, LP not only serves as a valuable asset to businesses but also provides a benchmark against which they can gauge their performance, ultimately contributing to their ability to maintain competitiveness within their respective countries and align with their strategic goals. The efficiency with which resources are used and the efficacy with which objectives are met are two indicators of performance [33]. From another angle which is from a marketing standpoint, efficiency is the extent to which the firm's resources are used economically to provide the expectation of customer at certain level. When the expectation of customer is met shows the effectiveness [35] Differentiation, in addition, is defined as logistics' capacity to provide client value via the specialisation and individualization of logistical offerings [36].

Very little research is being done on LP in a Malaysian setting. The research may have looked at the view of users and logistics service provider (LSP) for the performance of logistics. While there are a few other studies on the topic, this one is one of the few that evaluates the performance of logistics in Malaysia in the perspective of trade facilitating and transportation. World Bank established the LPI as a collection of measurements to evaluate the efficiency of ports as a whole. World Bank also developed benchmarking metric for LPI. The Logistics Performance Index (LPI) helps consolidate data from several sources into a single, universal metric. But this metric has a narrow focus on measures of productivity, with sustainability metrics making up just a fraction of the KPIs (KPIs). Malaysia's logistics sector has international acclaim. According to the World Bank's 2014 Logistics Performance Index (LPI), Malaysia ranks 25 out of 166 nations worldwide [37]. But there is a lack of thorough investigation of logistics. This study empirically focuses more to user in analyses logistics performance, in contrast to recent research like the quality for logistics service by [38] in the Malaysian context. Customers are the ones to decide of logistics value creation [39]. Logistics performance measurement is of paramount importance in today's economically competitive environment. Developing, executing, and monitoring the efficient flow of products, information, and cash to fulfil the needs of the client is what the Asian Development Bank (2012) calls "logistics" [40]. The LPI is based on a poll of international shipping forwarders and express carriers about the logistical "friendliness" of the countries in which they do business and with which they deal. They have extensive familiarity with the nations wherein the they operate, as well as the ability to make

informed qualitative assessments of other trade countries and extensive experience with logistics on a global scale. The data for efficiency in the elements of logistics chain can be gather from the operator feedback. Aside from being a useful comparative tool, the index's focus on logistics service providers means that it measures performance from the user's point of view, making it the gold standard for demonstrating the facilitation of trade and logistics affability in international trade.

In this research, six (6) factors were employed to evaluate logistics effectiveness. According to the results, there is a need for additional research into how trade-friendly logistics services are in each Malaysian industry hub. Because of its superior logistical services, the manufacturing sector is likely to grow in the region. The World Bank's components and definition of LPI are outlined below:

a. **Customs:** Performance Index evaluates the speed and accuracy of the customs shipment process (speed, simplicity and predictability of customs agencies). This entire process is established throughout a series of organizational chores that enable the current legislation on international trade to be applied and tax on the shipping of products and services to be received.

b. **Infrastructure:** Transportation and communication networks are evaluated as part of the category. It has to do with how things are transported to the customer and is affected by factors outside of the company's control. However, it is essential to assess how businesses cope

with the existing facilities, whether they are a benefit or a hindrance that hinders them from being competitive.

c. **International shipments:** Measure the ease with which competitive international shipments can be arranged.

d. **Logistics competency and quality:** Competence and quality in logistics evaluated by this metric. It illustrates the actions of many stakeholders inside an organisation, standing in for service quality to customers and facilitating the best possible working relationship between businesses and their clientele.

e. **Trace and track:** Measures how well packages can be followed from origin to destination. Every shipment should be tracked from its initial departure point to its final destination so that its origin and destination may be determined. Traceability is the product of the collective effort of all participants in the goods' supply chain.

f. **Timeliness:** Delivery punctuality is a key performance indicator, thus we also track this. This is a crucial consideration since, given the current intense level of competition, missing delivery dates is just not an option. As a result, more complex computerization techniques have become necessary.

These factors have been shown to have a more significant effect on LPI than do factors like travel time and expense. Transparency in procedures, quality of processes, predictability and dependability of services, and so on are all examples of components of fundamental logistical value [41]

3. Research Methodology

Research methodology refers to suitable methods used to carry out research and to determine the effective measure in addressing the problem statement. An impact research methodology usually creates a minimum bias in data and increases trust in the accuracy of collected data.

Population, Sample Size and Sampling Technique

This research places its focus on individuals who are presently employed in or have previously held top management positions within the industrial sector of Bukit Kayu Hitam. The determination of an appropriate sample size is a critical aspect of our research, and we have adhered to established principles to guide this decision. Traditionally, a widely recognized guideline suggests a minimum of five respondents for each independent variable being investigated. However, some experts, as exemplified by [42], advocate for a more stringent approach with a ten-to-one ratio, emphasizing the importance of robust analysis. In line with the five-to-one rule, we would necessitate a minimum of thirty (30) respondents, while adhering to the ten-to-one ratio would require at least sixty (60) respondents. Given the constraints imposed by time limitations and practical considerations associated with obtaining an adequate number of respondents within our designated timeframe, we opted for a non-probability purposive convenient sampling method. This method allows us to select samples deliberately, focusing on individuals who are both readily accessible and relevant to our research objectives. Our target population comprises current and former top management employees of Bukit Kayu Hitam, and our aim is to draw samples from this specific group. The determination of our sample size, denoted as "n," was carried out utilizing the Krejcie and Morgan table as recommended by [43]. This calculation resulted in a sample size of 118 respondents, based on a population estimate falling within the range of 170-179 [44]. We distributed our questionnaires online using Google Forms. Our study used self-administered questionnaires, where respondents filled out the questionnaire themselves through Google Forms. The questionnaire had four sections: Section A included five questions related to demographic information such as specialty, company ownership, employee count, business operation duration, and industries served. Section B had 33 questions, Section C had 41 questions, and Section D had 21 questions. We distributed the questionnaire to respondents, and we received responses from 120 participants via Google Forms.

Data Collection Method

Data collection is the process of gathering, measuring, and analyzing accurate information using established and validated methods. Researchers use collected data to assess their hypotheses. This research employed two data collection methods: primary and secondary data. Primary data was obtained through direct communication with specific respondents and the distribution of questionnaires. Standardized questionnaires were used to enhance data recording speed and accuracy and simplify data processing. A specially designed questionnaire was distributed to the targeted respondents to gather information relevant to the research objectives. In this research, a Likert scale questionnaire was used. A Likert scale is a commonly used psychometric scale in surveys and is widely recognized for its use in research, although it is often referred to interchangeably with a rating scale, despite some differences.

Data Analysis Method

Data analysis is the process of examining data using logical and analytical reasoning. It involves a thorough examination of each component of the collected or provided data. The data obtained from questionnaires were coded and analyzed with the help of computerized software called SPSS (Statistical Software Package for Social Science), version 12. We used appropriate descriptive and inferential statistics to summarize the data. Additionally, a pilot study, as defined by [45], is a testing process for questionnaires with a small group of respondents. It allows researchers to identify and address any issues with items that may be unsuitable, unclear, or

confusing to respondents, giving them the opportunity for improvement or changes.

The pilot study has been conducted top management of Bukit Kayu Hitam firms with 20 respondents. Based on the pilot study conducted, all items in the questionnaires can be accepted with the reliability value above than 0.7. Table 1 describe the data of reliability Cronbach's Alpha for research instrument lies in between 0.944 to 0.960.

Table 1. Result of Reliability Test

Variable	No. of items	Items Deleted	Cronbach's Alpha
Sustainable Practices	21	0	.944
Eco Strategy	41	0	.960
Logistics Performance Index	33	0	.951

4. Analysis and Result

This section encompasses the patterns and analyses of results that bear direct relevance to the research questions and hypotheses posited. It serves as an intricate elucidation of the findings derived from the study, meticulously scrutinized and interpreted utilizing the Statistical Package for Social Science (SPSS). A pilot test, involving a representative sample of 20 respondents, was initially conducted to refine the survey instrument. Subsequently, the comprehensive survey was administered to a total of 120 respondents, all of whom held top management positions within Bukit Kayu Hitam. The demographic profile of the respondents was methodically delineated in Section A of the questionnaire, encompassing inquiries regarding the respondent's area of specialization in logistics, the organizational nature, the size in terms of the workforce, the duration of business operations, and the categorization of industries, further subdivided into ten distinct subcategories. The scale of measurement employed throughout this study adhered to the 5-point Likert scale. For the sake of clarity and precision in conveying the results, mean-scores were thoughtfully categorized into three distinct levels. Scores falling below 2.49 were categorized as 'low,' those between 2.50 and 3.39 were classified as 'moderate,' and scores ranging from 3.50 to 5.00 were denoted as 'high.

Table 2. Respondent's Demographic Profile

Profile	Frequency	Percentage (%)
Area of speciality		
Logistic Manager	12	10.0
Logistics Coordinator	10	8.3
Transport Manager	17	14.2
Distribution Centre Manager	16	13.3
Warehouse Supervisor	30	25
Warehouse Manager	18	15
Supply Chain Analysts	4	3.3
Others	13	10.8
Ownership of company		
Foreign Company	40	33.3
Private Company	55	45.8
State owned company	12	10.0
Joint venture company	13	10.8
Number of employees		
1-15	15	12.5
16-30	46	38.3
31-50	28	23.3
50 and above	31	25.8
Length of Business Operations		
1-5 years	25	20.8
6-10 years	53	44.2
11-15 years	16	13.3
15 years and above	26	21.7

Table 3. Mean Level according to variable

Variables	Mean	Minimum	Maximum
Sustainable Practices	3.8813	2.81	5.00
Logistic Performance Index	3.4576	2.03	4.70
Eco Strategy	4.3461	3.00	5.00

Table 3 presents the mean levels across different variables. As per the table, it is discerned that the 'Eco Strategy' variable exhibits a notably high mean score of 4.3461. This, in turn, signifies a pronounced prevalence of eco-strategy practices within the purview of companies operating in Bukit Kayu Hitam, with a demonstrable commitment to environmental sustainability. Following closely, the 'Sustainable Practices' variable registers the second-highest mean score, standing as a testament to the robust implementation of sustainable practices within the logistics sector of Bukit Kayu Hitam's corporate landscape. Conversely, the 'Logistic Performance Index' variable reflects a mean score of 3.4576, suggesting a moderate level of adherence to practices associated with logistic performance index. In summation, the mean levels across these variables collectively portray a spectrum ranging from moderate to high, indicating a commendable commitment to eco-strategy and sustainable practices within the corporate milieu of Bukit Kayu Hitam.

Table 4. Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of estimate
1	.567	.322	.310	.391

Turning to the findings presented in Table 4, the R-value of 0.567 indicates a robust relationship between the two independent variables and the dependent variable. Furthermore, the R Square value of 0.322 signifies that, taken as a whole, the predictors 'Eco Strategy' and 'Sustainable Practices' account for 32 percent of the contribution to the 'Logistic Performance Index.' This model can be considered as robust. It is noteworthy that this model exclusively elucidates 32 percent of the variance in the dependent variable, specifically 'Sustainable Practices.' Consequently, the remaining 68 percent of the variance pertaining to the maintenance of sustainable practices within logistics remains unaccounted for and, thus, unknown.

Examining the outcomes as presented in Table 5, it becomes evident that the internal reliability of each construct falls within a range spanning from 0.944 to 0.960. Notably, an Alpha Coefficient of 0.6 was established as the minimum threshold criterion for assessing reliability. Within this context, the findings illustrate that the construct 'Eco Strategy' boasts the highest coefficient, standing at an impressive 0.960, signifying a high level of internal reliability. Conversely, the construct 'Sustainable Practices' exhibits the lowest coefficient, although still robust at 0.944, indicating a strong degree of internal reliability.

Table 5. Reliability Statistics

	Cronbach's Alphas	Cronbach's Alpha Based on Standardized Items	No of items
Logistics Performance Index	.951	.950	33
Eco strategy	.960	.961	41
Sustainable Practices	.944	.942	21

Table 6. ANOVA Table

ANOVAa						
Model		Sum of Squared	df	Mean Square	F	Sig
1	Regression	8.484	2	4.242	27.721	<.001b
	Residual	17.903	117	153		
	Total	26.386	119			

The ANOVA results reveal a p-value of 0.001, which is less than the conventional significance level of 0.05. This indicates that the regression model holds statistical significance. In other words, it suggests that at least one of the predictors within the model significantly explains variance in the factors contributing to the 'Logistic Performance Index.' To discern which independent variables bear significant relationships with the dependent variable, we examine the coefficient values derived from the regression analysis.

Table 7 Coefficients Table

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model 1	B	St. Error	Beta	t	Sig	Tolerance	VIF
(Constant)	1.319	0.398		3.311	0.001		
Mean_ES	0.084	0.126	0.07	0.663	0.509	0.52	1.925
Mean_SP	0.457	0.094	0.516	4.886	<.001	0.52	1.925

Based on the coefficients presented in Table 7, it is evident that one predictor demonstrates a significant influence on the dependent variable. Specifically, 'Sustainable Practices' exhibits a significant value of 0.001, which is below the established significance threshold of α 0.05. This finding implies that 'Sustainable Practices' plays a notable role in influencing the 'Logistic Performance Index' in the context of inland ports. Notably, this single variable accounts for an explanatory power of 32 percent. Of particular significance is the substantial beta coefficient associated with 'Sustainable Practices' (β= 0.457), signifying that, among the two predictors considered, 'Sustainable Practices' emerges as the dominant influencer on the 'Logistic Performance Index' in inland ports.

5. Discussion and Conclusion

This research yields several important implications for both government authorities and the logistics industry. By successfully implementing sustainable practices, logistics firms in the Bukit Kayu Hitam region can enhance their logistics performance, contributing to the overall effectiveness of ports in Malaysia. In light of this, it is advisable for relevant government departments to incentivize and support logistics firms in adopting more IT equipment in their operations. Such measures not only help reduce the carbon footprint of these firms but also cut operational costs significantly. From the industry perspective, logistics companies that embrace sustainability practices have demonstrated improvements in their Logistics Performance Index (LPI). Industry leaders should take the lead in adopting technology and sustainability-related initiatives, setting examples for other logistics firms in Bukit Kayu Hitam. This collective effort will not only elevate the logistics performance of individual companies but also enhance the overall Logistics Performance Index in the region. However, it is essential to acknowledge certain limitations encountered in this research. The scarcity of specific information and studies pertaining to 'Eco Strategy' within the logistics industry posed challenges. While extensive information exists on general eco strategies applicable to various organizations, research into eco strategies tailored for the logistics sector remains limited. Additionally, time constraints were a constraint in this research. As a recommendation for future researchers focusing on Logistics Performance Index (LPI), conducting direct interviews with logistics firm employees could provide valuable insights into eco strategies.

In conclusion, this research contributes to a deeper comprehension of the relationship between 'Eco Strategy' and sustainability practices with the Logistics Performance Index (LPI). The findings affirm the positive correlation between sustainability practices and LPI, aligning with previous research indicating the normalization of sustainability practices in logistics firms for efficient operations [46]. To attain higher performance levels, logistics-related companies in Bukit Kayu Hitam should continually align themselves with global logistics industry trends. Learning from international logistics firms that leverage high-tech and green technologies can enhance the logistics performance of companies in Bukit Kayu Hitam, enabling them to compete on a global scale. Achieving excellence in logistics services, as demonstrated by top international logistics firms, largely depends on advanced technology adoption and effective management practices. Thus, local logistics companies can benchmark themselves against these international firms to strive for greater achievements.

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