JDI JOURNAL OF DEVELOPMENT AND INTEGRATION

JOURNAL OF DEVELOPMENT AND INTEGRATION
No. 81 (2025) 18-26 | jdi.uef.edu.vn

Improving the Green Logistics Service Quality: The Catalyst of Green Growth in Long An Province

Tran Thi Trang*, Vo Thanh Thu
HUTECH University, Vietnam

KEYWORDS

Green growth,
Green logistics,
International cooperation,
Service quality,
Sustainable development.

ABSTRACT

Given the fact that the global economy becoming more and more dynamic which enhances goods and services trading activities among different countries coupled with the increasing pace in manufacturing have brought negative effects on the atmosphere and the states of natural resources, the concept of green logistics and green growth have gained increasing popularity in many international businesses. As for Vietnam, in order to keep up with the current trend, it needs more positive and sustainable changes relating to the reduction of emissions and development in the environment protection quality. However, being a developing economy has led to Vietnam usually considering environment as an inferior factor to manufacturing and logistics activities. Taking the seriousness of the matter into account, the paper analyzes the shortcomings as well as the potential of businesses in Vietnam, particularly in Long An, in developing green logistics services. The study focuses on the factor quality of green logistics services, more particularly the current condition of service quality in Long An. The paper also incorporates the impact of green logistics services on green growth and sustainable development of the region in which growth can coincide with minimizing environmental impacts leading to the conclusion that developing green logistics services is a way for businesses to save resources, enhance transportation efficiency, and simultaneously improve their brand image in international cooperations.

1. Introduction

With the increasing expansion of the modern technology and the general social awareness, the implementation of green practices in business activities has become the main goal of many organizations as it benefits the brand image and the achievement of high effectiveness. And as the world integrates creating great demand for the exchange of products among countries, logistics has turned into the major component of economy growth, hence the green logistics come along with the emergence of green economy like a natural consequence. However, in the context of Vietnam businesses, green logistics

*Corresponding author. Email: *tt.trang@hutech.edu.vn*

https://doi.org/10.61602/jdi.2025.81.03
Submitted: 29-Oct-2024; Revised: 28-Dec-2024; Accepted: 2-Jan-2025; Online first: 15-Apr-2025
ISSN (print): 1859-428X, ISSN (online): 2815-6234

is not a prevalent phenomenon due to the lack of sufficient infrastructure and enforcing regulations, leading to the deterioration of the general service quality in the industry. Therefore, this paper is conducted to explore different directions in which businesses and governmental agencies can collaborate and promote the utilization of green technology in logistics practices and in turn, enhance green logistics service quality which is the strong determination of green growth. In order to achieve this, the paper uses some methods of finding, collecting, and analyzing secondary data from previous research or articles and in turn, infers information relating to the reality of green logistics in Vietnam, more particularly Long An at present. Related theoretical bases are also incorporated to reinforce the findings in the article. This information is also being capitalized on to find out the opportunities and challenges to improve green logistics services in Long An which is the foundation to establishing solutions for the future.

2. Theoretical basis of the research object

2.1. Green growth

It stands to reason that green logistics activities are encouraged through the enhancement in environmental awareness of individuals and organizations among communities. This incremental tendency of awareness is also reflected by the emergence of another concept, which is green growth. The World Bank defines *"Green growth - that is, growth that is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters"* (Nam et al., 2017). To achieve economic growth, one nation must exploit and capitalize on the available natural resources to manufacture goods or build infrastructure. In other words, the utilization of natural resources leading to negative environmental impacts is inevitable in a country's growth momentum but this can be held in check and minimized which is the core goal of green growth. The definition of World Bank also refers to the aspect of risk management, particularly in case of natural disasters. One country possessing a high rate of green growth must invest in natural disaster prevention policies in which incorporates the development of adaptability among local institutions and residents as well as the restoration of natural resources and mutilated environments. Since growth which reflects the utilization process of factors endowed by nature with an aim to satisfying demands and facilitating activities in the realm of production and consumption, is an indispensable element of economy, green growth can be seen as a part of green economy (Adamowics, 2022). Green economy links the encouragement of the production economy with the environmental protection which enhances competitiveness as well as promotes innovation and the nation's technological basis (Dogaru, 2021). So, both green growth and green economy represent the construct of sustainability in which economic growth must accompany the maintenance and restoration of natural resources.

2.2. Green logistics service quality - The catalyst of green growth

The concept of green logistics service represents the process of businesses providing services along with the application of sustainability practices with an aim to reducing the negative environmental impacts, in which greenhouse gas is the biggest contributor (Jazairy, 2020). Green logistics service is considered to be one type of logistics services, consisting of the services relating to the construction of strategic management system to connect different activities like purchasing materials, storage, transportation, information conveyance through marketing channels as well as organizational structure inside businesses (Tan et al., 2020). So, the term of green logistics is the combination of the effective management activity and the minimization of environmental impacts. In other words, businesses have to not only ensure the constant and synchronized flows of physical matters and information to the right location but also curb the emission of greenhouse gas along these flows. Given that the economy is becoming more and more inclusive boosting trade, commodity and service exchange among countries, logistics activities have played an indissoluble role in the process of development. Hence, environmental impacts of logistics activities can wreak havoc on the condition of green growth or green economy of one nation. Simply put, green logistics promote both the economy and the environment to develop more sustainably (Khan, 2019). Therefore, enhancing the quality of green logistics services is one of the

objectives that many local institutions as well as the government should focus on if they are to achieve greater effectiveness in the green growth trend pertaining in the modern society. In other words, green logistics services have a positive influence on green growth as it improves the economic performance and ecological sustainability of businesses operating in the country (Mohsin et al., 2022). Green logistics services involve with the efficient usage of natural resource and the diminishment of waste generation which are the focal forces of green growth (Ju et al., 2023). Enhanced green logistics services generate favorable trade environments for businesses and increasing their competitiveness in the marketplace which stimulate growth and sustainability goals (Yingfei et al., 2022).

In terms of how green logistics services affect green growth and sustainable development, one factor acts as the mediator of this correlation is service quality (Yingfei et al., 2022). Hence the paper focuses on analyzing the quality factor in green logistics service sector which in turn, boost the global services trading and sustainable economic growth. Service quality is a factor based on the perceptions of customers that how well a service provided by businesses meets their expectations (Danish & Nesan, 2024). These expectations consist of the influences from many determinants like social communications, needs and past experiences. In the logistics industry, service quality is perceived by specific indicators like information accuracies, how well the order is handled, timely shipment and customer care from the personnel (Ali et al., 2021). Other research accords different characteristics to green service quality like the 5C framework which includes Commitment, Competence, Communication, Creativity & Customization and Coordination & Collaboration (Gupta et al., 2022). It can be seen that service quality is closely linked to customer perceptions hence maintaining constant contact and support in forms of information provision and need satisfaction is the key to achieve high green logistics performance and in turn, the surge in both economic and environmental status.

3. The reality of improving green logistics service quality and promoting green growth

3.1. The current achievements in green logistics service quality in Long An - The correlation with green growth and sustainable development

Since green logistics is closely tied to the concept of sustainable development of the economy, improving green logistics has to accompany the goal of developing sustainably and comprehensively, more specifically in 3 macro-aspects: economy, society and environment. As for the economy aspect of green logistics, Long An and other provinces in the Southeast which is the region with the most dynamic economy of the nation, are responsible for 45% of the total goods and 65% of the total container goods across the country, according to Vietnam Logistics Report 2022 of Ministry of Industry and Trade. This province also possesses great economic potentials, particularly the advantage of geo-economics as Long An is located at the bridging position between Ho Chi Minh city and the Southeast region. In 2023, Long An carried out the construction planning of 2 dry ports Ben Luc and Tan Lap as well as formed 10 logistic

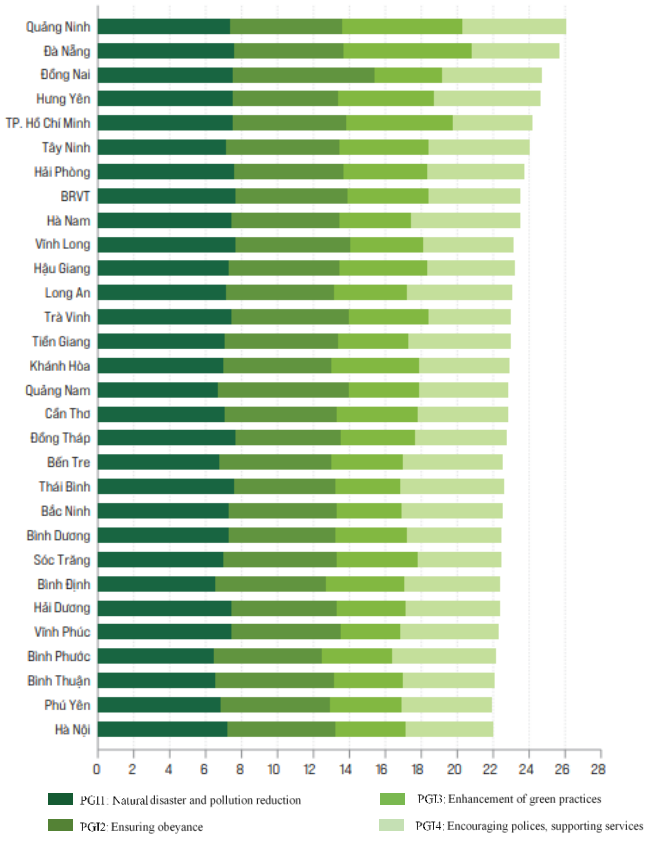

Figure 1. The Provincial Green Index 2023 rankings of major cities and provinces in Vietnam (Vietnam Chamber of Commerce and Industry)

Table 1. Governmental planning of commodity ports in Long An (Extract from the Decision No. 686/QĐ-TTg)

No.	Port name	Location	River, Canal	Estimated capacity (1,000 T/year)	Note
1	Thanh Tai Port	Can Duoc District	Vam Co Dong River	800	Update, Renovate
2	Bourbon Ben Luc Port	Ben Luc District	Vam Co Dong River	2,500	Update, Renovate
3	Hoang Tuan Port	Can Duoc District	Vam Co Dong River	1,200	Update, Renovate
4	Tan Thanh Long Port	Can Duoc District	Vam Co Dong River	500	Update, Renovate
5	Phuong Quan Port	Can Duoc District	Vam Co Dong River	500	Update, Renovate
6	An Long Port	Can Duoc District	Vam Co Dong River	500	Update, Renovate
7	Thien Loc Thanh Port	Can Duoc District	Vam Co Dong River	1,000	Update, Renovate
8	Kim Tin Port	Can Duoc District	Vam Co Dong River	800	Update, Renovate
9	Hoang Long Port	Can Duoc District	Vam Co Dong River	600	Newly build
10	BMT Long An Port	Can Duoc District	Vam Co Dong River	800	Newly build
11	Tra Cu Port	Duc Hoa District	Vam Co Dong River	1,500	Update, Renovate
12	Huu Thanh Port	Duc Hoa District	Vam Co Dong River	500	Newly build
13	Can Giuoc Port	Can Giuoc District	Can Giuoc River	500	Newly build
14	Construction 2 Mechanical Port	Can Duoc District	Vam Co River	500	Update, Renovate
15	Tan An Port	Tan An City	Vam Co Tay River	1,000	Newly build
16	Moc Hoa Port	Moc Hoa District	Vam Co Tay River	500	Newly build
17	Binh Hiep Port of Entry	Kien Tuong Village	Vam Co Tay River	300	Newly build
18	Tuyen Binh Port	Vinh Hung District	Vam Co Tay River	300	Newly build

centers to encourage the trading of products between Long An and other provinces in the Southeast and the Mekong River Delta region. What is more, Long An until the end of 2023 will be the home of 16 industrial zones and 22 industrial clusters, which showcases its potential to produce at a massive level, and be the promising area to develop logistics activities and capture foreign investments. The market of tropical fruits is also highly developed in Long An, is a favorable condition to conduct export practices as the demand of these products in the world is off the charts and on the rise (Mai Huong, 2023).

However, besides the economic resources, the development of green logistics must involve solutions about transportation, modern and co-friendly warehouses as well as ensure robust and efficient information systems. Green logistics service quality comprises two aspects: green logistics which refer to the implementation of sustainable practices associating with the transportation and storage of goods while still ensuring the efficiency of logistics activities (Gan et al., 2022); and service quality, involving all the dimensions that are interactive with customers like the comprehensive exchange of information and customer service efficiency along with the perception of customers about their experiences (Ali et al., 2021). As for green practices and sustainability, Long An International Port also utilized these advances in the digitalized and greener shifting process into logistics activities which mostly relate to the use of renewable energy sources like solar panel systems; the saving of resources like LED lights usage; investment in emission-reducing Euro 5 qualified truck fleets; crane equipment equipped with 100% electricity energy (My Phuong, 2024). Besides the environmental contributions, Long An International Port also fulfilled its social responsibility by becoming the hosting place of Long An Half Marathon 2024, a program that aims to spread the message of green lifestyles and call for funds to green wash the nation (Khanh My, 2024). In addition, according to Vietnam Chamber of Commerce and Industry, Long An Province ranked at number 12 in the Provincial Green Index Report in 2023, a considerable achievement for the area (Figure 1). In terms of level of support from local government in the implementation of green practices in businesses, Long An ranked at number 3 which showcases the endeavor of the local authority in promoting green growth within the region. According

to report, Long An is one of the leading provinces in the assisting governmental policies for businesses wanting to participate in green logistics and other green industries.

With respect to logistics service quality, one of foremost factor that needs considering is the current infrastructure as it will affect how well businesses serve their customers. On June 13th, 2023, Vietnam government issued the Decision No. 686/QĐ-TTg relating to the planning of Long An's infrastructure to further foster economic activities and reach sustainability status in the period from 2021 to 2030, with vision until 2050. The decision proposed the renovation of current infrastructure system like ports, highways, avenues, etc. Most notably, the decision refers to the plan to construct eight new commodity ports, as can be seen in Table 1 (the ports with the note "Newly build" in the final column). The Planning also proposed the construction of eight new logistics centers besides two current ones in order to boost trading activities between Long An and surrounding regions. The heavy investment in building and renovating logistics infrastructure provides local businesses with solid foundations to diversify and update their service offerings. Currently, Long An Province has the total of 18 commodity ports, 17 specialized ports and 14 passenger terminal ports, which are sufficient for businesses to carry out a variety of services relating to the transportation of goods and people (Duc Tuan, 2024). This variety is the determinant of high perception of service quality. One instance is Long An International Port. Based on the business website, the company's port is promised to accommodate all vessel of different sizes and can be flexible to customer demands. In addition, there are abundant services provided by Long An International Port, ranging from domestic and international transportation to container handling and customs services. Or the New Era Cold Storage (NECS) Joint Stock Company located in Long An Province is providing new solutions in shape of reefer containers for customers wanting to adopt sustainable practices (T.H., 2024). The company also provides modern information technology like WMS, ASRS robots to ensure the optimal accuracy in customer communications which helps enhance the quality of its container services. NECS also received the EDGE certification relating to the efficient use of resources and safe emission processes. Moreover, NECS applies international standard ISO 45001:2018 to ensure safe working conditions and minimize risks in daily operations. Focusing on the well-being of employees is essential as employees are the direct interaction with customers. Employee satisfaction significantly enhances their motivations to serve the customers which in turn, increases the general level of customer service and customer satisfaction (Kurdi et al., 2020), which is the concept that green logistics service quality revolves around.

3.2. The current landscape of green logistics in Vietnam - Opportunities and challenges for improving green logistics service quality and promoting green growth in Long An

The export-import turnover of Vietnam in 2022 rose by 9.5% than that of 2021 and the growth rate in the logistics industry is recorded at 14-16% on average annually which is a very promising number (Son et al., 2023). These figures represent that the Vietnam economy is attracting more and more investments from foreign businesses, hence the trading and logistics activities are being enhanced. Although green logistics focuses on the protection of natural resources and minimization of environmental impacts, the economic factor is also highly crucial as the implementation of green logistics requires many investments and economic resources need to be robust and available. In 2021, the report of Agility relating to the Emerging Markets Logistics Index ranked Vietnam at the 8th place which is three-rank higher than that of the previous year. All these figures can help Vietnam attract more FDI and exchange of technology from foreign countries. And being in the strategic position in the country map, Long An can enjoy corollary benefits as trading activities and investments from the central government will increase. The next opportunity to improve green logistics service quality in Long An is that this province is located in the Southeast region which has the most dynamic logistic and economic exchange activities in the nation. Currently, Vietnam government is attending more to the sustainable development and green logistics through implementing solutions to minimize the CO_2 emissions or participating in United Nations Framework Convention on Climate Change (Trang, 2023). With the favorable geographic position and the economic growth along with considerable trading activities of Long An in the recent years, supports and instructions from the government is an indispensable

outcome and a favorable condition for businesses to apply more effective and sustainable logistics solutions. Next, the explosion of technology and science recently has brought to businesses in Vietnam many new awarenesses about digital solutions which not only create more efficiency in logistics but also minimize impacts on the natural ecologies (My Phuong, 2024). The business awareness about protecting the environment is increasing due to the continually developing scientific basis which shapes a positive scenario of improving green logistics services within Long An in particular and Vietnam in general. Along with the change in business awareness is the green service trend including logistics services is getting more popular among consumer communities. According to the figures from Vietnam Logistics Report 2022, there are more than 30% of consumers agree with the need of the shift to more sustainable logistics activities, and 10% of those being surveyed are ready to pay more to experience green logistics services (Trang, 2023). The positive perception from consumers about green logistics services is the opportunity for businesses in this realm enhance their brand image and competitive advantage over other participants.

As for the challenges, the current infrastructure in Vietnam is the major challenge that hinders not only green logistics services but also all logistics services in Long An. Projects to develop infrastructure for logistics activities are mostly implemented inland whereas waterway is the new trend that enhances international trading. Besides, waterway is also needed for enhancing goods transportation within the country. Vietnam Report posited that the new way to improve in the logistics market in 2024 is to develop water transportation along with the inland one, hence it is crucial to connect seaports with the inland port system as well as the highway, railway one (My Phuong, 2024). The sensible combination of different means of transportation can help businesses save the cost and time to deliver goods to consumers, in turn minimizes the waste of resources and environmental impacts which are the criteria to boost the green trend in logistics. Besides, statistics show that every year the emissions from transporting activities in Vietnam are around 30 million tons of CO_2, which is a great deal higher than those of many developed and other developing countries. One reason for this is the lack of heavy-duty trucks which make the transportation of goods require more trucks leading to an increase in costs and emissions. The World Bank reported that the average age of trucks in Vietnam is 7.5 years old with 94% of the trucks are over five years old, a very high number which creates inefficiency in logistics as well as increasing air pollution (Son & Nhung, 2023). In addition, the shortage in resources within businesses is also the main challenge since investment in green logistics requires a relatively high cost. Up until 2022, there are 98% of logistics businesses in Vietnam that are of small and medium size (Trang, 2023), which have a limited capital so the implementation of green logistics is considered to be a stretch. Moreover, the high-quality human resources which expose to the modern technology are still scarce. According to Vietnam Logistics Research and Development Institute, the logistics industry needs to supplement around 2.2 million workers until 2030, in which there is a demand for 200,000 workers that have high professions (Trang, 2023). Lacks of adequate workers and modern equipment can act as a deterrent for many businesses in Long An to switch to more sustainable practices. The next challenge is associated with the insufficiency in the regulation system and policies of the current government. The regulations about documentations or instructions in implementing green logistics inside businesses are still not clear and ambiguous in terms of responsibilities of different institutions (Trang, 2023). Furthermore, green logistics is closely tied to the concept of sustainability and circular economy, in which refers to the recycling and restoring of waste but these activities are not clearly enforced by laws in reality. Many businesses still mix different waste together and this waste is being dumped directly into one cart and transfer into one landfill without being separated and recycled. This is a factor that needs immediate and stricter solutions due to its detrimental effect on the surrounding environment.

3.3. Suggestions to enhance the improvement of green logistics services

Given the current achievements as well as potential challenges in the current logistics industry in Vietnam in general and in Long An in particular, the paper suggests some directions to enhance the green logistics service quality. One thing to be taken into account is that the trend of green growth will create more financial conditions to help businesses apply green logistics into their services. However, the

challenges pertaining in the developing economy like Vietnam have set obstacles for local authorities that need considering and finding ways to overcome.

First, the government, through the specialized agencies like the Ministry of Transportation and the Ministry of Natural Resources and Environment, the Ministry of Industry and Trade, … has achieved the Vietnam Logistics Strategy and Planning until 2030, and proposed the vision until 2050 in which emphasizes the development direction of green logistics. In order to bring the process of planning into effect, economic management agencies of the central government as well as Long An need to explore and learn from the policies involving with the construction of infrastructure and the green growth, green logistics projects of other countries in the world and in turn, apply in accordance with the current reality. As for businesses operating in Long An, increasing international integration recently is also the opportunity to establish projects that can attract foreign investments, which assists them with more resources and knowledge to build warehouses and information systems that are highly qualified, improving the effectiveness of logistics services.

Second, the government, both local and national, should be proactive in building and granting the set of criteria which assess and measure the degree of "greenness" of the logistics system: (i) Green transformation in different types of transportation: railway, road, inland, waterway, international waterway, …, (ii) Measuring the level of green transformation in warehousing activities; in manufacturing and recycling products and packaging, … These criteria will be the basis to capture green logistics investment projects, and the reference to award or penalize businesses.

Third, Long An local authorities should issue requests to the Vietnam administrative to reorganize and amend the current regulations relating to the issue of recycling waste or of the quality and age of truck fleets or even specific regulations about the compensation when businesses exceed the permitted CO_2 emissions. Besides, as for business behaviors that wreak havoc on the environment, the law must have the specific penalty, and this penalty must be considered so as it has actual effect on businesses. For example, the fine has to be higher than the proceeds businesses gaining from their violations or than the investment cost for businesses to build systems to mitigate the consequences.

Fourth, besides the law system the government needs to formulate the connections and encouragements towards businesses in order to improve green logistics services. The government can invest more resources into implementing construction projects of new infrastructure so as for businesses to have greater condition to optimize their logistics services and in turn, come up with more modern and sustainable solutions. What is more, businesses, especially small and medium-sized businesses, have to know how to capitalize on the market advantage and encouraging policies from the government to enhance the service quality in logistics. If the government provide subsidies for companies, the business activities will be stagnant and less competitive; hence the government should only support in terms of infrastructure or tax, export-import policies and this support is applied fairly to all businesses. The sensible solutions to deal with the problem of financial resources mostly lay under the responsibility of businesses. But the implementation of green logistics services is not only the pressure in terms of financial conditions but also the way for businesses to enhance their brand image, optimize their processes, and improve the possibility to form partnerships with international companies. One most possible solution for small and medium-sized businesses is to find partners domestically and internationally to help with the lack of resources, and can go in the direction of one logistics business collaborating with one business needing the logistics services. The free trade agreements or the advantage in local market knowledge can be utilized as the "weapon" for these businesses to conduct negotiations and formulate strategic relationships with other companies in the world.

4. Results and Discussion

The research bases mostly on the secondary data collected from previous research and related articles hence the result reflects the outcomes of these referred materials. The first result is the reflected reality of improving green logistics services in Long An. Green logistics concept has developed and encouraged by both the local and central government in the recent years, but the application of these practices into the business activities seem to be limited due to the lack of modern infrastructure, modern vehicles and modern regulations. However,

the logistics activities in Long An have attracted a great deal of investments from the overseas as this region is developing at a promising rate in terms of production and goods exchange and provides a strategic position for foreign companies to diminish costs and achieve higher efficiency. The strategic position has made Long An province with the highest FDI in the Mekong River Delta region (Truc Giang, 2024). Up until August 2024, the province receives the total capital of foreign investments at 11,315.2 million USD spreading over 1,312 projects. The focus on developing logistics activities and infrastructure have helped enhance the general level of service quality in the industry and turn Long An into a promising place for foreign collaborations and trading which is the catalyst of green growth. Promoting green logistics within businesses is the way to enhance these investments and minimize the current levels of harmful emissions. Focusing in building new infrastructure, new waterways, and enforcing stricter regulations involving with green logistics and circular economy in the landscape of businesses is the way government can encourage green logistics in local areas.

Another result to be discussed is despite the pitfalls, currently there are many developments in the green logistics within Long An in particular and Vietnam in general. The current construction projects are heading towards more modern and energy-conserving machines and infrastructure, which is a positive shift in the logistics industry. However, these projects usually take place in the big companies like international ports and big logistics businesses. The government should also promote green logistics practices inside small and medium-sized companies through the clear instructions and the establishment of new agencies to help them with looking for and forming partnerships with foreign companies. Finally, the consumers' habits and preferences have become more similar to each other in different countries which are more environmentally conscious. Customers grow to be more sensitive to environmental issues pertaining in the logistics industries and this is reflected into how they perceive the quality of logistics service provided by businesses. Therefore, a transformation to green logistics will be the new trend in the future to capture more potential consumers as well as foreign investments and collaborative partnerships which in turn, boosting growth in the nationwide scope, a robust and sustainable growth.

5. Conclusion and limitations

Green logistics is the futuristic solution that is indispensable in a modern society, in which economy growth always accompanies policies relating to environment and natural resources protection. With the positive growth condition of Vietnam in the modern logistics industry, the development of green logistics in local areas, including Long An, has received favorable conditions but also some challenges, obstacles which are stringed along. These obstacles mostly emanate from the process of establishing the regulatory system of Vietnam being relatively out of touch with reality along with the limitation in infrastructure and equipment which lower customer perceptions of logistics service quality. In order to enhance the logistics service quality, the government has to offer support relating to documentations, investing in infrastructure as well as formulating amicable and mutually beneficial international partnerships. However, the problem of financial resources and finding suitable collaborators falls into the hands of the promotion policies and the brand image of the business itself. Businesses have to come up with plans and strategies that are sensible according to their status quo and advantages. The endeavor to create connections, and the rapport between the government and businesses are the means to construct and enhance green logistics projects in the nation. In addition, the factor of green growth must be taken heed of, in which growth can be increased further based on sustainable policies of agencies, institutions and in turn, green logistics is the vehicle for businesses to optimize their activities and enhance international collaboration as it has become the common trend and gradually transformed into a common requirement in the today's modern world.

This article analyzes the present state of logistics service quality, highlighting both benefits and drawbacks, and proposes suggestions for organizations and municipal authorities to enhance green logistics services, therefore contributing to economic development. To substantiate the issue, empirical investigations are essential to determine the elements influencing the quality of green logistics services, necessitating the collection of primary data to validate the model, hence enabling broader conclusions.

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