

The Implementation Of Green Logistics In Reducing Logistic Cost At Teluk Lamong Terminal

Wynd Rizaldy^{1*}, Lis Lesmini², Sarinah Sihombing³, Muhammad Iqbal Firdaus⁴
^{1, 2, 3, 4} Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia

*Corresponding Author: wyndrizaldy@gmail.com

Abstract

The paper aims to analyze green logistic implementation at ports in Indonesia. It reviews and analyzes UU 344 No. 17/2008 about Sailing and UU 165 about government regulation, No. 61/2009. This study used descriptive-explorative method. The data source was taken from sea port and ministry of transportation. The public policy was analyzed by observation with three independent variables of green logistics. The purpose of this study is to encourage parties and to find out the correct procedure in managing logistic toward the green logistic that can be applied as technical instruction at Teluk Lamong Terminal that can be used as a pilot project of green logistic in Indonesia. Furthermore, this research will give benefit for stakeholders in having Standard Operating Procedure (SOP). It is used as an assisting tool for implementing the proper green logistic management while waiting the technical instruction from the seaport administrator.

Keywords: Seaport, Green Logistic Management, Standard Operation Procedure (SOP)

Introduction

The focus of infrastructure development has evolved with negative environmental impacts without endangering economic growth. The growth of trade activities and needs of competitiveness on the global market are forcing ports in the world to reduce costs (Pavlic, Cepak, Sucic, Peckaj, & Kandus, 2014). Green Logistics analyses the environmental consequences of logistics and how to deal with them. (McKinnon, Cullinane, Whiteing, & Browne, 2010)

Tissayakorn & Akagi (2014) stated that Green logistics is a logistic activity that aims reducing environmental pollution and resources consumption by using advanced logistics technology, planning and implementing of transport, storage, packaging, handling, processing and distribution methods. It is an effective and efficient flow of goods that connect to the main green supply and demand to

overcome the obstacles between space and time for green services activities in the process of economic management. The activity is also known as environmental logistics (McKinnon et al., 2010). Green logistics represents the convergence of several strands of research that began at different times over the past 40 years (Tissayakorn & Akagi, 2014). Modern green logistics management system can be established by helping the public in order to foster the concept of green logistics, strengthening the government's supervision, and supporting all businesses operations including logistics companies. The purpose of this research is to analyze green logistic handling at seaports based on UU 344 No. 17/2008 about Sailing and UU 165 of government regulation No. 61/2009 about port and Green logistics.

Methodology

This research used literature review as primary data. The secondary data were taken from seaport operator or terminal operator by using International Container Stevedoring Services (ICSS) rate and Container Yard & Movement Service for International (CYMSI) rated as terminal handling charge (THC).

Quantitative and qualitative methods at Teluk Lamong Terminal were obtained to describe the progress based on the TEUs handling and comparing with Terminal JICT and Tanjung Perak Terminal. After that, the writers evaluated the implementation of the government regulation and policy in knowing whether the practice has followed the regulation properly. The next process was to collect the data of the implementation obstacles and three independent variables of green logistics from previous studies that could be considered to reduce cost.

Results and Discussion

Based on literature review, the researchers analyze green logistics to provide a solid background and give challenges in developing sustainable green logistic and

port practical implementation. The application of green logistics does not always refer to investment of new expensive equipment. The application of green logistics can be done through efficient and environmentally friendly in operational. Eco-driving can be used as an example of the application green logistics through good techniques and how to drive a truck. It is necessary to invest in new equipments or fleets that can adopt green logistics. The expectation that the efficiency gained in the long term will exceed the investment value. Companies have to make suitable strategies for investment in order to obtain sustainable competitiveness.

Data collection related to the terminal implied that the multipurpose terminal which is engaged in container and dry bulk services is part of the sea toll. Supported by revitalization of APBS, the opportunity for the entry of commercial ships of 80 thousand Deadweight Tonnage (DWT) becomes larger. Moreover, the local flow has been supported a depth of -14 mlws and width of 150 meters. The continuation of Port management development and integration with the industrial area. Government believe that the eco-conspective shipping channel can reduce logistics costs to be more efficient. Now direct shipping access to various countries is open. As a result, the distribution of import-export goods becomes progressively smooth, fast, and secure. This semi-automatic terminal is also in line with the challenge of increasing the volume of foodgrain transportation in Indonesia.

Therefore, the development of the terminal is to encourage the distribution of logistic distribution distribution which is still centralized in western Indonesia. On the other hand, Tanjung Perak Port is becoming busy so as to encourage comprehensive improvement. The advantages the flow of containers, liquid bulk, dry bulk, and general cargo can be directly directed to Terminal Teluk Lamong. A positive achievement after the company consistently puts forward the services that are consistent with the needs of consumers as well as able to compete in the global market. Now, Terminal Teluk Lamong is the main driver of the regional and

national economies providing integrated services so that the distribution of goods from and to the east of Indonesia becomes faster and safer.

The Lamong Bay terminal equips itself with advanced semi-automatic facilities. Aim of all facilities for serving consumers is to make logistics management more efficient. It is the first port in Indonesia that has most advanced control room in South East Asia which control uses semi-automatic equipment. In addition to being sophisticated, the port is environmentally friendly because it uses electrical energy and Euro 4 standard diesel engines. Moreover, dedicated waiting line has been made to appeal large ships so that they do not need to queue long upon docking at the port. There has been also construction of dry dock stage I along the 250 meters, the expansion of the cultivation field from 15.86 hectares to 35.8 hectares, the expansion of dry bulk area from 8 hectares to 10 hectares, and power plan development in an area of 7 hectares adding the number of ship to shore (STS) at international and domestic container pier for five units.



Figure 1. Design Revision Ultimate master plan of port Lamong bay by Hermawan Widhi.

Source: socialization of improvements to ease of doing business, Surabaya 08 April 2016 by Faruq Hidayat

Pelindo III expanded the container yard facility at TelukLamong Terminal (TTL), Tanjung Perak Port, Surabaya, East Java. At this time the container yard at Teluk Lamong Terminal is 15 blocks with a capacity of 1.5 million TEUs, in comparing with the previous one which was only 10 blocks with a capacity of one million TEUs. Teluk Lamong Terminal is projected to be the main container terminal at Tanjung Perak Port. Projection of The ultimate phase for this terminal to be an area of 30 container stacking field blocks with a capacity of 6.5 million TEUs.

Table 1. Estimate Revenue gained during development and final development of Teluk Lamong

Year	2010	2018	2030
Blocks	10	15	30
TEUs (in million)	1	1.5	6.5
Hectares		35.8	89,9
Revenue gained	1270 US\$ x 1 million = 1.270 million US\$	1270 US\$ x 1.5 million = 1.905 million US\$	1270 US\$ x 6.5 million = 8.255 million US\$
For FCL/20"/PP (include Local handling charge) with formula TR=Qx P			
Increase revenue		635 Million US\$	6350 Million US\$

Note : taken THC rate from Surabaya Port, to China, Europe, and US via Bali

source : <http://www.stagecargo.com/docs/FCL-Worldwide-Price.pdf>

The author suse local terminal handing charge at Teluk Lamong terminal as an indicator to show the different costs and conclude the reduced cost after comparing with TanjungPriok (Jakarta) and Tanjung Perak (Surabaya) terminal local terminal handling charge (THC). Table 2 shows the composition of cost for 20 feet or 1 TEU Full Container Load (FCL) standard handling.

Table 2. ICSS and CYMSI rate for 3 terminals in Java island

Type cost/port	Terminal lamong bay (USD)	TanjungPriok (USD)	Tanjung Perak
International Container Stevedoring Services (ICSS)			
1. Loading/unloading ship crane (sc) /wharf crane (wc)	73. 80 to 82.00	74.70 to 83.00	73. 80 to 82.00

2. Transshipment sc/wc	45.00 to 50.00	50.00 to 56.00	45.00 to 50.00
3. Shifting container sc/wc row to row dry full (with or without landing)	30.75 to 39.98	34.00 to 58.00	30.75 to 39.98
4. Uncontainerized (loading/unloading)	394.63	310.00	394.63
5. Open/Closing Hatch	64.58	54.00	64.58
6. Change status	-	-	-
7.			
8. All set gear box (sc/wc)	57.40 to 68.68	26.42	57.40 to 68.68
Total ICSS	666.16 to 699.87	549.12 to 587.42	666.16 to 699.87

Container Yard & Movement Service for international (CYMSI)

1. Container storage tariff. (period 1)	IDR 35.000	IDR 27.200	IDR 27.200
2. LO/LO (lift on/out)	IDR 216,000	IDR 187.500	IDR 216,000
3. Extra Movement	IDR 537.000	IDR 370.000	IDR 473.200
4. Loading cancel	IDR 432.000	IDR 480.300	IDR 523.000
5. Behandle (custom inspection)	IDR 1.574.000	IDR 1.015.000	IDR 1.546.000
6. Electricity supply	-	-	-
7. Monitoring	-	-	-
8. Stripping	IDR 250.000		IDR 250.000
9. Stuffing			
10. Haulage	IDR 150.000		IDR 91.000
11. Closing Cargo	IDR 750.000		IDR 780.000
12. Closing Document	IDR -		IDR 500.000
13. Penalty over weight	USD 200		USD 200
14. Reweighing	IDR 537.000		IDR 523,000
15. Early stack charge	-		IDR 261.500
16. Wharf	-		IDR 56.715
17. Cancelled stacking per container/doc	-		IDR 20.000
18. Document correction	-		IDR 50.000
19. Inter terminal transfer container	-	IDR 523.000	-

Total cost for each terminal	IDR 4.481.000 + USD 200	IDR 2.603.000 USD 200	IDR 5.317.615 USD 200
Reduction cost between TLT and Tanjung Perak terminal	IDR 836.615/container		
Reduction item	4 item or work		

The government, shipping line, and the shipping cargo agent can gain revenue from this activity. On the other hand, the rate itself becomes the cost for customers who are shipper or consignee or exporter or importer.

However, there are challenges in implementing green logistics in Indonesia. The first is the availability of environmentally friendly vehicle technology in Indonesia which is still low. At present Indonesia still uses Euro 2 standard vehicle emission. Meanwhile, Thailand, for example, has been using Euro 3 standards since 2009, even using Euro 4 since 2012. The next challenge is the quality of fuel in Indonesia is lowest in South East Asia countries, especially high sulphur content. For diesel, sulphur content is still around 2,000-3,000 ppm; while the Euro 4 standard limits the maximum sulphur content, which is 50 ppm. Another challenge is the availability and warranty of sustainable environmentally friendly fuel supplies. Next, the number of Gas and distribution of Fuel Filling Stations (SPBGs) are limited, so that transportation users need to think twice to switch to SPBG use. Another challenge is understanding and competence of some businesses regarding the concept and application of green logistics still needs to be improved. Finally, the challenge is the limit capital of business people. As an example, most transportation companies have difficulty funding to carry out fleet rejuvenation. The implementation of green logistics includes the relationship of many parties. For road transportation, for example, related parties include fleet producers, the Ministry of Industry (design of motorized vehicles), Ministry of Transportation (type tests and periodic testing of motor vehicle emissions), Ministry of Environment (emission threshold exhaust gas), Ministry of Energy and Mineral Resources (development of fuel specifications), Pertamina (production

and distribution of fuel), and Police (enforcement). Property owners (manufacturers and retailers) also play a role in encouraging the implementation of green logistics.

The authors also would like to examine the three components of green logistics which contribute to cost reduction. The three component or three of (Alshubiri, 2017) “The independent variables of green logistic are includes of three components of financial economic, social and environment. The three variables can be described in Figure2.

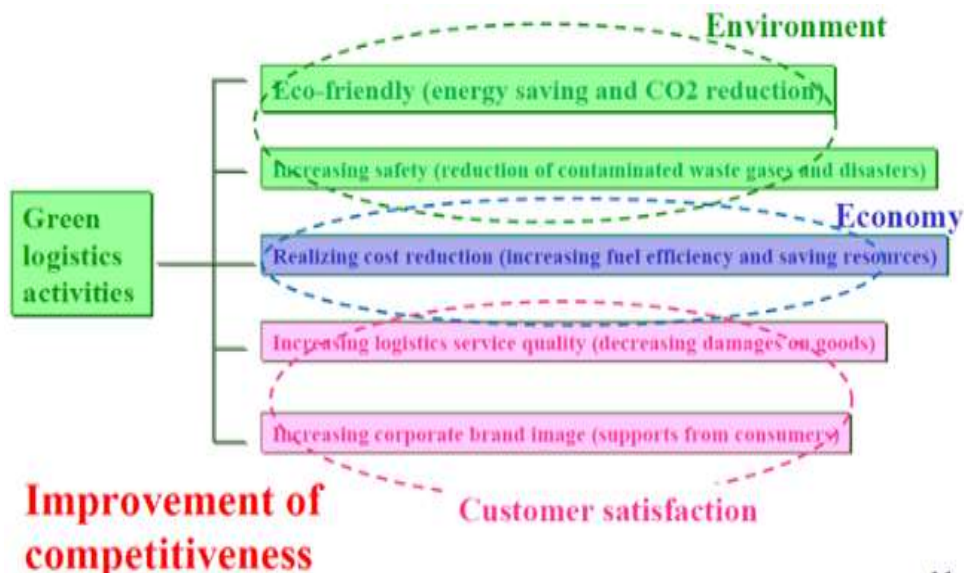


Figure 2. Three Advantages from Green Logistic Activities (source: sugata)

Table 1 has shown that the revenue of Teluk Lamong Terminal taken from THC plan has increased 100% by 2030 after developing 30 blocks which can accommodate 6.5 TEU. While the result of comparison on the three main terminals in Java shows that there was a reduction cost and work load compared to Teluk Lamong Port and Tanjung Perak, which was around IDR 836.615/TEU on the Container Yard & Movement Service for international's rate in addition to 4 main work load such as Early stack charge, wharf, cancel stacking and document correction. However compared toTanjung Priok Terminal the result shows that

there was no reduction cost, even there was a higher cost on ICSS around USD 117.04/TEU on SC handling, and USD 112.45/TEU on WC handling. In addition, CYMSI's rate was IDR 1.878.000 and USD 200/TEU, so total higher cost for TLT is USD 317.04 and IDR 1,8 million/TEU for SC or USD 312.45 and IDR 1.8 million/TEU for WC.

Teluk Lamong Terminal is the first green port in Indonesia and Asia. In addition to using low energy consumption lighting systems, the Terminal also operates environmentally friendly gas-fueled trucks. Low energy use efficiency is expected to have an impact on efficient port costs. Even though there are 8 inhibiting factors from the improvement competitiveness guidance of three independent variables on green logistic, later government and management of TLT need to solve those factors.

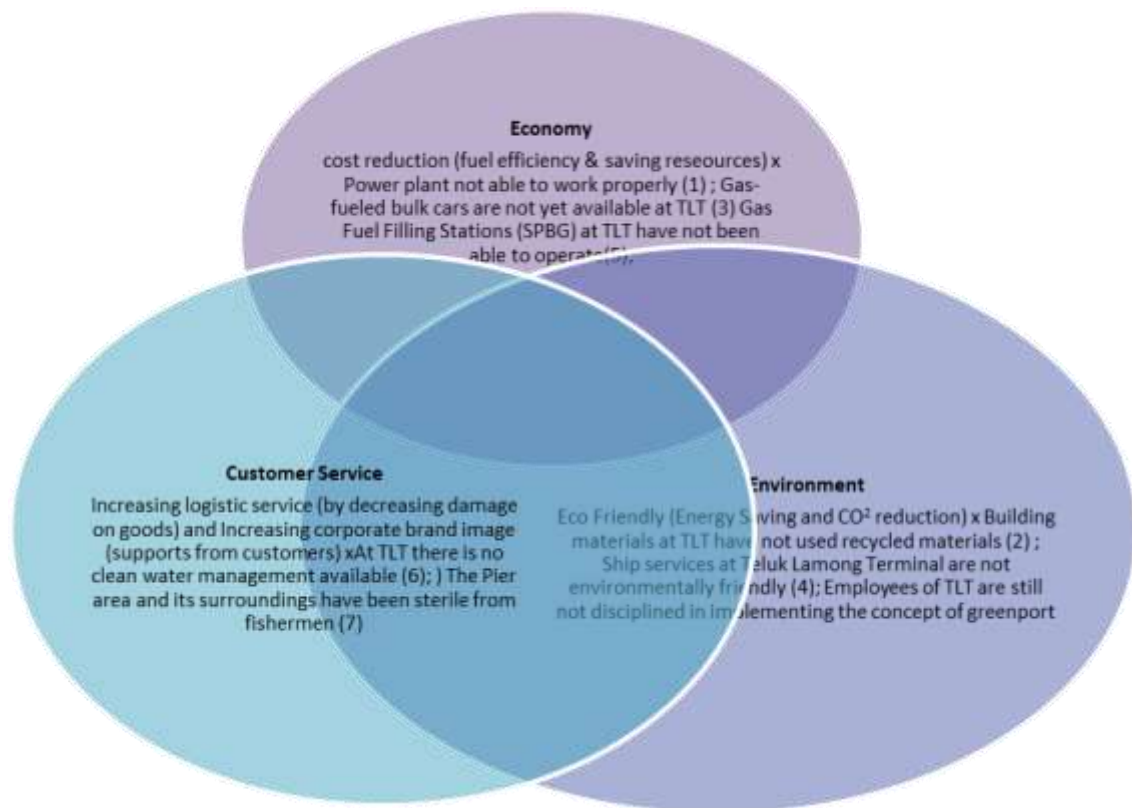


Figure 3. Diagram Venn for Green logistic which impact the 3 independent variables advantage versus Inhibiting factor

Finally, implementing green logistics produces a number of contradictory issues. Timing is a critical component of any logistic system. The increasing demand for door-to-door services and just-in-time strategies ultimately leads to an increase in environmental impacts. These demands require the use of more air and truck transportation, which reduce energy efficiency and cause high pollution levels. Another contradictory issue involves reliability. The least polluting modes of transportation are generally the least reliable ones in terms of on-time delivery, lack of damage, and safety. Logistics systems are focusing on reducing inventories in order to reduce costs. However, this will require more in-transit inventories, thus further contributing to more pollution (2). These are some challenges that companies face when looking to implement a green logistics system. From the flow chart, the stake holders who involve on this project can set the proper SOP to handle green logistics activities in TLT

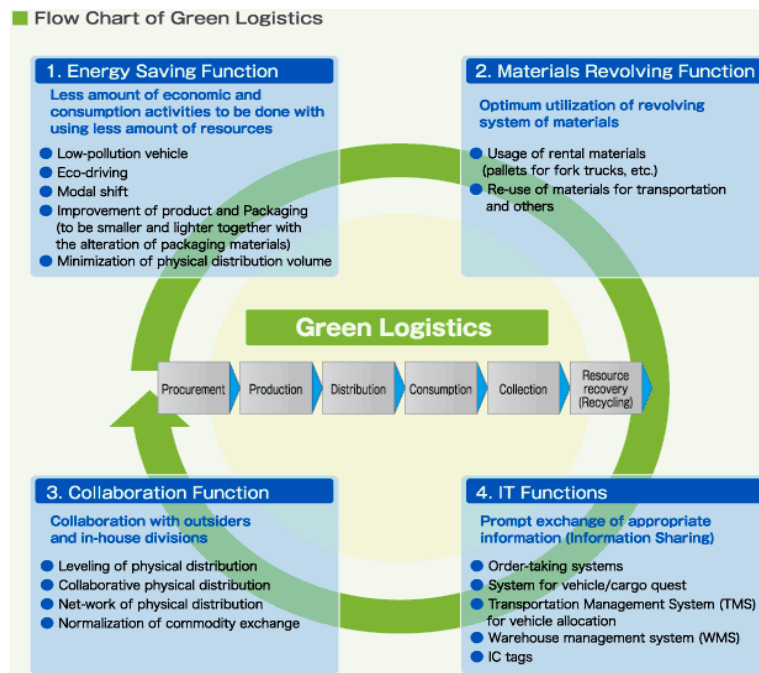


Figure 4. Flow of chart of Green Logistic
(Source: SCMwiki 2012)

References

- Alshubiri, F. (2017). The impact of green logistics-based activities on the sustainable monetary expansion indicators of Oman. *Journal of Industrial Engineering and Management*, 10(2Special Issue), 388–405. <https://doi.org/10.3926/jiem.2173>
- Indonesia, R. (2008). Undang-Undang Republik Indonesia Nomor 17 Tahun 2008 tentang Pelayaran.
- McKinnon, a, Cullinane, S., Whiteing, A., & Browne, M. (2010). *Green Logistics: Improving the Environmental Sustainability of Logistics*. *Transport Reviews* (Vol. 31). <https://doi.org/10.1080/01441647.2010.537101>
- Pavlic, B., Cepak, F., Sucic, B., Peckaj, M., & Kandus, B. (2014). Sustainable port infrastructure, practical implementation of the green port concept. *Thermal Science*, 18(3), 935–948. <https://doi.org/10.2298/TSCI1403935P>
- Peraturan Pemerintah RI. (2009). Peraturan Pemerintah RI No. 61 tahun 2009 tentang Kepelabuhanan.
- Perawati, D., & Edi, D. W. (2008). Di Pt Terminal Teluk Lamong, (17), 267–274.
- Srisorn, W. (2013). The Benefit of Green Logistics to Organization. *Waset.Org*, 7(8), 825–828. Retrieved from <http://www.waset.org/publications/16246>
- Tissayakorn, K., & Akagi, F. (2014). Green logistics management and performance for Thailand's logistic enterprises. In *Proceedings of the IEEE International Conference on Industrial Technology*. <https://doi.org/10.1109/ICIT.2014.6895018>