

Environmental Management practices in Logistics: An overview of Nacala Logistics Companies in Mozambique

Murarene Gabriel^{1*}; Misuzu Asari¹

1: Kyoto University, Yoshidahoncho, Sakyo-ku Kyoto-city Kyoto 606-8501, Japan

*corresponding author: gabriel.murarene.58m@st.kyoto-u.ac.jp

Keywords: *Environmental management practices, Logistics systems, Environmental management plan.*

INTRODUCTION

The logistic industry consumes a significant amount of energy and produces waste, air pollutants, noise and vibration (Plămădeală & Slobodeaniuc, 2019) and is rightfully considered as one of the sectors with the greatest impact in relation to the environment (McKinnon *et al.*, 2015). There is a need for them to ensure their activities don't impact the environment so as to ensure the fundamental right of environmental quality.

Campos (2012), suggests that an Environmental Management System in line with the ISO 14001, can be an ideal tool for those organizations looking to manage their environmental issues such as pollution prevention, legal compliance, and minimizing the impacts of their activities on the environment. Several studies on the application of environmental management practices in the logistics sector suggest various strategies with differing objectives to measure and adapt activities to minimize the environmental impact. However, there is no study presenting an overview about the insertion of environmental management practices in logistics operations in Mozambique, particularly in the Nacala Corridor, where doubts have been raised about the environmental impacts of the Nacala Logistics venture, particularly on air emission from the coal transportation and waste generation (Selemane, 2017). This research aims to fill this gap and add to the knowledge and dissemination of environmental management practices of the Nacala Logistics companies.

METHODOLOGY

This study is classified as exploratory bibliographic review and the targets are 4 companies of Nacala Logistics (NL), Corredor de Desenvolvimento do Norte, SA (CDN), Corredor Logístico do Norte, SA (CLN), Central East African Railway (CEAR) and Vale Logistics Limited (VLL), that operates in the Nacala Corridor, in Mozambique and Malawi. The four major steps carried out in this study are: 1) review of the literature on environmental management practices in logistics activities, to create a theoretical basis; 2) collection of Environmental Management Plans (EMP) and Integrated Management System Guidelines (IMS) of the Nacala Logistics companies; 3) content analysis of the documents collected following the recommendations presented by Elo and Kyngäs (2008); and 4) discussion of results with the literature and establishment of conclusions.

RESULTS AND DISCUSSION

Documents published by the 4 companies operating in the Nacala Corridor were analysed. Table 1 presents the environmental management practices analysed from the EMP and IMS in the 4 companies grouped into 5 areas. The procedure used to group the practices was described in methodologies and its according to Martins *et al* (2019). The 5 areas listed are related to logistic system components presented by Rushton *et al* (2014), Ghiani *et al* (2004), Tambovcevs & Tambovceva (2012) and Zuo & Li (2009).

Table 1: Environmental management practices identified in each area and companies (Source: Authors)

Category	Environmental management practices	Company
Area 1: Modal choice, Vehicle Use and Route	(1) Mapping the energy and/or fuel consumption	All
	(2) Defining transport load capacity	CDN, CEAR, CLN
	(3) Adopt Speed restriction	CDN, CEAR, CLN
	(4) Regular maintenance	All
	(5) Mapping the water consumption	CDN, CEAR, CLN
	(6) Mapping Air emission	CDN, CEAR, CLN
	(7) Mapping Noise and Vibration	CDN, CEAR, CLN
	(8) Waste segregation and collection	CDN, CEAR

Area 2: Storage or Warehouse Management	(1) Rainwater collection for use in other activities. (2) Use of natural ventilation. (3) Use of fluorescent light and sunlight (4) Use of manual forklift (5) Waste segregation and collection (6) Mapping the Air emission (7) Mapping the energy consumption (8) Sprinkling of coal yards	CDN, CEAR, CLN CDN, CEAR, CLN CDN, CEAR, CLN CDN, CEAR CDN, CEAR CLN CLN CLN
Area 3: Suppliers & Purchasing Processes	(1) Selection of suppliers considering their environmental practices, compliance with the environmental legislation (2) Environmental training programs for the development of suppliers (3) Prioritization of purchase of inputs available in the local community.	All CDN, CLN, CEAR All
Area 4: Packaging Management	(1) No packaging services (2) No suppliers in production of packaging. (3) Development of campaigns to encourage the customers to use more sustainable packaging. (4) Adoption of special wagons for specific products (eg cereals, coal, fuel)	All All CDN, CEAR CDN, CEAR, CLN
Area 5: Expansive Management	(1) Adoption of Environmental Management system in an integrated system with occupation Health and Safety (2) Adoption of Sustainability policy (3) Compliance with legal requirements (4) Carry out environmental Inspection and Audits (6) Carry out Environmental Training capacity buildings (7) Environmental criteria used in the evaluation of employees (8) Create and monitor environmental performance indicators and goals (9) Promote environmental education campaign in a community (10) Provide environmental performance report to the Government	All All All All All All All All All

The results show a great commitment of Nacala Logistics companies prioritizing care for the environment, through the adoption of several environmental management practices to minimize their impacts, confronting the concerns raised by Selemene (2017) regarding air pollution and generation of waste along the corridor. In the analysed documents, it can be seen that for the waste management practices, the NL companies, in addition to adopting segregation and collection of waste within logistic activities chain, also advocate the transportation, recovery, packaging and final destination of various types of waste such as domestic, medical, construction waste and hazardous waste. Some practices have been reported by Björklund (2016) and Maack (2012) as sustainable practices for the logistic chain.

CONCLUSION

As the research has demonstrated, a variety of environmental management practices have been identified within 5 logistics areas, and there is a clear highlight about several practices in areas related to Transport, Storage and Expansive management. However, the least emphasis is on Supply and Packaging areas. Environmental management practices related to waste management and air pollution control were the most common on the analysed companies. As a limitation of this research, it should be noted that content analysis can be very flexible and the definition of the free categories and groups depends on the researchers.

Future prospects of this study include conducting a survey on environmental management practices of the companies and the managers' consciousness toward these practices to minimize their environmental impacts.

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