

[MAN 14] THE STUDY OF INTEGRATED COLD CHAIN LOGISTICS SDN BHD (ICCL) BEST PRACTICE IN SUSTAINABLE WAREHOUSE

Chuah Ai Lyn¹ & Adam Mohd Saifudin²

¹⁻²*School of Technology Management and Logistics, College of Business, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah
chuahailyn007@gmail.com¹*

ABSTRACT

Sustainable warehouse practice has become significant priority to ensure a sustainable environment and future. Companies need to practice sustainable warehousing because the practice brings a lot of benefits to the companies and also the environment. The objective of the study is to examine the effective management and training on sustainable practice contributes to warehouse efficiency. This study focuses on a company practicing best sustainable warehouse practice-Integrated Cold Chain Logistics Sdn Bhd (ICCL). Questionnaires (15 questions) were given to the employees working in the company. Management and training in a company are the independent variables for an effective sustainable warehouse practice. Theoretically, it contributes an insight study on how management and training will affect sustainable warehouse practice and benefit the industry. Practically, the research is applicable for management practitioners in the industries, especially those who are operating warehouses, in making important decisions to improve sustainable operations. Other factors will be improvement of 5S, sustainable operational training and sustainable materials handling management, including inventory management and audit process.

Keywords: *sustainable warehouse practice, management, training, efficiency*

INTRODUCTION

Sustainable warehouse is about integrating, balancing and managing the economics, environmental and social inputs and outputs of the warehouse operations (Daud, David, & Tan, 2009). The increasing human population and rapid economy development have cause strained resources and created volatile pricing on commodities. The whole world is currently practicing sustainable warehousing and there are government-regulated changes issued by European Union during year 2010 stating that by 2020, all new buildings must be able to achieve “nearly zero energy” and gain most of its energy supply from renewable resources (Reddon, 2015). Therefore, the management and training activities in the company that practice sustainable warehousing is important. Awareness about this practice is needed to be implemented in management and training in order to conduct the sustainable warehousing.

It is important to study this research because to ; 1) obtain reliable access to energy, assuring that the products can be held in ideal conditions; 2) increase the efficiency of warehousing; 3) improve the return of investment, where the time allowed the product to flow from manufactures to retails can be shorten and also retain the freshness of the

products; 4) decrease the damage made on the environment by decreasing the use of unrenewable resources (Reddon, 2015).

STATEMENT OF THE PROBLEM

It is known that the whole world is now attempting and implementing on practicing sustainable warehousing. According to Singh and Trivedi (2016) that not much research is done regarding sustainability from the logistics point of view and also lacking sustainable frameworks from production management. It is critically agreed by Waqas and Norma (2012) that warehouse sustainability can be further enhance if there are better solutions on just-in-time replenishment, inventory centralization and also shorten the production time meanwhile maintaining the quality.

RESEARCH OBJECTIVE

1. To examine the effective management on sustainable practice contributes to warehouse efficiency.
2. To examine the effective training on sustainable practice contributes to warehouse efficiency.

LITERATURE REVIEW

Warehouse sustainable practice and efficiency

Warehouse is defined as a place in which products and merchandise are stored, and it functions like a big storehouse (The Free Dictionary, 2016). Warehousing is a performance or administrative and physical functions related with storage of goods and materials. The functions in warehousing include invoice, identification, inspection, verification, putting away, retrieval and many more (Business Dictionary, 2016). Ajeesh (2015) explained that warehousing is a set of activities that involves in receiving and storing goods and also preparing them for further shipment. Studies from Study Point (2011) said that there are two types of warehousing, which are private warehousing and public warehousing.

Waqas and Norma (2012) said that there are eight elements when a company is practicing sustainable warehouse, which are warehouse facility design, warehouse layout, inventory management, warehouse staff, warehouse operations, onsite facilities, warehouse management system and mechanical handling equipments.

Angelo and Brian (2013) said that to be efficient means to use resources such as people, money, raw materials and cost effectively. Saifudin, Nizamuddin and Norita (2012) mentioned that efficiency in any distribution network is determined by the operation of the warehouses. There are six major operations, which are receiving, transfer, handling, storage, packing and processes. These six major operations require appropriate planning and controlling to ensure high efficiency in the warehouse (Saifudin, Nizamuddin, & Norita, 2012).

Management

There are a lot of definitions for management. Karam (2015) defined management as conceptual, theoretical and analytical purposes as that process by which managers create, direct, maintain and operate purposive organization through systematic, coordinated co-operative human effort. Management is also the act or skill of controlling and making decisions about a business, department or organization (Merriam Webster, 2016).

According to Angelo and Brian (2013), management is important because the company and the employees can experience a sense of accomplishment, stretching the employee's abilities and magnifying their range and help building successful products or services for the company. This will cause positive results on sustainable warehouse practice and benefit the industry.

Training

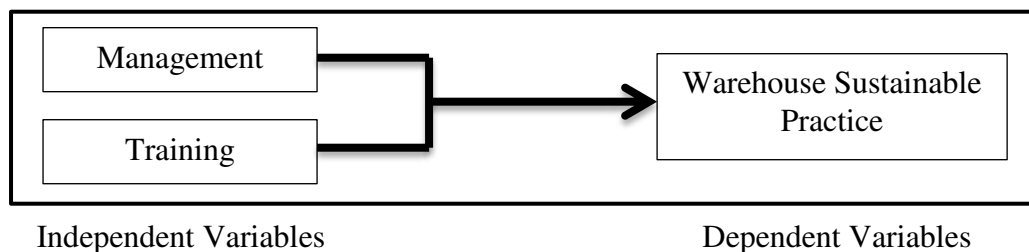
Training is providing education, instruction, or discipline to a person or thing that is being trained (The Free Dictionary, 2016). It is also a process of being conditioned or taught to do something (Your Dictionary, 2016).

Austin (2009) mentioned that there are challenges faced in training aside from the company's concerns, which are differing learning styles of employees, generation gaps among the employees, language and literacy barriers among employees, training consistency; and turnover and absenteeism.

However, not having employees trained will also come at a cost. Brain (2016) said that training is important because untrained employees will produce unhappy employees, produce low production value, inefficient and cause companies to lose customers. Stretar (2015) mentioned that improving employee performance is not a one-time thing, but instead a continuous effort. By continuing this effort it will affect sustainable warehouse practice and benefit the industry.

Framework

The framework for this study is as follows:-



Hypotheses

The hypotheses for this study are:

1. Effective management on sustainable practice contributes to warehouse efficiency.
2. Effective training on sustainable practice contributes to warehouse efficiency.

RESEARCH METHODOLOGY

Research design

The research design is divided into primary and secondary respectively. Primary research is being carried out to allow further understanding on certain problems and issues. It involves process such as questionnaires, surveys and interviews with individuals or small groups. Secondary research is also known as desk research, where research is conducted by making use of information previously obtained from reliable sources (Business Case Studies, 2016).

Primary research design consists of qualitative and quantitative research. Qualitative research is about conducting interviews with Integrated Cold Chain Logistics Sdn Bhd (hereafter is ICCL) section heads and above. The interview sessions will be conducted based on questions on how to manage and practice sustainable warehouse efficiency.

On the other hand, quantitative research will also be conducted. Quantitative research is conducted by handing out questionnaires to 61 employees in ICCL, which includes managing directors, directors, managers and below manager levels. The questionnaire is adapted from:-

1. A Model for Sustainable Warehousing: From Theory to Best Practice (Amjed & Harrison, 2012)
2. Sustainable Green Supply Chain Management: Trends and Current Practices (Singh and Trivedi, 2015)

Secondary research design is done through internet, books, journals and other written and reading materials. Information and data will be collected from all the materials to allow researcher to have a better understanding on sustainable warehouse.

Data Collection

The data will be gathered using print-out questionnaires and analysed using SPSS version 22.0.0.0. SPSS is the acronym for Statistical Package for the Social Science. The software has a very flexible data handling capability and data manipulation utilities, which will be useful while analysing data.

RESULTS

Quantitative analysis

Correlation analysis is conducted to understand the relationship between variables. The researcher used Pearson's Coefficient to conduct the correlation analysis.

Table 1

Correlation analysis of sustainable warehouse efficiency and management

		Sustainable Warehouse Efficiency	Management
Sustainable Warehouse Efficiency	Pearson Correlation	1	.611**
	Sig. (2-tailed)		.001
	N	61	61
Management	Pearson Correlation	.611**	1
	Sig. (2-tailed)	.001	
	N	61	61

**. Correlation is significant at the 0.01 level (2-tailed).

From the table we can see that there is a positive correlation between sustainable warehouse efficiency and management ($r = 0.611$). The relationship between the two variables is strong ($r > 0.5$). Since the P-value is 0.001, we can conclude that the hypothesis of effective management on sustainable practice contributes to warehouse efficiency is accepted.

Table 2

Correlation analysis of sustainable warehouse efficiency and training

		Sustainable Warehouse Efficiency	Training
Sustainable Warehouse Efficiency	Pearson Correlation	1	.651**
	Sig. (2-tailed)		.001
	N	61	61
Training	Pearson Correlation	.651**	1
	Sig. (2-tailed)	.001	
	N	61	61

**. Correlation is significant at the 0.01 level (2-tailed).

From the table we can see that there is a positive correlation between sustainable warehouse efficiency and training ($r = 0.651$). The relationship between the two variables is strong ($r > 0.5$). Since the P-value is 0.001, we can conclude that the hypothesis of effective training on sustainable practice contributes to warehouse efficiency is accepted.

Regression analysis is conducted to show the relationship between the sustainable warehouse efficiency (dependent variable) with management and training in a company (independent variables).

Table 3

Model summary of sustainable warehouse efficiency with management and training

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.673 ^a	.453	.434	.27790

a. Predictors: (Constant), Training, Management

The regression coefficient (R) of sustainable warehouse efficiency with management and training is 0.673 and the R square is 0.453. This represented high degree of correlation between the dependent and independent variables. 45.3% of the sustainable warehouse efficiency can be explained with management and training in a company. This shows that there are also other factors affecting the sustainable warehouse efficiency but management and training are also main factors.

Table 4

ANOVA analysis of sustainable warehouse efficiency with management and training

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.704	2	1.852	23.983	.001 ^a
	Residual	4.479	58	.077		
	Total	8.184	60			

a. Predictors: (Constant), Training, Management

b. Dependent Variable: Sustainable Warehouse Efficiency

Since the probability value for the statistics was less than 0.05 ($p = 0.001$), we can conclude that both the hypothesis were supported.

Table 5

Coefficient analysis of sustainable warehouse efficiency with management and training

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.782	.550		1.421	.001
	Management	.298	.169	.269	1.761	.040
	Training	.516	.178	.443	2.905	.005

a. Dependent Variable: Sustainable Warehouse Efficiency

Researcher concluded that there are significance relationships between dependent variable and independent variables. The table showed that the relationship is a positive relationship. As a result, the estimated regression equation for both independent variables can be written as: -

$$\text{Sustainable Warehouse Efficiency} = 0.298 + 0.169 (\text{Management})$$

$$\text{Sustainable Warehouse Efficiency} = 0.516 + 0.178 (\text{Training})$$

Qualitative analysis

The researcher conducted an interview in ICCL and found out that there are a lot of management aspects involved in maintaining the efficiency of a sustainable warehouse. In order to reduce energy consumption and maintain sustainability, the construction of the warehouse is separated into three rooms, the loading bay, ante room and warehouse.



Diagram 1
Floor plan of ICCL's warehouse

ICCL also came out with other brilliant ways to reduce the outside air from entering the warehouse. For example, there are balloons seal around the truck during loading to prevent the air entering the warehouse from the gaps between the trucks and walls. They also try to request customers to provide products that are already frozen or chilled to reduce the usage of the temperature compressor. Extra charges will be charged on products that are not frozen or chilled when delivered to the warehouse and also to open-air trucks. ICCL uses four types of storage system, which are the steel racking, single deep racking, double deep racking and mobile racking. There are temperature sensors installed inside the warehouse to sense if there are any changes in the temperature of the warehouse. GPS that has temperature sensors were also installed in the company trucks to enable the company to track the location of the truck and read the air temperature inside the truck.

ICCL provides a lot of training to their employees. The training differs from the position of employees in the company. There are many kinds of training, such as food-handling training, forklift training, truck training, halal training, Kaizen training, safety training and many more. Most of the trainings were done internally, except for Halal training, where the company will outsource experience people from outside to train their employees. The workers inside the warehouse were also trained to drive forklifts and conduct safety features. This is to ensure that the safety of the workers. Training was also given to ensure the cleanliness of the warehouse. Internal housekeeping will be conducted weekly to ensure the cleanliness of the warehouse.

DISCUSSIONS AND CONCLUSION

The first hypothesis is that effective management on sustainable practice contributes to warehouse efficiency. Studies showed that the hypothesis is supported and accepted because the independent variable, which is effective management, shows positive significance relationship with warehouse efficiency during quantitative analysis. Furthermore, the qualitative analysis also showed that effective management is very crucial in warehouse efficiency. There are a lot of management aspects that required to be considered in the warehouse industry to maintain sustainability and efficiency.

The second hypothesis is that effective training on sustainable practice contributes to warehouse efficiency. Studies showed that the hypothesis is supported and accepted because the independent variable, which is effective training, shows positive

significance relationship with warehouse efficiency during quantitative analysis. Furthermore, the qualitative analysis also showed that effective training is important in warehouse efficiency. Training is important because training can help improve warehouse operations and ensure the safety and health of employees.

Theoretically, this research contributes an insight study on how management and training will affect sustainable warehouse practice and benefit the industry. Practically, the research is applicable for management practitioners in the industries, especially those who are operating warehouses, in making important decisions to improve sustainable operations. Other factors will be improvement of 5S, sustainable operational training and sustainable materials handling management, including inventory management and audit process.

Based on this research, it is concluded that more research should be conducted and explored about sustainable warehouse practice with other variables such as technology, green management and environment. This will impact positively to the sustainable warehouse and support to the current food manufacturing industries or food trading business.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

There are some limitations in this research with respect to the scope and the methodology used. Questionnaire distributed and collected could only manage to get 61 out of 100 respondents as targeted. As the survey and the interview are done within the company, it cannot represent the overall research study of sustainable warehouse operation industry in the country.

Therefore, it is suggested that for future research, more companies should be involved in this research study with more information from qualitative and quantitative data collected. For this research study, it is an opening for such research to be explored further in sustainable warehouse.

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