

# Green Supply Chain Management

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## ABSTRACT

This study had shown that green training practices in firms play the most important roles and provided some advantages to the green supply chain management in an organization. This study need to solve the problem because the problem will make the firm not effective in the production level. This problems need to be solve because to ensure that the supply chain management on that cover area of green purchasing are doing well according to the departments in firms. Besides that, implementation of effective green training will make a good sustainable in green supply chain that will impact on the overall well-being of society and environment. In this study, (Adriano Alves Teixeira, 2016) also shown that, the green training very important on having effective relationship with customers that cover on the collaboration with customers. Other than that, this problem need to be counter on the lack green training practices in order to increase the satisfactions for the customers related to the products.

**Keywords:** *green supply chain, supply chain, sustainability*

## I. INTRODUCTION

Based on the (Gotschol, 2014), found that in order to become a green company, they should give preference to the Green Supply Chain Management which is contain about the green purchasing and collaboration with customers, this will a more economically sustainable and environmental friendly approach in the future. Besides that, (Walker, 2015)said that in order to have more sustainable operation management, GSCM need to extent the traditional concept of supply chain management in order to improve the environmental performance of products and services across their activities in life cycles. This study had shown based on (Nascimento, 2014)there is a positive plan to adopt the GSCM in the Brazil. In this study (Zhu, 2008) had found that green purchasing (GP) which is related to the environmental criteria of supplier option and purchasing and also collaboration with customers (CC) can be refer to the green feedback, customers relationships and guidelines in the greening of organization or firms. According to the (Abreu, 2015) said that GP and CC practices are apply in order to face the difficulties managing the stakeholder incorporation in environmental action by requiring customer and supplier in the decision making process related to the green issues across the supply chain. Nowadays, this study was applicable in the all organization across the world by implementing the green training practices in order to produces a sustainable green supply chain management especially on the green purchasing and collaboration with customers. This study also related to the implementation of ISO 14001 which is every organization need to have apply that international standard operation for their company because the implementation of this standard will help the firms to improve their performances through more efficient use of resources and reduction of waste, also gaining competitive advantages and getting the trust from the firm's stakeholder.

### A. Problem Statement

Based on the study, (Adriano Alves Teixeira, 2016) this research show the investigation of the implementation of green supply chain management practice for example green purchasing and cooperation with customers will contribute some problems because of the lack of green training. The problem for this study was the lack of green training practices in the firms that effected to the green supply chain management that cover on the green purchasing and collaboration with customers.

## II. LITERATURE REVIEW

### B. Theoretical Background

Based on this study that is conducted the research by apply resource-based view theory of sustainable supply. Example of resources in firm and organization can be defined as all assets, capabilities, organization process, firm attributed, information, and knowledge that controlled by an enterprise that enable the firm to convince of and also to implement strategies in order to achieve the firm goals that to improve the efficiency and effectiveness of production. This study also stated that the relationship between human resource management and environmental management (Toubolic and Walker, 2015). This can be easily referred

as the Green Human Resources Management with Green Supply Chain Management GSCM. This alignment of two components can contribute some benefit to firms to overcome the barriers by adopting CC and GP. By having GHRM that can be defined as alignment between traditional human resources practices for example ( training and performance appraisals) and environmental policies and objectives of the firms, will help the firm to have greater employee engagement in sustainability management (Rentwick, 2013). Generally, as the firm implement about the employees appraisal by giving them rewards or bonus that will effect on the performances of the firms which they will do the task jobs based on the firms needed.

In this study have many factors of Green Human Resources Management that will contribute to the GSCM but the study strengthen more on the green training GT contribute that most contribute to GSCM. Based on the (Daily and Huang , 2001) stated that GT can be refer as a process of on-the-job training and continue education intended in order to achieve corporate environmental target and purpose. Besides that, GT is type of training that cover area of environmental topics. The person involves in the GT is the staff such as top, senior, middle management and lower employees that undergo the training and integrates the firms with environmental issues. Based on the study found that GT is positively related to the greening of firms around the world. For example research that is conducted by the (Sarkis, 2010) found that the implementation of GT is really relevant by adopting advance environmental practises among firms in the Spain. In this study indicated that GT have positively related to the GSCM that focus on the Green Purchasing GP and Collaboration with Customers. GP can be refer to the purchasing function activities such as ( outsourcing, buying, delivery schedule ade etc. ) on the acquisition of material from supplier to meet the need of producing the organization product or services. Meanwhile CC can be defined as a cooperative supply chain lead to coordinate its partnerships to produce commodities and services along the chain for minimum overall cost. It also can be as the satisfaction of customers demands.

However, in this study also have state about the several theoretical gaps. Firstly, (Hoof, 2014) stated that works have suggested that organizational learning and training are relevant idea to create more sustainable supply chain in firms. Besides that, in this study also stated that there are many works on the green training are qualitative or conceptual that hard to study in this research. This study required more on quantitative studies to get better information and result in future. There will be a theoretical or research gap will appear whether the GT are positively related to the green supply chain practices which are GP and CC. Last but not least, in this study also stated that to take point on the Firm Size FS that also contributed to the more sustainability of green supply chain.

### **III. METHODOLOGY**

In this section, this study had prepared the research framework that shown in Figure 1. Besides that , in this study also use survey research in order to collect the data. (Rungtusanatham, 2003) stated that survey research are generally relational because they tend to be designed to empirically examine relationships among two or more variables. Based on the framework ,there are actually the independent variable of Green Human Resources Management that contain the concept of Green Training GT. Meanwhile the dependent variable is Green Supply Chain Management GSCM that contain of Green Purchasing GP and Cooperation with customers CC. By referring to the framework, this study show that there are interaction among the GHRM and the Green Supply Chain Management GSCM. We can see that all the items on GT will be effected to the GP and CC. For example of items in GT is items number GT3 which is Green Training is provided to the employees in the firms. This implementation of items GT3 will determine the outcomes in two different concept of Green Supply Chain Management GSCM either GP or CC. The study also state that, the firm size also can effect on the Green Supply Chain Management GSCM.

GREEN HUMAN  
RESOURCES  
MANAHEMENT

GREEN SUPPLY CHAIN  
MANAGEMENT

Figure 1. Research Framework



Figure 2. Research Framework by using SmartPLS

The independent variable of Green Human Resources Management which is Green Training consist of 10 items which are GT1 until GT10 .and the dependent variable is Green Supply Chain Management that separate the items into two concept which are Green Purchasing ( consists of 5 items which are GP1 until GP5, and Collaboration with Customers have 3 items which are CC1 until CC3 ). Besides that, in this study also conducted the survey by questionnaire by provide the scale rating. The question can be referred to Table 1.

**Table 1. Questionnaires**

	QUESTIONAIRES ITEMS	1	2	3	4	5
Concept						
Green Training	GT1- Content of GT are raised through a systematic analysis of training gaps and need					
	GT2- The responsibilities and duties of official green trainers are precisely defined					
	GT3-GT is offered to all employees (including outsourced)					
	GT4-There is an adequate infrastructure (physical space, material, people) for the delivery of GT					
	GT5-GT sessions occur within the company					
	GT6-GT sessions occur outside of the company					
	GT7-There are adequate assessments of employees' performance after attending GT sessions					
	GT8-Generally, employees are satisfied with the GT offered;					
	GT9-The topics approached during GT are appropriate and current for company activities					
	GT10-Employees who receive GT have the opportunity to apply green knowledge in everyday activities					
GSCM	GP1-Selection of suppliers with ISO 14001 certification					
	GP2-Cooperation with suppliers to achieve green goals					
	GP3 - Available green guidelines to suppliers					
	GP4- Assessment of green issues of second-tier suppliers					
	GP5- Conducting green audits within the suppliers					
	CC1- Cooperation with customers for cleaner production					
	CC2- Cooperation with the customers to develop greener packaging					
	CC3- Cooperation with customer for eco-design					

**C. Nature Of The Research**

Based on the research, which is conducted a study by using the quantitative research on the how Green Human Resources Management will effect on the Green Supply Chain Management. Besides that, quantitative research involve a cycle of phase hypothesis formulation. Moreover, the quantitative research requires a measurable data collection, analysis and interpretation in order to prove the assumption that stated in the research.

The quantitative research also require a statistical test which are use to interpret the assumption that have been develop in the study. Besides that, its also can solve the underlying issues in more generalized form since the assumption are made from general perspective.

Lastly, quantitative research also provides a more detailed consideration of the issues being developed which the issue is GHRM and GSCM since it does not only outline the special characteristics within a study. It also key different in the consideration making the conclusion for this research. The hypothesis is being developed and analysed using statistical approaches which mean that scientific and mathematical research must include data analysis

**D. Research Paradigm**

Based on the study, it conducted a positivism approach because this research is quantitative research. The quantitative research always follows positivist approach because in testing the empirical hypothesis. In a positivism approach will involve the human behaviors that will effect on the what the study was analyzed. For example in the study, there are human behavior in the Green Human Resources Management that act as factor which will come out with the effect on the Green Supply Chain Management ( Green Purchasing and Collaboration with Customers).

### E. Unit of Analysis

According to the study, the research is conducted on comparing which one of Green Supply Chain Management ( Green Purchasing or Collaboration with Customers ) that has provide more result value. The unit of analysis is can be classified as group analysis and social organization. This is because in the research has targeted firms Brazilians in order to get the results which the research conducted the questionnaires to the group of employees.

## IV. CONCLUSION

In the study, the study conducted a quantitative and based on the electronic survey. The research builds the questionnaire of electronic survey that contains 10 questions on the GT variables and 8 questions on Green Supply Chain Management.

Besides that, the Firm Size (FS) is measured by using four types of patterns in Brazil. The pattern is identified by the number of employees which are micro-sized firms ( up to 19 employees), small firms ( 20-99 employees ), medium-sized firms (100-499 employees) and large firms ( 500 or more employees). The survey questionnaires is send by email to the Brazilian environmental / sustainability / operation managers and also to the owner of manufacturing firms which provide them with online link about the questionnaires.

The data is collected by receiving the firm respondent's answers by email and phones around 330 potential participants with 95 questionnaires are collected in 201 and 2013. There also about 28.78% rates of return of questionnaires are obtained. Based on the final research sample of participants, the data are obtained which are 66.32% are from manufacturing sector ( among all participants : 20% from automotive companies, 13.68% from chemical sector, 10.53% from electronic sectors and 22.11% are from others manufacturing sectors). The coal, oil and gas equipment sectors also give the data result about 9.47% and the mixed sector resulted about 24.21%.

Besides that, the sample's representation comprised 2.1% of micro-size firms, 18.9% small firms, 42.1% medium-sized firms, and 36.9% large firms and all those firms have their ISO 140001 certification.

According to this study, the data are analyzed with using structural equation modeling SEM by apply the partial least squares PLS which also has support from SmartPLS 2.0 M3 software in order to get the result of data.

During the collection of data process, the study has come out with a path of diagram to illustrate the relationship between the dependent and independent variables. After that, a measurement model had built in order to determine if the obtained coefficient are significant or not.

Based on the study, (Adriano Alves Teixeira, 2016) found that the items of GT4-GT7 are removed because the indicator show the reliability <0.6. in this study just included the items of reliability >0.6. The data are constructed by adopting a two-stage approach which show on the convergent validity, internal consistency reliability and discriminant validity. After that, the process of data analysis is go through by constructed a structural model estimation based on the bootstrapping with 2000 subsamples. Based on the study, (Latan and Ghozoli, 2012) stated that there are several statistical equations that required to get the result for example the R-square that show the large and satisfactory, and also variance inflation factor (VIF). Lastly, the hypothesis is tested by using the items and undergoes the SmartPLS 2.0 M3 software and come out with the results.

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