NEW CHALLENGES IN THE GREEN SUPPLY CHAIN MANAGEMENT – A STUDY WITH REFERENCE TO CHENNAI CITY

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ABSTRACT

Green supply chain management is the process of using ecofriendly inputs and transforming the inputs into outputs that can be re-used at the end of the life cycle. Green supply chain management is one of the recent innovations for the enrichment of Supply Chain Management. The main aim of this paper is to review the literature of the green supply chain management over the last few years. The major activities that came out of the literature reviews such asgreen design, green organizational activities, green manufacturing and waste management.This paper concentrates on the key drivers for the green initiatives likegreen supply chain, prestige, paperless office, green manufacturing, increased customers, government compliance and public relations.

Keywords: Green supply chain, prestige, green design, paperless office, Green Manufacturing

INTRODUCTION

The public becomes more aware about the environmental issues, green design, paperless office and Green Manufacturing. The consumers will ask more questions about the products when they are purchasing. The companies have expect the questions about how green their manufacturing processes and green supply chain.The sustainable development has tomakethe remarkable progress in establishing the environmental and social sustainability towards the organizational operations management and green supply chain. The sustainable development means the development meets the needs of the present without negotiating the ability of the future generations.The sustainability covers there are three aspects such as economic, environmental and corporate social responsibility. The green supply chain management means making the entire supply chain is more environmental sustainable. The companies may choose to adopt green supply chain management for many various reasons such as laws and regulations, differentiate in a competitive industry and need to implement green supply chain management to stay in this competitive technological world.

LITERATURE REVIEW

Walton, Handfield and Melynyk (1998) ascertained that increasing government regulations and stronger public is important for the environmental

accountability that brought these issues intoexecutive collections, and strategic planning.

According to Guide & Srivastava (1998), Srivastava, (2007) the concepts of green supply chain isgreen operations, green design, green manufacturing, and waste management. It will reduce the wastage and improve the organizational productivity.

Ashley (1993) Allenby and Richards (1994) examined that the framework of green design. The life-cycle analysis is a framework that came out of green design. Green design, green marketing and green manufacturing reduces the wastage and improve the productivity of the organization

Works of Arena,Mastellone and Perugini (2003) found thatthe life-cycle analysis is a framework and the Green Operations of the organizations was an important concept that came out of the green supply chain management.

Crainic, Gendreau and Dejax (1993) ascertained that standardized model for reducing the electronic waste without harming the organizational environment. There are different waste management issues came into this context particularly recycling and remanufacturing. On the other hand the Green Manufacturing was not conceptualized till 1993.

Kuruvilla, S.J. and Joshi, N. (2010) found that "Influence of Demographics, Psychographics, Shopping Orientation, Mall Shopping Attitude, and Purchase Patterns on Mall Patronage in India". This study identified the gaps in agricultural supply chain management practices that researchers can use to enrich theory construction, while practitioners can focus on determining the scope and frontiers of agro-food SCM.

Rajagopal (2010)the findings examined that personality, social, and cultural factors influenced consumer purchase intentions and decisions. It is also examined that the store and brand preferences have a positive impact on developing the intentions to purchase fashion clothing.

GREEN SUPPLY CHAIN MANAGEMENT

The green Supply Chain is the movement of materials as it move from their source and the end is the customer. The green Supply Chain produce the value in the form of products and service to the end of the customers through various processes and activitieswhich is performed by the organizations network from the linkages of upstream and downstream. The network process and the activities may consists of maintenance of theraw material, work-in-progress, stock, and finished products as well as the suppliers, purchasing department, manufacturing centers, transportation, distribution centers, warehouses, and retail outlets.

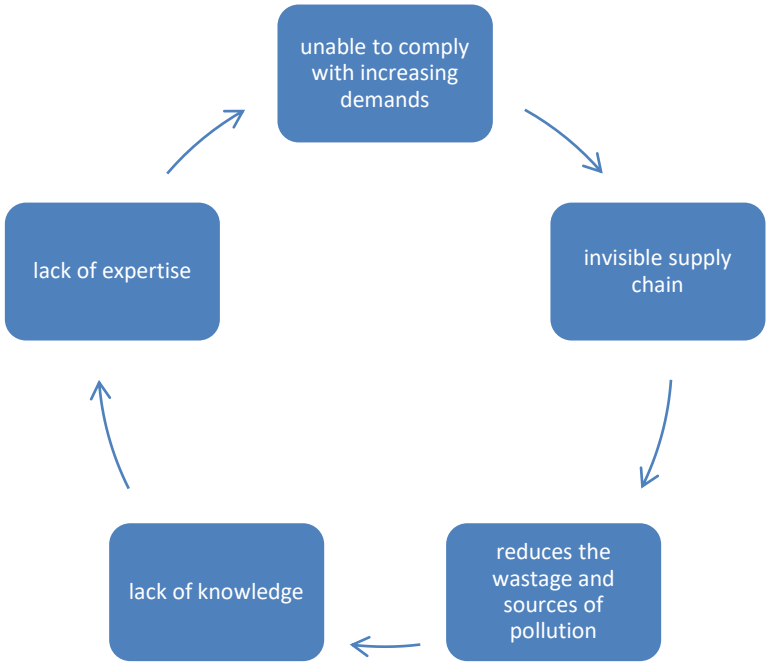
The green supply chain management ranges from monitoring and implementing the general environmental management to creating or controlling the processand implemented through various activities. To attaining a green supply chain management is minimization of wastageitbecome considered as an important strategic of the organization. The most common enemy in the environmental protection is manufacturing and production process.

Thus, the manufacturing and production processes of the organizations are viewed as the culprits in harming of the environment.The organizations need to create customer awareness to reduce the waste management. The organizations with green supply chain management will have a competitive advantage over the companies.

NEW CHALLENGES IN THE GREEN SUPPLY CHAIN MANAGEMENT

Worldwide organizations are accurately aware about green supply chain management but implementing supply chain management is not a simple task. There are some common challenges faced by the business people in the green supply chain management such as invisible supply chain, unable to comply with increasing demands, reduces the wastage and sources of pollution,manage production and distribution, lack of knowledge and lack of expertise.

RESEARCH MODEL - NEW CHALLENGES IN THE GREEN SUPPLY CHAINMANAGEMENT



STATEMENT OF THE PROBLEM

Green Supply Chain Management emerges as a new systematic environmental approach in the supply chain management. These days it has been increasingly recognized and practices by forward-thinking of organizations. The consumers are prefer to purchase these products that are produced with a minimum of pollution, free of toxins, and minimal environmental impact. Now a days the companies are taking voluntary steps to develop greener earn credibility, and develop the reputation for leadership.

OBJECTIVES OF THE STUDY

a. To identify the new challenges in the green supply chain management.

b. To study the comprehensive conceptual model of green supply chain management.

SCOPE OF THE STUDY

The scope of this study is quite broad. The supply chain management encompasses the multiple aspects like manufacturing, packaging, transportation, warehousing and delivery. Further the scope of this study is supply chain managements such as invisible supply chain, unable to comply with increasing demands, reduces the wastage and sources of pollution, manage production and distribution, lack of knowledge and lack of expertise.

LIMITATIONS OF THE STUDY

- ✓ This study is only concentrated new challenges in the green su chain management.
- ✓ This study is limited to Chennai c

HYPOTHESIS

H1: There is a significant relationship between age of the respondents andnew challenges in the green supply chain management.

H2: There is a significant relationship between the factors ofnew challenges in the green supply chain management among the respondents.

METHODOLOGY

Primary as well as secondary data has been used for this research. The sample size of this study is 86. The researcher used Cronbach‘s Alpha test to measure the internal consistency to validate the questionnaire. KMO and Bartlett’s test, one-way ANOVA, post Hoc- Tukey HSD test and structural equation modelling also adopted to analyze the factors of new challenges in the green supply chain management.

ANALYSIS AND RESULTS

a. Reliability statistics

The Cronbach‘s Alpha test is used to measure the internal consistency for validate the questionnaire.

Cronbach's Alpha	N of Items
.905	6

The Cronbach‘s Alpha Value is = 0.905.

b. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.877
Bartlett's Test of Sphericity	Approx. Chi-Square	340.808
	df	15
	Sig.	.000

Interpretation

KMO is an index which defines the sampling adequacy. The KMO value = 0.877 which is more than 0.5 so that it is considered as acceptable.

Bartlett's Test of Sphericity help the researcher to decide whether the results of factor analysis are worth considering for analyzing this study. Bartlett's Test of Sphericity significant at the level of 0.000 significance. So that it shows there is a high level of correlation between new challenges in the green supply chain management among the respondents, so the sampling is adequate for factor analysis.

c. ONE- WAY ANOVA

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Theconcept of Green supply chain management can influence the organizational prestige.	Between Groups	16.896	3	5.632	4.744	.004
	Within Groups	97.337	82	1.187		
	Total	114.233	85			
Lackof knowledge will affect the productivity.	Between Groups	7.903	3	2.634	2.510	.064
	Within Groups	86.050	82	1.049		
	Total	93.953	85			
Marketing is an important activity in developing and implementing the green supply chain management	Between Groups	16.242	3	5.414	5.882	.001
	Within Groups	75.479	82	.920		
	Total	91.721	85			
The green supply chain management reduces the wastage and reduces the sources of pollution	Between Groups	11.432	3	3.811	4.330	.007
	Within Groups	72.161	82	.880		
	Total	83.593	85			
Adopted green manufacturing technique	Between Groups	23.691	3	7.897	8.230	.000
	Within Groups	78.681	82	.960		
	Total	102.372	85			
unable to comply with increasing demands	Between Groups	8.508	3	2.836	1.964	.126
	Within Groups	118.423	82	1.444		
	Total	126.930	85			

Interpretation

The P value of the factors of new challenges in the green supply chain management such as prestige, Marketing, reduces the wastage and reduces the sources of pollution and adopted green manufacturing techniqueare less than 0.01 at 1% level of significance. Therefore, the null hypothesis of the above factors were rejected at 1% level of significance. It concludes that there is a significant difference in prestige, marketing, reduces the wastage and reduces the sources of pollution and adopted green manufacturing technique among the respondents.

The P value of Lack of knowledge will affect the productivity is more than 0.05 at 5% level of significance. Thus the null hypothesis is accepted at 5% level of significance. It is ascertained that there is no relationship between lacks of knowledge

will affect the productivity among the respondents.

d. POST HOC –TUKEY HSD TEST

Tukey HSD					
Dependent Variable	Age	Age	Mean Difference	Std. Error	Sig.
the concept of Green supply chain management can influence the organizational prestige.	less than 30 years	30-40 years	.578	.369	.405
		41-50 years	.810*	.298	.039
		above 50 years	1.258*	.348	.003
	30-40 years	less than 30 years	-.578	.369	.405
		41-50 years	.232	.349	.910
		above 50 years	.681	.393	.314
	41-50 years	less than 30 years	-.810*	.298	.039
		30-40 years	-.232	.349	.910
		above 50 years	.449	.327	.521
	above 50 years	less than 30 years	-1.258*	.348	.003
		30-40 years	-.681	.393	.314
		41-50 years	-.449	.327	.521
the concept of paperless office is implemented in your organization.	less than 30 years	30-40 years	.407	.347	.646
		41-50 years	.603	.280	.145
		above 50 years	.831	.328	.062
	30-40 years	less than 30 years	-.407	.347	.646
		41-50 years	.196	.328	.932
		above 50 years	.424	.370	.661
	41-50 years	less than 30 years	-.603	.280	.145
		30-40 years	-.196	.328	.932
		above 50 years	.228	.307	.880
	above 50 years	less than 30 years	-.831	.328	.062
		30-40 years	-.424	.370	.661
		41-50 years	-.228	.307	.880
Marketing is an important activity in developing and implementing the green supply chain management.	less than 30 years	30-40 years	.736	.325	.115
		41-50 years	.897*	.262	.005
		above 50 years	1.169*	.307	.002
	30-40 years	less than 30 years	-.736	.325	.115
		41-50 years	.161	.307	.953
		above 50 years	.433	.346	.597
	41-50 years	less than 30 years	-.897*	.262	.005
		30-40 years	-.161	.307	.953

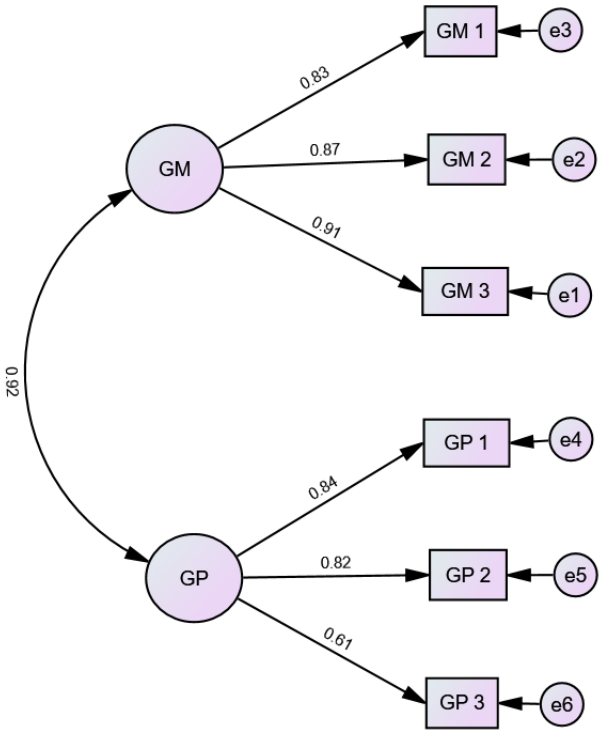
		above 50 years	.272	.288	.781
	above 50 years	less than 30 years	-1.169*	.307	.002
		30-40 years	-.433	.346	.597
		41-50 years	-.272	.288	.781
The green supply chain management reduces the wastage and reduces the sources of pollution	less than 30 years	30-40 years	.910*	.318	.027
		41-50 years	.633	.256	.072
		above 50 years	.931*	.300	.014
	30-40 years	less than 30 years	-.910*	.318	.027
		41-50 years	-.277	.301	.794
		above 50 years	.021	.339	1.000
	41-50 years	less than 30 years	-.633	.256	.072
		30-40 years	.277	.301	.794
		above 50 years	.298	.282	.716
	above 50 years	less than 30 years	-.931*	.300	.014
		30-40 years	-.021	.339	1.000
		41-50 years	-.298	.282	.716
Adopted green manufacturing technique	less than 30 years	30-40 years	.873*	.332	.049
		41-50 years	1.118*	.268	.000
		above 50 years	1.381*	.313	.000
	30-40 years	less than 30 years	-.873*	.332	.049
		41-50 years	.246	.314	.862
		above 50 years	.508	.354	.480
	41-50 years	less than 30 years	-1.118*	.268	.000
		30-40 years	-.246	.314	.862
		above 50 years	.263	.294	.808
	above 50 years	less than 30 years	-1.381*	.313	.000
		30-40 years	-.508	.354	.480
		41-50 years	-.263	.294	.808
unable to comply with increasing demands	less than 30 years	30-40 years	.556	.407	.525
		41-50 years	.788	.329	.085
		above 50 years	.560	.384	.468
	30-40 years	less than 30 years	-.556	.407	.525
		41-50 years	.232	.385	.931
		above 50 years	.004	.434	1.000
	41-50 years	less than 30 years	-.788	.329	.085
		30-40 years	-.232	.385	.931
		above 50 years	-.228	.361	.921
	above 50 years	less than 30 years	-.560	.384	.468
		30-40 years	-.004	.434	1.000

		41-50 years	.228	.361	.921

Interpretation

Post Hoc- Tukey HSD test was used to test the significant difference between groups based mean difference of new challenges in the green supply chain management. According to this study it was ascertained thatless than 30 age group of therespondents accepted the factors of challenges in the green supply chain management such as prestige, lack of knowledge, Marketing, reduces the wastage and reduces the sources of pollution, adopted green manufacturing technique and unable to comply with increasing demands.But the other group of respondents are not aware about the above factors.

STRUCTURAL EQUATION MODELLING



Model fit Indices

Model fit	Recommended value	value
CMIN/DF	<3	1.888
Goodness of fit (GFI)	≥0.90	0.946
Comparative Fit Index (CFI)	≥0.90	0.979
Normed Fit Index (NFI)	≥0.90	0.957
Incremental Fit Index (IFI)	≥0.90	0.979

Root Mean Square Residual (RMR)	<.05	0.05
Tucker Lewis Index (TLI)	≥0.90	0.961
Relative Fit Index (RFI)	≥0.90	0.920

From the above table it was identified that, the discrepancy divided by the degrees of freedom is 15.107 / 8 = 1.888. Goodness of fit (GFI) =.946, Normed Fit Index (NFI) = .957, Comparative Fit Index (CFI) =0.979, Incremental Fit Index (IFI) = 0.979, Root Mean Square Residual (RMR) = 0.05, Tucker Lewis Index (TLI) = 0.961 and Relative Fit Index (RFI) = 0.920. It shows that the model fit is good.

FINDINGS

The Green Supply Chain management initiatives are rapidly becoming the high priorities for the society in these days, as it reduces the carbon footprint and becoming better stewards of the planet's natural resources. Initially practicing green marketing is a costly affair. The organization need to adopt the green supply chainmanagement practices such as green products, green services, green technology, green power and green energy in order to increase the productivity and reduce the wastage.

CONCLUSIONS

This study concluded that the new challenges in the Green Supply Chain Management reveals the environmental issues and it demonstrates how the green Supply Chain Management practices help to save the money, increase the efficiency and reduce the wastage. The development of green supply chain management requires green products, green services, green technology, green power and green energy in order to increase the productivity and reduce the wastage and it should be the integrated approach to the green supply chain management. Difficulties to understand the challenges, unawareness of the Green Supply Chain Management practices and its impact upon the consumers, organizations and society. The proper assessment of the new challenges and implementation of the above strategies can be added the value ofentire organizational activities.

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