

IMPACT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON ENVIRONMENTAL PERFORMANCE

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ABSTRACT

The research aims to examine the environmental performance by manufacturing sector of Pakistan with the perspective of green supply chain management practices such as green purchasing; green manufacturing; green packaging and green distribution with environmental efficiency. In an environment where it is necessary to meet the satisfaction of customers for productivity of the organization, it is important to highlight the role and skills of environmental performance of the firm to prevent the pollution and greening the environment. Close ended questions were used to get responses of the independents. Questionnaires were distributed to employees of manufacturing company of FMCG products to get their responses. This research is of quantitative in nature. The sampling technique used is Simple Random Sampling and the sample size is set to 260 respondents. Descriptive analysis, reliability test, correlation and multiple regression tests were run by using SPSS tools for study. Results showed that there are positive and significant relationships of environmental Performance with Green Manufacturing; Green Packaging and Green Distribution of FMCG products by their manufacturing firms. This research is specifically done on the manufacturing FMCG products in manufacturing industry. There were few variables studied and surveyed that can be beneficial for organization of all type of manufacturing items by efficiently greening their supply chain practices and enhancing environmental performance of the firm. Therefore, it's recommended to use this research work to manage the green supply chain management practices to prevent pollution and gain environmental sustainably.

Keywords: Green Purchasing, Green Manufacturing, Green Packaging, Green Distribution, Environmental Performance.

INTRODUCTION

Over the several years, researchers claimed that the current era of globalization seems to led to an increased worldwide handiness of goods (Bendul et al., 2017). Industries are investing a considerable sum of money specifically to make sure the continuous accessibility and handiness of such items, as well as to gain the attention of more users and to gain the buyers which has been resulted towards the depletion of capital around the globe with a scale which becomes unsustainable (Aslam & Azhar, 2013). Some forms including release of carbon mono-oxide, dumped packaging substances, wasted hazardous stuffs, roadway congesting environment by traffic and many more types of industrialized pollution, corporate operations could constitute a major risk to its environmental performance.

Green Supply chain managements (GSCM) recently emerged mostly as wide variety of business tools that support organizations to enhance its credibility and environmental efficiency. Therefore, increasingly further companies continue focused towards integrating green activities of them or strengthening them (Ahi & Searcy, 2015; Markley & Davis, 2007).

Thus according Mirhedayatian et al. (2014), Green SCM practices strive to achieve environmental sustainability since they provide opportunities to reduce pollution and emissions. As either a result, Green SCM assessment is useful for each and every firm's operational performance with the concern of environment developments. The government has involved in environmental effect by the manufacturing sector of Pakistan and passed numerous environmental legislation which really contributes to the enhancement of “greening” in compliance with global environmental norms. Standards regarding air quality control; soil management and land protection; environmental pollution safeguards in times of emergency and disaster; wastewater management; and others are always amongst them (Omar et al., 2016).

Problem Statement

In the current developing era, industries are facing much limitation in manufacturing goods with the concern of environmental safety as it the main concern for the government and public to control the pollution either it's regarding to land or water and even air for safe and healthy environment. It is necessary for the organization to design their strategies and policies as per the requirements of environmental safety and sustainability.

Objective & Significance of Study

1. To determine the influence of green purchasing of product on environmental performance.
2. To analyze the impact on environmental performance by greening packaging in manufacturing sector of Pakistan.
3. To examine the effects of green manufacturing on environmental performance in manufacturing industry.
4. To analyze the impact on environmental performance by greening distribution in manufacturing sector of Pakistan.
5. The environmental safety and sustainability is the duty of every business and every industry of the world and manufacturing industry have directed impact on it and can play a wide significant role in making the environment green. Organizations implemented green supply chain management strategies to take a part in cleaning the world and greening the environment.

LITERATURE REVIEW

The amount of literature or research history about green supply chain managements practices has increased through the department for production of good and materials as well as for operations management in current decades and has become admired and likely followed by scholars (Singh & Trivedi, 2016). Srivastava (2007) had already emphasized that practices under green supply chain of management can become an approach for enhancing an environmental performance of an organization, as well as many other scholars including Chen et al. (2010); Deif (2011); Meera & Chitramani (2014); Fahimnia et al. (2015); Singh & Trivedi (2016); Famiyeh et al. (2018) have been continuously investigating it.

In previous researches, several GSCM definitions can be found; those explained the meaning of greening the supply change management as, that one was interpreted by Srivastava (2007) as merging environmental reasoning into supply chain management, which include product development, purchasing and choice of materials, production methods, customer distribution of finished goods, and also edge of product management just after consumable life (Nasrollahi, 2018).

GSCM incorporates the notions of Supply Chain Management and environmental sustainability; in concluding the green element to practices and procedures, it collects the explanation of supply chain managements (Frödell, 2011; Gong et al., 2019). GSCM could explain as management

of supply chains in such manners that would minimize adverse environmental effect of the company (Holt & Ghobadian, 2009; Rao & Holt (2005); Lee (2008); Lee et al., 2012). GSCM practices indeed seek to generate the environmentally safer for companies, and moreover enable to optimally utilize natural resources to enhance the productivity of industries.

It implies that enterprises must concentrate towards long-term sustainability that would detect the environmental and social problems at the same time (Porter & Kramer, 2006). Green Supply Chain Management practice has always been in a strong position to promote stability.

In contrast with traditional management for environmental performance, a company's greening supply chain ideology presumes complete liability for its goods, by the discarding or purchasing of raw stuff till the end utilization and discarding of goods (Sadiku, 2020). It reflects the implementation of theories for environmental management and performance through the full frame of activities covering the complete model of order from customer, which includes designing of producing, procurement, production and manufacturing, package of product, and distributing of goods till customer (Puviyarasu, 2016; Badi & Murtagh, (2019).

Research Hypothesis:

H₁: Green purchasing is positively associated with Environmental performance.

Green Purchasing is the essential part of supply chain management and has significant relation with the performance towards environmental safety by purchasing the long last product and reusable which could not harm the environment.

H₂: Green manufacturing is positively associated with Environmental performance.

In manufacturing and making Goods the greening concept shows a positive relationship with environmental performance as it is the concern of the company to not reduce the wastage of stuffs and water to control the air pollution as well as land.

H₃: Green packaging is positively associated with Environmental performance.

Green packaging represents the goods and products wrapping with such material which can be reuse or easy to recycle to stop the pollution of water and land and plays the vital part in environmental performance by making such strategies.

H₄: Green distribution is positively associated with Environmental performance.

Greening distribution impacted the performance of environment significantly as in green distribution the company may use such vehicles with cause no or little pollution and by taking much orders and maintaining delivering techniques.

RESEARCH METHODOLOGY

Data Collection Procedure

To analyze the impact of green supply chain management; the data has been gathered via questionnaire in proper way. Various organizations that manufacture or distribute FMCG products in Pakistan were targeted by the researcher to gain the information Curkovic et al. (2005).

The questionnaire was distributed among such employees with the approval of their managers or supervisors; who are working in this field to attain their information about green supply management related to environmental performance. Then after filling up the forms; the data was

collected by the researcher for several testing to analyze the main objective of the study. Furthermore, a questionnaire was made on Google forms and sends it to the all corporate clients to gain maximum reliable data.

Sample size and Sampling Technique

The size of sample gained for this study is 260 participants who voluntary took part by submitting their responses via questionnaire. The samples were taken randomly by the employees of manufacturing companies by distributing survey questionnaire to them to run a test.

Sampling technique; which is used to attain data is random based, from different designated employees of the various firms. As it on random technique; people of different age group took part which leads to gain the reliable and relevant data for the work (Paulraj, 2011; Hsu et al., 2013).

Research Instrument

The survey tool which is the questionnaire on variables of research is following Likert Scale which says that it has five options or rating degree scale which has: Strongly Disagree=1, Disagree=2, Neutral=3, Agree=4, Strongly Agree=5.

Analysis

The environmentally friendly item and design comprises a series of principles, include the consumption of environmentally sustainable raw materials, layout for reduced energy requirements, usage clean renewable energy technological processes to reduce waste materials, and reverse logistics (Eltayed & Zailani, 2011). To analyze the effects of greening supply chain management practices on environmental performance of the firm; that data has been gathered and testes by using statistical tools (Zhu, & Sarkis, 2004; Zhu & Sarkis, 2007).

The main objective of this research work is to examine the environmental performance of the organizations in manufacturing sector by understanding how green packaging, green manufacturing, green distribution and green packaging of the products influences the environmental performance and stability. Greening the practices of supply chain management can control the pollution either air, water and land by producing environmental friendly products and adopting the safest distribution of it (Diabat & Govindan, 2011).

The tool used to attain the information and data is survey questionnaire which has been designed on the bases of all five variables of the research; which are green purchasing; green manufacturing; green packing; green distribution and environmental performance. The data collected from employees of different organizations on random bases to gain the reliable information for work. Tables and charts were used to manage the data for testing (Ageron et al., 2012; Caramia & Dell'Olmo, 2020).

Respondent Profile

The research work aims to understand the effects of practicing green supply chain management and estimate that how it is influencing the performance towards environment. The data gained randomly by the employees of manufacturing and distribution sector Eltayeb & Zailani (2011).

There are 260 numbers of participants who voluntary took part and fill the survey questionnaire and these participants are classifies in gender, age and qualification. In first segment of the questionnaire; their demographic data was asked to analyze on the basis of their gender age and qualification and it was make them clear that their information kept confidential (Tseng et al., 2019).

Gender

The questionnaire responses collected by random employees in manufacturing sector where 260 of participants filled the form and submitted their responses. The following Table 1 stated that there are 163 male respondents from total of 260, whereas; 97 employees are females who submitted their information via questionnaire survey. It says that 62.7% are male partaker in attaining the information and 37.3% were female.

Table 1 GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	163	62.7	62.7	62.7
	Female	97	37.3	37.3	100.0
	Total	260	100.0	100.0	

Age

The segment of age is divided into five categories among which first class belongs from responded of age 18 years to 22 years; second class ranging into 23 to 27 years; third is between 29 years to 32 years; forth is among 33 years to 37 years and last class is for 28 years and above partakers.

The Table 2 indicates; the highest percentage that is 40.4% participants belongs to second class which is between 23 to 27 years. 39.6% partakers are in third class which is 28-32 years whereas 12.3% are of class forth. 5.8% and 1.9% of participants belonged to class fifth and first respectively.

Table 2 AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-22	5	1.9	1.9	1.9
	23-27	105	40.4	40.4	42.3
	28-32	103	39.6	39.6	81.9
	33-37	32	12.3	12.3	94.2
	38 & Above	15	5.8	5.8	100.0
	Total	260	100.0	100.0	

Qualification

Qualification segment is divided into five categories on survey questionnaire. The five categories named as matric; intermediate; graduate; masters and any other. The respondents fill their information on which bases the table has been generated by using statistical tool. The Table 3 indicates that there is or partaker from first and last category of qualification segment which are matric and any other (Large & Thomsen, 2011).

There are 36.9% respondents who have qualification till intermediate and 34.2% belongs to those who are qualified masters in different fields. 28.8% which employees of total participants are graduated in different field of education. It shows out of 260; 96 are intermediated respondents whereas 89 and 75 respondents are masters and graduate qualification holder.

Table 3 QUALIFICATION					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Intermediate	96	36.9	36.9	36.9
	Graduate	75	28.8	28.8	65.8
	Masters	89	34.2	34.2	100.0
	Total	260	100.0	100.0	

Reliability Analysis

Reliability test is used to estimate the accuracy of the questions about all variables of the research work used in survey questionnaire. The reliability test which is being used in educational research in statistical tool by using the software of SPSS is known as Cronbach’s Alpha. Cronbach's alpha ratings were used to determine reliability.

Cronbach's alpha has been used to check the forms' content validity, and indeed the findings demonstrate that each of the coefficients is well above 0.6, indicating that the frameworks are acceptable. Every one of the parameters was determined to be considerably higher above the permissible level of 0.60. The findings are adequate to prove that each of the structures is reliable.

Cronbach's Alpha	N of Items
0.952	5

The Cronbach’s alpha of collective variables are 0.952 as it showing in Table 4 which stated that all the five variables of research study to analyze the effect of greening supply chain management towards environmental performance are reliable and acceptable as it is more than 0.6. Every variable of the research has been tested individually as well to understand their level of reliability by using Cronbach’s alpha on statistical software. Their values are listed below in the Table 5:

Construct	Cronbach’s Alpha Value	No. of Items
Green Purchasing	0.946	4
Green Manufacturing	0.726	4
Green Packaging	0.948	4
Green Distribution	0.947	4
Environmental Performance	0.833	4

The above table indicated the values of reliability of every single variable of the research; in which all the values are higher than 0.6. It is stated and estimated by using Cronbach’s alpha test that every variable is reliable in this work (Feng et al., 2017; Sah et al., 2014).

Hypothesis Testing

The hypothesis testing is used to figure out the acceptance or rejection of the statements by analyzing it is true or false. The significance value greater than 0.05 will be rejected the hypothesis whereas the lower value to it will be accepted.

As it is mentioned in above chapter two that there are four hypotheses for this research work for estimating the influence on green supply chain management on the performance of firm towards environment (Weeratunge & Herath, 2017).

Pearson Correlation

The Correlation analysis is among of the widely used factors for determining the link as well as interdependence between two or more variables. The Pearson coefficient would be a description of something like the correlation potential between two or more variables evaluated on the very same dimension even at the same given scale Aulia et al. (2016). The common and most used tool of stats to analyze the relationship between the variables is Person Correlation test Dermawan et al. (2018); Farooque et al. (2019).

It could range from one of negative to the one of positive in number. It shows either the variable a and variable b is positively related with each other or they have negative relation between them. If two variables have positive relation then if variable a increases, variable b will also increase and if the variable a decreases then variable b increases; shows the negative relation between variable a and variable b and vice versa.

	Mean	Std. Deviation	N
GP_MEAN	2.1212	1.37940	260
GM_MEAN	2.8721	1.04472	260
GPK_MEAN	2.2442	1.46169	260
GD_MEAN	1.9433	1.27642	260
EP_MEAN	2.3865	1.18656	260

The descriptive statistics is defined in Table 6 which indicates that the mean value of variable Green Purchasing (GP) is 2.1212 and its standard deviation is 1.3794 as well as the same of Green Manufacturing is 1.0447 but its mean value is higher that GP that is 2.8721. The value of mean and std. deviation of Green Packaging (GPK) is 2.2442 and 1.4616 respectively; and 1.9433 and 1.2764 are those value of Green Distribution (GD) (Rego et al., 2010; Anbumozhi & Kanda, 2005).

The mean value of variable Environmental Performance (EP) is 2.3865 and the value of standard deviation is 1.1865 of environmental performance. All these value of mean and standard deviation has been calculated by using statistical software program called SPSS.

		GP_MEAN	GM_MEAN	GPK_MEAN	GD_MEAN	EP_MEAN
GP_MEAN	Pearson Correlation	1	0.619**	0.947**	0.962**	0.871**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000
	N	260	260	260	260	260
GM_MEAN	Pearson Correlation	0.619**	1	0.559**	0.680**	0.688**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000
	N	260	260	260	260	260
GPK_MEAN	Pearson Correlation	0.947**	0.559**	1	0.908**	0.864**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000
	N	260	260	260	260	260
GD_MEAN	Pearson Correlation	0.962**	0.680**	0.908**	1	0.878**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000
	N	260	260	260	260	260
EP_MEAN	Pearson Correlation	0.871**	0.688**	0.864**	0.878**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	
	N	260	260	260	260	260

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

Table 7 is based on correlation test, showing the relationship between the variables by their significance value. The significance value decide the relationship among the variables and above table indicates that every relation has value less than 0.05 which is counted as significance value and shows a positive relationship between all the variables. All the variables in above table are positively significant which means every variable is has a positive relationship which each other (Zhu et al., 2007; 2012).

Regression Analysis

The test of regression analysis is used to decide either the hypothesis will be accepted or rejected. It shows the relationship of independent variables with dependent variable which is environmental performance in this study.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.906 ^a	0.821	0.818	0.50573

Note: a. Predictors: (Constant), GD_MEAN, GM_MEAN, GPK_MEAN, GP_MEAN

The above model summary Table 8 shows the value of R 0.906 or 90.6% which indicated that the relationship of dependent variable which is environmental performance with all four independent variables. The value of R Sq id 0.821 that is 82.1% and it is considered as most purified value than the value of R. 0.818 or 81.1% is the value of adjusted R Square as shown in above table.

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	299.434	4	74.858	292.688	0.000 ^b
	Residual	65.219	255	0.256		
	Total	364.653	259			

Note: a. Dependent Variable: EP_MEAN;

b. Predictors: (Constant), GD_MEAN, GM_MEAN, GPK_MEAN, GP_MEAN

The ANOVA Table 9 shows the regression of variables and has significant value which is less than 0.05 so the model of research has been accepted on the bases of significant value.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	0.273	0.097		2.816	0.005
	GP_MEAN	0.020	0.109		0.186	0.852
	GM_MEAN	0.248	0.042		5.925	0.000
	GPK_MEAN	0.359	0.068		5.312	0.000
	GD_MEAN	0.284	0.098		2.901	0.004

Note: a. Dependent Variable: EP_MEAN

S.No	Hypothesis	Status	P-Value (Sig. value)
1	Relationship of Environmental Performance and Green Purchasing.	Rejected	Not Sig. More than 0.05
2	Relationship of Environmental Performance and Green Manufacturing.	Accepted	Positive and Sig. Less than 0.05
3	Relationship of Environmental Performance and Green Packaging.	Accepted	Positive and Sig. Less than 0.05
4	Relationship of Environmental Performance and Green Distribution.	Accepted	Positive and Sig. Less than 0.05

The coefficient Table 10 indicates the relationship of dependent variable that is environmental performance with independent variables. The P value of green purchasing is 0.852 which is more than

0.05 and shows a not significant relation with dependent variable. The P values of green manufacturing, green packaging and green distribution are less than 0.05 so all these variables have significant effect on dependent variable (Table 11) (Shang et al., 2010).

CONCLUSION

Green supply chain management has different practices to greening the environment and plays a significance part in environmental protection when it comes to the manufacturing sector of Pakistan. Here in this research work; we discussed some green supply chain management practices in the manufacturing firms that how things are needed to be strategized with the concerned about production of goods and its impact environmental performance.

Green Purchasing of raw material and manufacturing supporting goods; green manufacturing of FMCG products which has been used on daily basis; green packaging of such items which is being produced in the firms and green distribution of FMCG products which is an everyday process has been discussed and examined its impact on environmental performance that how much these practices affecting the environment and their effect by greening all these supply chain practices in manufacturing companies.

After all the data collection and testing procedure, it has been analyzed that green distribution; green manufacturing and green packaging his highly positively effecting the environment performance of the firm. By greening these practices; a company can control or prevent the pollution and waste management which shows a positive impact on environmental sustainability however green purchasing got a negative result as we had this study on manufacturing of FMCG products and these products are being used on daily basis and has been effecting the health of consumer so no one wants to compromise anything on their health and for that purpose; best and great quality raw materials need to be used by just concerning about the health of consumer rather than anything else should be try on it.

Recommendation

As per the results of the study' it is cleared the effect of green supply chain practices on environmental performance but it can also been tested that how practices of green supply chain management motivates employees to fulfill the goals of the firms and the influence of green supply chain management is being studied on employees performance.

There are many green supply chain management practices but because of the shortage of time; only four green supply chain management practices has been tested and many more are there and those can be examined even in manufacturing sector as well as other sectors of Pakistani companies.

This study can be enhance in such a manner to analyze the effect on green supply chain management practices in decision making power of consumer of FMCG products to understand that either any company who follow the practices of green supply chain management can affect the buying decision of consumer or not. Green supply chain management can also be studied on export performance in Pakistan.

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