Quantitative Analysis of Drivers Affecting Green Supply Chain Management in Rajasthan SME'S

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Abstract: *The escalating deterioration of the environment is a major concern for business organisations today. Green is a strategy implemented to improve the environmental sustainability and with supply chains evolving dynamically towards competitive advantage, A green supply chain aim at confining the waste within the industrial system so as to conserve energy and prevent the dissipations of harmful materials into the environmental. The divers are affecting direct and indirect of green supply chain management. Frequently researches in study on drivers of green supply chain management are criticized for its narrow perspectives and lack of small and medium enterprises relevance. So, it is real need to find drivers which are affecting of green supply chain management. In current competitive scenario, the drivers of Green Supply Chain Management assume a significant importance and call for serious research attention. The purpose of this research is examining the drivers affecting green supply chain management. The main objectives of this paper are quantitative analysis of drivers affect green supply chain management in small and medium enterprises in Rajasthan, India. An empirical study was conducted through survey method in small and medium enterprises in Rajasthan, India and analyzed using SPSS. Correlation, regression analysis develops and used to establish the affect of drivers on Green Supply Chain Management. ANOVA test was used to determine the statistical significance of the relationship between the variables. The results were presented using tables. The study established that the drivers has positively affected of green supply chain management.*

Keywords: Drivers, Green Supply Chain Management, Small and Medium Enterprises (SME'S)

1. Introduction

Green Supply Chain Management (GSCM) can be defined as the management of the raw materials, parts /components and processes from suppliers to manufacturer to customers and product take back with improvement to environmental impacts through life cycle stages. Changing environment and the deterioration of the natural resources has triggered organizations to identify, understand and manage the issues of environmental sustainability. This has led to new paradigms in supply chain management strategies, and this has shifted the attention towards the impact to the natural environment and the environmental performance of organizations. This shift in the supply chain management has evoked due to the growing social, political and legislative pressures. According to Ford Chairman, William Clay Ford Jr., "Sustainability is not a soft issue, or a passing fad. When people are empowered with knowledge and choices, they will do what's best for themselves, their families, and their communities. And in fiercely competitive global market where information is shared instantly, consumers will virtually have all the knowledge and choices in the world. Companies that don't do the right thing will find that they are not sustainable. Green supply-chain management has its roots in both environment management and supply chain management literature. Adding the 'green' component to supply-chain management involves addressing the influence and relationships between supply-chain management and the natural environment. Similar to the concept of supply-chain management, the boundary of GSCM is dependent on the goal of the investigator. The definition and scope of GSCM in the literature has ranged from green purchasing to integrated green supply chains flowing from supplier to manufacturer to customer, and even RL [Zhu and Sarkis (2004)].

Defines GSCM as " integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end of life management of the product after its useful life".[Srivastava.S.K(2007)]

2. Literature Review

Literature review is that part of this study is to find out the research gap. Literature review takes into consideration the broader concept to of sustainable development and outlines how and why small and medium enterprises and industries should be concerned with environments and social issues sin Green Supply Chain Management.

Yin Xiu-qing [19], in his Research on implementation of Green Supply Chain Management (china) found that with the access of our country into WTO, China has become an important section of the world value chain, goods "made in China" gradually stand out in the international market. But in the process of pursuing internal benefit, we ignore the problem of environment, at the same time, not green product produced by domestic enterprises is hard to crack in world markets, which affect international competitiveness of domestic enterprises and the great scheme of sustainable development. . Domestic enterprises as the biggest beneficiaries in the implementation of green supply chain management, should take more effective measures in accordance with the realities to promote the implementation of green supply chain management in enterprises from various aspects.

Minhaj Ahemad Abdul Rehman, Rakesh L. Shrivastava [24], the levels of driver is important in understanding of successful GSCM implementation. Market competitive pressure and regulatory pressure are the most important

drivers due to its high driving power and low dependence among the entire identified GSCM driver.

Guo-Ciang Wu, Jyh-Hong Ding, Ping-Shun Chen[38],This empirical study of Taiwan's textile and apparel manufacturers investigates the relationships between green supply chain management (GSCM) drivers and GSCM practices this research show that (1) except for investment recovery, the other three GSCM practices are positively affected by GSCM drivers; (2) investment recovery is positively affected only by organizational support; (3) market pressure has no moderating effects on most of the relationships between GSCM drivers and GSCM practices; (4) regulatory pressure has positive moderating effects on most of the relationships between GSCM drivers and GSCM practices; and (5) competitive pressure has negative moderating effects on most of the relationships between GSCM drivers and GSCM practices.

Norhana Muslan, Abu Bakar Abd Hamid, Helen Tan and Halimah Idris [45], in his study found Perceptual measures of performance have been found to be well correlated with objective performance and appropriate organization willingness aligned organization objective, to provide financial and environmental performances. Our independent variable of interest was the organization specifically on the GSCM antecedents. GSCM is a complex set of network of activities involved in delivering the finished product to the end–user customer and reverse logistics for the re-fabricate and re-use of the products.

Chung-Shan Yang, Chin-Shan Lu, Jane Xu, Peter Bernard Marlow[46], in this study investigated crucial green supply chain management (GSCM) and firm performance dimensions based on global container shipping service in Taiwan and find The empirical evidence relating the extent of internal GSCM capabilities, external GSCM capabilities with environmental performance and firm competitiveness supports the contention that internal GSCM capabilities can lead to cross-functional departments green cooperation resulting in reduction of pollutant, and external GSCM capabilities can lead to inter-organizational green collaboration with supplier, partner, and customer resulting in reduction of pollutant and improved competitiveness.

Luthra, S. Kumar, V. Kumar, S. & Haleem, A. [28], mentioned that government legislation is one of the major drivers affecting GSCM practices adoption in the country. They have proved that there is a positive relationship between adopting GSCM practices and enhanced reputation and brand image of an organization. Although the results were positive from the perspective of enhancing reputation and brand image of an organization, it didn't imply that seeking for efficiency is the driver for adopting GSCM practices. Nimawat Dheeraj and Namdev Vishal [32], they stated that green supply chain management is a very powerful way to differentiate a company from its competitors and it can greatly influence the plan success. With increased awareness to corporate responsibility and the requirement to meet the terms with environmental policy, green supply chain management (GSCM) is becoming increasingly important for Indian manufacturers. (Pandya Amit R. & Mavani Pratik M. [31],they studied the major external driving factors affecting green supply chain management practices adopted by the Manufacturing companies in Ankleshwar and their objective to recognize and select appropriate strategy for implementing green supply chain management (GSCM) in Indian manufacturing company

B.L. Lakshmi Meera, Dr. P.Chitramani [50] the research proposes that demonstrates the relationship between Green SCM pressures, Green SCM practices and Environmental Performance in manufacturing companies. This study projects the relationship between Green supply chain management practices and Environmental performance of manufacturing industries. Results indicate GSCM implementation should be considered not just within the organization but has to be extended to the supply chain for long term environmental sustainability.

3. Methods/Approach

Research methodology is based on empirical data collected through a questionnaire survey. The survey methodology is used for study. The main objective of survey is observing the status of Driver affecting of green supply chain management in small and medium enterprises in Rajasthan, India. The problem was selected on the gap identified in literature. Data is collected through the questionnaire survey. The questionnaire was administered in various small and medium enterprises in Rajasthan, India. Questionnaire was designed based on the literature. Questionnaire item were develop to represent each variable in the research. Reliability analysis seeks the extend to which a measurement procedure. To ensure data collection procedure is reliable, the cronbach's alpha coefficient was computed using SPSS.A value of 0.8, higher than the threshold of 0.7 was obtaining showing acceptable level of consistency. A correlation analysis was conducted to establish relationship between Drivers and GSCM.A multiple regression analysis was used to test if drivers are affecting Green Supply Chain Management. ANOVA test was used to determine level of significance of the affect of drives and Green Supply Chain Management. The various derivers which are more important for the adoption of GSCM.

4. Results and Discussion

The data are collected from various small and medium enterprises. The SPSS software is used to analysis of collected data following results show:

4.1 Reliability Analysis

The Cronbach's alpha was conducted to assess the reliability of each scale. Alpha values over 0.7 indicate that all scales can be considered reliable (Nunally, 1978). Internal consistency analysis was carried out cronbach's alpha more than 0.7 in each For organisation (0.823), regulatory (0.807), customers (0.818), completion (0.805), society (0.818), supplier (0.815), marketing (0.847), economic outcomes (0.809), environmental outcomes(0.803) , operational outcomes(0.850), intangible outcomes (0.803). . Here we are found cronbach's alpha for every factor more than 0.8 so the

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value of 0.8, higher than the threshold of 0.7 was obtaining showing acceptable level of consistency.

Table 1: Mean & Std. Deviation

	Mean	Std. Deviation
Organization Related	3.7339	.3793
Regulatory	3.5591	.6986
Customers	3.6405	.4960
Competition	3.5081	.5263
Society	3.465	.6621
Supplier	3.4677	.5683
Marketing	3.445	.7844
Economics outcomes	3.6210	.5768
Environmental outcomes	3.5698	.6067
Operational outcomes	3.439	.7107
Intangible outcomes	3.4301	.6335

Table 1 show the Organization show highest mean score value (3.7339), this indicate that SME'S giving more importance to organization related factor. regulatory having mean score value(3.5591), customers mean score value(3.6405); competition having mean(3.5081),;society mean score(3.465); supplier mean score value(3.4677); marketing mean score value(3.445); economic outcomes mean score value are(3.6210); environmental outcomes mean score value(3.5698); operational outcomes having mean score(3.439),intangible outcomes having mean score value(3.4301) these results indicate that The driving factors are more helpful for maintaining green supply chain management in SME'S.

4.2 T test

A t-test is a statistical test that can determine if there is a significant difference between two groups on a dependent variable. Here find the value of p<0.05 Hence there are not significance difference between independent variable(organisation, regulatory, customers, completion, society, supplier, marketing) and dependent variable(economic outcomes, environmental outcomes, operational outcomes , intangible outcomes). Table 2 show the value are find out in t test: Table 2 show the value find in t test for independent variables and dependent variables have p value are p=0.00 for each factor. The value of t for inferred organization t(30)= 54.804, regulatory t(30)=

28.366, customers t(30)= 40.861, competition t(30)= 37.110, society t(30)= 29.134, supplier t(30)= 33.972, marketing t(30)= 24.455, economic outcomes t(30)= 34.948, environmental outcomes t(30)= 32.761, operational outcomes t(30)= 26.939, intangible outcomes t(30)= 30.143.

Table 2: T test

	T	Df	Sig. (2-tailed)
Organization Related	54.80	30	.000
Regulatory	28.36	30	.000
Customers	40.86	30	.000
Competition	37.11	30	.000
Society	29.13	30	.000
Suppliers	33.97	30	.000
Marketing	24.45	30	.000
Economics Outcomes	34.94	30	.000
Environmental Outcomes	32.76	30	.000
Operational Outcomes	26.93	30	.000
Intangible Outcomes	30.14	30	.000

4.3 Correlation Analysis

Correlations estimate the extent to which changes in one variable are associated with changes in the other and are indicated by the correlation coefficient (r). Correlation coefficients can range from +1.00 to -1.00. A correlation of +1.00 indicates a perfect positive relationship, a correlation of 0.00 indicates no relationship, and a correlation of -1.00 indicates a perfect negative relationship (Welman & Kruger, 1999). Table shows the correlation between independent variables (Organization Related, Regulatory, Customers, Competition, Society, Suppliers) and dependent variables (Economics Outcomes, Environmental Outcomes Operational Outcomes, Intangible Outcomes).Pearson correlation value are show in the table 3 for each factor and following hypothesis are tested:

H1 $\mu \neq \mu_o$: Organizational related, Regulatory, Customers, Competition, Society, Suppliers factors have significant influences on economical outcomes, Environmental Outcomes Operational Outcomes, Intangible Outcomes: From the table we can see that r value (show in table3) **, p=.000 for the economical outcomes, Environmental Outcomes Operational Outcomes, Intangible Outcomes, so it is significant as p<0.05. . Less the value of p, stronger is the strength of the relationship.

Table 3: Pearson Correlation

		Economics Outcomes	Environmental Outcomes	Operational Outcomes	Intangible Outcomes
Organization Related	Pearson Correlation	-.054	.294	.020	.196
	Sig. (2-tailed)	.775	.109	.916	.290
Regulatory	Pearson Correlation	.154	.182	.027	.154
	Sig. (2-tailed)	.408	.327	.887	.408
Customers	Pearson Correlation	-.059	.160	.297	-.158
	Sig. (2-tailed)	.751	.390	.104	.395
Competition	Pearson Correlation	.045	-.132	-.224	.048
	Sig. (2-tailed)	.811	.478	.227	.799
Society	Pearson Correlation	.088	.580**	.354	.022
	Sig. (2-tailed)	.638	.001	.050	.908
Suppliers	Pearson Correlation	-.017	.036	.086	.210
	Sig. (2-tailed)	.926	.846	.647	.258
Marketing	Pearson Correlation	-.068	-.058	-.015	.116
	Sig. (2-tailed)	.717	.756	.935	.534

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Following Hypothesis are tested for correlation analysis when Organizational related, Regulatory, Customers, Competition, Society, Suppliers factors have significant influences on economical outcomes, Environmental Outcomes Operational Outcomes, Intangible Outcomes:

H1 (a)	Organizational related factors have significant influences on economical outcomes.
H 1(b)	Organizational related factors have significant influences on environmental outcomes.
H 1(c)	Organizational related factors have significant influences on operational outcomes.
H 1(d)	Organizational related factors have significant influences on intangible outcomes.
H2(a)	Regulatory related factors have significant influences on economic outcomes.
H2(b)	Regulatory related factors have significant influences on environmental outcomes.
H2 (c)	Regulatory related factors have significant influences on operational outcomes.
H2 (d)	Regulatory related factors have significant influences on intangible outcomes.
H3 (a)	Customers related factors have significant influences on economical outcomes.
H3 (b)	Customers related factors have significant influences on environmental outcomes.
H3 (c)	Customers related factors have significant influences on operational outcomes.
H3 (d)	Customers related factors have significant influences on intangible outcomes.
H4 (a)	Competition related factors have significant influences on economical outcomes.
H4 (b)	Competition related factors have significant influences on environmental outcomes.
H4 (c)	Competition related factors have significant influences on operational outcomes.
H4 (d)	Competition related factors have significant influences on intangible outcomes.
H5 (a)	Society related factors have significant influences on economical outcomes.
H5 (b)	Society related factors have significant influences on environmental outcomes.
H5 (c)	Society related factors have significant influences on operational outcomes.
H5 (d)	Society related factors have significant influences on intangible outcomes.
H6 (a)	Suppliers related factors have significant influences on economical outcomes.
H6 (b)	Suppliers related factors have significant influences on environmental outcomes.
H6 (c)	Suppliers related factors have significant influences on operational outcomes.
H6 (d)	Suppliers related factors have significant influences on intangible outcomes.
H7 (a)	Marketing related factors have significant influences on economical outcomes.
H7 (b)	Marketing related factors have significant influences on environmental outcomes.
H7 (c)	Marketing related factors have significant influences on operational outcomes.
H7 (d)	Marketing related factors have significant influences on intangible outcomes.

4.4 Regression Analysis

In statistics, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables.

a) Case 1 - Economic is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 7.7% variation in economic outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the economic outcome will be (B = 3.723, sig= .069). Alternative hypothesis is accepted. Ha: $\mu \neq \mu_o$: All the input factors collectively support the economical outcomes. So, we conclude that all the input factors collectively do not support the economic outcomes. It is helpful when we are trying to predict economic outcome by input. The value of B tells us about the how the individual drivers affect the economic outcomes.

b) Case 2 – Environmental is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 48.5% variation in environmental outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the environmental outcome will be (B = -1.186, sig = .447). Alternative hypothesis is rejected. Ha: $\mu \neq \mu_o$: All the input factors collectively support the environmental outcomes. So, we conclude that all the input factors collectively do not support the environmental outcomes.

c) Case 3 – Operational is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 34.6% variation in operational outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the operational outcome will be (B = 0.256, sig = .900). Alternative hypothesis is accepted. Ha: $\mu \neq \mu_o$: All the input factors collectively support the environmental outcomes. So, we conclude that all the input factors collectively support the environmental outcomes.

d) Case 4 – Intangible is taken as dependent variable and rest all the factors (inputs) are taken as independent variables: From the table of Model Summary, seeing the value of R Square we conclude that factors (inputs) accounts for 15.1% variation in intangible outcomes. And from coefficients table we conclude that when factors (inputs) is zero then the intangible outcome will be (B =2.137, sig = .310). Alternative hypothesis is accepted. Ha: $\mu \neq \mu_o$: All the input factors collectively support the intangible outcomes. So, we conclude that all the input factors collectively support the intangible outcomes.

Following hypothesis are tested for each case:

All the input factors collectively support the economical outcomes.
All the input factors collectively support the environmental outcomes.
All the input factors collectively support the environmental outcomes.
All the input factors collectively support the intangible outcomes.

5. Conclusion

In this study we have quantitative analysis of drivers affecting green supply chain management in Rajasthan small and medium enterprises .The drivers have critical role in increase performance and sustainability of green supply chain management in small and medium enterprises in Rajasthan, India implementation of GSCM gives benefits induces cost saving and increase sale and furthermore improve economic performance. GSCM increases initiatitive from inside and outside the firms on natural environment. Input factors organization, regulatory, customers, completion, society, suppliers increase performance of output factors economic outcomes, environmental outcomes, operational outcomes and intangible outcomes.

Organization related factor have critical role in small and medium enterprises. We have found here critical value is high of organization related factor. They have high importance in SME'S. Furthermore they are explaining variance and they are strongly related to economic outcomes, environmental outcomes, operational outcomes and intangible outcomes. The factor organization shows positively correlation with GSCM performance and positively affected on implies of green supply chain management performance and improve economic outcomes, environmental outcomes, operational outcomes and intangible outcomes.

The drivers regulatory is important part of implementing GSCM, because the factor regulatory are positively related to SME'S they improve their ecological efficiency, environmental compliance, environmental performance they also increase economic outcomes, environmental outcomes, operational outcomes and intangible outcomes of enterprises and support it.

The factor customers are positively related to SME'S. They support green supply chain management and positively affect it. Research finding customers as a factor and green supply chain management are show better relationship in small and medium enterprises. Although Customers factor are important factor in SME'S because they are improve efficiency of SME'S they also help in sustain GSCM and decision making.

The critical factor competition positively related to small and medium enterprises. their critical value are good which indicates that they are positively correlate with GSCM in SME'S, They improve firm performance and help increasing number of firms in green marketing to gain or maintain competitive advantage. They also increase performance of SME'S and increase the firm ability to manage people to gain competitive advantage that show strongly relationship with economic outcomes, environmental outcomes, operational outcomes and intangible outcomes in SME'S

Society is the important factor to development of SME'S; they are positively related to SME'S which explain variance between society and SME'S they affect positively on GSCM in SME'S in Rajasthan. Society as a factor important role show for improves performance reduces risk of consumers, improve quality and sustain environmental performance in SME'S. The factor society have critical role in small and medium enterprises they positively related to economic outcomes, environmental outcomes, operational outcomes and intangible outcomes.

Suppliers take as a factor we have find in this study the factor suppliers are critical role in SME'S, they positively affect on green supply chain management in small and medium enterprises. They directly and indirectly affected the GSCM; we have analysis and find the relationships are better. Suppliers are show positive affect that's mean the suppliers can improve efficiency of SME'S and support performance of economic outcomes, environmental outcomes, operational outcomes and intangible outcomes of SME'S

Marketing is take a factor we have analyse the value of correlation are positive which show positively affected to GSCM in SME'S and they can help to improve market value of SME'S .Marketing have critical role in green supply chain management they shows positive relationship. Although as a factor that improve efficiency, quality, environmental awareness and can help selection of green products. They are show good relation with economic outcomes, environmental outcomes, operational outcomes and intangible outcomes.

Furthermore we have regression analysis it was concluded that all input factors are positively support the economic outcomes. The economic outcome have financial benefits, increase sale furthermore improve economic performance. Output factor environmental outcomes are positively supported by all input factors they help to increases initiatives from inside and outside the firms on natural environment. However the affect of environmental outcomes on green supply chain management in SME'S are statiscally significant. All input factors are positively support to operational outcomes. So the all input factors significant with operational outcomes. They can helps organization face competition with new opportunities and increase operational and financial performance, eradicate waste or harmful raw material, improve performance of SME'S. Further study find that all the inputs factors are significant with intangible outcomes, the input factors support intangible outcomes. Intangible outcomes includes enhanced quality, cost, saving, new customers and better enterprises image among others. These all factors affecting green supply chain management in small and medium enterprises in Rajasthan (India).

6. Future Scope

Future studies replicating this research across multiple industries and sector would increase the understanding and find the drivers which are affecting of green supply chain management. The research represents a limited numbers of enterprises in limited industries in limited area. They can

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increase in survey area and the studies to relate GSCM with other aspects of performance.

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