A Study on the Green Supply Chain Management Practices and Their Influence in the Environmental Performance of the firm: with reference to Indian Pharmaceutical Industry

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Abstract: The objectives of this paper were to identify the current green supply chain management practices and their influence on environmental performance of the firms belonging to the pharmaceutical industry in India. The paper is based on a survey conducted among senior executives of the pharmaceutical industry in India. A questionnaire designed for the purpose was administered to 30 senior executives from the firms belonging to this sector. The findings of the study try to link the various factors of green supply chain management with the environmental performance of a firm. Further the factor analysis attempts to define the underlying structure and correlations among the variables like Internal environmental management, Top management commitment, Green purchasing, Eco-design, Cooperation with customers, Environmental performance, Supplier relations, Economic benefits, Markets and Regulations. The study also discusses some of the barriers which affect the implementation of these practices.

Keywords: Eco-design; Environmental performance; Green supply chain management; Green purchasing.

Introduction

The escalating impacts of technological innovation, modernization and industrialization necessitate the development of concepts like environmentalism and green supply chain management practices in order to restore competitiveness. There must be a fundamental shift in the way the operations and production system operate by bringing about reduction in resource consumption and improvement in the product life cycle. This can be achieved by integrating environmental thinking into operations management by including design for end of life product recovery, reverse logistics, remanufacturing and reuse and recycling, to name a few. Currently companies are increasingly investing to manage information flow in the supply chain. Sustainability and environmental issues are among the most pressing concerns for modern humanity, governments and environmentally conscious business organizations to promote organizational sustainability, specifically for the emerging economies [1]. Recently the regulatory bodies have forced industries to adopt to green supply chain management practices as evidenced in the studies of [2].

The aim of GSCM is to conserve energy by restraining the wastes within the industry and prevent the hazardous materials which spread widely into the environment. Within the organization it identifies the disproportionate environmental impact of supply chain processes. A study by Seuring and Muller [3] suggested that Indian organizations have reported cost reduction, increase in profitability and productivity through enhanced supply chain management. Many organizations have adopted externally-oriented approach to extend their GSC initiatives to lessen the sources of waste and pollution throughout the whole supply chain [4]. The objective of the paper is to study the GSCM practices and their influence in the environmental performance of the firms within the pharmaceutical industrial sector of India. The study also shows how GSCM practices signify the conduct of the business and represents the environmentally-friendly image of goods/services, procedures, systems and technologies. The research findings will be important for manufacturing companies particularly those in the pharmaceutical sector, in developing environmental collaboration with their suppliers in order to achieve sustainability performance. The factor analysis attempts to define the underlying structure and correlations among

the variables like Internal environmental management, Top management commitment, Green purchasing, Eco-design, Cooperation with customers, Environmental emissions, Economic benefits, Costs and Regulatory Compliance. The study also discusses some of the barriers which affect the implementation of these practices.

Literature Review

A study by Singh and Bhardwaj [5] discusses the initiatives taken by various small and medium enterprises in their supply chains and product life cycle. It also highlights the use of new technologies in procurement, cost effectiveness of GSCM, inventory control and 3R concept adoption. According to Srivastava [6], GSCM can be defined as "integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life". GSCM comprises practices such as total quality management, lean supply chain management, reverse logistics, life cycle assessment and product stewardship. Chan et al., [7] argue that a firm's commitment to greening its supply chain is demonstrated by how the firm manages lean production, reverse logistics, product development and design, and packaging. Holt and Ghobadian [8] examines the UK manufacturing sector and factors influencing their GSCM practices. Data was collected from 60 manufacturing companies and the greatest pressure perceived was to improve environmental performance through legal actions and internal motivators, the least significant being society and selective customers. A study in the manufacturing sector identifies cost and complexity as two of the biggest barriers faced by companies while implementing GSCM. Further Meera and Chitramani [9] in their study investigate the relationship between GSCM drivers and practices and their impact on environmental performance of an organization.

In spite of the presence of regulatory framework for ensuring the protection of the environment, India is lagging far behind the standards mainly due to lack of implementation, corruption issues, lack of adaptability and short-term measures. Hence an urgent need is felt for the implementation of GSCM [10, 11]. According to Barnatt, [12], the integration of technologies like cloud computing allows efficient and optimal utilization of transportation and logistics services thereby reducing freight related negative externalities. Arimura et.al [13] found that to promote GSCM practices, government assistance programs must exist which encourage organization to adopt voluntary EMS. Their study reinstated the fact that ISO 14001 promotes GSCM practices and facilities with certifications are more likely to assess their supplier's environmental performance.

However previous research on green supply chain management practices failed to identify the influence of various factors on improved environmental performance. There are relatively very few studies done in this direction in the Indian pharmaceutical sector. Hence the current study aims to fill this research gap and tries to evolve a relationship between various factors influencing the green supply chain management practices and environmental performance of the firm.

Methodology

The main aim of the paper was to understand the influence of green supply chain management practices adoption on the environmental performance of firms belonging to Indian pharmaceutical sector. The present paper evaluates empirically the relationship between the levels of influence of green supply chain management practices on the environmental performance of these firms. The factors considered under green supply chain management were Top management commitment, Internal environmental management, Green purchasing, Eco-design, Cooperation with customers, Environmental performance, Supplier relations, Economic benefits, Regulations and Markets. Primary data was collected from selected pharmaceutical companies with the help of a carefully designed questionnaire, which was primarily administered to subject experts and then to the top-level executives of the pharmaceutical companies through e-mails and subsequent follow-up. Total of 35 industries participated in the survey. The 5-point Likert scale was used to collect the responses. The main focus of the questionnaire was to understand the aspects that contributed to the impact of external and internal factors of GSCM and its impact on environmental performance. SPSS software was used to analyse the data. The Cronbach's alpha was used to test the reliability of the questionnaire being used, which showed the result as 0.890.

The research framework identified internal environmental management, top management commitment, green purchasing, eco-design, cooperation with customers, environmental performance, supplier relations, economic benefits, markets and regulations affecting the level of GSCM practices implementation as independent variables and environmental performance as the dependent variable. The following hypotheses were proposed and tested.

Hypotheses

H_1: *There exist a relationship between the level of internal environmental management of a firm and the degree of their environmental performance.*
H_2: *There exist a relationship between the top management commitment of a firm and the degree of their environmental performance.*
H_3: *There exist a relationship between green purchasing and the degree of their environmental performance.*
H_4: *There exist a relationship between eco design and the degree of their environmental performance.*
H_5: *There exist a relationship between co-operation with customer and the degree of their environmental performance.*
H_6: *There exist a relationship between environmental impacts and degree of their environmental performance.*
H_7: *There exist a relationship between economic benefits and degree of their environmental performance.*
H_8: *There exist a relationship between markets and degree of their environmental performance.*
H_9: *There exist a relationship between regulations and degree of the EPI.*

Results and Discussion

Primary data collection was done from 30 industries during 2016-2017 by personal visits and e-mails, mainly from the medium and large-scale industries. Following table shows the descriptive statistics for the various factors.

Table1. Descriptive Statistics

	Mean	SD	N
Top management commitment	4.100	.84939	30
Internal Environmental management	4.0111	.70294	30
Green Purchasing	3.4916	.84710	30
Eco design	3.9833	.90837	30
Customer relation	3.7434	.68536	30
Environmental impacts	3.9333	.68536	30
Negative impacts	3.6133	.66630	30
Economic benefits	3.7833	.67828	30
Regulations	4.0389	.71745	30
Markets	3.8557	.81970	30

Inter Item Reliability Statistics

There are 45 variables included in order to verify**:** Internal Environmental Management, Top Management Commitment, Green Purchasing, Eco-Design, Co-operation with customers, Environmental impacts, Supplier relations, Economic benefits, Market and Regulations. The inter item reliability for each of these was calculated. Following tables shows the inter-item correlation matrix for each of these variables.

Table 2

Cronbach's alpha based on standardized items	No. of items
.849	6

Table 3. Inter item reliability for Factor A

A	Internal Environmental Management
A1	Cross-functional cooperation for environmental improvements
A2	Total quality environmental management
A3	Environmental compliance and auditing programs
A4	ISO14001 certification
A5	Environmental Management Systems
A6	Eco-labelling of Products

Table 4: Statistics

Item Statistics			
	Mean	**Std. Deviation**	**N**
A1	4.0333	0.96430	30
A2	4.000	0.87099	30
A3	4.2667	0.82768	30
A4	4.2333	0.89763	30
A5	3.9000	0.95953	30
A6	3.6333	1.06620	30

Table 5. Inter-item Correlation Matrix

	A1	**A2**	**A3**	**A4**	**A5**	**A6**
A1	1.000	.780	.421	.469	.637	.448
A2	.780	1.000	.336	.485	.743	.483
A3	.421	.335	1.000	.331	.382	.701
A4	.469	.485	.331	1.000	.428	.201
A5	.637	.743	.382	.428	1.000	.401
A6	.448	.483	.701	.201	.401	1.000

Table 6. Inter item reliability for Factor B

B	**Top Management Commitment**
B1	Commitment of GSCM from Senior Managers
B2	Support for GSCM from mid-level managers
B3	Environmental Regulations

Table 7. Reliability Statistics

Cronbach's Alpha	N of Items
.894	3

Table 8. Item Statistics

	Mean	Std. Deviation	N
B1	4.2667	.90719	30
B2	3.9000	1.06188	30
B3	4.1333	.81931	30

Table 9. Inter-Item Correlation Matrix

	B1	B2	B3
B1	1.000	.816	.600
B2	.816	1.000	.809
B3	.600	.809	1.000

Table 10. Inter item reliability for Factor C

C	Green Purchasing
C1	Cooperation with suppliers for environmental objectives
C2	Environmental audit for suppliers' internal management
C3	Suppliers'ISO14000 certification
C4	Second-tier supplier environmentally friendly practice evaluation

Table 11. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.831	.831	4

Table 12. Item Statistics

	Mean	Std. Deviation	N
C1	3.5000	.97379	30
C2	3.4667	1.10589	30
C3	3.6000	1.06997	30
C4	3.4000	1.00344	30

Table 13. Inter-Item Correlation Matrix

	C1	C2	C3	C4
C1	1.000	.416	.563	.494
C2	.416	1.000	.629	.634
C3	.563	.629	1.000	.572
C4	.494	.634	.572	1.000

Table 14. Inter item reliability for Factor D

D	**Eco -Design**
D1	**Design of products for reduced consumption of material/energy**
D2	**Design of products to avoid or reduce use of hazardous of products and/or their manufacturing process**
D3	**Design of product for support regulation**
D4	**Design usability of part particularly for Extend using products, repair easy and increase efficiency**

Table 15. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.855	.856	4

Table 16. Item Statistics

	Mean	Std. Deviation	N
D1	4.0667	.78492	30
D2	3.9000	.88474	30
D3	4.0667	.98027	30
D4	3.9000	.88474	30

Table 17. Inter-Item Correlation Matrix

	D1	D2	D3	D4
D1	1.000	.407	.532	.755
D2	.407	1.000	.604	.604
D3	.532	.604	1.000	.684
D4	.755	.604	.684	1.000

Table 18. Inter item reliability for Factor E

E	Cooperation with customers
E1	Cooperation with customer for eco-design
E2	Cooperation with customers for cleaner production
E3	Cooperation with customers for green packaging

Table 19. Reliability Statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.856	.857	3

Table 20. Item Statistics

	Mean	Std. Deviation	N
E1	3.8667	1.10589	30
E2	3.6667	.95893	30
E3	3.7000	1.02217	30

Table 21. Inter-Item Correlation Matrix

	E1	E2	E3
E1	1.000	.607	.757
E2	.607	1.000	.633
E3	.757	.633	1.000

Table 22. Inter item reliability for Factor F

F	Environmental Performance
F1	Reduction of air emission
F2	Reduction of waste water
F3	Reduction of solid wastes
F4	Reduction of physical
F5	Decrease of consumption for hazardous/harmful/toxic materials
F6	Decrease of frequency for environmental accidents
F7	Improve an enterprise’s environmental situation

Table 23. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.879	.886	7

Table 24. Item Statistics

	Mean	Std. Deviation	N
F1	4.0667	.98027	30
F2	4.0000	.83045	30
F3	3.8667	.81931	30
F4	3.7333	.73968	30
F5	4.0333	.85029	30
F6	3.9333	.94443	30
F7	3.9000	1.09387	30

Table 25. Inter item reliability for Factor G

G	Economic Benefits
G1	Decrease of cost for materials purchasing
G2	Decrease of cost for energy consumption
G3	Decrease of fee for waste treatment
G4	Decrease of fee for waste discharge
G5	Decrease of fine for environmental accidents

Table 26. Inter-Item Correlation Matrix

	F1	F2	F3	F4	F5	F6	F7
F1	1.000	.635	.698	.596	.494	-.070	.199
F2	.635	1.000	.760	.561	.684	.484	.569
F3	.698	.760	1.000	.736	.551	.389	.446
F4	.596	.561	.736	1.000	.618	.220	.435
F5	.494	.684	.551	.618	1.000	.561	.745
F6	-.070	.484	.389	.220	.561	1.000	.761
F7	.199	.569	.446	.435	.745	.761	1.000

Table 27. Inter item reliability for Factor H

H	Supplier relations
H1	Increase of investment
H2	Increase of operational cost
H3	Increase of training cost
H4	Increase of costs for purchasing environmentally friendly materials

Table 28. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.812	.817	4

Table 29. Item Statistics

	Mean	Std. Deviation	N
H1	4.0667	.86834	30
H2	3.8000	.80516	30
H3	3.5000	.93772	30
H4	3.7667	.77385	30

Table 30. Inter-Item Correlation Matrix

	H1	H2	H3	H4
H1	1.000	.464	.339	.640
H2	.464	1.000	.411	.531
H3	.339	.411	1.000	.784
H4	.640	.531	.784	1.000

Table 31. Inter item reliability for Factor I

I	Markets
I1	Export
I2	Competitors' green strategies
I3	Industrial professional group activities

Table 32. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.794	.808	3

Table 33. Inter-Item Correlation Matrix

	I1	I2	I3
I1	1.000	.552	.541
I2	.552	1.000	.659
I3	.541	.659	1.000

Table 34. Item Statistics

	Mean	Std. Deviation	N
I1	3.9667	1.12903	30
I2	3.7667	.81720	30
I3	3.8333	.94989	30

Table 35, Regulations

J	Regulations
J1	Central environmental regulations
J2	Regional environmental regulations
J3	International Regulations: WEEE
J4	International Regulations: Hazardous waste
J5	International Regulations: Nuclear waste
J6	International Regulations: Others

Table 36. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.874	.878	6

Table 37. Item Statistics

	Mean	Std. Deviation	N
J1	4.2667	.94443	30
J2	4.1333	.81931	30
J3	3.9667	.99943	30
J4	3.9667	.88992	30
J5	3.9667	.85029	30
J6	3.9333	.98027	30

Table 38.Inter-Item Correlation Matrix

	J1	J2	J3	J4	J5	J6
J1	1.000	.665	.119	.298	.355	.243
J2	.665	1.000	.427	.621	.601	.655
J3	.119	.427	1.000	.658	.770	.596
J4	.298	.621	.658	1.000	.682	.709
J5	.355	.601	.770	.682	1.000	.783
J6	.243	.655	.596	.709	.783	1.000

Factor Analysis

Factor analysis was used in data reduction to identify a small number of factors that explain most of the variance that is observed in a much larger number of the manifest variables. Thus, among the 45 variables stated or reviewed in research paper, the dominating ones were identified. The first ten components can successfully explain 86.988 percent of variance in the dependent variable. The components with maximum variability can be identified.

Table 39. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.443	40.985	40.985	18.443	40.985	40.985	8.993	19.984	19.984
2	4.702	10.449	51.434	4.702	10.449	51.434	8.489	18.866	38.849
3	3.811	8.470	59.904	3.811	8.470	59.904	3.975	8.833	47.682
4	2.425	5.389	65.293	2.425	5.389	65.293	3.478	7.728	55.411
5	2.200	4.889	70.182	2.200	4.889	70.182	3.347	7.438	62.848
6	1.879	4.176	74.357	1.879	4.176	74.357	3.083	6.852	69.700
7	1.705	3.788	78.146	1.705	3.788	78.146	2.356	5.236	74.936
8	1.487	3.304	81.449	1.487	3.304	81.449	1.853	4.118	79.054
9	1.405	3.123	84.572	1.405	3.123	84.572	1.830	4.068	83.121
10	1.087	2.415	86.988	1.087	2.415	86.988	1.740	3.866	86.988
11	.963	2.139	89.127						
12	.781	1.736	90.863						
13	.690	1.533	92.396						
14	.600	1.333	93.729						
15	.499	1.110	94.839						
16	.390	.866	95.704						
17	.325	.723	96.428						

18	.296	.658	97.086						
19	.252	.559	97.646						
20	.212	.471	98.116						
21	.172	.383	98.499						
22	.162	.359	98.858						
23	.124	.275	99.133						
24	.107	.237	99.370						
25	.081	.180	99.550						
26	.079	.176	99.727						
27	.057	.128	99.854						
28	.037	.082	99.936						
29	.029	.064	100.000						
30	7.959E-016	1.769E-015	100.000						
31	6.865E-016	1.526E-015	100.000						
32	5.864E-016	1.303E-015	100.000						
33	4.559E-016	1.013E-015	100.000						
34	3.560E-016	7.910E-016	100.000						
35	2.639E-016	5.864E-016	100.000						
36	2.282E-016	5.072E-016	100.000						
37	9.954E-017	2.212E-016	100.000						
38	4.240E-017	9.423E-017	100.000						
39	-6.732E-017	-1.496E-016	100.000						
40	-1.010E-016	-2.245E-016	100.000						
41	-1.483E-016	-3.295E-016	100.000						
42	-2.937E-016	-6.527E-016	100.000						
43	-3.450E-016	-7.666E-016	100.000						

44	-4.272E-016	-9.493E-016	100.000						
45	-8.680E-016	-1.929E-015	100.000						
Extraction Method: Principal Component Analysis.									

Pearson Correlation

Table 40. Correlations

		INT_ENV_MGT	TOP_MGT_COM	GREEN_PURCHASE	ECO_DESIGN	COOP_CUST	ENVIRON_PERF	ECO_BENEFITS	SUPPLIER_RELATIONS	MARKET	REGULATIONS
INT_ENV_MGT	Pearson Correlation	1	.755**	.398*	.766**	.680**	.823**	.405*	-.344	.681**	.618**
	Sig. (2-tailed)		.000	.029	.000	.000	.000	.027	.062	.000	.000
	N	30	30	30	30	30	30	30	30	30	30
TOP_MGT_COM	Pearson Correlation	.755**	1	.460*	.794**	.660**	.788**	.355	-.191	.863**	.628**
	Sig. (2-tailed)	.000		.010	.000	.000	.000	.054	.313	.000	.000
	N	30	30	30	30	30	30	30	30	30	30
GREEN_PURCHASE	Pearson Correlation	.398*	.460*	1	.357	.471**	.436*	.468**	-.206	.478**	.424*
	Sig. (2-tailed)	.029	.010		.052	.009	.016	.009	.275	.008	.020
	N	30	30	30	30	30	30	30	30	30	30

ECO_DESIGN	Pearson Correlation	.766**	.794**	.357	1	.669**	.884**	.410*	-.089	.787**	.643**
	Sig. (2-tailed)	.000	.000	.052		.000	.000	.025	.640	.000	.000
	N	30	30	30	30	30	30	30	30	30	30
COOP_CUST	Pearson Correlation	.680**	.660**	.471**	.669**	1	.665**	.294	-.326	.705**	.568**
	Sig. (2-tailed)	.000	.000	.009	.000		.000	.114	.079	.000	.001
	N	30	30	30	30	30	30	30	30	30	30
ENVIRON_PERF	Pearson Correlation	.823**	.788**	.436*	.884**	.665**	1	.431*	-.138	.824**	.688**
	Sig. (2-tailed)	.000	.000	.016	.000	.000		.017	.467	.000	.000
	N	30	30	30	30	30	30	30	30	30	30
ECO_BENEFITS	Pearson Correlation	.405*	.355	.468**	.410*	.294	.431*	1	-.192	.496**	.525**
	Sig. (2-tailed)	.027	.054	.009	.025	.114	.017		.310	.005	.003
	N	30	30	30	30	30	30	30	30	30	30
SUPPLIER_RELATIONS	Pearson Correlation	-.344	-.191	-.206	-.089	-.326	-.138	-.192	1	-.063	-.239
	Sig. (2-tailed)	.062	.313	.275	.640	.079	.467	.310		.739	.203
	N	30	30	30	30	30	30	30	30	30	30

MARKETS	Pearson Correlation	.681**	.863**	.478**	.787**	.705**	.824**	.496**	-.063	1	.609**
	Sig. (2-tailed)	.000	.000	.008	.000	.000	.000	.005	.739		.000
	N	30	30	30	30	30	30	30	30	30	30
REGULATIONS	Pearson Correlation	.618**	.628**	.424*	.643**	.568**	.688**	.525**	-.239	.609**	1
	Sig. (2-tailed)	.000	.000	.020	.000	.001	.000	.003	.203	.000	
	N	30	30	30	30	30	30	30	30	30	30
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

The starred values indicate a positive correlation between the variables. There are few variables which are negatively co-related for example, regulations and supplier relations.

Regression

Table 41. Descriptive statistics

	Mean	Std. Deviation	N
DEG_EPI	3.4667	1.10589	30
INT_ENV_MGT	4.0111	.70294	30
TOP_MGT	4.1000	.84939	30
GREEN_PURCHASE	3.4917	.84711	30
ECO_DESIGN	3.9833	.73968	30
CUST_COOP	3.7444	.90838	30
ENVIRON_PERF	3.9333	.68536	30
ECO_BENEFITS	3.6133	.66630	30
SUPPLIER_REL	3.7833	.67828	30
MARKET	3.8556	.81970	30
REGULATIONS	4.0389	.71744	30

Table 42. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.830[a]	.689	.525	.76236	.689	4.202	10	19	.003

a. Predictors: (Constant), REGULATIONS, SUPPLIER_REL, GREEN_PURCHASE, ECO_BENEFITS, COOP_CUSTOMERS, TOP_MGT_COMMIT, INT_ENV_MGT, ECO_DESIGN, MARKET, ENVIRON_PERF

The first table shows the model summary & overall fit statistics. The R^2 of the model is 0.689 with $R^2 = 0.689$, which means it explains 68.9 % of the variance of the data. The model is really good with a significance of .003 i.e. less than .005.

Table 43. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.424	10	2.442	4.202	.003[b]
	Residual	11.043	19	.581		
	Total	35.467	29			

a. Dependent Variable: DEG_EPI

b. Predictors: (Constant), REGULATIONS, SUPPLIER_REL, GREEN_PURCHASE, ECO_BENIFITS, COOP_CUST, TOP_MGT_COMMIT, INT_ENV_MGT, ECO_DESIGN, MARKET, ENVIRON_PERF

With F statistic 4.02 and 29 degree of freedom the test is highly significant, thus a linear relationship between our variables and model can be assumed.

Table 44. Regression Coefficient, Intercept and their Significance

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.224	1.681		.133	.895
	INT_ENV_MGT	-.801	.431	-.509	-1.858	.004
	TOP_MGT_COM	.135	.428	.104	.315	.756
	GREEN_PURCHASE	.772	.216	.592	3.581	.002
	ECO_DESIGN	.712	.466	.476	1.526	.143
	COOP_CUST	-.256	.279	-.210	-.919	.370
	ENVIRON_PERF	.407	.598	.252	.681	.504
	ECO_BENEFITS	-.081	.310	-.049	-.261	.797
	SUPPLIER_REL	-.266	.258	-.163	-1.030	.316
	MARKET	-.141	.497	-.105	-.284	.779
	REGULATIONS	.389	.308	.252	1.261	.223
a. Dependent Variable: DEG_EP						

The model being multiple linear, one can clearly identify the path for internal environmental management, and green purchasing in a firm directly impacts the degree of Environmental performance of the firm. This allows us to accept our H_1 & H_3 hypothesis stating that there exists a relationship between internal environmental management and degree of Environmental performance. Also, there exists a relationship between green purchasing in a firm and degree of Environmental performance. Thus, rejecting all other hypothesis. Thus, a firm involving GSCM practices should focus more on internal environmental management and green purchasing. Thus, both internal production as well as external sourcing should be looked into while evaluating GSCM performance and Environmental performance of the firm.

Conclusion

The findings suggest that the pressure from environmental regulations, suppliers, consumers and community stakeholders have prompted the pharmaceutical manufacturers in India to implement GSCM practices. The present study is in congruence with the studies of Seuring [14], Chien and Chen [15], Verma & Gangele [16], where it is stated that regulations, market, suppliers and internal drivers exert pressure on corporations to implement GSCM practices. Furthermore, it was found that the implementation of GSCM practices can enhance the environmental, operational and financial performance of corporations, consistent with the findings of Rao [17], who emphasized the beneficial effects of the implementation of GSCM practices in improving environmental, organizational and financial performance. As discussed by Verma & Gangele [11], a corporation should not overlook long-term sustainability while pursuing short term profit. It is important to pursue economic development and at the same time consider environmental burden, thereby preserving the natural resources and environment on which the entire human race is dependent, instead of relentlessly exploiting available resources. In pursuing economic development, social justice has to be taken into account in order to strike the right balance between economy, environment and benefit to society. *Enterprises used to be concerned only with their own profit, ignoring the most important links in their production chain: upstream suppliers and downstream customers. The present study found that*, in the face of the current global sustainability concerns, corporations can benefit from an entirely green supply chain by cooperating with *upstream suppliers on green production technology and exchanging green information with them, as well as taking the voices of downstream customers and green consumers into account in their production processes.* To meet the expectations of society, pollution preventive measures should be adopted as an

environmental management strategy. However, corporations in general are concerned that stressing an empirical study of green supply chain management drivers, practices and performances environmental performance would add to their operational cost, accompanied by a decreasing market share and competitiveness.

In case of Internal Environment Management, the companies seem to be very diligent in their actions as they believe that ISO14001, eco labelling etc. have a great impact. Commitment from the top management is a must and the middle managers should strive to replicate it. A supplier should have the necessary certifications and should follow the regulations in order for the pharmaceutical firm to deal with them. The design of the product is done carefully in order to minimize the cost and energy consumption wherever possible. Moreover, it shouldn't be hazardous in any way. Firms tend to nominally cooperate with customers in the pharmaceutical sector. When adopted, GSCM has a tremendous impact on environment (as is realized by the industry) in terms of reduction of air, water and solid pollution and accidents. The industry is continually striving to reduce costs in every sphere of the operation and they do it prudently as they realize it would incur heavy capital and operating cost along with the training cost and cost of management of the facility. A firm's GSCM practices are most influenced by the export obligations of the market followed by association with professional groups. Moreover, competitor's strategies are also influential. The various companies pay most attention to the Central government's policies. Nevertheless, the present study found that the implementation of GSCM practices has a positive effect on environmental, operational and economic performance; that is, an increase in environmental performance will be accompanied by increased corporation profit and market share. The research can be further extended to explore what are the barriers and motivators for successful implementation and foundation of GSCM practices in a company. The study involving, identification of such factors will allow company to take decisions on, how to maintain its EPI rank by carrying its GSCM practices effectively.

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