

Drivers For Green Supply Chain Management In Food & Grocery Retail – A Study

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ABSTRACT

As the world becomes increasingly concerned with green and sustainability issues, Industries, organizations and governments are gradually moving towards more sustainable business practices - and India is no exception. Indian Industries are also becoming environmental conscious and many Industries are working towards the environment friendly part of business. Green Supply Chain Management (GSCM) has emerged as a key concept and approach for the organizations to become environmentally sustainable. The purpose of this paper is to study and explores the factors that drive the food and grocery retail to implement Green Supply Chain Management Initiatives. The study suggested eight factors which are majorly motivating or influencing these Industries to implement the Green Supply Chain Management initiatives. The eight factors on Green Supply Chain Management Drivers/ Pressures are labeled as Vertical Channel Partners, Environmental Regulations, Society, Expected Business Benefits, Top Management Support & Corporate Values, Competitors' Practices, Organizational Factors and International Environmental Agreements. The results of this paper provide a list of key drivers to the managers and the policy-makers so that they can use it as guidelines for setting up apposite norms and policies for the firms to take on Green Supply Chain Management.

KEYWORDS

Food and Grocery Retail, Environment Management, Green Supply Chain Management, Sustainability.

INTRODUCTION

India's retail sector – classified as organized and unorganized sectors – stands globally as the fifth largest, of which the organized sector is still at an embryonic stage, with private labels occupying less than 6% of the total market. This Indian retail segment is flourishing and is anticipated to develop hastily at a rate of 25-30% p.a. Conventionally, this retail industry was subjugated by the unorganized local players, with consumers shopping at unorganized retail formats like mom-and-pop shops, road-side small markets called 'haats' and nearby grocery stores for their regular and common needs. Not only do they just shop there, they

turn loyal towards those vendors vending in the neighborhood or locality as these vendors not only sell goods, or offer home delivery options, or extend credit to those short of cash or in need, but also know most of their customers personally, and thus add a personal touch in their customer dealings. Strong bonds between these vendors and their loyal customers have been observed in many areas.

Green supply chain or sustainable supply chain refers to that supply chain in which sustainable ecological processes are integrated into the customary age-old supply chain. These ecological processes can include any or as many or all of activities ranging from purchasing eco-friendly material to selecting supplier, from designing environmental products to its assembling and/or manufacturing, from sustainable distribution to managing it till the end of its life. Unquestionably, controlling water, air, land and other waste pollution is this green supply chain's major aim, yet it also emphasizes on value creation and/or value addition through green operations throughout the chain. By reducing wastage during manufacturing and focusing on recycling and/or reusing of products, green practices not only reduces a business' manufacturing costs, but also enhances its performance by increasing efficiency or worth of its assets, building positive image of the company in society and offering higher customer satisfaction.

Green Supply Chain Management, also known as GSCM, as a concept, has emerged in the past few years, and includes every step in a product life cycle, i.e. from a product's designing to its manufacturing and recycling, with the major distinction that it includes all green activities at each and every phase. Scope of GSCM is wide enough as it is not only used in manufacturing firms, but also in other sectors, like government, services, education, etc.

REVIEW OF LITERATURE

It was Michigan State University's Manufacturing Research Association (MRA) which was engaged in the research of Environmental Responsibility for Manufacturing (ERM), and consequently were the first to come forward with the systematic idea of the Green Supply Chain Management (GSCM) in 1996. They defined it as a management of a supply chain, involving producers, suppliers, distributors and customers, but based on the green theories and green concepts. The major aim of GSCM, as defined by them, was to diminish as much possible the negative impact on the environment and enhance as much possible the resource efficiency, while performing the entire process beginning from designing of the product(s) to its material acquisition, assembling and/or processing, packaging, selling and distribution, transporting, using and disposing. Adding the word 'green' to the 'supply chain' adjoins a new model where there is a direct relation between the supply chain and the environment (Geffen and Rothenburg, 2014).

In recent years, owing to the growing pressure from governments, institutions, and consumers, GSCM has gained great attention and has become an imperative subject area of research. Previous researchers have

conducted inter-disciplinary research, incorporating management, social sciences, engineering, logistics, network analysis and performance management areas' efforts, to explore and examine the matter relating to green supply chain management (Sharkis, 2016). As a new ecological approach, GSCM is measured as an ecological innovation and the text on GSCM has been increasing and evolving double folded with more and more organizations and researchers having realized that the green programs' management does not conclude at the firms' boundaries.

NEED & IMPORTANCE OF THE STUDY

After reviewing the available and collected literature, it was instituted that insufficient or negligible research has been conducted in arena of GSCM practices in food & grocery retail in India. While in the 21st century, the mounting want for assimilating environment-friendly options into supply chain is one of the greatest challenges before all the organizations, it is even more critical and fundamental for the food and grocery retail segment to install these GSCM practices in their firms so as to diminish their continually enlarging effect on the surroundings. Here lies the need and significance of this study as the scenario today calls for research in this current topic of GSCM applications, especially in food and grocery retail.

OBJECTIVES OF THE STUDY

The objectives of this study are envisaged below:

1. To study the current scenario and current practices and future direction of GSCM activities within the supply chain of the food and grocery retail.
2. To identify and investigate the factors contributing in the development and adoption of GSCM practices in the supply chain of food and grocery retail.

RESEARCH METHODOLOGY

1. DEVELOPMENT OF INSTRUMENT

Under this study, the data collected are the responses provided by the Managers of Environment, Health and Safety (EHS) departments or Environment Management Representatives (EMR) and other equivalent departments to the questionnaire prepared, which includes issues relating to the environment, i.e. the green issues, along with other supply chain functions. The apposite persons from whom the needed data has been acquired idyllically have knowledge on both the aspects. The questionnaire contains around 30 items affecting the application of GSCM Practices. These items are the drivers or motivators for GSCM implementation and are based upon several literature sources as well as initial information inputs from the Industry Experts. Questions were answered using a five-point Likert scale revealing the respondents' level of agreement or disagreement (where 1 stood for strong disagreement and 5 stood for strong agreement).

2. ADMINISTRATION OF DATA COLLECTION

Administration of the data collection was carried out using the following three steps:

1. **Pilot test** – In order to check and distill the questionnaire, a pilot study was conducted, under which a total of 27 valid responses were gathered. On the basis of the propositions obtained from these respondents, some minor alterations were applied to the questionnaire.
2. **Convenience Sampling** – There exists a large but finite population of small, medium and large retail. But only finite population of Large and Medium size is considered to be surveyed. Sample size calculation performed with consideration of Finite Population correction factor with $N = 2052$, $n = 384$, $p = 0.5$, $q = 0.5$, Confidence level = 95%, $\alpha = +$ or $- 5\%$ gives $n = 324$ as sample size.
3. **Random Surveys** – In order to shun the prejudice or favoritism connected with the convenience sampling method, random surveys, through post and e-mail, pursued by telephonic calls, were conducted. 33.1% was the response rate because out of the total 1000 questionnaires posted and mailed, 331 utilizable responses were obtained. Using t-tests, responses from the two groups early from convenience sampling technique and late from random surveys conducted were compared. The results of the test signified that overall, no statistical differences subsisted amid the mean scores of respondents – early and late – at 5% level of confidence. Hence, full data set of 331 responses was utilized for the study.

Table 1 : Distribution of respondent in terms of Size.

TABLE 1: DISTRIBUTION OF SURVEY RESPONDENT

Particulars	Total	Percentage (%)
Size	331	100
Medium-Size	178	53.77
Large-Size	153	46.22

FACTOR ANALYSIS

An exploratory factor analysis was conducted to obtain groups of GSCM Drivers which motivates implementation of the GSCM Practices from the survey data. For the Factor Analysis to be considered as apt, the result of the KMO & Bartlett's Test of Sphericity should be below 0.05, and in this study, it is 0.000, thereby meeting the aptness criteria. Moreover, for Factor Analysis to be regarded as good, KMO Measure of Sampling Adequacy's result should be more than 0.6, and in this study, it is 0.785, thereby again meeting the set criteria. The factors for this study were mined using the technique of maximum likelihood, followed by varimax rotation. For further analysis, the Kaiser criterion was used, under which out of the 30 variables, those 8 factors whose eigen values were greater than 1 were considered and empirically grouped as 8 GSCM Drivers or influencers (Table 2). The eight GSCM Drivers or Pressure factors explained 89.45% of their inherent variance.

TABLE 2: ROTATED FACTOR MATRIX^A ON GSCM DRIVERS/PRESSURES

Items	Components							
	1	2	3	4	5	6	7	8
Our Supplier's advances in developing environmentally friendly goods motivate us to adopt green supply chain initiatives.	0.928							
The downstream network/s (from Manufacturer to end customer) of supply chain is forcing/motivating my organization to participate in their green supply chain initiatives.	0.884							
My organization's major customers would reject the products if they contain hazardous elements or materials.	0.879							
My organization expects to receive special recognition from its major customers for the adoption of green supply chain initiatives.	0.728							
Through adopting green supply chain initiatives, my organization tries to reduce the threat from the complaints of consumer associations / Customer forums.	0.609						0.504	
The upstream network/s (from Suppliers' supplier to manufacturer) of supply chain is forcing/motivating my organization to participate in their green supply chain initiatives.	0.579	0.474			0.513			
Through adopting green supply chain initiatives, my organization tries to reduce the threat of current or future government environmental legislations.		0.850						
Through adopting green supply chain initiatives, my organization tries to avoid the threat of current or future government environmental legislations.		0.745						
There are frequent government inspections or audits in my organization to ensure that the organization is in compliance with environmental laws and regulations.		0.670						
Through adopting green supply chain initiatives, my organization tries to reduce the complaints from Domestic Pollution Control Boards.		0.637	0.491					0.351
My organization believes that it our social responsibility to minimize the negative effects on the environment in all its operations.	0.544		0.948					
It is important for my organization to consider the societal well being in all of its operations and supply chain activities.			0.933					
My organization pays considerable attention to the reaction of the society to its action and activities.			0.884					
In order to reduce the public's perceived risks associated with the organization, my organization implement GSCM initiatives.			0.615			0.567		
Increase on new business opportunities avenues after GSCM implementation motivates my organization to implement it.				0.940				
Expected business benefits from after Green supply Chain Management Practices in organization encourages/motivates organization to implement GSCM.	0.412	0.356		0.726				
There is a general belief that green supply chain initiatives have benefits that outweigh their costs in long run.				0.716	0.561			
My organization's Top management is committed towards Green supply chain initiatives implementation in organization.					0.773			
The constant support from organization senior managers and top managers for GSCM initiatives encourage for its implementation.	0.483				0.735			
My organization's Strategic plans induced to make it a Green supply chain management efficient organization.			0.388		0.659			
Protecting the environment is a central corporate value in my organization.				0.437	0.598	0.368		
Green supply chain initiatives are generally having considerable competitive benefits.						0.843		
Big organization/players and Competitors adopt green supply chain initiatives which motivate my organization to implement GSCM.	0.390					0.750		
My organization's capabilities of investment for green investments support the implementation of GSCM in organization.							0.781	
My organization's quick adapting capability towards transformations supports the GSCM implementation in organization.	0.475						0.700	
Cross Functional Cooperation from the employees form the various departments for environmental improvements supports GSCM implementation.							0.636	
Financial incentives offered by International organizations (United Nations) are significant motivators for my organization to adopt green supply chain initiatives.								0.885
Environmental regulations in export countries (as RoHS, REACH.etc.) induced my organization to adopt green supply chain initiatives.			0.365			0.417		0.703

TABLE 3: DESCRIPTIVE STATISTICS ON GSCM DRIVERS / PRESSURES

Items	Mean	SD
Vertical Channel Partners (VCP)	3.94	0.8
Our Supplier's advances in developing environmentally friendly goods motivate us to adopt green supply chain initiatives.	4.27	0.8
The downstream network/s (from Manufacturer to end customer) of supply chain is forcing/motivating my organization to participate in their green supply chain initiatives.	4.02	0.7
My organization's major customers would reject the products if they contain hazardous elements or materials.	4.12	0.9
My organization expects to receive special recognition from its major customers for the adoption of green supply chain initiatives.	4.32	0.8
Through adopting green supply chain initiatives, my organization tries to reduce the threat from the complaints of consumer associations/Customer forums.	3.44	1
The upstream network/s (from Suppliers' supplier to manufacturer) of supply chain is forcing/motivating my organization to participate in their green supply chain initiatives.	3.5	1.2
Environmental Regulations (ER)	3.6	0.5
Through adopting green supply chain initiatives, my organization tries to reduce the threat of current or future government environmental legislations.	3.26	1
Through adopting green supply chain initiatives, my organization tries to avoid the threat of current or future government environmental legislations.	3.85	1.1
There are frequent government inspections or audits in my organization to ensure that the organization is in compliance with environmental laws and regulations.	3.81	0.9
Through adopting green supply chain initiatives, my organization tries to reduce the complaints from Domestic Pollution Control Boards.	3.47	1.3
Society (Soc.)	3.73	0.7
My organization believes that it our social responsibility to minimize the negative effects on the environment in all its operations.	3.94	1.1
It is important for my organization to consider the societal well being in all of its operations and supply chain activities.	3.64	0.9
My organization pays considerable attention to the reaction of the society to its action and activities.	3.66	0.9
In order to reduce the public's perceived risks associated with the organization, my organization implement GSCM initiatives.	3.68	0.8
Expected Business Benefits (EBB)	3.34	0.5
Increase on new business opportunities avenues after GSCM implementation motivates my organization to implement it.	3.35	1.1
Expected business benefits from after Green supply Chain Management Practices in organization encourages/motivates organization to implement GSCM.	3.76	0.9
There is a general belief that green supply chain initiatives have benefits that outweigh their costs in long run.	2.91	1.3
Top Management Support & Corporate Values (TMS & CV)	3.07	0.5
My organization's Top management is committed towards Green supply chain initiatives implementation in organization.	2.61	1.3
The constant support from organization senior managers and top managers for GSCM initiatives encourage for its implementation.	3.63	0.8
My organization's Strategic plans induced to make it a Green supply chain management efficient organization.	2.09	0.9
Protecting the environment is a central corporate value in my organization.	3.96	0.7
Competitors' Practices (CP)	4.5	0.5
Green supply chain initiatives are generally having considerable competitive benefits.	4.77	0.5
Big organization/players and Competitors adopt green supply chain initiatives which motivate my organization to implement GSCM.	4.23	0.7
Organizational Factors (OF)	3.93	0.5
My organization's capabilities of investment for green investments support the implementation of GSCM in organization.	3.55	0.8
My organization's quick adapting capability towards transformations supports the GSCM implementation in organization.	3.6	0.7
Cross Functional Cooperation from the employees form the various departments for environmental improvements supports GSCM implementation.	4.64	0.8
International Environmental Agreements (IEA)	3.91	0.4
Financial incentives offered by International organizations (United Nations) are significant motivators for my organization to adopt green supply chain initiatives.	3.26	0.8
Environmental regulations in export countries (as RoHS, REACH.etc.) induced my organization to adopt green supply chain initiatives.	4.56	0.8

INTERPRETATION

GSCM's top eight driving forces are found to be –

1. Vertical Channel Partners,
2. Environmental Regulations,
3. Society,
4. Expected Business Benefits,
5. Top Management Support & Corporate Values,
6. Competitors' Practices,
7. Organizational Factors, and
8. International Environmental Agreements.

The analysis conducted further substantiates the dependability of the above eight drivers. This analysis is done employing Cronbach's alpha of 0.904, 0.823, 0.714, 0.761, 0.668, only two variables, 0.871 & only two variables respectively, for each group. Factor analysis is conducted on the basis of the guidelines provided by Heir et al (2012). Since all the Cronbach's alpha's values are more than 0.6 as stated by Heir et al (2012), it is interpreted that the constructs are internally consistent and reliable.

RESULTS & DISCUSSION

Descriptive statistics of the eight GSCM drivers are depicted in Table 3, which discloses that the food and grocery retail are highly driven and motivated by the Vertical Channel Partners (mean = 3.94, SD = 0.76). Vertical Channel Partners includes upstream network(s) and the downstream network(s) of supply chain for any organization. The table also reflects that the Food and Grocery Retail is influenced by the various Environmental Regulations (mean = 3.6, SD = 0.51). The third major factor that motivates to adopt GSCM practices is Society (mean = 3.73, SD = 0.69). This factor includes the variables including the social responsibility of corporate towards environment, the public perceived risks of the corporate towards environment etc. Pressure from the Customers, public and pressure from the various segments of society as a stakeholder are basis on which companies have to reassess their environmental supply applications. The analysis also reveals that benefits are expected (mean = 3.07, SD = 0.49) from the business after application of GSCM Practices implementation in the Food and Grocery Retail.

The fifth factor which gets derived from the analysis is Top Management Support and Corporate Values (mean = 3.07, SD = 0.49) under which emphasis is placed on and by the top level management on capability development for application and implementation of the GSCM practices, since commitment of the top level management is an important facility or pre-requisite in building up of such unswerving and prolong-able programs which nourishes their firms' relationships with the suppliers. "Competitiveness" (mean = 3.07, SD =

0.49) is defined as the potential for GSCM to improve long-term profitability. It also acts as one of the main influencers for the GSCM implementation in Food and Grocery Retail. The motivation behind implementation and development of GSCM is improvement in the spiritedness of their firm so that they enjoy a competitive edge and take a bigger position in the industry. Producers can look forward to benefits like liability reduction, company's image improvement and continuity of business for a longer period of time through implementation of GSCM practices. There is an array of several diverse factors associated with organization (mean = 3.93, SD = 0.49) which also motivate the GSCM implementation. Apart from these, personal commitment of individuals as well as commitment of middle level managers has also been established to have positive relation with GSCM. Another factor that affects majorly the GSCM implementation in the export oriented Food and Grocery Retail are International Environmental Agreements (mean = 3.91, SD = 0.43), in spite of the fact that the national regulations concerning environment appear to have a superior and more instant or more significant affect on the GSCM practices. Many Food & Grocery Retail players, especially those who are having their major exports to US, UK and other European Countries are also being affected by the Agreements present in International Environment, like the RoHS, the Climate Change Treaty, etc.

IMPLICATIONS & CONCLUSION

From the review study, it can be seen that most of the Indian organizations including various Food and Grocery Retail have amplified the ecological alertness owing to authoritarian, competitive as well as promotional forces and other several related and/or unrelated drivers. However, GSCM is still in its infant stat in India. Only the large and medium companies have acknowledged the need of implementing the Green SCM initiatives, while others have delayed in the execution of these ideologies into following. This paper is only one of the few efforts made to investigate GSCM observance in Food & Grocery Retail. Thus, the exploration and its results are still reasonably in investigative mode. Prospective research can be tried out on new associations, counting interceding as well as modest relationships, which might exist between different factors recognized. A further study based on broader sample selected across India can also present a better depiction of GSCM applications throughout India under GSCM.

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