



## GREEN SUPPLY CHAIN MANAGEMENT PRACTICES: A STUDY OF SELECT FIRMS IN AUTOMOBILE SECTOR

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### Abstract

“Going green” is not just a fad. It is not just a moral imperative. It is an economic imperative too. If not taken seriously, the consequences could prove calamitous to mankind. Every country in the world has a bounden duty to go as green as possible in every sphere of economic activity. Damage to environment and damage to ecology have wreaked havoc on global economy and destroyed lives and property. The commonest sphere of economic activity where going green will make a vast difference to all stakeholders is manufacturing. Rich countries like US accuse countries like China and India of not doing enough to tackle the carbon imprint. The accusation has to be taken with a pinch of salt. The per capita carbon imprint is much, much lower in India when compared with that of US and other western economies. These countries have been the earliest polluters of the environment and have been polluting the environment much longer! All the same, countries like India have resolved to bring down their per capita carbon imprint. The researcher believes that the country’s manufacturers should initiate the greening exercise in the supply chain management space since it is a major monetary item that cuts across several stages of production. At every stage, the green supply chain management practices can be implemented for eventual wealth maximisation of all stakeholders. The researcher concludes that embracing state-of-the-art technology and shunning the mindset, if any, that rejects evolving technology will speed up implementation of GSCM practices. On its part, the regulator should create a new class of GSCM professionals to help our manufacturers in particular and industry in general to implement GSCM practices cost-effectively and effortlessly.

**Key Words:** Carbon Imprint; Economic Imperative; Moral Imperative; GSCM Professionals.

### 1.1 Theoretical background of the topic

Going “green” is not just the “in thing” these days – it is the “inevitable thing”, so to speak. What is more, it has become imperative to go green in all spheres of activity, including economic activity. Man’s greed and avarice led him to take Mother Nature for granted. Before long, he realised that it was better to work with rather than against, Mother Nature. Man learnt the hard way after unusually heavy rains led to the flooding of rivers and the rivers inundated large cities. Deserts began to receive rains and geographies reputed for receiving heavy rainfall saw the rainfall they usually receive dwindle. People living in some of the wettest areas of the planet had to face scarcity of water. People living in tropical geographies realised that the local weather pattern had been changing slowly but surely in the medium term. Sooner rather than later, things came to such a pass that man had to take the “greening” exercise seriously. It was no longer an option for him. It had become inevitable failing which he had to pay a heavy penalty in terms of lives and property. Man realised that the ecology of the planet had become fragile. His actions were damaging the environment. He should do enough to protect the environment from pollution. He had to go green wherever possible before it was too late. He should begin with the economic sphere where companies / businesses did not bear the costs of externalities they inflicted on Mother Nature and mankind.

### 1.2 Statement of the Problem

Companies / businesses do not bear the costs of the externalities they inflict on Mother Nature and mankind. Considering that companies / businesses account for a large chunk of the country’s GDP, it is here that one should logically begin the “greening” exercise. The exercise will lead to optimal exploitation of resources, minimal amount of pollution and minimal damage to the environment. Within companies / businesses, the supply chain component is a major monetary item that cuts across several stages of production. Each stage offers an opportunity to attempt the greening exercise. To that extent it offers an opportunity to the various stakeholders associated with it to maximise their wealth further. For example, it will help manage the suppliers effectively. The supply chain becomes transparent. Investments and risks can be apportioned among partners in the chain. Product safety and product quality can be ensured. Waste, considerably reduced by improved efficiency, can be put to beneficial use. These should inevitably lead to improved finances for the companies / businesses. In the circumstances is rather surprising that the green supply chain management (GSCM) practices have not taken off seriously in the country. Hence the reasons behind this stagnation have to be ascertained so corrective measures can be initiated.



### 1.3 Review of literature

1. Sunil Luthra, Vinod Kumar, Sanjay Kumar and Abid Haleem attempt to develop a structural model of the barriers to implementation of GSCM in Indian automobile industry (Sunil, Vinod, Sanjay, & Abid, 2011). They identify some barriers and contextual relationships among the identified barriers. They classify the barriers according to the dependence and driving power with the help of MICMAC analysis. Further, they suggest a structural model of barriers to implementation of GSCM in the Indian automobile industry using Interpretive Structural Modeling (ISM) technique.
2. Green supply chain management has emerged as an important organizational philosophy to minimise environmental risks, argue the researchers (Diabat & Govindan, 2011). They design a model of the drivers affecting the implementation of green supply chain management. They use an Interpretive Structural Modeling (ISM) framework for the purpose. They identify the various drivers of the green supply chain management (GSCM) by using the GSM literature and consulting industry experts. They validate the model on a case study involving a manufacturing unit.
3. The researchers remind that manufacturing industries began to focus on green concept in their supply chain management only lately (Govindan, Kaliyan, Kannan, & Haq, 2014). The intention was to focus on environmental issues. All the same, they have a tough time identifying barriers that hinder the implementation of green supply chain management. The researchers focus on identifying the barriers in the backdrop of effectiveness of procurement. They identify 47 barriers after perusing literature and interacting with industry experts. They supplemented their efforts by conducting a questionnaire-based survey of various sectors of the industry. They identify critical barriers by resorting to an analytic hierarchy process. They top it off with a sensitivity analysis to examine priority ranking stability.

### 1.4 Research Gap

The researchers have made valid observations. However, the issue in the Indian context is the alleged reluctance of industry to embrace state-of-the-art technology for the “greening” exercise, fearing the financial implications of such an act. Industry does not realise that it is being penny-wise and pound-foolish by entertaining such a view. As a matter of fact, industry stands to gain at the micro-level and at the macro-level by undertaking GSCM practices. The reviewed literature would have done well to deal with these aspects. Towards this end, a research gap has arisen and it is this gap the present study seeks to bridge.

### 1.5 Scope of the Present Study

The study confines itself to managers and consultants based in and around Bangalore urban and rural districts with exposure to GSCM practices. The study covers select 30 managers of select automobile companies and 30 consultants.

### 1.6 Objectives of the Study

The objectives of the study are:

1. To examine the current practices of GSCM in select firms of automobile sector.
2. To identify the benefits of implementing GSCM practices in select firms of automobile sector.
3. To identify the issues associated with the implementation of GSCM practices in select firms of automobile sector.

### 1.7 Hypothesis proposed to be tested

The study proposes to test the following hypothesis:

“Companies believe that going green will involve additional expenses”

Null Hypothesis  $H_0$  and Alternative Hypothesis  $H_1$  are postulated as follows:

$H_0$ : Companies do not believe that going green will involve additional expenses

$H_1$ : Companies believe that going green will involve additional expenses

### 1.8 Research Design

#### 1.8.1 Research Methodology

The study is descriptive in nature and has used the ‘fact-finding’ survey method.

#### 1.8.2 Sources of Data

Primary data has been collected from the respondents, viz., 30 managers and 30 consultants. Secondary data has been collected from the financial press.

#### 1.8.3 Sampling plan

**Managers:** Given the rather limited number of industries with exposure to GSCM practices operating in the area, purposive



or judgement sampling under the non-probability method has been deployed to select the industries. Applying exposure to GSCM practices as the criterion, the selected 30 managers of select automobile companies in Bangalore. This criterion, according to the researcher, is the most appropriate one for the present study.

**Consultants:** Given the rather limited number of consultants with exposure to GSCM practices operating in the area covered by the study, purposive or judgement sampling under the non-probability method has been deployed. Applying their exposure to GSCM practices as the criterion, the researcher selected 30 consultants with an exposure of at least 10 years to bank finance. This criterion, according to the researcher, is the most appropriate one for the present study.

#### 1.8.4 Data Collection Instruments

Interview schedules were administered to the respondents for collection of primary data.

#### 1.8.5 Data processing and analysis plan

Non-parametric statistical units were used to test the association between some qualitative characters and conclusions were drawn on the basis of formation of  $H_0$  and  $H_1$ .

#### 1.8.6 Limitations of the study

Primary data has sometimes been deduced through constant topic-oriented discussions with the respondents. It is possible that a certain degree of subjectivity has influenced their views.

#### 1.9 Managers

In the following paragraphs, the primary data collected from the manager respondents is analysed.

##### 1.9.1 Reasons for GSCM practices not being taken seriously by Indian industry

That GSCM practices are not taken seriously by Indian industry is a well known fact. It has been documented too. Barring a few exceptions, none has any idea what GSCM practices are all about and what they could mean for their business. Hence the researcher sought to know from the respondents the reasons for Indian industry not taking GSCM practices seriously. Their replies to the query appear in the following Table.

**Table-1, Reasons for GSCM practices not being taken seriously by Indian industry**

Reasons	Number of respondents
Reluctance to adopt advanced technology	26
Information on GSCM practices is inadequate	25
The law is yet to create a new class of professionals or GSCM practitioners	24
Companies believe that going green involves additional expenses	22
The well-entrenched mindset cannot be changed overnight	21

Reluctance to adopt advanced technology is cited as a reason by 26 respondents. 25 respondents cite inadequate information on GSCM practices as a reason. The law is yet to create a new class of professionals or GSCM practitioners, according to 24 respondents. 22 respondents cite that companies believe that going green involves additional expenses. 21 respondents cite that the well-entrenched mindset cannot be changed overnight.

##### 1.9.2 Company-specific advantages accruing from GSCM practices

With one school of thought holding that advantages accrue to companies in particular and the industry in general from the adoption of GSCM practices, the researcher requested the respondents to indicate the company specific advantages accruing from adoption of GSCM practices. Their replies to the query appear in the following Table.

**Table-2, Company-specific advantages accruing from GSCM practices**

Advantages	Number of respondents
Companies can reduce operational costs	28
Finances of the companies will be impacted favourably	27
Companies can manage suppliers effectively	26
Companies can reduce production cost	25
Companies can achieve waste reduction through enhanced efficiency	24



According to 28 respondents, companies can reduce operational costs. Finances of the companies will be impacted favourably, according to 27 respondents. Companies can manage suppliers effectively, according to 26 respondents. Companies can reduce production cost, according to 25 respondents. Companies can achieve waste reduction through enhanced efficiency, according to 24 respondents.

### 1.9.3 Advantages accruing to the industry as a whole from GSCM practices

It is also believed in informed circles that advantages accrue to the industry as a whole from the adoption of GSCM practices. Hence the researcher requested the respondents to indicate the advantages accruing to the industry as a whole from the adoption of GSCM practices. Their replies to the query appear in the following Table.

**Table-3, Advantages accruing to the industry as a whole from GSCM practices**

Advantages	Number of respondents
Raw materials can be reused	29
Production of hazardous substances can be minimised	29
Optimal exploitation of the productive resources of businesses can be ensured	28
Environment-friendly production processes will generate green outputs	27
Recycling can be promoted	26

According to 29 respondents, raw materials can be reused. Production of hazardous substances can be minimised, according to 29 respondents. Optimal exploitation of the productive resources of businesses can be ensured, according to 28 respondents. Environment-friendly production processes will generate green outputs, according to 27 respondents. Recycling can be promoted, according to 26 respondents.

### 1.10 Consultants

In the following paragraphs, the primary data collected from the consultant respondents is analysed.

#### 1.10.1 Reasons for GSCM practices not being taken seriously by Indian industry

That GSCM practices are not taken seriously by Indian industry is a well known fact. It has been documented too. Barring a few exceptions, none has any idea what GSCM practices are all about and what they could mean for their business. Hence the researcher sought to know from the respondents the reasons for Indian industry not taking GSCM practices seriously. Their replies to the query appear in the following Table.

**Table-4, Reasons for GSCM practices not being taken seriously by Indian industry**

Reasons	Number of respondents
The law is yet to create a new class of professionals or GSCM practitioners	29
Information on GSCM practices is inadequate	28
Reluctance to adopt advanced technology	26
Companies believe that going green involves additional expenses	26
The well-entrenched mindset cannot be changed overnight	23

The law is yet to create a new class of professionals or GSCM practitioners, according to 29 respondents. 28 respondents cite inadequate information on GSCM practices as a reason. Reluctance to adopt advanced technology is cited as a reason by 26 respondents. 26 respondents cite that companies believe that going green involves additional expenses. 23 respondents cite that the well-entrenched mindset cannot be changed overnight.

#### 1.10.2 Company-specific advantages accruing from GSCM practices

With one school of thought holding that advantages accrue to companies in particular and the industry in general from the adoption of GSCM practices, the researcher requested the respondents to indicate the company specific advantages accruing from adoption of GSCM practices. Their replies to the query appear in the following Table.

**Table-5, Company-specific advantages accruing from GSCM practices**

Advantages	Number of respondents
Companies can reduce production cost	29
Companies can reduce operational costs	28
Companies can achieve waste reduction through enhanced efficiency	28



Finances of the companies will be impacted favourably	26
Companies can manage suppliers effectively	25

Companies can reduce production cost, according to 29 respondents. According to 28 respondents, companies can reduce operational costs. Companies can achieve waste reduction through enhanced efficiency, according to 28 respondents. Finances of the companies will be impacted favourably, according to 26 respondents. Companies can manage suppliers effectively, according to 25 respondents.

### 1.10.3 Advantages accruing to the industry as a whole from GSCM practices

It is also believed in informed circles that advantages accrue to the industry as a whole from the adoption of GSCM practices. Hence the researcher requested the respondents to indicate the advantages accruing to the industry as a whole from the adoption of GSCM practices. Their replies to the query appear in the following Table.

**Table-6, Advantages accruing to the industry as a whole from GSCM practices**

Advantages	Number of respondents
Optimal exploitation of the productive resources of businesses can be ensured	29
Environment-friendly production processes will generate green outputs	29
Recycling can be promoted	28
Production of hazardous substances can be minimised	27
Raw materials can be reused	26

Optimal exploitation of the productive resources of businesses can be ensured, according to 29 respondents. Environment-friendly production processes will generate green outputs, according to 29 respondents. Recycling can be promoted, according to 28 respondents. Production of hazardous substances can be minimised, according to 27 respondents. According to 26 respondents, raw materials can be reused.

### 1.11 Summary of findings

In the following paragraphs, a summarised version of the findings arrived at, by analysing the primary data furnished by respondents, is furnished:

#### 1.11.1 Managers

1. Reluctance to adopt advanced technology is cited as a reason by 26 respondents. 25 respondents cite inadequate information on GSCM practices as a reason. The law is yet to create a new class of professionals or GSCM practitioners, according to 24 respondents. 22 respondents cite that companies believe that going green involves additional expenses. 21 respondents cite that the well-entrenched mindset cannot be changed overnight.
2. According to 28 respondents, companies can reduce operational costs. Finances of the companies will be impacted favourably, according to 27 respondents. Companies can manage suppliers effectively, according to 26 respondents. Companies can reduce production cost, according to 25 respondents. Companies can achieve waste reduction through enhanced efficiency, according to 24 respondents.
3. According to 29 respondents, raw materials can be reused. Production of hazardous substances can be minimised, according to 29 respondents. Optimal exploitation of the productive resources of businesses can be ensured, according to 28 respondents. Environment-friendly production processes will generate green outputs, according to 27 respondents. Recycling can be promoted, according to 26 respondents.

#### 1.11.2 Consultants

4. The law is yet to create a new class of professionals or GSCM practitioners, according to 29 respondents. 28 respondents cite inadequate information on GSCM practices as a reason. Reluctance to adopt advanced technology is cited as a reason by 26 respondents. 26 respondents cite that companies believe that going green involves additional expenses. 23 respondents cite that the well-entrenched mindset cannot be changed overnight.
5. Companies can reduce production cost, according to 29 respondents. According to 28 respondents, companies can reduce operational costs. Companies can achieve waste reduction through enhanced efficiency, according to 28 respondents. Finances of the companies will be impacted favourably, according to 26 respondents. Companies can manage suppliers effectively, according to 25 respondents.
6. Optimal exploitation of the productive resources of businesses can be ensured, according to 29 respondents. Environment-friendly production processes will generate green outputs, according to 29 respondents. Recycling can





be promoted, according to 28 respondents. Production of hazardous substances can be minimised, according to 27 respondents. According to 26 respondents, raw materials can be reused.

### 1.12 Conclusions

Conclusions are inferences / generalisations drawn from the findings and relate to hypotheses. They are answers to the research questions or the statements of acceptance or rejection of hypotheses. As explained already, this study proposes to test the following hypothesis:

*Hypothesis:*

“Companies believe that going green will involve additional expenses”

Hence  $H_0$  and  $H_1$  are as follows:

$H_0$ : Companies do not believe that going green will involve additional expenses

$H_1$ : Companies believe that going green will involve additional expenses

On the basis of the primary data collected from the respondents, vide Tables: 1 and 4, a chi-square test was applied to ascertain the association, if any, between the three variables. The following Table reveals the computation made using MS-Excel.

Observed Values			
Category	Yes	No	Total
Managers	22	8	30
Consultants	26	4	30
Total	48	12	60
Expected Values			
Category	Yes	No	Total
Managers	24.00	6.00	30.00
Consultants	24.00	6.00	30.00
Total	48.00	12.00	60.00
	Yes	No	
o-e	-2	2	
	2	-2	
(o-e) <sup>2</sup>	1	1	
	1	1	
((o-e) <sup>2</sup> )/e	0.041667	0.166667	
	0.041667	0.166667	
CV	0.083333	0.333333	0.41666667
TV			3.841459149
p			0.196705719

The calculated value of  $t^2$  is 0.41666667, lower than the table value of 3.841459149 for an alpha of 0.05 at one degree of freedom. Hence the null hypothesis is accepted.

Hence, companies do not believe that going green will involve additional expenses

### 1.13 Recommendations

The following are the researcher’s recommendations:

1. Companies need to adopt state-of-the-art technology. They should not hesitate to embrace state-of-the-art technology. It helps them to cut costs, improve productivity, improve production and minimise externalities by helping the companies to go green.
2. It is wrong on the part of companies to assume that going green warrants additional outflows of cash from their kitty. In fact, nothing can be farther from the truth. As a matter of fact, companies could reduce their production costs and operational costs by embracing GSCM practices.
3. It is important for companies to remember that by embracing GSCM practices, they are not only promoting their own business but also promoting universal welfare by reducing pollution and minimising damage to environment.



After all, most of the resources that industry exploits are not renewable in nature. Before long, such resources are bound to dry up. Hence using the resources carefully is of utmost importance. GSCM practices help the companies to minimise wastage through recycling.

4. Industry should shun the mindset, if any, that rejects evolving technology and embrace evolving technology in their own interest and in the interest of mankind as a whole.
5. The regulator should create a new class of professionals or GSCM practitioners to help trade and industry to implement GSCM practices effectively and effortlessly. It is worth remembering here that it is pursuit of optimising the country's insolvency legal framework, the government has decided to create a new class of professionals called insolvency professionals to optimise the insolvency regime. Similarly, the government should take the lead in popularising GSCM practices among businesses.
6. Since GSCM practices lead to waste reduction, companies can contribute to pollution reduction and optimal exploitation of scarce but valuable resources.

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