

An empirical study to understand the factors influencing green supply chain management adoption in India

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Abstract

Companies worldwide are trying to implement green supply chain management practices at various levels of their supply chain. This process is triggered by multiple factors such as increasing awareness about environmental deterioration, increasing legislations and pressures from the government to comply with regulatory requirements, etc. A research study was conducted to understand to what extent greening of the supply chain is taking place and to determine the drivers for green practices in Indian manufacturing companies. A conceptual model was developed from

literature sources and data was collected using a structured questionnaire from various manufacturing organisations. The objective of this research work is to bring out the insights of the supply chain greening process and to inspire various stakeholders to work towards environment-friendly supply chains.

Key words: *Green supply chain management, Green practices, Green drivers, Sustainability, Environmental strategy*

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Introduction

Rapid industrialisation during the 20th century has led to several environmental negatives such as greenhouse gas emissions, chemical spills and toxic pollution (Peng and Lin, 2008). Today, people, organisations and governments across the world are becoming increasingly concerned about the impact of pollution to the environment from different manufacturing industries. To deal with increasingly complex global supply chain networks and pressures from various stakeholders, many firms are adopting Green Supply Chain Management (GSCM) practices to manage and control their extended supply chains. GSCM practices can be implemented throughout the supply chain, starting from the design stage of the product to the end-of-life management of the product (Emmet and Sood, 2010).

GSCM practices are environmentally friendly practices; they include energy efficiency, water efficiency, environment conservation, waste management, recycling and reuse, hazardous and toxic substance management, and optimisation of transportation. As per Emmet & Sood (2010), GSCM practices can be adopted at different stages of the supply chain, such as 1) Sourcing and supplier selection, 2) Product design, 3) Procurement, 4) Manufacturing and production processes, 6) Logistics, 7) Delivery of the final product to the customer and 8) End-of-life management of the product. In total, these stages cover: Upstream, downstream, within the organisations and the connecting logistic processes. GSCM can be implemented throughout the supply chain's four different areas as mentioned below.

Figure 1: A Green Supply Chain



Source: Created by the authors

Several researchers have defined GSCM from various theoretical viewpoints.

Kogg (2003) defined GSCM as “the set of supply chain management policies held, actions taken and relationships formed in response to concerns related to the natural environment with regard to the design,

acquisition, production, distribution, use, re-use and disposal of the firm's goods and services.”

Srivastava (2007) defined GSCM as “integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes,

delivery of the final products to the consumers, and end-of-life management of the product after its useful life.”

GSCM is all about converting the complete supply chain into a more environmentally sustainable form. There are several reasons for companies to adopt GSCM. First, the government may impose strict regulations to promote a sustainable environment (Green et al., 2012; Huang et al., 2013). Second, companies are becoming increasingly competitive (Chin-Chun Hsu et al., 2012). Companies can differentiate themselves by making their products attractive for their end-customers by becoming environmentally friendly. Additionally, if a company's competitors are already practicing GSCM, it becomes imperative for the company to implement GSCM practices to stay competitive. Governments and companies across the world have started accepting that it is their social responsibility to reduce greenhouse gas emissions, reduce waste generation and save electricity (Logistics Management Institute (LMI), 2005 report).

Worldwide, companies are progressively adopting practices that focus on internal and external objectives related to both economic growth and protecting the environment (Angell & Klassen, 1999; Darnall, Jolley, & Handfield, 2008). Some key environmental initiatives include instituting supplier regulations (Locke, Kochan, Romis, & Qin, 2007), developing environmental management systems (Darnall et al., 2008; Zhu et al., 2008a; Green Jr. et al., 2012) and appointing company champions for environmental sustainability (Gattiker & Carter, 2010).

Need for greening the supply chain

Globalisation and an increasing number of countries entering the World Trade Organization (W.T.O) have resulted in increasing interest towards GSCM. There are several articles discussing how foreign firms such

as Toyota and Ford have encouraged and motivated their Chinese suppliers to adopt GSCM practices. The European Union has a policy called “Waste electrical and electronics equipment directives” for disposing waste electrical and electronic equipment after the end of their life to reduce the harmful effects on the environment.

In the global environment, market pressures are playing a vital role in driving firms to adopt GSCM (Huang et al., 2013). Foreign customers are demanding environment friendly products and services from their global suppliers, including Indian suppliers. Many international buyers are conducting strict environmental audits of their Indian suppliers before placing orders as they demand environment-friendly goods (Mitra, 2004).

Corporate participation in industrial environmental management is now considered by most companies as a strategic need (Bala K., 2016). Companies are now openly stating their environmental policies and integrating them into all their operational and supply chain activities. In an attempt to reduce environmental impact on a broader scale, manufacturing companies are extending their environmental initiatives beyond their organisational boundaries (Emmet and Sood, 2010). A detailed study is required to understand the benefits of such externally-oriented approaches for greening supply chains.

Literature Review

Review of related literature helps to understand the broad area of GSCM and then to focus on the sub-areas such as Green Purchase, Green Design, Green Manufacturing, Green Packaging, Green Distribution, Green Marketing, Waste Management, etc.

In one of the initial studies in the area of GSCM, Qinghua Zhu and Joseph Sarkis (2004) empirically examined the relationship between GSCM practice,

and environmental and economic performance in China. They used and tested Just-in-time (JIT) approach and quality management (QM) as two moderating variables to understand the relationship between GSCM practice with environmental and economic performance. One of the key findings of the study was that firm size has no significant relationship with any of the performance measures.

Pressure from regulators, supply chain partners, competitors and customers act as motivators for companies to green their supply chain (Qinghua Zhu, Joseph Sarkis & Yong Geng, 2005). Interactions between customers and supplier staff, partnership agreements, and joint research and development lead to improvements in the environmental performance (Zhu Q. et al., 2005). From the study of Zhu Q. et al. (2005), “regulatory factors” emerged as the most important factor while “supply chain pressures”, and “marketing drivers” were factors having lower importance for GSCM implementation.

Defee et al. (2009) suggested closed-loop supply chain orientation as a strategic solution to organisations seeking competitive advantage in a supply chain setting that puts a premium on socially accountable decisions. Creating a closed-loop supply chain orientation may be facilitated when the supply chain leader demonstrates a transformational leadership style, and also when socially important environmental issues are present.

In their paper titled “Green Supply Chain as a competitive advantage enabler in the FMCG sector”, Subhajit Mazumder and Anand Chatterjee (2010) said that cost strategy (low cost) and evolving strategy (focus) are now outdated, and for sustaining in an aggressive market, companies need to improve their supply chain efficiency and should become more environmentally conscious.

Acquaye, Adolf, et al. (2014), in their research paper “Benchmarking Carbon Emissions Performance in Supply Chains”, advised companies to build their own benchmarking framework to address concerns such as supply chain visibility and complexity, geographical variances and non-standardised unstructured data, etc. The benchmarking framework should ensure that the entire supply chain's ecological impact (in terms of carbon emission) and resources used at all tiers of suppliers are evaluated.

Recently, benchmarking has become an integral part of GSCM. Industry-level benchmarking practice ensures that individual businesses can compare their carbon emissions against other businesses in the same industry (Adolf, et al., 2014). Industry-level supply chain carbon maps can act as the initial stepping stone for businesses to manage their environmental performance, and also to identify and target high carbon emission hot-spots for cross-sectorial benchmarking.

Green procurement

Firms implement green procurement practices to achieve sustainability in this dynamic business environment (Bag, S., 2017). Green procurement is gaining popularity due to its strong positive link with the triple-bottom-line framework. Green procurement process has a key role in reducing the negative environmental impacts of consumption by focusing on reduced procurement items and selecting greener raw material alternatives (Warner, K. E., & Ryall, C., 2001). Although consumers are increasingly concerned about environmental deterioration, the current market-share of green products remains fairly low (Barbarossa, C., & Pastore, A., 2015).

González-Benito, et al. (2016), in their research work on Portuguese firms, found sufficient evidence of green purchasing management, which helped improve the performance of the purchasing function. Min, H., &

Galle, W. P. (2001) identified several key green procurement variables that can stimulate the successful implementation of green purchasing and also help in evaluating the effects of green purchasing on the firm's supplier selection, waste management, packaging, and regulatory compliance. By using different green purchasing techniques together, a "Green multiplier effect" could be generated that will make the green purchasing activity the most important driving force among environmental initiatives in the supply chain (Lutz Preuss, 2001).

Green design and green manufacturing

To understand the green design concept, Don Fullerton and Wenbo Wu (1998), in their article "Policies for Green Design", used a general equilibrium model to analyse the effects of disposal-content fees, subsidies for recyclable designs, unit-pricing of household disposal, deposit-refund systems, and manufacturer "take-back" requirements on GSCM. They suggested that if households pay the "Social Cost" of disposal, then they send the right signals to manufacturers to reduce packaging and to design products that can be recycled more easily.

If governments start collecting garbage or industrial waste free of cost, they can achieve the objective of reducing environmental impact by putting a tax on producers' use of packaging and giving subsidies to recyclable designs (Don Fullerton, and Wenbo Wu, 1998). The advantage of this general equilibrium model is that it encompasses the entire life-cycle of each product from the design phase to production, consumption and disposal.

Andrew A. King and Michael J. Lenox (2000) proposed an industry self-regulatory body - a voluntary association of firms - to control their collective action as a complement to government regulation. The reason for proposing an industry self-regulatory body could be because government regulations are often

intrusive or ineffective, and can frequently be subverted (Andrew A. King and Michael J. Lenox, 2000). There could be different conflicting forces that may help or hinder industry self-regulation, which implies that more care needs to be taken to identify partners for such joint voluntary initiatives.

Finding raw materials, the manufacturing process for the product, its distribution, use, and how to dispose of used products are decided during the design stage. Any company venturing out with an environmental practice program must start with a green design (Don Fullerton and Wenbo Wu, 1998). Source reduction and waste management strategies are two key techniques for reducing waste and to prevent materials from reaching landfills (Daniel R. et al., 2000). Source reduction design strategies include weight reduction, material substitution and product life extension. Design of a product must satisfy several goals. Bhat & Vasanthakumar N. (1993) in the article "Green marketing begins with green design" says 70% of the total product cost is incurred during the design stage. Additionally, product design decisions have a considerable impact on the quantity of waste generated at different stages in the supply chain. Therefore, concurrent product development should be preferred over a sequential approach (Bhat and Vasanthakumar N., 1993).

Green-design practices can bring about environmental improvement, decrease energy consumption and improve waste treatment (Lin et al., 2013). Eco-design is a useful technique to improve manufacturers' environmental performance by addressing product functionality while simultaneously minimising lifecycle environmental impacts (Zhu and Sarkis, 2004).

Green marketing

According to the American Marketing Association, "Green marketing" is the marketing of manufactured

products that are considered to be environmentally safe. Green marketing is also known as Environmental Marketing, Ecological Marketing and Eco-Marketing. Green Marketing is a much broader area because it involves a broad range of activities such as designing and producing a product, which is beyond traditional products, and marketing the product in a different way to instil core values in consumers that are beneficial for the environment. Consumers can further align with these values to set a new target market while taking into consideration green aspects during processing, packaging, and distribution with minimal damaging impact on the environment (Agarwal, S., Rana, N. S., & Goel, S., 2012). Additionally, detailed knowledge about the usefulness of green marketing strategies can assist both private and public sector enterprises in designing and developing appealing green products that will be preferred by customers (Thanika, D. J., Pudaruth, S., & Marie Monique, E. N., 2012).

Waste management

Preventing / reducing waste products avoids many ecological costs before they may occur. Many European firms and other firms doing business in the European Union have added incentives to engage in recoverable operations (Daniel R. et al., 2000). Legislative acts such as The German Recycling and Waste Control Act requires that manufacturers actively seek techniques and products that avoid waste, promote the reuse of non-avoidable wastes, and take back and recycle or reuse scrapped products at the end of their lives.

Waste management is an important indicator to measure environmental performance of companies (Sarkis et al., 2007). But, different types of waste have different impacts on the environment; for example, even small amounts of hazardous waste will have significantly higher impacts than much larger amounts of non-toxic waste (Jerónimo, d. B. et al., 2013), which resulted in Jerónimo et al. (2013) suggesting the study of only certain types of wastes, which can be

categorised as hazardous.

Theoretical framework - Identifying drivers of green supply chain practices

For greening the supply chain from the product design stage to delivery of the final product to the end consumer, and for end-of-life management of the product, an integrated environmental thinking is required (Srivastva. S., 2007). GSCM involves traditional supply chain management practices integrating environmental criteria or concerns into organisational purchasing decision and long term relationships with suppliers (Gilbert S., 2000). The practice of monitoring and improving environmental performance in the supply chain has been defined as GSCM (Godfrey R., 1998). From the literature reviewed, 15 drivers were identified, but five key drivers were finalised to carry out the research. These drivers have been discussed as follows:

Government law and regulations

Compliance with environmental regulation has been reported as the most important stimuli for the support of environmental enhancement (Baylis, R., Connell, L. and Flynn, A., 1998). Legislation and regulations may be the essential instruments for the proper governance of business enterprises, including the environment (Mudgal, R.K., Shankar, R., Talib, P., & Raj, T., 2009). The government may frame environment-friendly policies and may announce special benefits to those organisations implementing GSCM (Scupola, A., 2003, Srivastva, S., 2007).

Economic benefits

The firm may significantly cut waste and cost of the final product by implementing systematic economic recovery, recycling or reusing of waste material. Proper disposal of the final manufactured product may lead to environment safeguard, which has become a critical concern for the government agencies across the globe, and for the common man. Also, logistics

providers may be helpful in becoming more environmental friendly through systematic and efficient recycle and reuse (Carter, C.R. and Ellram, L.M., 1998).

Social responsibility

A firm should always think about its external stakeholders. The management must be mentally and emotionally ready to implement green concepts and processes in order to benefit society as a whole. A company with higher innovative capacity may be more likely to be successful in implementation of an advanced environmental strategy (Christmann, P., 2000). Execution of green practices cannot be initiated without the commitment and support of the top management, as it has to allocate the financial, technological and human resources to implement green management concepts (A. H. Quazi, 1999). Further, the top management's CSR initiatives may provide support in the strategic and action plans for successfully implementing green practices (R. Narasimhan and J. R. Carter, 1998).

Competition

In a liberalised world, it has become a necessity for the company to implement GSCM practices to stay competitive (Chin-Chun Hsu et al., 2012). Better communication, coordination and strong infrastructure may help in developing a healthy organisational culture for the implementation of green concepts (Christmann P., 2000, Del Brio, J. A. and B. Junquera, 2003), which may further help in competing in both existing and new markets (Russo, M. and P. Fouts, 1997).

Demand from buyers or/and suppliers

Suppliers and community stakeholders also influence GSCM adoption (Huang et al., 2013). Lack of supplier involvement in the use of environment-friendly raw materials may adversely affect the entire supply chain from the green point of view. Buyers/customers need

to be made more aware about eco-friendly products and their benefits by arranging special training and awareness programmes. More aware buyers may start demanding environment-friendly products (Luthra S., Kumar V., Kumar S., and Haleem A., 2011). Organisations may motivate buyers by offering incentives to buyers who purchase green products (Lee S., 2008).

Other external stakeholders

A firm should always think about its external stakeholders. The management must be mentally and emotionally ready to implement green concepts and processes, which benefit society as a whole. A company with higher innovative capacity will be more likely to be successful in implementing an advanced environmental strategy and will be capable of communicating its benefits to various stakeholders (Christmann, P., 2000).

Based on the above discussions, the following hypothesis was formulated:

Hypothesis 1: Green drivers influence GSCM adoption equally.

Degree of awareness and internal motivation attached to green practices

Regular workshops and training sessions may help in making employees, suppliers, vendors and contractors aware of the benefits of implementation of green concepts and practices (P. Rao, and D. Holt, 2005). Additionally, better training and education may further encourage the management to implement green concepts in Indian companies (Ravi. V. and Shankar, R., 2005; Luthra S., Kumar V., Kumar S., and Haleem A., 2011). Organisations may provide appropriate technologies and resources required to implement green concepts in the supply chain, and may give special benefits to departments or employees implementing green concepts (Jeyaraj, A., J. W. Rottman and M. C. Lacity, 2006). We consequently

hypothesise that:

Hypothesis 2: Awareness about green practices leads to GSCM adoption in an organisation.

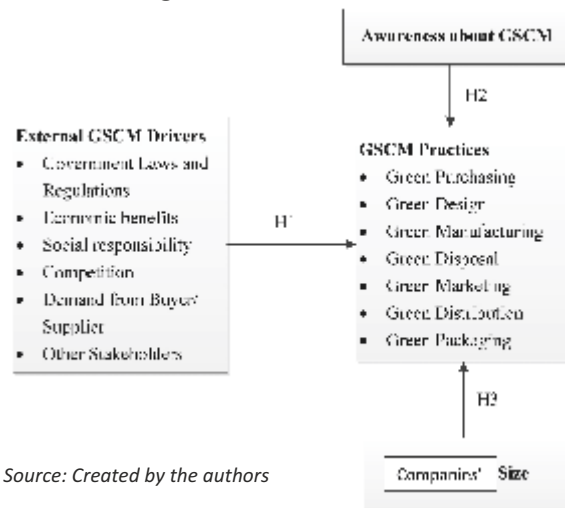
Financial and operational resources and GSCM practices

Financial support is required to hire skilled and trained manpower, to introduce appropriate technologies and to use green materials leading to environment-friendly manufacturing and supplies (Del Brio, J. A. and B. Junquera, 2003). Sufficient resources in terms of finance, manufacturing capabilities and technology should be available with the organisation to implement GSCM practices (Jeyaraj, A., J. W. Rottman and M. C. Lacity, 2006). Large companies may have sufficient financial and internal resources to implement GSCM practices (Gonzalez- Benito, J. and O. Gonzalez- Benito, 2006; Etzion, D., 2007).

In March 2008, technology consultancy firm Bearing Point, along with Supply Chain Standards (SupplyChainStandards.com), conducted a “Global Green Supply Chain” survey across different manufacturing sectors, across major global organisations and small organisations with less than USD 100mn in revenue. The survey, which incorporated responses from 600 senior managers, revealed that the level of interest in GSCM was directly proportional to the size of the company. More than 54% of companies with revenues in excess of USD 1bn agreed to have established green practices, but this dropped to 29% for companies with revenues below USD 100mn. Based on these previous research works, the following hypothesis can be formulated.

Hypothesis 3: Companies' size influence GSCM adoption.

Figure 2: Theoretical model



Source: Created by the authors

Research Hypotheses

Hypothesis 1: Green drivers influence GSCM adoption equally.

Hypothesis 2: Awareness about green practices leads to GSCM adoption in an organisation.

Hypothesis 3: Companies' size influence GSCM adoption.

Research Methodology

A descriptive study was undertaken in order to learn and be able to describe the characteristics of the variables of interest. Primary data sources were used for the study. The participants in the study consisted of practicing managers/ senior executives in manufacturing and processing companies in Greater Hyderabad region, India, who have a profound impact on environmental management decisions. These individuals were selected as units of analysis given their corporate authority to purchase and transform materials at different stages of the supply chain. The data was collected directly through an online survey using a structured questionnaire. Based on the findings of this study, a comparative analysis was done with the previous research findings.

Data collection and sampling strategy

The survey was conducted via Qualtrics Internet survey software to maximise data collection efficiency from respondents. To avoid biases with convenience sampling, random surveys were carried out through e-mails to executives of different manufacturing companies in Hyderabad and nearby areas. Data was collected over three months, from managers and other senior executives of different manufacturing companies. To encourage responses, the initial mailing of surveys was followed up by multiple reminder e-mails on a monthly basis to the contact persons at the companies.

Response rate

In general, response rates greater than 20% are recommended in supply chain management research (Prahinski and Benton, 2004; Pagell et al., 2004). But response rates for GSCM studies are much lower. A similar study by Kenneth W. Green Jr. et al. in US was 8%. The study by Purba Rao and Diana Holt in South East Asia had a response rate of 10%. In this study, the response rate was 4.2% (42 usable responses from 1,000 mails).

Reliability test

1. Size of the company: The size of the company is explained by the variables: a) Number of employees, and b) Capital Investment. The variables selected were found reliable ($\alpha = 0.813$).

Reliability Statistics

Cronbach's Alpha	No. of Items
.813	2

2. Awareness of GSCM among employees: Respondents were asked three questions: a) Organisation's awareness about GSCM, b) Investment from the top management on GSCM, c) Role of GSCM in reducing waste/cost. The index formed was found reliable ($\alpha = 0.769$).

Reliability Statistics

Cronbach's Alpha	No. of Items
.769	3

3. Drivers of the green supply chain: From the literature reviewed, 15 drivers were identified, but five key drivers were finalised to carry out the research. The selected drivers are: Government laws and regulations, economic benefit, social responsibility, competition, and demand from buyers/suppliers (Pamela Tierney & Steven M. Farmer, 2002). This existing research scale is validated from the literature and practicing supply chain managers' inputs. The survey construct included 5 items and was ranked by the respondents.

Common method bias

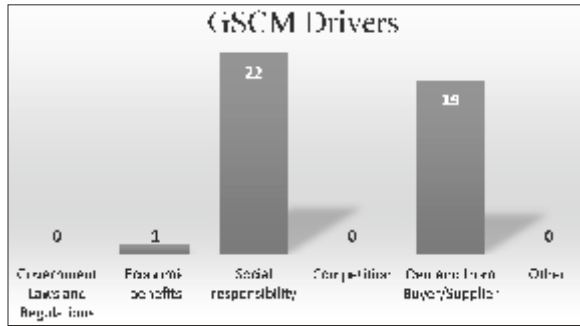
Many researchers have agreed that in supply chain management related research studies, "common method variance" (i.e., the variations in responses caused by the measurement instrument rather than the actual predispositions of the respondents that the instrument attempts to uncover) is a potential problem (Philip M. Podsakoff, et al., 2003). Consequently, the results obtained from the research work may be influenced by 'noise' induced from biased instruments. To overcome this issue, Harman's single factor test was conducted to test for the common method bias by conducting an Exploratory Factor Analysis, where all items (measuring latent variables) were loaded into one common factor. The total variance for the single factor was less than 50%. Therefore, we can conclude that common method bias does not pose an issue in our study and hence, it can be said that the results are free from common method bias.

Testing of Hypothesis

Descriptive statistics and analysis of variables are shown in Figures 3, 4 and 5.

H1: Green drivers influence GSCM adoption equally.

Figure 3: Response on various green drivers



Source: Created by the authors on the basis of respondents' data

From the above plot, we find that different companies have different views about the drivers of GSCM. More than half of the respondents agreed upon “Social Responsibility” as the key driver for GSCM in their company. The second key factor was demand from buyers and suppliers for the adoption of GSCM practices. The study found that factors such as Government laws and regulations, economic benefits, competition and other stakeholders have no significant role in the implementation and application of GSCM in Indian companies. Thus, we can reject the null hypothesis that all green drivers have an equal impact on various GSCM practices.

H2: Awareness about green practices leads to GSCM adoption in an organisation.

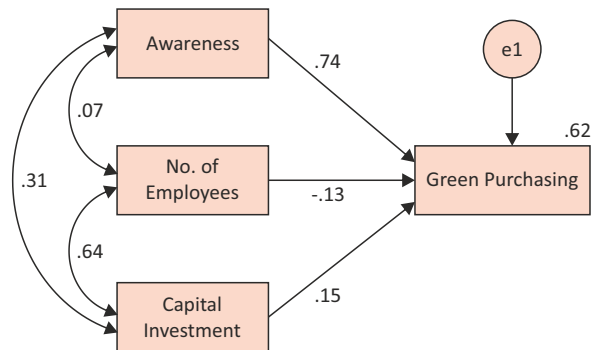
H3: Companies' size influences GSCM adoption.

Structural Equation Modelling (SEM) using AMOS Graphics software was used to test the conceptual hypotheses H1 and H2. For measuring the unobserved (latent) variable “Awareness level” the following questions were asked to the respondents on a five-point Likert scale with one (1) for VERY LOW and five (5) for VERY HIGH:

- a) Your organisation's awareness about GSCM.
- b) Investment by your top management in GSCM related aspects.
- c) Role of GSCM in reducing costs/waste.

The variables, number of employees and capital investments were used as proxies for the companies' size. The relationship of the three variables 1) awareness, 2) number of employees and 3) capital investments with the seven common GSCM practices (Green Purchasing, Green Design, Green Manufacturing, Green Disposal, Green Marketing, Green Distribution, and Green Packaging) were tested using seven different models. Below are the seven models:

Figure 4A: Impact of Awareness and Size on Green Purchasing Practice

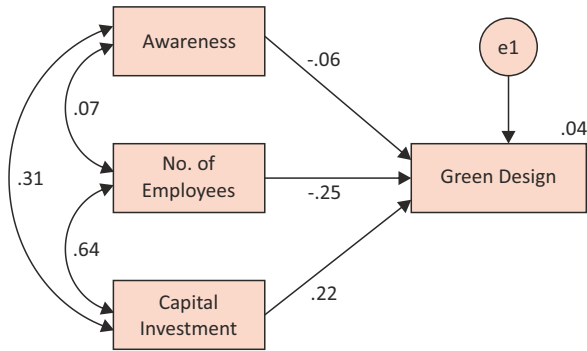


Source: Model developed by the authors using AMOS software

In the above diagram, we find a high correlation between the Number of employees and the capital investment by the company. The reason for such high correlation is that they both are indicators of the company's size. Also, we find some correlation between capital investment and awareness level. For increasing awareness about GSCM practices, you may need to make some initial investments in training and development.

We find the R² (R square) for the model is 0.62, which means 62% of variability in the Green Purchasing variable can be explained by the independent variables Awareness, Number of employees and Capital investment. Also, we find a high coefficient value for the variable Awareness, which implies that Awareness is an important factor for Green Purchasing.

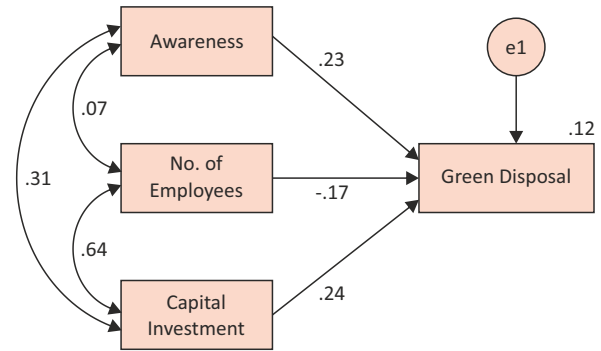
Figure 4B: Impact of Awareness and Size on Green Design practice



Source: Model developed by the authors using AMOS software

In the above diagram, the R^2 (R square) is just 0.04, which means the dependent variable Green design is unexplained by the independent variables Awareness, Number of employees and Capital investment. Also, Awareness and Size of the company have a very negligible role in Green Design practice.

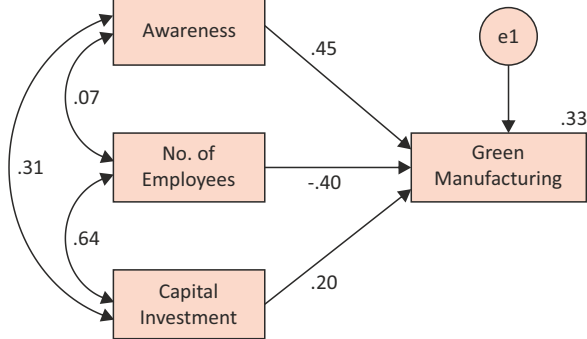
Figure 4D: Impact of Awareness and Size on Green Disposal practice



Source: Model developed by the authors using AMOS software

In the above diagram, the R^2 (R square) is just 0.12, which means the dependent variable Green Disposal is unexplained by the independent variables Awareness, Number of employees and Capital investment. Also, Awareness and Size of the company have a very limited role in Green Disposal practice.

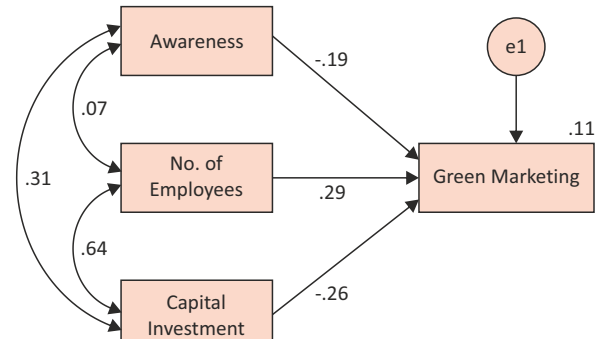
Figure 4C: Impact of Awareness and Size on Green Manufacturing practice



Source: Model developed by the authors using AMOS software

In the above figure, the R^2 (R square) value is just 0.33, which means that 33% of the dependent variable Green Manufacturing is explained by the independent variables Awareness, Number of employees and Capital investment. Also, we find Awareness has some impact on Green Manufacturing practice and the number of employees in the manufacturing unit has a negative relationship with Green manufacturing. That means with an increase in the number of employees in the manufacturing unit, the level of green manufacturing practice will decrease.

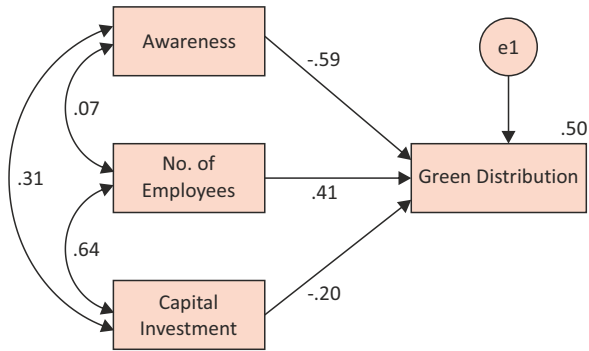
Figure 4E: Impact of Awareness and Size on Green Marketing practice



Source: Model developed by the authors using AMOS software

In the above diagram, the R^2 (R square) is just 0.11, which means the dependent variable Green Marketing is unexplained by the independent variables Awareness, Number of employees and Capital investment. Also, Awareness and Size of the company have a very limited role in Green Marketing practice.

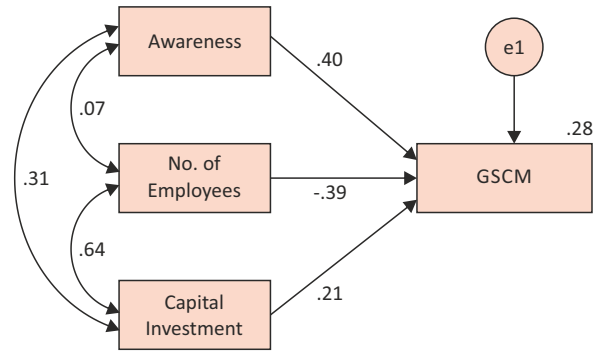
Figure 4F: Impact of Awareness and Size on Green Distribution practice



Source: Model developed by the authors using AMOS software

In the above figure, we find the R^2 (R square) for the model as 0.50, which means 50% of variability in the Green Distribution variable can be explained by the independent variables Awareness, Number of employees and Capital investment. Also, we find a high negative coefficient value for the variable Awareness, whereas the variable Number of employees is

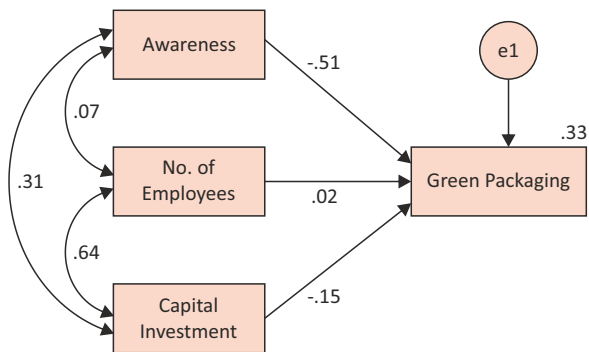
Figure 5: Impact of Awareness and Size on GSCM



Source: Model developed by the authors using AMOS software

In the above model, the influence of awareness and size on the entire supply chain is studied. Seven green practices were aggregated into GSCM and the effect of awareness and size on GSCM was studied. It was observed that awareness and capital investment are positively related with GSCM whereas number of employees in the organisation has a negative relationship with GSCM.

Figure 4G: Impact of Awareness and Size on Green Packaging practice



Source: Model developed by the authors using AMOS software

In the above model, 33% of variability in the Green Packaging variable is explained by the independent variables Awareness, Number of employees and Capital investment. Also, we can find a high negative coefficient value for the variable Awareness.

Discussion and Conclusion

“Social Responsibility” and “Demand from the buyers/suppliers” are the two key drivers for following GSCM practices in India. Unlike in China and Western Countries (Zhu and Sarkis, 2004), in India, “Competition”, “Economic benefits” and “Government laws and regulation” are the least preferred reasons for GSCM practices.

Most of the previous studies have found a strong relationship between the size of the company and GSCM practices (Del Brio, J. A. and B. Junquera, 2003; Jeyaraj, A., J. W. Rottman and M. C. Lacity, 2006; Gonzalez- Benito, J. and O. Gonzalez- Benito, 2006; Etzion, D., 2007). But with time, the size of the company has become insignificant for identifying the level of GSCM practices in any company. The same is a key finding from this study. Also, awareness amongst employees and various other stakeholders about

GSCM practices helps in promoting green purchasing and green manufacturing practices in the supply chain.

In spite of numerous advances in GSCM, "Organizations are struggling to figure-out how to motivate their employees to become engaged in environmental activities" (Cantor et al., 2012, p. 45), which could also be seen in this research study. What is critically missing in the literature is individual-level recognition factors that could contribute to

environmental leadership behaviour among corporate executives and senior managers (Ng & Burke, 2010, p. 603) and more specifically, "The true drivers that can induce firms to adopt green practices remains still an unanswered issue" (El Tayeb et al., 2010, p. 207). The direct effects found from the research study can create a strong foundation for better understanding of significant factors, which can lead to better implementation of GSCM practices.

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