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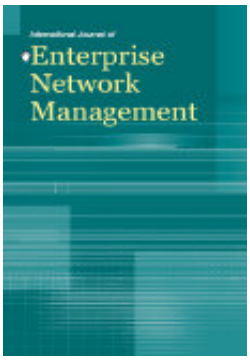

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Ishani Patharia, Priya Sharma

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Longitudinal assessment of green procurement practices adopted by manufacturing firms in an emerging economy using multivariate approach

Ishani Patharia* and Priya Sharma

Department of Commerce,
Bhagat Phool Singh Mahila Vishwavidyalaya,
Haryana – 131305, India
Email: ishani@bpswomenuniversity.ac.in
Email: ishanibpsmv@gmail.com
Email: piya2901@gmail.com
*Corresponding author

Abstract: The environmental performance index reveals that the environmental health and ecosystem vitality is critical in emerging economies of Asia. Therefore, green procurement policy has become an imperative component for the firms. The present study critically assesses and examines the green procurement practices being adopted by the top 25 manufacturing firms in an emerging economy (which is amongst the top polluted countries of Asia) over a time period of eight years (2012–2019). The results of the study reveal that the adoption and reporting of green procurement practices is very poor. The study has practical implications for the development of pragmatic strategies by the government and the corporate strategy makers to improve the environmental performance of the manufacturing firms through green procurement practices.

Keywords: disclosure practices; emerging economy; green procurement practices; green supply chain; manufacturing companies.

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Biographical notes: Ishani Patharia has more than 12 years of teaching experience. Her research interest areas are green marketing, consumer behaviour, sustainable development and corporate social performance. She has published papers in Scopus indexed and ABDC listed journals of national and international repute with high impact factor. She was awarded a major research project by the Indian Council for Social Science Research. She has also been awarded Professor Mannubhai M. Shah Memorial Research Gold Medal by Indian Commerce Association.

Priya Sharma is pursuing her PhD in Commerce from Bhagat Phool Singh Mahila Vishwavidyalaya. Her research interest areas are sustainable development, corporate environmental performance, and human resource development. She has a rich research experience and was earlier working as a Research Fellow before starting her PhD journey.

1 Introduction

The prominence of sustainability has been accepted globally and preserving it has become a global challenge. Industrial development and constantly increasing consumerism has led to a situation where this commercial chase has cast an unfavourable impact on the environment. In the pursuit of development and progression of the economic and financial status, developing countries are expanding industries and showing little concern towards the environment. However, these fast developing and leading economies are being criticised for environmental deterioration. The recent pandemic has aroused the greater need to critically analyse the various dimensions of industrial and human practices.

According to the 12th edition of biennial report presented by Yale and Columbia Universities with the World Economic Forum, India has been considered as one of the most polluted countries of the world with rank 168 out of 180 countries on Environment Performance Index (EPI, 2020). The EPI rank was 177 in 2018 which was lower than the last EPI rank of 141 in 2014 (http://www.yale.edu). Though, the country's rank has improved from EPI ranking of 2018 but India scored lower than the average regional score on all the basic parameters of index (Pandey, 2020). Also, the country stood behind all the South Asian nations except Afghanistan. The report suggests that the developing nations must intensify their sustainability efforts (EPI, 2020). According to the World Air Quality Report 2020 compiled by IQ Air Visual, India is the third most polluted country among 106 countries in the world according to the pollution data of global compilation of Pollutant Matriculate 2.5 (IQAir, 2020). This fall in the global environmental ranking is a result of the deteriorated air quality due to emissions from power plants/manufacturing industries and other human activities. Hence, it is desirable to reexamine business processes such as supply chain management in context to sustainability and environmental protection (Valkokari et al., 2011). Strategies of green purchasing have become a necessity as a part of inbound logistics (Balakrishnan and Suresh, 2019). Therefore, the concept of green supply chain management has emerged and gained immense importance in order to achieve the objectives of environmental sustainability (Ketikidis et al., 2012). As an internal component of green supply chain management, green procurement includes selection of suppliers on environmental criteria, procuring environmental-friendly raw materials, encouraging suppliers to take environmental actions (Pinto, 2020).

Green procurement practices are important to comprehend as a healthy environment contributes towards development of the nation and society. The new normal can be seen as the drifting point towards rejuvenating the future policies on the basis of the past discrepancies. Therefore, the study focuses on comprehending green procurement practices among manufacturing firms in India. This will help the stakeholders in developing focused strategies for the new normal.

2 Concept of green procurement or sustainable procurement

Procurement function involves huge spending especially in manufacturing sector. Therefore, an efficient purchasing strategy is considered as one of the crucial determinants of organisational success (Paik et al., 2009). Green Procurement also termed as sustainable procurement is one of the evolving issues in procurement procedure and

has become an integral component of environmental conscious organisations (Nderitu and Ngugi, 2014; Routroy and Pradhan, 2012). Green Procurement is an elucidation for environmentally conscious and financially conservative firms (Salam, 2008). According to Njoroge et al. (2018), green procurement (earlier known as 'affirmative procurement') simply stands for buying goods and services as per the established 'green' procurement preference programs. It implies purchasing those materials, products or services which causes minimum stress on the earth over their whole life cycle. It includes incorporating natural issues and factors into purchasing decisions. Sustainable procurement means adopting and considering the principles of corporate social responsibility (CSR) while making purchase decisions (Carter and Jennings, 2004). It is an integration of assessing requirement, specifying the requirement and deciding purchase criteria in such a way that is compatible with the nature and the society (Ecovadis, 2021).

According to Walker and Brammer (2009), sustainable procurement means following the procedure of procurement while keeping in mind the principles of sustainable development to safeguard the environment and thereby creating a strong, healthy and fair society. In the similar way, Brammer and Walker (2011) define it as a policy objective in the procurement process to accomplish the goals of sustainability in the buying and selling process. In other words, green procurement means purchasing products and services that cause either zero or less negative impact on the environment. It incorporates the effort of society and their environmental concerns into the hunt for high quality products and services at economical prices.

Sustainable procurement is a progressive attitude where organisations fulfil their requirements of goods, services and utilities by keeping in mind those factors which cause less damage to the environment and thereby achieving the value for money in a long run for the business as well as for the society (Berry and McCarthy, 2011). It can be considered as a significant part of the supply chain procedure which acts as a medium to achieve sustainability goals (Tiwari et al., 2019; Pinto, 2020).

Organisations following sustainable procurement fulfil their requirement for raw materials, services and utilities after considering not only individual cost-saving analysis, but also with the objective to attain maximum welfare for themselves and the world (Nderitu and Ngugi, 2014; Njoroge et al., 2018).

In crux, sustainable procurement includes the steps such as deciding wisely about purchase requirement, cutting down the unnecessary demand and then choosing products and services with better environmental performance. It is important here to consider the social and economic bearings of procurement decisions (Mansi, 2015). It is a concept of buying those goods and services, which has fewer burdens on environment and thus the process requires carrying out life cycle assessment of the product (Salam, 2008). Thus, it is a process in which goals of commercial development; community development and environmental protection are balanced against organisational needs (Walker and Phillips, 2009).

3 Review of literature

The corporate sector has an imperative role to play in resolving the environmental issues because they have huge resources in hand which can be used to resolve the issues related to the environment and lessen the harmful impact of their routine activities on the

environment. Every business organisation must be accountable to the society in which it conducts its activities. Environmental sustainability has become more imperative now than ever before as human pressure on ecosystem is increasing (Mmadu and Osevwe, 2012). Considering the recent scenario, many companies are under pressure from stakeholders to implement green practices (Pinto, 2020) and the pressure is likely to increase as the awareness about social and environmental issues spreads (Maqbool and Zamir, 2019). In order to survive and grow in this rapidly changing and comprehensive economy, the manufacturing sector is forced to think out of the box. The manufacturing industries are required to fulfil the needs of stakeholders in every aspect to ensure their survival in this competitive business environment (Paranitharan et al., 2016). It is imperative for them to seek creative and innovative ways to improve their actions (Koh and Saad, 2007). Global warming, climate change and other environmental issues have created an alarming situation. As a response to more environmentally demanding suppliers and consumers, manufacturers are focusing on environmentally conscious process of manufacturing (Sawhney et al., 2007). To show a concern, many organisations are using green procurement policy and sustainable sourcing as an important device in their operations. This concept is so crucial because such practices have greater pressure on the group of firms in the supply chain rather than a single firm to operate in an environmentally friendly manner. Thus, an effective execution of green procurement not only reduces the negative impact of organisational operations but also contribute towards improving the entire supply chain (Njoroge et al., 2018).

There are many studies focusing on sustainable or corporate social performance. But there is a dearth of studies focused on environmental performance which is a part of the wider concept sustainable performance. Therefore, looking at the criticality of the environmental issues around the world, there is a need to study the environmental performance of the manufacturing firms.

The WEF has placed India at thirtieth rank among 100 countries on its global manufacturing index (GMI) which shows progressive future for Indian manufacturing industry and hence, India was projected to grow into fifth leading country in the manufacturing sector by the year 2020. Indian manufacturing sector is an eye-catcher for foreign investments. Large population of India is a huge market for global economy. These points highlight the importance of conducting this study.

4 Conceptual framework of the study

The conceptual framework for the present study is guided by stakeholder theory, which highlights the significance of business relationship with all stakeholders (beyond only shareholders and investors). Walker and Brammer (2009) also followed concept of stakeholder approach while framing conceptual model of sustainable procurement in his study. The theory has also been widely adopted in many environmental management studies (Schneider and Wallenburg, 2012).

Stakeholder theory proposes that the crux of business mainly lies in building and sustaining relationships with all of its stakeholders and hence creating value for them (Freeman and Dmytriyev, 2017). All business firms have multiple stakeholders and different responsibilities to perform towards each stakeholder (Walker and Brammer, 2009). As a member of social setup, each stakeholder has an imperative role in

implementing green procurement policies (Song et al., 2017). Consequently, successful implementation of sustainable procurement can be achieved by good stakeholder management and adoption of such policies at each level of supply chain (Schneider and Wallenburg, 2012).

Therefore, the study strives to explore the trend of green procurement policy in Indian corporate sector which has a significant impact on its various stakeholders in a number of ways.

5 Green procurement policy in Indian manufacturing industry

Manufacturing is an integral part of the economy and a predominant activity which comprises product, resources, procedures and plants (Chattopadhyay et al., 2010). Global competition is a reality of manufacturing industry. Manufacturing companies around the globe are striving to improve their productivity from last many years (Muthukumar et al., 2014). The manufacturing sector is also identified as more environmentally sensitive industry than the other sectors of economy (Pahuja, 2009). The overall environmental performance of Indian companies has been very dissatisfactory in the previous decade (Chopra, 2015). Procurement process is a key part of supply chain in manufacturing sectors and has a substantial impression on the finished product (Routroy and Pradhan, 2012). Therefore, the manufacturing companies should incorporate issues related to environment protection while purchasing raw material, tools from suppliers and utilising services from providers. Especially an emerging economy like India which has a smudged image of environment indices on global ranking agencies must adopt a green manufacturing framework (Rehman et al., 2016).

In a study conducted by Njoroge et al. (2018) in the manufacturing sector of Nyeri County, it was found that selecting suppliers on environmental grounds helps positively in implementation of strong and effective green procurement policy. Previous studies have also shown that sustainable procurement practices can change the market, enhance financial capability, conserve natural resources and boost up employment. Green purchasing as an internal component of green supply chain management, has a positive effect on financial outcome of a company (Pinto, 2020). A growing number of consumers prefer products and services which are manufactured and supplied in a socially and environmentally responsible fashion (Adapa and Fisher, 2020).

Salam (2008) counted a number of advantages of green procurement which included, environment conservation, reduction of waste, cost reduction, decreasing hazardous or toxic levels and many more. Ho et al. (2010) also described three rationale for adopting green procurement or purchase. First of all, green purchasing improves other environmental standards and reduces overall environmental pollution from the source. Secondly, it works as a device to perform CSR in a better way and hence tackles with the environmental challenges of society. And finally, it performs a number of indirect functions such as promoting staff sustainable behaviour, combating climate change, reducing carbon emission and developing sustainable consumption patterns. Thus, corporate and government of some of the developing countries have shown interest in sustainable, ethical and e- procurement (Islam et al., 2017).

In 2009, Ministry of Corporate Affairs (Government of India) issued National Voluntary Guidelines (NVG) which mandates companies to present their regular report on social, environmental and economic responsibilities. However, the disclosure of environmental performance is less prevalent in Indian companies. In an exploratory study, Even the leading Indian companies have less disclosure of social performance and comparatively low level of environmental disclosure (Maqbool and Zamir, 2019; Bhatia and Chander, 2014). Environmental issues have not gained adequate attention in annual reports (Kansal and Singh, 2012). However, there are still no strict rules or policies for public sector companies to adopt and implement green procurement policy.

There has been a sharp increase in the number of studies exploring green and sustainable supply chain management (Ahi and Searcy, 2015). But the number of studies focused on green/sustainable procurement is low in developing or underdeveloped countries (Mansi, 2015). Earlier studies recommend that there is a serious need to explore green procurement practices globally (Walker and Brammer, 2012) and it is widely acknowledged that adopting green procurement policy can contribute significantly in promoting the use of environment friendly products and services, and thus promote the overall strength of global environment (Ho et al., 2010). Therefore, this study attempts to cover this literature gap by focusing on the green procurement practices adopted in the manufacturing companies.

6 Research methodology

The sampling included two criteria. First of all, companies issue a standalone or annual report that can be accessed from companies' official website or from BSE website. Secondly, companies have environmental or sustainability information in their annual financial or sustainability reports. The study has incorporated 25 manufacturing companies listed under Bombay Stock Exchange of India. The study has covered a time period of eight years ranging from 2012 to 2019. Thus, 200 annual reports were thoroughly analysed. The time period is justified because in accounting year 2012, Security Exchange Board of India (SEBI) made it mandatory for the top 100 listed entities to publish business responsibility reports every year covering their practices about environment and stakeholder. Presently, it is mandated for top 500 companies (based on their market capitalisation). This study adopts manual content analysis method for data collection. The information or disclosure on green procurement practices has been studied through annual financial reports and sustainability reports from the official website of the companies.

Annual report of a company is a medium to express its image to the community (Goh and Lim, 2004). It is an authentic measure of performance because it is audited before public disclosure. The current study uses the content analysis for data collection primarily for two main reasons. First, annual reports and/or sustainability reports contain information regarding sustainable and environmental practices of companies (Mansi, 2015; Ahi and Searcy, 2015). Secondly, review suggests that annual reports of companies are the most commonly used component in the study of corporate social and environmental activities (Maqbool and Zamir, 2019). Researchers from both developed and developing countries follow a common approach of content analysis to explore the disclosure practices (Bhatia and Chander, 2014). Moreover, content analysis is an established and primary method for analysing published information.

Precisely, the data collection method adopted in this study is inspired by the independent report 'disclosures on green procurement policy'. Therefore, corporate annual reports, sustainability reports and official website disclosures of the 25 manufacturing companies listed on Bombay Stock Exchange in India were studied while collecting data.

The presence or absence of any dimension of green procurement policy or sustainable sourcing and its various elements were examined thoroughly in the above stated reports. In order to overcome any doubt, the study also searched for the various green procurement dimensions as keywords to ensure that all the information are taken into account. The assessment parameters include consistency of business responsibility report during the time period of study and green procurement related disclosure based on green procurement policy, periodic evaluation of supplies on environmental grounds, encouragement to suppliers for using environment friendly packages/ products. After reviewing the reports, all heads were scored cautiously. If a company has disclosed one particular element, it was assigned a score of 1 otherwise 0.

7 Results and discussion

The present research paper analysed a total of 200 annual reports of the leading 25 manufacturing companies in India for consecutive eight years (2012-s2019).

Table 1 Green procurement practices among top 500 BSE companies (sample 25 companies)

Sr. no.	*Particulars*	*Number of companies*							
		2012	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*
1	Business responsibility reporting	1	5	5	5	10	25	25	25
2	Green procurement policy	1	3	4	4	6	7	8	8
3	Periodic evaluation of vendor on environmental grounds	2	2	2	4	3	5	7	7
4	Encouragement to suppliers using environment friendly product/package	1	2	3	2	3	4	5	5

The study explored the trend of publishing business responsibility reports since the enactment of mandatory provision from financial year 2012 onwards. The present study found that out of 25 companies, only a few started to publish business responsibility reports from financial year 2013 since the preparation of business responsibility report became mandatory in August 2012 by SEBI (refer to Table 1). All the companies started to publish business responsibility reports from financial year 2017 onwards, i.e., five years post the mandatory guidelines of SEBI.

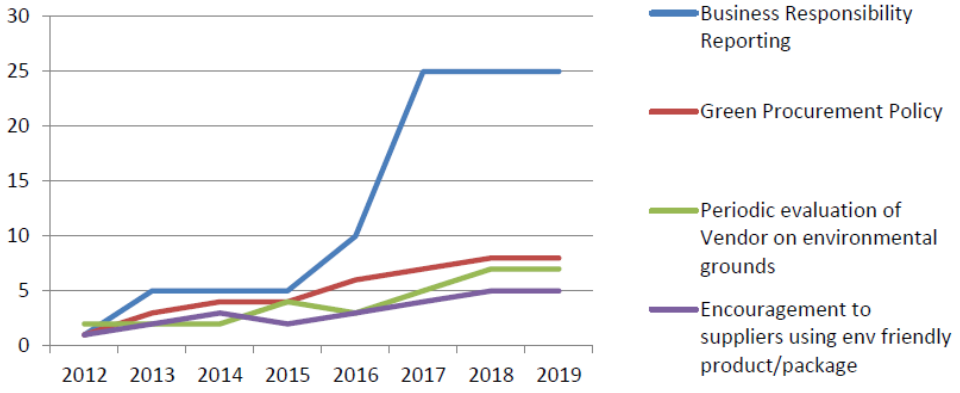
Very few companies (8 out of 25) disclosed about adoption of green procurement policy or sustainable sourcing, selection of suppliers on the basis of environmental grounds and have a policy of periodic evaluation of suppliers on the basis of EHS (environment, health and safety) criteria (7 out of 25). Similarly, fewer companies disclosed that they encourage suppliers to use environment friendly packages/products (5 out of 25).

Business responsibility report is a formal disclosure of companies' actions towards sustainability. And hence, all the companies disclosed information about green procurement and sustainable sourcing in the format of Business Responsibility report. 'Section E: principle-wise performance' containing information regarding green procurement (question no. 3), i.e.,

- 'Does the company have procedures in place for sustainable sourcing (including transportation)?'

Figure 1 displays the trend of green procurement disclosure practices from 2012 to 2019. Number of companies publishing business responsibility increased tremendously after 2012. The reason may be the mandatory provision of publishing business responsibility reports for top 100 companies (by market capitalisation) in 2012. SEBI extended this compulsory reporting to top 500 companies in 2015, that resulted in another shot of rise in number of companies publishing BRR after 2015. Number of companies reporting green procurement practices are very low but are slowly rising over the years. Evaluation of suppliers on the basis of environmental grounds and encouraging suppliers to use environmentally friendly products and packages are least considered in green procurement practices and disclosure.

Figure 1 Green procurement practices (trend 2012-2019) (see online version for colours)



Company wise disclosure score varies a lot (Table 2). Only one company (Ambuja Cements) started publishing a business responsibility report from 2012. And four companies (Bharat Electronics, Bajaj Auto Ltd, Asian Paints Ltd. and Adani Power Ltd.) have been publishing BRR since 2013 with the enactment of mandatory submission of business responsibility report every year.

It was also observed that application of green procurement policy is not so popular even in the leading companies. Only one company (Bharat electronics) reported green procurement policy in their annual report since 2012. Similarly, disclosure of the other two heads 'periodic evaluation of suppliers on environmental grounds and encouragement to suppliers for using environment friendly packages' was uncommon.

Table 2 Company-wise disclosure (2012–2019)

Company/heads	*Sector*	*I*		*II*		*III*		*IV*	
		Score	*Rank*	*Score*	*Rank*	*Score*	*Rank*	*Score*	*Rank*
3M India Ltd	Diversified	3	4	0	-	0	-	4	4
Adani Power Ltd	Power generation and distribution	7	2	7	2	3	3	6	3
AIA Engineering Ltd	Casting and forging	3	4	0	-	0	-	0	-
Ajanta Pharma Ltd	Pharmaceutical	3	4	0	-	0	-	0	-
Akzo Nobel India Ltd	Paints and varnishes	4	3	0	-	0	-	0	-
Alembic Pharmaceuticals Ltd	Pharmaceutical	3	4	0	-	0	-	0	-
Amara Raja Batteries Ltd	Auto ancillary	3	4	0	-	3	3	0	-
Ambuja Cements Ltd	Cement	8	*1*	3	5	0	-	0	-
APL Apollo Tubes Ltd	Steel tubes and pipes	3	4	0	-	0	-	7	2
Apollo Tyres Ltd	Tyres	4	3	4	4	5	2	3	5
Ashok Leyland Ltd	LCV and HCV	3	4	0	-	0	-	0	-
Ashoka Buildcon Ltd.	Construction and civil	3	4	0	-	0	-	0	-
Asian Paints Ltd	Paints and varnishes	7	2	0	-	0	-	0	-
AstraZeneca Pharm India	Pharmaceutical	3	4	0	-	0	-	0	-
Atul Ltd.	Dyes and pigments	3	4	0	0	-	0	-	
Astral Polytechnik Ltd	Plastics	3	4	0	0	-	0	-	
Aurobindo Pharma Ltd	Pharmaceutical	4	3	0	2	4	0	-	
Avanti Feeds Ltd	Aquaculture	3	4	3	5	3	3	0	-
Bajaj Auto Ltd	2-3 wheelers	7	2	7	2	8	*1*	1	6
Bajaj Electricals Ltd	Domestic appliances	4	3	0	0	-	0	-	
Balkrishna Industries Ltd	Tyres	4	3	0	0	-	0	-	
Balmer Lawrie and Co. Ltd.	Diversified	3	4	6	3	0	-	8	*1*
Balrampur Chini Mills Ltd	Sugar	3	4	0	-	0	-	0	-
Bharat Electronics Ltd	Electricals	7	2	8	*1*	0	-	0	-
Berger Paints India Ltd	Paints and varnishes	3	4	4	4	2	4	3	5
Average disclosure		*4.04*		*1.68*		*1.04*		*1.28*	

Notes: I – business responsibility reporting, II – green procurement policy, III – periodic evaluation of vendor on environmental grounds, IV – Encouragement to use environment friendly product/package by suppliers. The score represents the number of years out of the eight years under the study during which the data pertaining to the parameters was disclosed.

Table 3 Descriptive statistics of disclosure scores out of 32, i.e., 4fourparameters across eight years (year-wise)

Statistic	*Values*							
	2012	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*
Mean	1.25	3	3.5	3.75	5.5	10.25	11.25	11.25
Standard error	0.25	0.707	0.645	0.629	1.658	4.956	4.625	4.626
Minimum score	1	2	2	2	3	4	5	5
Maximum score	2	5	5	5	10	25	25	25
Skewness	2	1.414	0	–1.129	1.096	1.907	1.88	1.88
Kurtosis	4	1.5	–1.2	2.27	–0.049	3.67	3.66	3.66

In order to evaluate complete disclosure score distribution, the descriptive statistics (mean, standard error, scores, skewness and Kurtosis) have been calculated and discussed in Table 3. Increasing average score confirms the trend shown in Figure 1 that overall disclosure score is increasing with the time. However, there is a variation in individual disclosure scores (refer to Table 1) in which disclosure score of business responsibility reporting is increasing rapidly each year. Whereas disclosure scores of other parameters are increasing very gradually. Increasing standard error also depicts the high deviation of average scores from overall average score. A high positive skewness also confirms the variability in scores of individual parameters and a situation wherein the procurement practices are improving. Performance was poor in the year 2015–2016. But there has been tremendous improvement since then. The kurtosis score above the measure of 3 (ideal for normal distribution) that more and more firms are now adopting green procurement practices.

The study found that adoption of green procurement policy is not so popular in the manufacturing sector of India which is highly disappointing. The sample selected for the study consists of the leading companies of the Indian economy having a large share of market capitalisation. Still, in spite of being the most representative and financially sound companies of India, the extent of their green procurement disclosure is low. The descriptive statistics (Table 3) reveal that there is high inconsistency in the green procurement practices among manufacturing firms in India. The performance is also very poor and needs urgent remedial action.

Bhatia and Chander (2014) in their study of top Sensex companies also reported low environmental disclosure in annual reports. Maqbool and Zamir (2019) concluded that Indian companies listed on BSE are highly responsive to external projects of disclosure and provide relatively low level of disclosure of internal projects. Green procurement practices being the internal job of companies are given less consideration. Kansal and Singh (2012) also admitted low level of environmental disclosure and noted only 12 out of 100 companies disclosing about use of environment friendly materials.

However, the increasing average score depicts that the number of companies disclosing green procurement practices is increasing year by year, which is a positive signal. It gives a glimpse of hope for adoption of sustainable procurement and other green purchasing activities in future.

8 Recommendations of the study

The study has important practical implications. Manufacturing sector has been considered the fast-developing sector and has an important contribution to the economy in India. Thus, it is expected that green procurement initiatives and disclosure practices undertaken by the manufacturing sector should be exemplary. Given the environmental sensitivity of this industry and present scenario of poor environmental condition of the country, adopting green and sustainable sourcing is a must.

While many developing countries are responding to global environmental challenges through green initiatives, India is lagging behind and the results can be seen in its deteriorating environmental condition. There should be some initiatives by the government in this regard. India has adopted the policy of 'green public procurement' which describes a range of policies that ensures to consider environmental issues only while making state and national government purchases (http://www.india.ul.com). The mandatory guidelines have somehow improved the business responsibility reporting over the years. This indicates more stringent norms should be developed and implemented for the manufacturing firms.

Though manufacturing industry is the biggest contributor in environment degradation yet it could be the most innovative and environmentally responsible sector. Focused strategies should be developed regarding periodic evaluation of vendor on environmental ground. The corporates can follow short period contractual arrangements binding the vendors to follow some environmental practices clearly mentioned in the contract such as use bio degradable substances, environment friendly processing procedures, environmental support efforts, etc.

Measures should also be adopted by the firms to encourage the suppliers for using environment friendly products, processes and packaging. These may include recognition/ appreciation letters, premium on purchases made from such suppliers. It is also very important to develop proper take back procedures by the company to encourage the use of such practices so that the green supply chain can be completed effectively.

In order to support all the above efforts, the government must take strict action on non-compliance and develop support mechanism for effective compliance. Environment friendly practices often require huge investment by the companies. These activities also help in increasing the opportunities for income enhancement of human resource engaged in primary sector. Thus, they may be supported by parallel rebate in tax for such environment friendly efforts especially related to green procurement. This will result in sustainable supply chain management. Hence, the government and corporate sector need to shake hands with environment friendly purchases by transforming the policies, their implementation and evaluative mechanism.

9 Scope for future research

Future studies may require broadening this area of study by understanding the obstacles in implementing green procurement practices in developing countries. The results of this study could be partial so far as they relate to Indian manufacturing industry only. As the study was confined to only top manufacturing companies listed on BSE, the results do not replicate the position of other industries. The results of this type of studies may also differ subject to changing industrial environment and alternative economic condition.

Thus, comparative studies may be carried out in other emerging economies. The findings are limited to published information which is widely accepted to gather data of social and environmental performance. Future studies may use a mixed approach to measure the green procurement practices. Further studies may explore the factors affecting or barriers in adoption of green procurement practices by measuring the relationship between corporate governance variables and financial resources with green procurement practices.

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