Developing and Implementing Environment Management Practices in Small and Medium Size Manufacturing Companies in India

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Abstract. The adoption and implementation of environment management system (EMS) has garnered a lot of interest among organizations all around the world. Adoption and implementation of EMS entail number of benefits to the companies from energy efficiency, waste reduction, improved sustainability etc. However, adoption of environment management practices may not yield direct benefits in short run for Small & Medium Enterprises (SMEs). Therefore, it is crucial to understand as to what influence the adoption and implementation of environment management practices. The purpose of this study is to examine the factors that contribute to the adoption and implementation of environment management practices in small & medium manufacturing companies in India. 219 senior managers were surveyed from seventy-eight manufacturing companies from Noida Industrial area NCR, India. Application of factor analysis found four factors significantly contributing to the adoption and implementation of environment management practices in manufacturing companies in India.

Keywords: Environment management system (EMS), Small & medium companies, India

1. Introduction
Today Environment management system has emerged as one of the most significant function in the overall management structure that aims to mitigate the adverse impact of overall business operations. It has gained a widespread acceptance across all policymakers, business leaders, practitioners and regulatory bodies to implement environment protection standards and systems. An EMS comprises of various methods and measures to manage the environmental impact of business operations [1]. Adoption of EMS not only help the companies to meet regulatory companies concerns but also mitigate cost in a longer run and build positive image. Although the adoption of EMS is more common in large companies, there is an increasing trend of developing and implementation of EMS among small & medium size enterprises [2]. Considering its benefits, the adoption and implementation of EMS is no longer limited to the high profit margin or large-cap firms [3]. Several small & medium companies are also adopting EMS for identifying and managing the adverse impact of business activities on the environment. SMEs are adopting EMS to reduce resource wastage, lower cost, increase efficiency and encourage employees to improve environmental performance. However, developing and implementation of EMS is still a major challenge for SMEs in India due to financial drawbacks and lack of expertise in the field.

Small and medium companies employ more than 480 million people in the country and contribute up to 30% of the total GDP of India. Limited studies have been conducted to identify and analyze the
factors that influence developing and implementation of EMS in small manufacturing companies in developing countries. Therefore, it is worth studying the factors behind developing and implementation of EMS in small & medium size manufacturing companies. This study attempts to answer that what influence developing and implementation of EMS in small and medium size manufacturing companies in India? This study aims to identify the various factors that help the small and medium size manufacturing companies to develop and implement environment management systems. The results of this study have important implications for policymakers, practitioners and SMEs. The findings help in enhancing understanding of various factors impacting the adoption of EMS in companies. The findings suggest that concern for environment protection is the most important factors that influence firms to identify and manage negative environmental impact. This study presents interesting insight about the four important factors that play crucial role in developing and implementing small & medium manufacturing companies in India. These are factors are; concern for the environment, commitment of top management, implementation support and long-term investment. The rest of the paper is organized as follows. The second sections discuss relevant studies in the field of environment management system in organizations. The third section presents research methodology used in the study and the fourth section provides results and discussion and final section concluded the study.

2. Background
In the past few decades, it has become imperative for companies to incorporate environmental consideration in their business operations. ISO 14001 has been widely used EMS by business organizations all around the world. EMS can be defined as the crucial component of the overall management structure that includes planning, procedure, practices for developing implementing and maintaining environmental policy in the organization [4-7]. EMS aims to integrate the environmental considerations into management planning and serves as a guiding principle to comply with environmental regulation [8]. The adoption and implementation of EMS also reflect the management commitment towards environment protection. EMS are most effective when it is integrated as the part of normal business as against treated as a separate function in the business [9-12]. It helps in determining environmental policy and performance to achieve firm’s goals in the area of reduction of risk to environment and human health, compliance of environmental regulations, reduction in waste and prevention of pollution. The successful implementation of EMS should include the following; a) formulation of environmental policy b) assessment of negative impact on the environment due to business operations c) role and responsibilities of employees d) policies and procedures to manage waste e) environmental awareness program f) record of environmental performance g) review and audit of EMS in the business organization [13-14].

India is one of the fastest growing major economies in the world where small & medium enterprises (SMEs) are often called as the backbone of the economy. SMEs contribute 45 percent of total industrial output and more than 40 percent of the total exports of India. It also creates 1.3 employment opportunities every year. Since SMEs represent large share of total economic activities in the economy, it also has a significant adverse impact on the environment. SMEs are dominantly found in resource-intensive and environmentally sensitive industries like manufacturing sector of India. Although the environmental issue at an individual firm level may not be clearly visible, but these companies have significant commutative adverse environmental impact [15-16]. At the same time, SMEs have limited resources and expertise to address environment management issues and considerations. Not only scarce financial resource and lack of knowledge of their environmental impact, but more often SMEs are not aware of the environmental legislation in order to be compliant. In recent years, many SMEs are adopting and implementing EMS into their business operations [17-19]. Prior studies suggest that large number of companies adopting EMS primarily for cost-saving, compliance for legislation, positive public image, reduce environmental risk and increase market opportunities [21-22].
3. Methodology
Both exploratory and descriptive research design has been used in this study to gain insights about the factors that influence developing and implementation of EMS in small and medium manufacturing companies in India. Data for this study were collected from 219 senior managers/managers from seventy-eight small and medium size manufacturing companies operating in Noida industrial area, National Capital Region (NCR) India. Senior managers or managers working in small & medium manufacturing companies were selected as they are responsible for planning and implementation of environment management practices in the companies. Purposive sampling method was employed to collect the data for the study. Questionnaires were personally administered at the manufacturing facilities of the companies and self-administered questionnaire were also sent online via emails or linkedIn. The data for the present study were collected during 29 October to 27 December 2020. All the items in the questionnaire were measured using 5-point scale with 5 being strongly agreed and 1 being strongly disagreed. A total of 73 questionnaires were personally administered and 146 questionnaires received through online platform. Principal Component Analysis (PCA) using Varimax rotation was applied to extract the underlying factor structure from the large set of variables. SPSS version 20 was used to analyze the data set. This was followed by Confirmatory Factor Analysis (CFA) to factor structure the measures. During analysis, only factor with item loading of 0.7 or greater was retained. To check the reliability of individual factors obtained analysis, value of Cronbach’s coefficient alpha found to be reliable ranged from 0.713 to 0.877, which was greater than 0.60 [20].

4. Results
The results of factor analysis using PCA extraction produced four important factors influencing development and implementation of EMS in small and medium manufacturing companies in India. These four factors were named as concerns for environment protection, top management commitment, implementation support and long-term investment in sustainability. Further, these factors were subjected to a Confirmatory factor analysis using AMOS and items having factor loading of less than 0.7 were removed. Results of the analysis are shown in table 1.

Table 1. Factors influencing development and implementation of EMS in small and medium manufacturing companies in India

| Developing and implementation of EMS | 1   | 2   | 3   | 4   | Mean | SD  |
|----------------------------------|-----|-----|-----|-----|------|-----|
| Concerns for environment protection |     |     |     |     |      |     |
| Business operations harm the environment | 0.898 |     |     |     | 3.97 | 0.56 |
| Environment protection is imperative for survival | 0.792 |     |     |     | 3.90 | 0.62 |
| Ecology and biodiversity can be preserved by taking actions | 0.769 |     |     |     | 3.92 | 0.51 |
| Senior management commitment |     |     |     |     |      |     |
| My company provide required staff for EMS | 0.784 |     |     |     | 3.70 | 0.62 |
| Role and responsibilities of staff is defined in adopting EMS | 0.772 |     |     |     | 3.63 | 0.68 |
| My company provide training and awareness program to implement EMS | 0.716 |     |     |     | 3.53 | 0.65 |
| Formulation of environment policy by senior management help in adopting EMS | 0.798 |     |     |     | 3.23 | 0.71 |
| Senior managers actively plan and monitor EMS in the company | 0.707 |     |     |     | 3.73 | 0.53 |
Implementation support

| Item                                                                 | Cronbach’s Alpha | Mean | Standard Deviation |
|----------------------------------------------------------------------|------------------|------|--------------------|
| My company provide assistance for implementing EMS                   | 0.883            | 3.15 | 0.61               |
| Separate staff is assigned to implement EMS                           | 0.753            | 3.23 | 0.63               |
| EMS is properly aligned across all departments in my company         | 0.703            | 3.41 | 0.54               |
| Long term investment                                                 |                  |      |                    |
| EMS help in addressing environmental regulations pertaining to business | 0.796            | 4.73 | 0.73               |
| It will help in improving profitability and business growth          | 0.852            | 4.12 | 0.56               |
| A periodic audit helps in continuous improvement in EMS               | 0.742            | 3.89 | 0.64               |
| EMS adoption build positive image and recognition                    | 0.727            | 3.92 | 0.68               |
| I feel cost of operation will reduce in long run                     | 0.719            | 4.25 | 0.57               |

Cronbach’s alpha values for each factor:

- Concerns for environment protection: 0.883
- Senior management support: 0.912
- Implementation support: 0.846
- Long term investment: 0.862

First factor ‘concerns for environment protection’ captured three items having factor loading ranging from 0.898 to 0.769 and accounted for 18.93% of the total variance. The value of Cronbach’s alpha found to be 0.883 suggesting strong reliability of the scale. The results supported the strong correlation between the items like adverse impact caused to the environment, environment protection is important and necessary actions must be taken to protect the environment. This factor implies that concerns for the environment and need for environmental readiness impact developing and implementation of EMS. The second factor ‘senior management support’ comprised of five items with the factor loading ranging from 0.798 to 0.707. This factor accounted for 16.23% of total variance. It represents the availability of trained staff, clarity of roles & responsibility among staff, training and awareness program pertaining to environment management and proper planning and monitoring by top management. This implies that commitment of senior management is important for developing and implementing EMS in the organisation. The Cronbach’s alpha value found to be 0.912 and deemed to be reliable. The third factor ‘implementation support’ comprised of three items with the factor loading ranging from 0.832 to 0.703. It accounted for 13.12% of the total variance. This factor represents assistance, availability of trained staff and proper alignment among all the departments to implement EMS in the organizations. This factor suggests that supports system is one of the most significant factors in developing and implementing environment management system in the organization. The value of Cronbach’s alpha found to be 0.846, suggesting strong reliability of the scale. The fourth and final factor ‘long term investment in sustainability’ comprised of five items ranging from 0.796 to 0.719. It accounted more than 9.46% of total variance. This factor represents that adoption and implementation of EMS is considered as the long-term investment in sustainability by the organization. It includes the items like cost reduction, reputational benefits, compliance to environmental regulation, improved profitability & business growth in the long run. Therefore, the companies develop and implement EMS from the long-term perspective as an investment. The Cronbach’s alpha value found to be 0.862 and deemed to be reliable.

5. Conclusion

The novelty of this study lies in the identification of factors that the impact developing and implementing EMS in small and medium manufacturing companies in India. The results of the study suggested four important factors namely concerns for environment protection, senior management
support, implementation support and long-term investment in sustainability. The finding of the study presents important implications for managers, practitioners, regulators and SMEs in India. The development and implementation of EMS to large extent depend upon on the top management commitment, environmental consideration and implementation support in the organization. The increased adoption of EMS among SMEs could be augmented by increasing awareness about environmental impact and compliance with environmental regulations for long-term benefits. This study also suffers from certain limitations. It should be noted that findings of this study were limited to the small & medium manufacturing companies in India. Large sample size covering more sectors could be taken into consideration for future studies. This study only examined the senior managers’ perceptions about developing and implementation of EMS in their organizations. The perception could change with time. Therefore, this could be another limitation. Future studies in the context of SMEs can take into consideration these issues.

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