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**DETERMINANTS OF ENVIRONMENTAL
MANAGEMENT SYSTEMS
OF MANUFACTURING SMALL
AND MEDIUM SCALE ENTERPRISES
IN SRI LANKA**

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Abstract: The main objective of this study was to identify the critical factors that affecting the implementation of environmental management systems (EMSs) of manufacturing SMEs in Sri Lanka. Out of twelve factors, management commitment, professional expertise, financial resources, stakeholders and environmental information are identified as key factors. Based on the survey results, it is proposed that the government should play an important role in promoting environmental management in SMEs. It is necessary for the government to provide active support in the aspects including mandatory policy, encouraging policy and supporting policy.

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Introduction

A sustainable business should have its unique position to develop and achieve sustainable production and sustainable consumption at the same time. A responsible and sustainable system of environmental management should start with pollution prevention then expand into control and environmental design (Chavan, 2005). The ability of organizations to manage their environmental performance is emerging as a strategic issue for many companies worldwide. This is because the environment is now regarded as an asset to be valued. On the other hand managers today are not only expected to reduce lead times, improve quality, reduce cost and enhance flexibility, they are also expected to become more environmentally responsible (Montabon et al., 2000). Therefore, the significant impact of SMEs in terms of input and output requirements and the size of workforce they employ deserve special attention, and engaging them in environmental improvement is regarded as a vital part of sustainable development (Hillary, 2004).

The environmental management is "... the system that anticipates and avoids or solves environmental and resource conversation problems" (Thompson, 2002) In 1970s and 1980s the concept of environmental management was largely technocratic and end of pipe (Barrow, 2005).The main approach was top-down using pressure from legislation which may lead to find and closure. At the end of 1980s, environmental management began to

seen as cost reduction and an institutionalized organizational task, and being green and clean became a popular catchphrase for advertisement products. But in 1990s with the increased of stakeholder's pressure on environment, organizations recognized the environmental impacts associated with their operation through the introduction of comprehensive environmental management systems. In the last twenty years, environmental management has shifted from being subject to "Command and control" to self regulation and accept public accountability and consultation (Martin, 2002). Environmental management is still undergoing rapid change, but the goal remains the same to ensure sustainable development.

SME sector and their environmental issues are comparatively under researched or ignored by the academia. The SMEs research has in recent years come in for some criticism for its lack of theoretical rigor and conceptual development (Goss, 1991). The business-environment literature has in the main neglected SMEs, instead focusing its attention on the large firms (Smith, 1993). However the emerging literature on SMEs and the environment has also been accused of insufficient analytical inquiry, relying too heavily on anecdote (Geiser and Crul, 1996). Therefore a need to direct a conceptual emphasis upon investigations of the relationship between small firms and the environment.

The environmental solutions designed for large firms cannot necessarily be applied to SMEs. It has been noted SMEs often differ from larger firms in their management style, organizational structure and the characteristics of the owners/managers (Dandridge, 1979). Further they are often resource poor, lack of assessing finance and labor and presenting the problem of finding the necessary time to manage environmental matters (Welsh and White, 1981). SMEs need their own unique answers to and understanding of the difficult environmental problems they face. The indications to date suggest there is a need for further research of the relationship between SMEs and the environment.

In Sri Lanka, significant number of writings aimed at SMEs but much of these writings is being spent the outlining the economic, marketing, liability, legal and employment aspects. The SMEs and the environmental issues have not been sufficiently investigated. Therefore, it is very significance to analyze the EMSs of SMEs in Sri Lanka. With a better understanding about the determinants of EMSs of SMEs, we can propose effective recommendations to the policy makers to encourage SMEs towards better environmental management implementation improving both economy and the environment.

Methodology

Only manufacturing SMEs selected for the survey, with the help of SME registration directory of Industrial Development Board (IDB, 2011). First select the all manufacturing SMEs in the Western Province, and then 200 firms randomly selected. The questionnaire was distributed among firms, first week of July and collects them after two months (end of August 2011).

After distributing the questionnaire telephone discussions were also done where further clarifications and encourage respondents to answer and return the questionnaire on time. Before construct the questionnaire, various numbers of publications on the adoption of environmental management

systems in SMEs were reviewed. The auditors of environmental management systems in larger organizations and the senior officials of Central Environmental Authority (CEA) were inter-viewed and requested to provide information and verification in formulating the questionnaire. After two months 176 completed questionnaire were collected. Any way 16 questionnaires were rejected due to incomplete information and inconsistency of filling them. The valid response rate was 80%. Table 1 shows the number of respondents from different sectors with highest response rate occupied by chemicals and agro products (40) followed by food and beverages (24) and rubber and plastic products (24).

TABLE 1. CATEGORIES OF RESPONDENTS BASED ON DIFFERENT SECTORS

Sector	Number of respondents	Percentage (%)
Chemicals and agro products		
Food and Beverages	40	25
Rubber and plastic products	24	15
Asbestos and cement based products	24	15
Electrical and optical equipments	16	10
Sale, maintenance and repair of motor vehicles	8	5
Manufacture of paint and emulsions		
vehicles	8	5
Manufacture of paint and emulsions	8	5
Ceramic and floor tiles	8	5
Polyethylene foam products	8	5
Aurvedic and herbal products	8	5
Hotel operations	8	5
Total	160	100

Source: Survey data (2011)

Data analysis and results

The respondents were asked to provide their opinions on the importance of factors that influencing the implementation of EMSs for their organizations by scores from 1 to 5 to determine the relative ranking of the factors, the scores were then transformed into relative importance index (RII). Table 2 lists the values of relative important index and ranks of the influencing factors.

$$\text{Relative Importance Index} = \frac{\sum W}{A \times N},$$

Where W is the weight given to each factor by the respondents (1 to 5): where “1” represent the least important and “5” represent the most important; A - the highest weight (5 in the study); N - total sample.

TABLE 2. RANKING OF THE INFLUENCING FACTORS BASED ON RII VALUE

Rank	Factors	RII
1	Commitment of the top management	0.889
2	Professional expertise	0.852
3	Financial resources	0.754
4	Stakeholders' influence	0.747
5	Good quality information	0.737
6	Availability of time	0.726
7	Legal enforcement	0.720
8	Government support	0.715
9	Training on Environmental Management	0.713
10	Market incentives	0.710
11	Employee participation	0.703
12	Organizational structure	0.679

Source: Survey data (2011)

TABLE 3. RESPONDENTS OPINION LEGAL REGULATORY SYSTEM ON ENVIRONMENTAL MANAGEMENT

Item	Opinion of respondents	Number of enterprises	%
Act and regulations	Systematic	16	12
	Average	32	20
	Not systematic	112	68
	Total	160	100
Legal enforcement	Stringent	24	15
	Average	40	25
	Not stringent	96	60
	Total	160	100

Source: Survey data (2011)

The respondents ranked “commitment of top management” and the “professional expertise” first and second, with a relative importance index of 0.889 and 0.852 (Table 2). The role of the top management in environmental management was highlighted by many researchers (Gupta, 1995; Quazi et al., 2001). According to Gupta (1995), 92% of 400 CEOs and top management surveyed agreed that the environment challenge was one of the central issues of the 21st century. Hunt and Auster (1990) Identified top management leadership as one of the seven critical elements that was required to create an effective environmental management. Without strong top management support, the implementation of EMSs would not be successful (Berry and Rondinelli, 1998). The professional expertise played a vital role in EMS implementation in SMEs. In Sri Lanka many enterprises are lack of

professionals who are familiar to environmental management. Moreover EMS is a new concept to most enterprises of the country.

The respondents rated “financial resources” as third with a relative importance index of 0.754. The stakeholders’ influence was graded the fourth, with a relative importance index of 0.747. The respondents ranked “access to quality information” as fifth with a relative importance index of 0.737 and “availability of time” as sixth (RII=0.726). Legal enforcement process on environmental management activities of organizations’ was ranked seventh, with a relative importance index of 0.720. The respondents ranked “government support” eight with the index importance of 0.715 and “training on EM” was ninth (0.713). The “market incentives” occupied the tenth place (0.710) and the “employee participation” ranked eleventh as with the relative importance index 0.703. “Organizational structure” was graded the twelfth, with a relative importance index 0.679.

In this survey, the current status of Sri Lankan legal regulatory system and legal enforcement on environment protection were also explored (Table 3). Within Sri Lanka’s legal regulatory system, there is over eighty laws and bylaws each deals with some aspect or other on the environment. These have been enacted from colonial times. The objectives with these laws were enacted do not cover in many cases in the environmental imperatives necessary to meet adequately the environmental challenges of the present day.

68% of the respondents (112) stated that Sri Lanka has no systematic legal framework for regulating the environmental protection (Table 3). In recent years the Sri Lankan government has made some important changes and additions were made to our legal framework for the environment during the 1980s. By far the most important addition was the enactment of the National Environmental Act (NEA) (Act No.47 of 1980 and amended in 1988 and 2000) and the establishment of the Central Environmental Authority (CEA). The Coastal Conservation Act (Act No.57 of 1981) is another important new law which established the coastal conservation Department. The forest ordinance and the Fauna and Flora Protection Ordinance are much older laws of importance. The State Lands Ordinance and the Land Settlement Ordinance govern the complex questions of State Lands and distribution of these lands to shelters.

However, most of these regulations do not contain explicit clauses defining the action and standards of performance. Only applying these explicit standards to communities with the consideration of the local context and characteristics can EM be effectively promoted. Moreover the system of environmental legal regulation remains with serious flaws. It is still essentially administrative rather than legal in nature, with courts and lawyers playing only a minor role; there is a real need to established clearer parameters of liability; and the system places too much emphasis on punishment as opposed to material incentives in order to secure compliance

Moreover 85% of the respondents (136) opined that the legal enforcement in Sri Lanka average and not stringent. Only 15% of the respondent (24) indicated that legal enforcement was stringent. The administration still has very considerable powers, and can use its direction to influence local environmental protection to suit itself. But environmental law is an area in

which problems of distorted decision making stem-ming from corruption, selective information of rules, the difficulties of controlling local political leaders, the low status of those involved in administration the system and so on appear to be particularly serious. Therefore strong strict legal enforcements need to await improvement of the Sri Lankan legal system.

Discussion of findings

According to analyzed data, the commitment of top management (owners/managers) is a crucial factor in implementing environmental management of SMEs. Previous studies also highlighted the lack of management commitment towards adoption of environmental practices (Merritt, 1998; Tilley, 1999; Schaper, 2002). Lack of human resources (expertise) also a key determinant of environmental management implementation in SMEs. SMEs are well known for lacking both in quantity and in technical knowledge to pursue environmental management. It is obvious that resources available to organizations are vital for implementation of any management initiatives. According to this analysis financial resources are fundamental for SMEs to implement environmental management. Lack of self funding, limited financial sources and long term return on investment periods are impeding the environmental management implementation in SMEs. The study finds that, stakeholders as important groups which can influence SMEs towards better environmental practices. This findings support previous study by Frondel et al. (2003). Stakeholders can influence on organization regarding environmental activities through direct pressure or by conveying information. Further SMEs are finding much difficulty in obtaining and interpreting environmental information, including the information particular to the EMSs such as ISO 14001. In addition communication barriers have also been identified as a barrier. The availability of time also identified as a key determinants of EMPs of SMEs, which both prevent the implementation or adoption of environmental initiatives but also pause a barrier to obtaining training and transfer the necessary skills within the organization.

It is necessary to establish a proper legal framework for promoting environmental protection and adopting proper EMSs in organizations. Presently the major problem is the lack of local regulations consistent with the national standards. In addition, because the involvement of the general public is very important in promoting environmental protection and it is necessary to establish channels for the public to address their complaints. As an encouraging policy the government can provide soft loan or short – term subsidies although it might not support tax exemption for the certified enterprises. Under the supporting policy the government should organized training courses and seminars on the subject of environmental management for the management of enterprises as their environmental awareness is pivotal in adopting EMSs. The owners of enterprises they are concerned that EMSs cannot bring them instant or short- term benefits, leading them to adopt a wait- and- see attitude (Alberti et al., 2000). The training should be included sharing of experience by those companies already with EMSs. From their experience, participant could learn more about the implementation process and the benefits.

Conclusion and implications

EMSs is a continual cycle of planning, implementing, reviewing, and improving the processes and actions that an organization undertakes to make its business and environmental goals. Thus, EMSs application is subjective to organizations, which allow organizations to systematically manage their environmental, health and safety matters. EMSs can result in both business and environmental benefits. Hence, EMS can be used as a framework for help SMEs to improve their environmental performance and make greater use of pollution prevention approaches, which will lead to cost reduction due to enhanced resource efficiency in production. There are various factors influencing the implementation of EMSs in SMEs. Using a structured questionnaire, this study attempted to identify the critical factors affecting the implementation of EMS in SMEs. Out of twelve, the five top critical factors are; commitment of management, professional expertise, financial resources, stakeholders and quality information. The government should play an important role in promoting organizations towards environmental management. As Mandatory policy the government should establish a proper legal framework for promoting environment protection and adopting EMSs for manufacturing SMEs. To encourage the organizations for implementation of EMSs the government can provide soft loans or short – term subsidies. Under the supporting policy the government should organize training course and seminars on environmental management Systems for increase the awareness of organizations as their environmental awareness is pivotal in adopting EMSs.

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