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An Litrature Review on Environment Performance Indicators

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ABSTRACT

In today's scenario environment and human health are becoming the more important issues, as the pressure from the Government, industrial neighbors, and environment agency has increased towards environment awareness. The customers are also considering the environmental issue of the company, which's product they buy, as a quality issue.

To measure the environmental performance, environmental professionals use Environmental Performance Measures (EPMs) or Environmental Performance Indicators (EPIs). EPIs are the measures of environment performance of an industry. EPMs or EPIs are the numeric value that shows the performance of an organization in environment aspect. Organization can minimize the pollution created by them, but first they should have the knowledge about the performance of their organization or industries towards the environment. EPIs are the key factors that provide the information of an organization in environmental aspect.

I.INTRODUCTION

Environmental Performance Measures (EPMs) or Environmental Performance Indicators (EPIs) are the measures of environmental performance of an industry. EPMs or EPIs are the numeric values that show the performance of an organization in environmental aspect.Industries or organizations can minimize the pollution created by them, but first of all they should have the knowledge about the performance of their organizations or industries towards the environment.

There are certain regulations and penalties made by government, so that to make the industries environment conscious. ISO 14001 gives the Environmental Management System (EMS) to measure the environmental performance of the firm. As the pressure from government, public, neighbors, employees, environmental agencies increases, the company becomes aware to measure, documents and disclose the environmental performance.

As per Indian Constitution, Article 51A of Directive Principles "It shall be the duty of every citizen of India, to protect and improve the natural environment including forests, lakes, rivers and wildlife and tohave compassion for living creatures." The constitutional provisions arebacked by a number of laws - acts, rules, and notifications like Factories Act 1948; (Prevention and Control of Pollution) Act 1974; Forest (Conservation) Act 1980; Air (Prevention and Control of Pollution) Act 1981; Water Biomedical waste (Management and Handling) Rules1998; Municipal Solid Wastes (Management and Handling) Rules, 2000; Ozone Depleting Substances (Regulation and Control) Rules 2000; Noise Pollution (Regulation and Control) (Amendment) Rules 2002; Biological Diversity Act 2002. The Department of Environment was established inIndia in 1980 to ensure a healthy environment for the country. This later became the Ministry of Environment and Forests (MOEF) in 1985. The EPA (Environment Protection Act), 1986 came into force soon after the Bhopal Gas Tragedy and is considered an umbrellalegislation as it fills many gaps in the existing laws.The Ministry of Environment & Forest, Government of India (GOI), has brought a number of regulatory and non-regulatory initiatives, in its efforts in harmonizing environmental protection with economic development. In 1991 GOI has made its first public announcement about the need forenvironmental disclosure in annual reports. In addition to the above requirement, companies are required to prepare director's report as per director's report rules, 1988. Further, the Companies' Bill 1993 & 1997 had proposed the amendment of section 173 to disclose through its board ofdirectors report the measures taken for protection of environment. There is also a mandatory requirement for Indian companies to report on conservation of energy, technology absorption, etc. in accordance with the provisions of Section 217 (1) (e) of the Indian Companies Act1956.

In India, financial accounting & reporting guidelines are issued and governed by the Institute of Chartered Accountants of India (ICAI). Companies Act mandates the preparation of annual accounts of companies in accordance with the accounting standards issued by ICAI (Chatterjee, 2005). Specificenvironmental accounting rules or environmental disclosure guidelines, for communication to different stakeholder groups, are not available for Indian companies. There is no mandatory requirement for quantitative disclosure of (financial) environmental information in annual reports neither under the Companies Act nor as per Indian Accounting Standards (AS's) Furthermore there are 23 stock exchanges in India, governed by the Securities and Exchange Board of India (SEBI) Act 1992. Each of these stock exchanges has different listing requirements. However, there is no mandatory SEBI listing requirement for Indian companies, from these stock exchanges, to disclose environmental information. Therefore, any environmental disclosure by Indian companies is purely voluntary.

II.ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

Environmental Management System (EMS) is a problem identification and problem-solving tool, based on the concept of continual improvement that can be implemented in an organization in many different ways, depending on the sector of activity and the needs perceived by management. In particular, standards for EMS have been developed by the International Organization for Standardization (ISO 14001) and by the European Commission e Eco-Management and Audit Scheme (EMAS Regulation) The standard ISO 14001:. 04 (and likewise the EMAS Regulation 761/2001)defines the EMS " a part of an organization's management system

used to develop and implement its environmental policy and manage its environmental aspects ", where the environmental aspects are " element of an organization's activities or products or services that can interact with the environment". So, an Environmental Management System is a method of incorporating environmental care throughout the corporate structure. It is a useful tool to improve compliance with legislation, address stakeholder pressure, improve corporate Image and raise awareness of environmental issues within the organization. MostEMSs are built on the " Plan, Do, Check, Act " model. So, an EMS is a continual cycle of planning, implementing, reviewing and improving the processes and actions that an organization undertakes to meet its environmental obligation and to permitthe continuous improvement of the global environmental performance. Following the model, the organization that will correctly have applied the principles of the standard will come to be in a higher step of the virtual spiral in comparison to the preceding cycle.

III.THE ISO 14000 SERIES OF STANDARDS FOR ENVIRONMENTAL MANAGEMENT

To arrive at a worldwide methodology of tools for environmental management, a separate Technical committee TC 207 under the International Standards Organization was established in 1993. It was divided into various sub-committees (SCs) and workgroups, to create the series of standards 14000 which would account for all aspects of environmental management.

The SCs deal with the following items:

- SC 1 Environmental Management Systems
- SC 2 Environmental Auditing
- SC 3 Environmental Labeling
- SC 4 Environmental Performance Evaluation
- SC 5 Life Cycle Assessment
- SC 6 Environmental Management — Terms andDefinitions
- EAPS Guide for the Inclusion of EnvironmentalAspects in product Standards

SC 1 worked on the specification standards ISO 14.001 and the guide ISO 14.004, the requirements for the establishment of environmental management systems. ISO 14.001 is the only specification document within TC 207, which if followed, can be confirmed by the issue of a certificate. All other standards are merely guidelines, which offer and simplify methodological steps for environmental management, but do not set any technical requirements.SC5, Life Cycle Assessment, and SC3, Eco-labeling, deal with the product oriented assessment of environmental impacts over the entire life-cycle, and how this can be communicated. Data is needed but not yet available on a firm level, whereby input–output data from material and energy flows and indicators from SC4 should be applied. Therefore, such analysis of product life-cycles deals mainly with global environmental impacts, such as climate change and ozone level depletion, rather than with regional or site-specific effects.SC1 and SC2 deal with the organization of firm-specific environmental protection and its regular audit. The performance data and requirements are to be supplied by SC4.

SC4 has divided the areas of environmental performance evaluation into

- environmental management system

- operational system (material and energy flows)
- condition of the environment

IV.ENVIRONMENTAL PERFORMANCE

Many organizations are seeking ways to understand, demonstrate and improve their environmental performance. Environmental management system should evaluate environmental performance of the company's environmental policy, objectives, and other environmental performance standards. In fact, an EMS gives an organized and coherent plan to properly deal with environmental issues, and its main purpose is to improve their environmental performance. In 1999, the International Organization for Standardization released ISO14031 standard to designate the use of environmental performance assessment within an organization. Several definitions of environmental performance from the literature are as follow:

Measurable results of an organization's management of its environmental aspects (results can be measured against the organization's environmental policy, environmental objectives, environmental targets and other environmental performance requirements) [1]

Results of an organization's management of its environmental aspects (results may be measured against the organization's environmental policy, objectives and targets). [2, 3]

In any case, in order to evaluate the environmental performance it is necessary to assess the environmental aspects (Element of an organization's activities or products or services that can interact with the environment). [1] Changes to the environment, either adverse or beneficial, resulting wholly or partially from environmental aspects, are defined as ''environmental impacts''. The relationship between environmental aspects and impacts is one of cause and effect. Besides, a significant environmental aspect is an environmental aspect that has or can have a significant environmental impact. [1] The organization shall ensure that the significant environmental aspects are taken into account in establishing, implementing and maintaining its EMS: identifying significant environmental aspects and associated impacts is necessary in order to determine whether and where control or improvement is needed and to set priorities for management action. In particular, it is necessary to define some significance criteria that shall be comprehensive, suitable for independent checking, reproducible and verifiable, in order to identify the significant environmental aspects of the organization's activities, products and services. The role of the significant aspects and the related problems are illustrated in the ISO guidelines (ISO 14004:04) and those of EMAS Regulation (Recommendation 680/ 2001 and Recommendation 532/2003) and by some authors. Usually, to assist organizations in the management of their environmental significant aspects and impacts it is necessary to use a tool such as an environmental indicator.

The environmental indicators are essential in the environmental performance evaluation. Indicators will support organizations in quantifying and reporting their environmental performances: in fact, it is necessary to associate one or more indicators to each environmental aspect. Particularly, indicators allow classifying and summarizing data concerning environmental aspects, returning an immediate and representative picture of the company situation in relation to its environmental situation, comparable with the territorial context of the organization and with the objectives that have been stated. Indicators should address those environmental impacts that are most significant and which the company can directly influence by its operations, management, activities,

products and services. They should also be sensitive enough to reflect significant changes in environmental impacts. These values are essential, because they represent the term of reference for all future environmental performance evaluations.

V.ENVIRONMENTAL PERFORMANCE INDICATORS (EPIS)

The definitions of indicators are particularly confusing [4]. Some specific definitions of indicators in the literature are: ‘‘measure of system behavior in terms of meaningful and perceptible attributes’’ [5]; ‘‘measure that summarizes information relevant to particular phenomenon, or to reasonable proxy for such to measure’’ [6]; ‘‘parameter, or value derived from parameters, which points to/provides information about/ describes the phenomenon/environment/area with significance extending beyond that directly associated with parameter (property that is measured or observed) value’’ [7]; and ‘‘variable that describes the system, where to variable is an operational representation of an attribute (quality, characteristic, property) of the system and it represents our image of an attribute defined in terms of the specific measurement or salvation procedures’’ [8].

In general, indicators should be able to:-

(i) assess conditions and trends;
(ii) compare across places and situations;
(iii) assess conditions and trends in relation to goals and targets;
(iv) provide early warning information; and
(v) Anticipate future conditions and trends. [9]

So, it is possible to say that desirable indicators are variables that summarize or otherwise simplify relevant information, make phenomena of interest visible or perceptible to the managing staff, and are able to quantify, measure, and communicate relevant information. Some of those properties are not universal requisites. Qualitative indicators may be used in some situations, but a matter of convenience [9]. Most definitions of environmental indicators rule out the possibility of qualitative indicators, by restricting the concept to numerical variables, either explicitly or implicitly [4, 5, and 7]. Indeed, it is maintained that one of the essential functions of indicators is to quantify an item.

Qualitative indicators may be preferred to quantitative indicators in at least three cases:

(i) when quantitative information is not available;
(ii) when the attribute of interest is inherently non-quantifiable; and
(iii) When cost is a crucial issue, overwhelming all other considerations. In some cases, qualitative assessments can be translated in to quantitative notation

Only the more general requirements or desirable properties are listed below:-

1. The values of the indicators must be measurable (or at least observable);

2. Data must be either already available or they should be obtainable (through special measuring monitoring activities);
3. The methodology for data gathering, data processing, and construction of indicators must be clear, transparent and standardized;
4. Means for building and monitoring indicators should be available;
5. The indicators or sets of indicators should be cost effective, an issue often overlooked;
6. Political acceptability at the appropriate level (local, national, and international) must be fostered (indicators that are not acceptable by decision-makers are unlikely to influence decisions); and
7. Participation of, and support by, the public in the use of indicators is highly desirable, as one element of the general requirement of participation of the broader society in the quest for sustainable development. [9]

Regarding the performance indicators, they can represent a finite set of quantities chosen to reflect certain aspects in an organization. One possible definition of this type of indicators is ‘‘a number, absolute or relative, that facilitates management, communication and follow-up of an organization’s performance’’ [10]. Bartolomeo (1995) defines environmental performance indicators as ‘‘the quantitative and qualitative information that allow the evaluation, from an environmental point of view, of company effectiveness and efficiency in the consumption of resources’’ [11]. The ISO 14031 [2] defines the environmental performance indicators as ‘‘specific expression that provide information about an organization’s environmental performance’’ and their scope is to make measurement of the environmental performance easier for organizations. According to ISO 14031 indicators should be divided as follows:

1. Environmental Performance Indicators (EPI): specific expression that provides information about an organization’s environmental performance, which are divided into:
1.1. Management Performance Indicators (MPI): that provide information about the management efforts to influence an organization’s environmental performance; and
1.2. Operational Performance Indicators (OPI): environmental performance indicator that provides information about the environmental performance of an organization’s operations.

2. Environmental Condition Indicators (ECI): specific expression that provides information about the local, regional, national or global conditions of the environment. The ECls provide information about the condition of the environment.

This information can help an organization to better understand the actual impact or potential impact of its environmental aspects, and thus assist in the planning and implementation of EMS. It is generally difficult to choose the suitable performance indicators, as well as to define their suitable number which can describe thoroughly what one wants to know. Also, when different specific needs for information are to be fulfilled, then different indicators should be chosen, or built.

VII.CONCLUSION

This paper is based on the literature review of some research papers related to Environmental Performance Indicators and its measurement. The paper includes brief idea on EMS, ISO1400 series and the EPIs. EPIs are the basic requirement for assessing the environmental performance so that the organization can manage or control its environmental performance to the standards.

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