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# SUSTAINABLE DEVELOPMENT, ENVIRONMENTAL MANAGEMENT SYSTEM AND ISO: 14000

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## ABSTRACT

*There is a global debate on environmental protection and carbon emission, global warming, pollution, sustainable development and ethical concerns over degradation of the physical environment. There is general awareness across the world for the need to evolve strategies to curb pollution through industrial production. The need of the hour is to take conscious measures to ensure environmental safety from all sorts of exploitation and degradation for achieving sustainable development. The developed countries are more vocal about their concerns in world*

*forums as compared to developing ones as they are not in a position to control such practices yet. Unprecedented industrial growth, unorganized deforestation, unplanned urbanization and over-utilization of natural physical environment are the outcomes of human greed. The ISO has drafted certain norms to be followed by countries in the standard procedures for pro-environmental practices.*

*The study presents an overview of the ISO: 14000 series of international standard on environmental management. It gives detailed requirements of the standards and the various phases of EMS framework in developing the post certification remedial actions. The paper includes two case studies of Indian companies.*

**Key Words:** Sustainable Development, Environment, ISO 14000, Environmental Management System.

## Introduction

In the times where Indian business firms are facing competition from multinational companies and quality and efficiency are the buzz words, the concern about customer retention has gained importance. The stakeholders like society, suppliers and consumers have become aware of the environmental issues and how the products and processes are affecting the environment. The companies are seeking ways to impress upon them that they are working towards sustainable development and growth. They want to earn trust of all the stakeholders about their environmental strategies. The decisions of the management have to be taken keeping environmental protection in mind. The processes have to be efficient yet environment-friendly. The products and processes involved in production should be as per the international norms of environment protection and pollution should be minimized. The ISO:14000 standards are a milestone in achieving the global green standards and the enterprise may go a long way in creating a positive image in the minds of all concerned that they are contributing to energy conservation and protection of natural physical environment by adopting the same.

ISO:14000 standards are designed to provide customers with an assurance that the claims of a company regarding sustainable growth are accurate. The standards help integrate the environmental management systems of company with the global requirements. The ISO process

has not fully involved all countries or levels of business. Some consumer and environmental organizations may well be skeptical of voluntary standards and there is a large measure of capacity building required to be created. These standards are not yet mandatory but optional. The ISO: 14000 series of standards has been designed to help enterprises meet their environmental management system needs. They have been under development by the International Organization for Standardization (ISO) since 1991. They consist of a set of documents that define the key elements of a management system that will help an organization address the environmental issues it faces. The management system includes the setting of goals and priorities, assignment of responsibility for accomplishing them, measuring and reporting on results, and external verification of claims.

The intention of ISO 14001:2004 is to provide a framework for a holistic, systematic and strategic approach to the organization's environmental policy, plans and actions. An effective environmental management system based on ISO: 14001 provides an organization's top management with a roadmap which allows them to manage environmental issues effectively by prevention and identification of areas for cost savings in energy consumption, raw material usage and waste disposal.

ISO: 14000 standards are being developed to meet the demand for an environmental management system that will be consistent for many sorts of organizations. The ISO: 14000 set of standards and guidelines defines the core environmental management system itself, and the auditing procedures necessary for verification. It also defines three sets of tools that are important in implementing an EMS: life cycle assessment, environmental performance evaluation, and environmental labeling. Accompanying the standards themselves is another body of material that defines how conformity to the standards will be assessed. ISO: 14000 standards do not, however, define the specific environmental performance goals that an organization should attain.

**Environmental Management System**

An Environmental Management System (EMS) is a structured framework for managing an organisation's significant environmental aspects and impacts. Some organisations have adopted the framework specified in national or international standards that set out the requirements of an EMS and have had their systems externally assessed and certified against these. Other

organisations have developed their EMS in a more informal way. Whatever approach has been adopted, the elements of the EMS framework will largely be the same. There are various EMS approaches including EMAS, BS7750, BS8555 but the global leader in terms of deployment and acceptance is ISO14001 and there are no indications that this will change for the near future. The basic structure of an EMS process is depicted in Figure 1 below: -

The International Standards Organisation (ISO) defines the 14001 (1) EMS as "*the part of the overall management systems that includes organisational structure, planning activities, responsibilities, practices, procedure and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy".*

The continuous improvement process for ISO: 14001 is slightly different than for the quality management systems. It includes 3 aspects:

• Expansion – more and more business areas should get covered by the implemented EMS;

• Enrichment – more and more activities, products, processes should be involved in the EMS;

• Upgrading – improvement in structure and framework of the EMS through know-how gained by the business when dealing with environmental issues.

The continuous improvement of environmental management system should result in the environmental thinking of the whole organization; it should move from operational measures to a strategic approach on how to deal with environmental challenges.

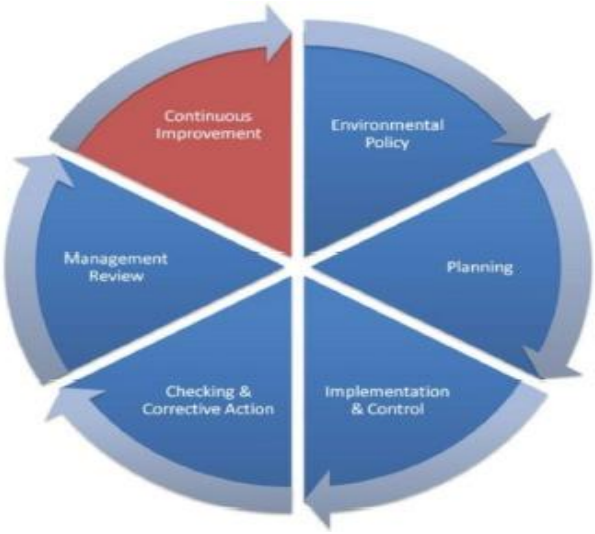


Fig. 1: The EMS Process Structure

**OVERVIEW OF ISO: 14000**

ISO: 14000 consists of a series of elements, and ISO:14001 is the dominant feature and actual standard of the series. It specifies a framework of control for an Environmental Management System against which an organization can be certified by a third party. Other elements of the series include:

• ISO: 14004 - guidance on the development and implementation of environmental management systems

• ISO: 14010 - general principles of environmental auditing (now superseded by ISO 19011);

• ISO: 14011 - specific guidance on audit an environmental management system (now superseded by ISO 19011);

• ISO: 14012 - guidance on qualification criteria for environmental auditors and lead auditors (now superseded by ISO: 19011);

• ISO 14013/5 - audit program review and assessment material.

• ISO 14020 - labeling issues;

• ISO 14030 - guidance on performance targets and monitoring within an Environmental Management System;

• ISO 14040+ covers life cycle issues.

ISO14001 is similar to ISO9001 in that it is a framework consisting of process standards, not performance standards. They both promote management systems that focus on prevention rather than corrective action.

**Principles behind the ISO 14000 series**

The ISO 14000 standards and documents are being developed with the following key principles in mind:

- To result in better environmental management
- To encompass environmental management systems and the environmental aspects of products
- To be applicable in all countries
- To promote the broader interests of the public as well as users of these standards
- To be cost-effective, non-prescriptive and flexible so they are able to meet the differing needs of organizations of any type or size, worldwide

- As part of their flexibility, to be suitable for internal and/or external verification
- To be scientifically based
- Above all, to be practical, useful and usable

ISO endeavors to avoid the creation of unnecessary barriers to trade. The objective of environmental management standards has been to develop a common language platform for environmental issues, so that businesses, prospective customers, and governments are certain that all organizational level environmental concerns have been addressed. By focusing on management and product standards, and emphasizing guidance over strict specifications in its documents, ISO 14000 has created a positive ambiance for world trade, at the same time encouraging progress in environmental performance.

**Summary of Requirements for ISO 14001:2004**

The ISO document provides a summary of the requirement of ISO 14001:2004, which is an international standard describing the specification and requirements for an environmental management system (EMS).

**ELEMENT-BY-ELEMENT GUIDANCE**

1. **ISO 14001 Requirement: General requirements**

An organization must establish, document, implement, and continuously improve their environmental management system and show how they meet all the requirements of this standard.

**2. Environmental Policy**

The organization must have a policy, or commitment statement, developed by top management regarding the implementation of EMS that conforms to the standard. There are specific items that must be committed to in the policy, such as compliance with legal and other requirements, Prevention of pollution, and continuous improvement. In addition, the policy must be communicated to all employees, and other stakeholders of the organization, and to the general public. This policy must be systematically documented, implemented, and maintained.

**3. Environmental Aspects**

This element requires a procedure to identify environmental aspects and related effects that the organization can control influence over, and determine those which are significant to the

organization. ISO 14001 does not prescribe what aspects should be significant, or even how to determine significance. The objective of this element is to help the organization identify how it affects the environment, prioritize aspects, and use the EMS to manage, control, and improve upon the aspects.

**4. Legal and Other Requirements**

This is a requirement for a procedure that explains how the organization obtains information regarding its legal and other requirements, and makes that information known to key functions within the organization. The purpose is to identify the environmental legal and other requirements that relate to its operations and activities so that the organization can ensure that they are taken into account in the EMS.

**5. Objectives, Targets, and Programs**

There is no requirement for a procedure in this element. However, there must be a process that ensures that the objectives and targets are consistent with the policy, which includes the commitments to compliance with legal and other requirements, continual improvement, and prevention of pollution. Also, the objectives and targets need to exist at whatever functions and levels of the organization, and be measurable, where practicable.

**6. Structure and Responsibility**

ISO 14001 requires that the relevant management and accountability structure be defined in this element. Top management is expected to ensure that resources are available so that the EMS can be implemented, maintained, and improved. These resources include human resources, organizational structure, financial and technological resources, and others. Roles, responsibilities, and authorities must be defined, documented and communicated as appropriate.

**7. Competence, Training, and Awareness**

The key point in this element is to ensure that persons performing tasks that have or can have significant impact on the environment and/or relate to the legal and other requirements are competent to do those tasks. Competence is ensured through appropriate education, training, and/or experience. The organization needs to identify training needs as they relate to the EMS, and make sure this training is provided and records are to be maintained.

**8. Communications**

Procedures are required for both internal and external communications. Note that ISO 14001 only requires procedures, and allows the organization to decide for itself the degree of openness

and disclosure of information. Whatever the decision is in terms of disclosure, the decision process must be recorded. There is a specific requirement that the organization should consider external communications about its significant environmental aspects and record its decision.

**9. EMS Documentation**

This requirement ensures that the organization has documented the system in either electronic or paper form such that it addresses the elements of the standard, describes how the organization conforms to each element, and provides direction to related documentation. Not all ISO 14001-required procedures need to be documented, as long as the system requirements can be verified. However, documentation must be provided such that enough is available to ensure the effective planning, operation, and control of processes related to the significant aspects, and to demonstrate conformance to IS14001. Such documentation at a minimum includes policy, objectives and targets, a definition of the scope of the EMS, and other main elements.

**10. Internal Audit**

ISO: 14001 requires that the system provide for internal audits. This procedure could include methodologies, schedules, checklists and forms, and processes used to conduct the audits. The system for internal audits has to fix responsibilities and requirements for planning and executing the audits, reporting results, and what records will be generated. The procedures also address determination of audit scope, how often they will be conducted, and specifically how they will be done.

**11. Management Review**

This element requires that periodically, top management will review the EMS to ensure it is operating as planned, and is suitable, adequate, and effective. The organization needs to ensure that in the review: results of internal audits (EMS and compliance); external communications; environmental performance; status on objectives and targets; status of corrective and preventive actions; follow up on actions from prior management reviews; and changing conditions or situations; and recommendations for improvement are all discussed.

The **ISO: 9000** standards also relate to attaining quality control and efficiency with continuous improvement in existing practices. The philosophy of ISO deals with Total Quality Management and Six Sigma for improving the processes and quality measures in an enterprise. The

certification to these standards can be applied for improving existing operating processes and even individual units or departments can also apply for the same.

**Integration to Lean Six Sigma**

Lean Six Sigma is a widely accepted business improvement approach used by thousands of organisations worldwide to reduce costs, improve cost and delivery. It uses an approach called DMAIC which stands for define, measure, analyse, improve and control. This has similarities to the framework adopted by ISO:14001. It differs to ISO:14001 in the sense that it uses a wide range of tools and techniques to solve problems. These tools include many statistical analysis techniques which enable data driven decision making based on facts not intuition. A large number of companies world-wide have improved in terms of environmental sustainability. Further, awareness should increase in small and medium scale enterprises. Most of the organisations have not improved much in terms of environmental protection policies. They have limited or no knowledge of EMS and of ISO: 14001, they create merely an image in the minds of stakeholders. This limits the ability to grow and survive. The integration of the standards to business improvement tools and techniques such as, six sigma, will increase the problem solving ability of the standard and its potential as sustainability in the decades to come.

**Advantages OF ISO: 14000**

There are several advantages of the standards, such as, internal and external.

*Internal Benefits*

1. **Reduces liability**: A systematic approach to managing environmental issues can help to ensure that environmental incidents and liability are reduced. The adherence to standards automatically improves awareness about the environmental issues and documentation of procedures like waste management, energy conservation, etc. lead to better environmental safety and sustainable development.

2. **Efficiency**: A systematic approach can help to identify opportunities to conserve material and energy inputs, to reduce wastes and to improve process efficiency.

3. **Performance**: A systematic approach to management leads indirectly to improved environmental performance and improved cost control. Improved corporate culture: Top management commitment to improved environmental management, clearly defined goals,

responsibilities and accountabilities, creates a greater awareness and understanding of environmental issues and an improved corporate culture.

4. **Employee involvement and motivation** – ISO 14001 demonstrates innovation and forward thinking approach to customers and prospective employees. It clearly defines employees' functions and establishes environmental awareness and clear methodologies. They inspire employees to take steps to ensure implementation of effective strategies to protect natural environment. They have to be actively involved and motivated to perform their duties in such a manner that the adverse impacts on environment is reduced, and the company is able to make a master plan for better management of its resources in the long run and all the policies favour future protection of resources and conservation of resources for future generations.

***External benefits***

1. **Third party assurance and recognition**: Companies often have to demonstrate that their products and services meet certain conditions. This is exactly what standards do efficiently, especially when combined with third party conformity assessment programs. They reduce or eliminate the need of companies to individually inspect each supplier's products and services with its own auditors. International standards such as the ISO 14000 series provide the widest possible recognition of this assurance.

2. **Market access**: ISO 14000 may become a pre-requisite of doing business. Companies have turned to agreed-upon international standards as a way of meeting certain expectations. Customers may demand that their suppliers meet specific environmental goals and have ISO 14000 certification to ensure that the goals are being met. It gives credibility to suppliers and vendors.

3. **Regulatory relief**: Regulators may begin to recognize the assurance provided by ISO 14000 and offer some sort of regulatory relief, such as easier permits, lesser inspections and streamlined reporting requirements, to those who implement EMS. Various countries are adopting the guidelines for global standards ensuring compliance with the environment-friendly practices. They need to implement regulations which are conducive to desirable ethical practices.

4. **Expression of due diligence**: By using ISO 14000 to systematically identify and manage environmental risk and liability, the courts, investors and lenders, and regulators may all use it as a sign of due diligence and commitment to good environmental management. The adoption of

standards and ethical decision making results in expression of diligence and care for environment protection.

5. **Public image and community relations**: The presence of an EMS, the attention to needs of energy conservation, waste management, tree plantations, green environment and other policies help an organization create a better public image and it facilitates communication with its stakeholders. It encourages cordial relations with the local community when the impression is good. It is important in the long run for survival to have a good corporate image in terms of environment-friendly practices for Indian firms.

6. **Financial markets**: Having an internationally recognized EMS in place will improve investor confidence and access to capital, and potentially provide access to preferential insurance rates. The ethical decisions and compliance to international standards would improve chances to attract venture capital and financial support from multinational investors. It will attract more FDI to the country implementing EMS.

7. **Greater competitive advantage** – The implementing organization would achieve improved cost control, improved organizational effectiveness and image of organization. It can achieve greater competitive advantage vis-à-vis competitors. The environment consciousness would enhance consumer interest as well. It may actually increase market share for the firm.

8**. More secure long term viability** – The implementation of environmental management standard facilitates effective management, demonstrates environmental focus and introduces change in a controlled manner. This would ensure long term stability and viability to the firm. The more satisfied stakeholders ensure profitability and growth for the firm. In the long run, Indian companies would have to implement the EMS and make strategies which are environment friendly in order to stay viable.

**Sustainable Development**

Sustainable development involves the simultaneous improvement of the economy, the environment, and the well-being of people. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The goals of economic and social development must be defined in terms of sustainability in all countries. For the business enterprise, sustainable development means adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the

future. The philosophy emphasizes that economic activity should not irreparably degrade or destroy these natural and human resources. It is a pervasive strategy to be implemented not only by a single enterprise in isolation from the society but all the participants in the global economy, in pursuance of effective EMS.

The standards however, do not include human aspect of sustainable growth. Thus, it does not make it self- sustaining and companies seeking certification can move a step ahead towards sustainable development. It brings environmental issues to the mainstream decision making in the corporate world. Generally, there is a challenge to choose from a number of options to invest and it facilitates the decision making exercise by asserting the impact of the product/process on all stakeholders along with the immediate environment. It is not only compliance of standards which make it effective, rather it is a combination of voluntary responses by companies that are important, governed by consumer and community forces.

The term "sustainable development" was coined in 1987 by the World Commission on Environment and Development, in it is report, "Our Common Future". This report emphasized the need to balance environmental protection and economic growth. The International Chamber of Commerce (ICC) created the Business Charter for Sustainable Development in 1991. The ICC Charter is comprised of sixteen Principles for environmental management that foster sustainable development. The Principles in this document include some of the basic elements of environmental management systems. The United Nations Conference on Environment and Development (UNCED) was held in Rio de Janeiro in 1992, and is also called the Earth Summit (or Rio Summit). Two documents from this summit are Agenda 21 and the Rio Declaration. Agenda 21 is a comprehensive guidance document for sustainable development, and the Rio declaration is a set of 27 principles for achieving sustainable development. These international initiatives on sustainable development signified new levels of environmental responsibilities for the business community worldwide.

The ISO: 14000 standards have significant implications for developing countries. They find it difficult to participate in the development of the standards as it is a time consuming and expensive process to be a part of it. It is essential to represent the interest of the country in international meetings and to develop expertise and to study the impact of various issues, on specific sectors, in the economy. Thus, these standards will not truly reflect the stakes of the developing countries as part of the development of standards. For such countries, it is like a

multi-lateral trade negotiations not reflecting their true commercial realities in international forums. Although they may have a long lasting impact on the country's trade and manufacturing processes, they are multi lateral and cover a wide range of products and processes. There is not much involvement of such countries in the same.

Another major challenge before developing economies is lack of institutional infrastructure essential for training and auditing requirement. Implementing ISO: 14000 standards demand sophisticated system of auditing and recording, which is expensive and time consuming. In developing countries, companies are concerned about how to define the policies, objectives and targets needed when they are implemented. Thus implementation and certification to the standards becomes a challenge for developing nations like India. Let us take a review of two prominent companies in India trying to follow the norms relating to international standards.

**Case Study 1: MARUTI SUZUKI LTD.**

Source: www:// marutisuzuki.com

Maruti Suzuki India Limited is a leading passenger vehicle manufacturer in India. The Company was established in 1981 as a joint venture between Government of India and Suzuki Motor Corporation (SMC), Japan. Today, it is SMC's largest subsidiary in terms of volume of production and sale.

Maruti Suzuki strives to consistently improve the environmental performance of its manufacturing operations, products and supply chain. The company identifies environmental impact and develops strategies to mitigate impact in each of these areas. The company reviews existing processes, systems and equipment from the point of view of their impact on the environment and health and safety of people. Stakeholders and their environment-related suggestions and concerns are also taken into consideration to bring about further improvement in the company's environmental performance.

Maruti Suzuki has an elaborate organizational structure to deal with all aspects of environmental performance. The management reviews parameters related to environment every month in the Business Review Meeting. The management approach promotes continuous improvement, striving to set industry standards and continuous learning. Horizontal deployment of good practices across Maruti Suzuki facilities and sharing with suppliers is also promoted. The company sets environmental targets each year. The responsibility of achieving the targets is

distributed to relevant departments and individuals. The progress in achieving the targets is monitored periodically. The whole process is guided by the PDCA (Plan-Do-Check-Act) cycle. . The performances against the set targets are evaluated and further actions are taken.

**Case study 2: Ashok Leyland Ltd.- ISO:14000 Experience**

Since the 1960s, ALL had shown strong commitment towards eco-friendly manufacturing practices. It had replaced the potentially harmful shot blasting technique used for surface cleaning treatment of rough materials and heat treatment scaling at the Ennore unit with the sand blasting technique.

Heavy-duty dust collector machines were placed to collect the blasting dust from the machines, this dust was sent to other companies for making firecrackers. In 1980, ALL stopped using harn chemicals like sodium cyanide by modifying the processes involved. It thus eliminated production of poisonous waste.

**Technology**

ALL started a round-the-year awareness program for reducing emissions from engines by conduct pollution checks. Action programs were held at operators' meets and campaigns. It also launched a mobile emission clinic that operated on highways and at entry points to the national capital, New Delhi. This clinic carried out tests for emission levels, recommended remedies and offered tips on maintenance and care of the vehicle.

**Processes**

ALL constantly reviewed its manufacturing processes and frequently modified/replaced the exist manufacturing processes with eco-friendly processes, such as:

1. Scrubbers are used to collect paint particles on the paint shop floor to avoid exposure adverse reactions.
2. ALL eliminated the use of certain chemical compounds at its Ennore plant after they were identified as ozone depleting substances.

**Effluent Treatment**

The effluent treatment process at ALL aimed at treating the waste generated to produce usable products and safe disposal of unused water. ALL established effluent treatment plants at all manufacturing units. At the Ennore plant, around 1.28 million litres of treated water was

discharged every day. Effluent plants at Hosur I were ranked on par with the most modern plants.

**Green Effort**

ALL's management allotted a certain percentage of land on its campuses for greening purposes. Of the total 53.41 hectares ground area of the Ennore Unit, around 10% was used for planting trees, landscaping and maintaining lawns.

**Advantages:** Replacement of chemical fertilizers with the manure extracted from sludge resulted in savings of Rs 1,65,000 per annum for the Ennore plant. According to company sources, on an average, around 250,000 litres of recycled water was pumped into the garden and other greening initiatives, saving the company Rs 15 million per annum. The company's energy conservation efforts resulted in reduction in energy required for heat treatment by 70%. As a result of all these initiatives, Ashok Leyland reportedly saved around Rs 70 million per year.

## CONCLUSION

The paper covers the standards regarding environmental management and the advantages arising out of the same. A number of countries have been part of the process of development of these standards. The implementation of standards is still not mandatory in most of the countries as there is lack of total awareness regarding the impact of managerial decisions on physical natural environmental elements. There are many requirements regarding documentation, audit and customer grievance, corrective action in the standard guidelines.

Initially, an organisation's senior management must develop its environmental policy. The policy itself must be appropriate to the organisation itself in terms of size, scale and any environmental impacts that it may have. The policy should contain three commitments: to prevent pollutions; comply with topical regulations and legislation; and finally to aim to continually improve and not stagnate. The framework of the policy should also be communicated to employees and be available to the public. The policy should also be documented, implemented within the workplace, reviewed and maintained by designated stakeholders within the company.

It could be deemed that the adoption of ISO:14001 would give an organisation a green corporate image, a company which cares about their local, national and global environment.

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