

Handbook 

# ENVIRONMENTAL AUDITING

-A Road Map to Registration.

**Subrota Kumar Saha**



**AOSED**

An Organization for Socio-Economic Development



# **HANDBOOK ON**

## **ENVIRONMENTAL AUDITING**

*- A Road Map to Registration*

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**HANDBOOK ON ENVIRONMENTAL AUDITING**  
**- A Road Map to Registration**

*Dedicated to Dr. Shyamal Krishna Saha whose inspiration and talent put me to achieve such endeavor*

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## Preface

The importance of environmental protection and conservation measures has been increasingly recognized during the past two decades. It is now generally accepted that economic development strategies must be compatible with environmental goals. This requires the incorporation of environmental dimensions into the process of development. It is important to make choices and decisions that will eventually promote sound development by understanding the environment functions. The United Nations Conference on Environment and Development (UNCED) in its Agenda 21 deals with the Quality and Supply of products underscored the importance of environmental protection and conservation of the natural resource base.

As a result most of the developing countries are accepting the principle of environmental screening of development projects at the planning stage and hence are looking for guidelines to environmental impact assessments and standards like environmental auditing. Many multi- and bilateral agencies stipulate environmental auditing for their product goods for international exposure.

In Bangladesh especially pharmaceutical industries as well as export oriented goods are looking forward for ISO norms. In this regards some foreign farms advocate for the norms with huge payments. In this book I have tried to compile the necessary documents for environmental auditing like ISO 9000, ISO 14000 series which may help an auditor in all the stages of auditing. I hope this book will be useful for the students, academicians as well as the auditors.

I gratefully acknowledge the reliance upon the standards published by the International Organization for Standardization Geneva, Switzerland. My colleagues Prof. Rakib Uddin, Dr D K Datta, MMS Rahman, Salim Uddin, Mesbaul Bahar are appreciated for inspiration in all stages of this work thanks are due to the students of ES Discipline, Khulna University especially Gopal, Asad, Farzana, Kushal and Mofiz due to their efforts in typing and encouragement. Special thanks should put for my wife and son for their sacrifice.

Finally, I express my special thanks to Mr Shamim Arefin, Executive Director, AOSED, Khulna for publishing the book.

February, 2004

**Dr. Subrota Kumar Saha**

## Publisher's Note

Environmental Audit is one of the important aspect of environmental management. But very little work has been done on environmental audit in Bangladesh. In fact, it will be hard to find a book devoted solely on environmental audit. The few foreign publications available in this regard contain very little in perspective of Bangladesh.

In recent years, Environment is a subject being discussed in all circles. People are so engrossed with this issue that it has taken on the character of a business. But at the same time, the number of people who have dedicated themselves to this issue is ever on the increase.

Environmental Audit is one of the important aspect of environmental management. But very little work has been done on environmental audit in Bangladesh. In fact, it will be hard to find a book devoted solely on environmental audit. The few foreign publications available in this regard contain very little in perspective of Bangladesh.

The realisation that Dr. Subrota Kumar Saha has taken the trouble to compile a book on Environmental Audit in perspective of Bangladesh is born out of our own involvement in environmental issues. This book will be very valuable not only for his own students, but it will be an essential guide for all who are engaged in any manner with environmental issues. AOSED is proud to be the publisher of the book on Environmental Audit, first time published in Bangladesh.

Shamim Arfeen  
Executive Director  
AOSED

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# **Chapter 1**

## **INTRODUCTION**

### **General introduction**

The community environmental expectations have increased considerably since the United Nations Conference on the Human Environment in Stockholm in 1972. Notably, sustainable development came out of the Brundtland Report followed by the Rio Declaration in 1992. The Brundtland Report is from the United Nations Commission on Sustainable Development and is published as *Only One Earth* by Oxford University Press in 1987. The Rio Declaration is one of the four formal documents (with 27 general principles for achieving sustainable development) coming from the United Nations Conference on Environment and Development. The international environmental principles are now applying more and more in all parts of the world. Environmental auditing is one of the best fitted outcomes of the conference.

The term environmental audit is a generic term and there will be a proposal for the consideration of the respective client and terms of engagement for the carrying out of the audit. The audit involves the development of a enterprise specific protocol for the conducting of the audit.

Do you have proper maintenance and operation procedures in place so as to eliminate or minimize the risk of an incident occurring that will have environmental consequences? Or, do you know how adequate your procedures are in avoiding prosecution should there be an incident? You should consider an Environmental Audit.

Environmental Audits can be required by legislation. However, many enterprises are voluntarily proceeding with an Environmental Audit as an informal process. There may be no present law requiring an Environmental Audit to be carried out for enterprise. In the future it is reasonable to expect that there will be an increased recognition of Environmental Audits and with that recognition will come legislative imperatives.

The Environment Audit will evaluate the environmental performance of the operations of the client by identifying and measuring all inputs and outputs (materials used and waste produced).

### Audit

Audit is an examination of accounts by authorized experts. It is consistent with overall business practice - *are problem solvers, not just problem finders*. It goes beyond merely identifying areas of regulatory non-compliance to evaluating environmental performance. It is the best management practice that reduces costs, ensure compliance, and avoid future liabilities. It advocates to understanding of organizational dynamics and management systems that allows identifying the root causes of performance deficiencies and prescribing the optimum corrective actions.

### Environmental Audit

Environmental audit originated in the United States in the 1970s as a way of checking whether a company was complying with a multitude of new environmental laws and regulations. More recently, it is used as an extremely valuable tool for assessing a company's environmental management systems, policy and equipment. It provides the company with proposal on how it can improve its environmental management practices and reduce the environmental impact. Besides, improved environmental practices often save money in the long run.

Audit is the term, taken from financial accounting, to infer the notion of verification of practice and certification of data. In terms of environmental management, the objectives of audit include:

- the organization and interpretation of the environmental monitoring data to establish a record of change associated with the implementation of a project or the operation of an organization;
- the process of verification that all or selected parameters measured by an environmental monitoring programme are in compliance with regulatory requirements, internal policies and standards, and established environmental quality performance limits;
- the comparison of project impact predictions with actual impacts for the purpose of assessing the accuracy of predictions;
- the assessment of the effectiveness of the environmental management systems, practices and procedures; and
- the determination of the degree and scope of any necessary remedial or control measures in case of non-compliance or in the event that the organization's environmental objectives are not achieved.

Audit documents normally required are a *compliance audit*, prepared during the implementation and operation of a project; and a *post-project audit*, prepared after implementation and commissioning of a project, or a systems audit.

The environmental audit is a systematic, independent, internal review to check whether the results of environmental works tally with the targets and the methods for determining the environmental impact and performance of company. Any businessman or governmental unit that is in harmony by an environmental law or rule can conduct an environmental audit.

The International Chamber of Commerce defines the "environmental audit" as *systematic examination of the interactions between any business operation and its surroundings. This includes all emissions to air, land, and water; legal constraints; the effects on the neighboring community, landscape and ecology; and the public's perception of the operating company in the local area. Environmental audit does not stop at compliance with legislation. Nor is it a 'green-washing' public relations exercise. Rather it is a total strategic approach to the organization's activities.*

According to the definition in ISO 19011 an audit is *a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.* Audit evidence is based on records, statements of fact or other information that the auditor gathers and that can be verified. The audit criteria may be, for example, the requirements of a management system standard such as ISO 9001 or ISO 14001. The evaluation of the audit evidence against the audit criteria leads to findings of conformity or nonconformity with the criteria, i.e., something does or does not conform to the applicable requirements. After consideration of all the findings, the auditor can draw conclusions such as whether the management system of an organization does or does not conform to a management system standard.

*It helps clients by*

- Conducting environmental audits designed to check performance with business policies and environmental laws.
- Implementing corporate-wide environmental audit program.
- Conducting ability to determine whether performance targets are being met or not.
- Reviewing potential legal responsibility from the concerned authorities.

## **Function**

*The functions of an environmental audit are*

- To improve an organization's compliance with environmental legislation and regulations such as air emission standards, effluent standards, waste management standards, waste management standards and standard operating procedures;
- To prevent damage and the tendency for environmental damage;
- To improve resource use through reduction in material use, to minimize wastes and to identify recycling opportunities;

- To increase actions undertaken or needing to be undertaken by an organization or activity to meet environmental goals such as sustainable development, recycling and efficient use of resources.

## **Benefits**

*The benefits of environmental auditing are*

- Identification of environmental risks;
- Use as a basis for the development of environmental management policies or efforts to improve existing plans;
- Prevention of financial losses through the shutting down of an organization or activity;
- Avoidance of legal sanctions against an organization or activity or its management under prevailing laws and regulations;
- Identification of possible cost savings from energy conservation and waste reduction, reuse and recycling;
- Prerequisite of an environmental audit report for use by an organization, or activity in dealings with environmental groups, government and the mass media;
- Provision of information required by insurance companies, financial institutions and shareholders.

## **Scope**

The scope of an environmental audit is very flexible, depending on the needs of the organization. An environmental audit should be conducted in a manner which allows for the provision of information regarding:

- The history of an organization or activity, including information on the setting, previous environmental damage at the site, environmental practices, monitoring records and known environmental issues;
- The natural resources used as input, processing of materials and all finished products and wastes including hazardous and toxic wastes;
- The handling and storage of chemicals, hazardous and toxic materials and any potential environmental hazards;
- Environmental risk assessment;
- Waste management control systems, transportation route for materials and waste disposal, including facilities to minimize waste disposal impacts and accidents;
- Measure of the effectiveness of pollution control equipment as indicated in inspection reports, maintenance logs, emission test results and routine analytical reports;
- Emergency response plans and procedures;
- Recycling, programs and product life cycle considerations;
- Plans to increase environmental awareness.

## **Relation between conventional auditing and environmental auditing**

Financial auditing, which originated in the late 1800s, is the precise examination of the financial statements of a business. It can be carried out internally, *i.e.*, by the employees of the company concerned. However, the law requires that is also carried out externally, *i.e.*, by a firm of professional auditors who are not employees of the company being audited.

The financial audit assesses, if finances are being managed correctly, *i.e.*, it is a check of the accounting controls within an organization. The audit thus plays an important role in verifying if an organization is profitable or not - important information for those running the company. Such information is commonly referred to as '*the bottom line*' *i.e.*, the bottom line of an income statement gives an amount of money which reflects either a profit or loss.

The bottom line, however, does not reflect environmental consequences (*e.g.*, pollution) that may have been incurred in the process of doing business, as these are often difficult to measure in financial terms. The environmental audit is an attempt to provide information on the environmental performance of a company, and thus include environmental issues in the decision making process.

## **Relation between Environmental Impact Assessment (EIA) and Environmental auditing (EA)**

EIA is the mandatory assessment of the planning documents, programs and projects. On the other hand, EA is the assessment of the compliance of environmental administration and performance of an operating business. It advocates for environmental protection requirements and the principles of sustainable development stipulated by law.

The concept of environmental auditing is closely related to *monitoring, norms and standards*.

**Environmental monitoring:** It is the systematic observation of the state of the environment and of the factors influencing it. Its main purpose is to forecast changes to the state of the environment and to provide initial data for planning documents, programs and projects. The procedure of environmental monitoring shall be established by law.

**Environmental norms:** They are reference figures or use rates of natural resources per production unit established for the quality of the environment, the volume of waste or per production unit.

**Environmental standards:** They are documents setting rules, guidelines and numeric values defined by the involved parties and regulating activities or results of activities which either have or are likely to have impact on the state of the environment.

## **Relation between Environmental Auditing and Accounting**

Regarding auditing, once environmental risks have been identified, the auditor must check for compliance with accounting standards. A company's environmental conservation activities are more than just an expenditure of funds; they also represent the values of corporate management. Environmental Accounting pinpoints the environmental expenditures and their meaning to the company as a monetary value. The most significant aspect of corporate environmental activities is the reduction of the environmental burdens visited upon society.

### **Objectives :**

*For the internal information on management-* To provide information on the environment-related costs, resulting in an appropriate project control of environmental investments.

*For stakeholders-* To promote the understanding of environmental conservation activities by providing information on such activities and environmental cost balance.

*For consumers-* To provide consumers with information on environmental conservation activities, helping them purchasing decisions.

Interest is growing in modifying national income accounting systems to promote understanding of the links between economy and environment. The field of environmental accounting has made great speed in the past two decades, moving from a rather secret attempt to one tested in dozens of countries and well established in a few.

Governments around the world develop economic data systems known as national income accounts to calculate macroeconomic indicators such as gross domestic product. Building a nation's economic use of the environment into such accounts is a response to several alleged mistake in the System Accounts (SNA), as defined by the United Nations and used internationally. One mistake in the SNA cited is that the cost of environmental protection cannot be identified. Consequently, money spent, say, to put pollution control devices on smokestacks increases GDP, even though the expenditure is economically productive. Valuing environmental services such as the watershed protection that forests afford and the crop fertilization that insects provide is difficult. Though some experts call for their inclusion in environmentally adjusted accounts, typically neither the economic value nor the degradation of these services is included. On the other hand, however, the alternate goods and services needed to replace those water treatment plants, for example—do contribute to GDP, which can be rather misleading.

Environmental accounting is underway in several dozen countries, where bureaucrats, statisticians, and other proponents both foreign and

domestic have initiated activities over the past few decades. One of the first countries to build environmental accounts is Norway, which began collecting data on energy sources, fisheries, forests, and minerals in the 1970s to address resource scarcity. Over time, the Norwegians have expanded their accounts to include data on air pollutant emissions. Their accounts feed into a model of the national economy, which policy-makers use to assess the energy implications of alternate growth strategies. Inclusion of these data also allows them to predict the impacts of different growth patterns on compliance with international conventions on pollutant emissions. More recently, a number of resource-dependent countries have become interested in measuring the decline trend of their natural assets and adjusting their GDPs environmentally.

How environmental accounting is being done varies in a number of respects, notably the magnitude of the investment required, the objectivity of the data, the ability to compare different kinds of environmental impacts, and the kinds of policy purposes to which they may be applied. Here are some of the methods currently in use.

**Natural Resource Accounts :** These include data on stocks of natural resources and changes in them caused by either natural processes or human use. Such accounts typically cover agricultural land, fisheries, forests, minerals and petroleum, and water. In some countries, the accounts also include monetary data on the value of such resources. For environmental goods and services that are not sold, it is that much harder to establish the value either of the flow or of a change in stock. However, even physical data can be linked to the economy for policy purposes. For example, changes in income can sometimes be traced to changes in the resource base or to the impact of environmental catastrophes on the economy.

**Emissions Accounting :** Developed by the Dutch, the National Accounting Matrix including Environmental Accounts (NAMEA) structures the accounts in a matrix, which identifies pollutant emissions by economic sector. Eurostat, the statistical arm of the European Union, is helping EU members apply this approach as part of its environmental accounting program. If emissions are valued in monetary terms, these values can be used to determine the economic cost of avoiding environmental degradation in the first place, as well as to compare costs and benefits of environmental protection.

**Disaggregating of conventional national accounts :** Sometimes data in the conventional accounts are taken apart to identify expenditures specifically related to the environment, such as those deserve to prevent

or mitigate harm, to buy and install protection equipment, or to pay for charges and subsidies. Over time, revelation of these data makes it possible to observe links between changes in environmental policy and costs of environmental protection. For example, while end of pipe pollution control equipment is easily observed, new factories and vehicles increasingly are lowering their pollutant emissions through product redesign or process change rather than relying on special equipment.

***Value of non marketed environmental goods and services :*** Considerable controversy exists over whether to include the imputed value of non marketed environmental goods and services in environmental accounts, such as the benefits of an unpolluted lake or a scenario. On the one hand, the value of these items is crucial if the accounts are to be used to assess trade-offs between economic and environmental goals. Otherwise, the accounts can end up reflecting the costs of protecting the environment without in any way reflecting the benefits.

***Green GDP :*** Developing a gross domestic product that includes the environment is also a matter of controversy. Most people actively involved in building environmental accounts minimize its importance. Because environmental accounting methods are not standardized, a green GDP can have a different meaning in each project that calculates it, so values are not comparable across countries. Moreover, while a green GDP can draw attention to policy problems; it is not useful for figuring out how to resolve them. Yet, most accounting projects that include monetary values do calculate this indicator.

***Toward Consensus on Method :*** Environmental accounting would receive a substantial boost if an international consensus could be reached on methodology. The UN Statistics Department has coordinated some of the ongoing efforts toward this end since the 1980s. In 1993, the UN published the System for Integrated Economic and Environmental Accounting (SEEA). In fact, SEEA is now undergoing revision by the so-called 'London Group,' comprised primarily of national income accountants and statisticians from OECD countries. The group's work will be an important step toward consensus on accounting methods, but the process will be lengthy.

# **Chapter 2**

## **AUDIT CRITERIA AND TOOLS**

### **Basic principles**

#### **Characteristics**

An environmental audit has the following characteristics;

a. **Comprehensive Methods.** An environmental audit requires the use of detailed procedures and methodology. It must be conducted using wide-ranging protocols and fixed procedures, to ensure the collection of the required data and the documentation and verification of that information.

b. **Evidence and Verification.** The concept of evidence and verification of environmental scarcity is a main element in an environmental audit. The audit team must verify all collected data and information through direct field inspection.

c. **Appropriate Measures and Standards.** The standards and measures of environmental performance must be adjusted to be relevant to the organization or activity and the production process being audited. An audit is meaningless unless there are accepted standard against which performance can be compared.

d. **Written Documents.** Reporters should contain factual observations and reasoning, and the documentation of the processes. All findings should be presented clearly and accurately, based on valid and documented evidence.

#### **The Keys to Success**

a. **Supports from Management.** The first step in implementing an environmental audit is to obtain management commitment. Implementation can be ineffective without the strong support from management. Moreover, the audit team should have the freedom to study potentially sensitive environmental problems.

b. **All Parties Participation.** A successful audit requires the commitment and cooperation of all members of the organization, since the assessment of environmental performance will cover all aspects of a wide variety of jobs.

The book is a simple way to know the registration procedure under International Organization for standardization (ISO) norms. It highlights how ISO series arose, its importance to the globalization to our economy and the consequent international competition for our products in terms of quality, productivity and environmental safety. In Bangladesh any developmental projects should have clearance from Department of Environment (DoE) before it takes off and quality assurance certificate from Bangladesh Standard and Testing Institute (BSTI) to introduce the products in market. The book is not only designed for registration from international body but also dig out obligation for local quality assurance body like DoE and BSTI.

Environmental auditing is essential in any developmental activities and thus a course on environmental auditing is necessary in disciplines of environmental concern. This book is a first time attempt in Bangladesh on environmental auditing and designed for undergraduate and post graduate programme on environmental science and management in Universities and Colleges. However the book also presents an overview on environmental auditing to be interesting for management professionals.

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**AOSED**

(An Organization for Socio-Economic Development)

A Grassroots level Organization active in the Southwest Coastal Region of Bangladesh for conserving the environment and ensuring the access of people's right to Natural Resources towards alleviation of Poverty.