

CHAPTER 18

Principles and Practices of Environmental Auditing in Kenya

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18.1 Introduction

This chapter examines Environmental Monitoring (EM) and Environmental Auditing (EA) as management tools for continuous environmental improvement in organisations and also as post Environmental Impact Assessment activities. For purposes of providing insights into the topic, Environmental Monitoring and Auditing steps depicting a manufacturing industry set up is presented. The latter part of the chapter discusses briefly the challenges facing the application of Environmental Monitoring and Auditing in Kenya. Environmental issues such as regulatory requirements, clean up of pollution, potential and current levels of environmental hazards and risks among others have prompted organizations to apply environmental monitoring and auditing to address the emerging environmental concerns. Organisations that have well established and effective Environmental Management Systems (EMS) undertake Environmental Monitoring and Auditing as a way of continuously improving on their Corporate Environment Management. Such undertakings are not and should not necessarily be motivated by regulatory compliance, but must be driven by an inherent organisation culture of environmental consciousness.

18.2 Environmental Monitoring

Environmental Monitoring can be defined as a continuous or periodic determination of actual and potential effects of any activity or phenomenon on the environment, whether short-term or long-term. As such it entails continuous and systematic collection of environmental data, which is analysed and used for decision-making. Environmental monitoring could also vary across and within projects depending on the scope and objective of the monitoring programme. Generally, two types can be distinguished on this basis, thus: baseline and effects monitoring. The former implies measurement of environmental parameters during a pre-project period for purposes of determining the nature and ranges of natural variation and

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to establish, where appropriate indicators for possible changes. The latter on the other hand involves the measurement of environmental parameters during project implementation so as to detect changes that can be attributed to the project.

What is monitored and the time of monitoring vary among projects and industrial processes and as such it is not possible to come up with monitoring steps that will be uniform across projects and industrial processes. However, the following schematic diagram (Figure 1) provides an overview of the general steps that may be considered while designing an environmental monitoring system.

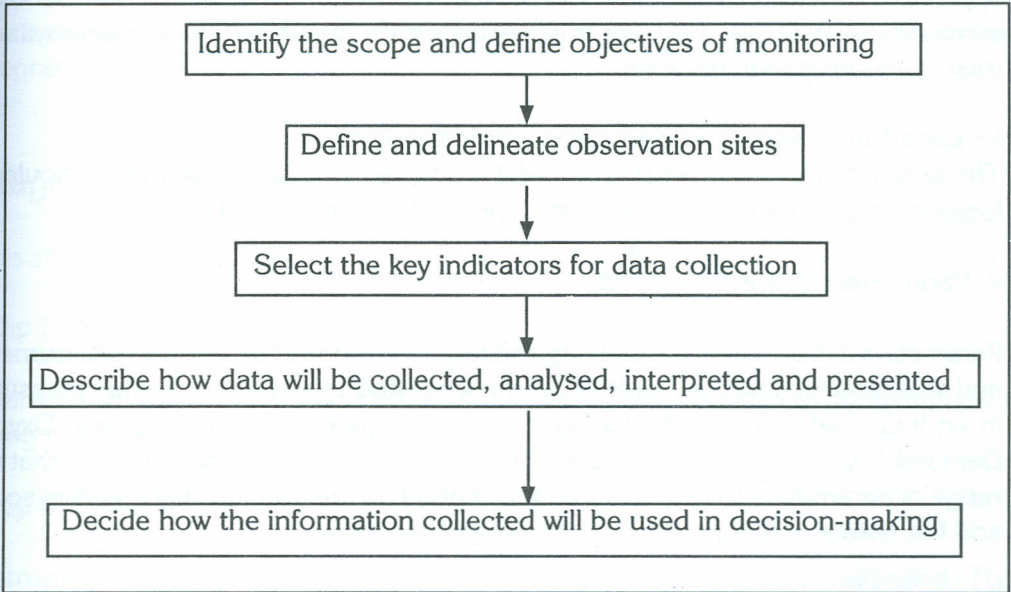


Figure 1: Steps in designing an Environmental Monitoring System

As an example, an Industrial Plant provides in-depth information on the steps to be considered when designing a monitoring system. Such a system can be divided into four stages: planning, preparation, implementation and data analysis and reporting.

Stage 1: Planning

The planning stage is generally divided into seven steps as described below:

i. Formulation of the programme

The monitoring objective should be clearly defined and ranked in order of importance. These objectives should also be endorsed by the top management in order to ensure that necessary financial and logistical support is provided.

ii. Familiarization with the industrial process

Monitoring personnel must be familiar with the industrial process and the plant. They should therefore obtain or prepare process flow diagrams; identify and quantify the process inputs and outputs. They should also prepare a list of parameters to be monitored.

iii. Consideration of environmental and ecological conditions

Existing environmental legislation that is in place should be checked and, if applicable, emission standards noted. The extent of ecological fragility of the surrounding area may have an implication on the waste emission pathways and their monitoring requirements.

iv. Location of sampling and measurement points

The positions from which sampling and measurements are to be made should be located on the process flow diagrams obtained or constructed.

v. Parameters to be measured

Parameters to be measured may vary and require a range of procedures, instruments and analytical techniques. Some of the most common parameters that are measured in an industrial plant are Biological Oxygen Demand (BOD₅), Chemical Oxygen Demand (COD), pH, Total Organic Carbon (TOC). It is important to note that the range of parameters to be measured will depend on the monitoring objective, scope and the nature of the industrial plant (type of process).

For a sewage treatment works, parameters such as BOD₅, COD, TSS (Total Soluble Solids), Faecal coliforms, pH, water colour, oil and grease, relevant anions and cations (such as total nitrogen, ammonia, nitrate, chloride, phosphate, Na, Bo, Mg) are routinely measured as part of the monitoring activities. Considering the sewage treatment process, the parameters analysed must be within acceptable standards by the time the sewage becomes the final effluent. Attaching a value and comparing the parameter value to the standard is the best way of making objective recommendations. In really efficient systems, it should be possible to use the final effluent as irrigation water or for domestic purposes like bathing or flushing water closets. Attainment of such systems remains the challenge for research and policy in pursuit of sustainable and strategic use of environmental resources like water in this case.

vi. Scope of Monitoring

The parameters to be measured must cover the entire cycle of operations in the process and provide reliable results. A pilot run may be necessary in order to

determine the frequency of sampling and measurements. It is important to obtain a specimen that is representative of the process stream in composition and quality. For this reason, it is necessary to take at least duplicate samples and readings.

vii. Preparation of monitoring proposal for approval

The proposal should include among other things the monitoring objective, scope and methodology, estimated total time for personnel (including preparation, implementation and reporting), contingency factors considering the problems that are likely to be encountered in the process for example instrument malfunction. The proposal should also show the overall duration, with start and completion dates for all stages as well as the resource requirement implication for the entire monitoring programme.

Stage 2: Preparation

This stage involves the following steps as described below:

Step i: Documentation

There has to be established a system for recording results. This can be done manually, using chart recorders, proformas or mechanically by way of data loggers.

Step ii: Instruments

Instruments should be checked and where necessary installed and calibrated. The range of instrument readings and chemical concentrations should be estimated when possible. Dry runs on sampling equipment should be done to check for leaks and any other malfunction.

Step iii. Procedures for collection of samples

Sample containers should be selected and prepared in accordance with good laboratory practice. Items such as reagents should be made up for subsequent chemical analysis.

Step iv. Substances for calibration

Standards for chemical analyses and other important measurements should be prepared, and accessories such as chromatographic columns must be available.

Step v. Health and safety requirements

This is particularly important when considering that some of the reagents being used and emissions being sampled are harmful to the human health. Adequate protective clothing should therefore be provided. All electrical supplies must be intrinsically safe when connected to the instruments and sampling equipment.

Step vi. Co-ordination of monitoring programme and process operation:

Instructions must be given to process operators to ensure that the monitoring programme and process operation are co-ordinated.

Stage 3: Implementation

To implement a monitoring system, the following steps are critical:

Step i. Briefing of staff on the monitoring programme

The leader of the monitoring programme should brief all staff involved in monitoring, making sure that health and safety requirements are met.

Step ii. Synchronizing monitoring programme and process operations

Periomas should be given to the appropriate staff, and the timing of the monitoring programme should be synchronized with the process operations. Monitoring will only be objective if there are process operation outputs.

Step iii. Sampling and instrumentation checks

All sampling and measurement instruments must be connected, calibrated and ready for operation.

Step iv. Process sampling and measurement

Sampling, instrument measurements and calibration should begin whenever possible, together with visual and other observations.

Step v. Recording of data

All sample containers must be correctly numbered and related to other measurements made at the time when the sample is taken. Any change in the calibration of instruments during monitoring period must be identified, together with the time in which it occurred during the test run.

Step vi. Chemical Analysis

The samples that have been collected should be analysed following standard procedures. In Kenya, industrial plant monitoring can be applied in manufacturing process industries for example sugar cane, beer, and pharmaceuticals among others.

Stage 4: Data Analysis and Reporting

Data analysis is intended to generate information that would be used in decision-making in line with the ultimate objective of monitoring and sustainable development. Some key steps include:

Step i. Verification of raw data

Any anomalies in the raw data should be analysed to find out their sources. Possible sources include intermittent sensor failure of thermocouples during temperature measurements, partially blocked filters or pumps during sampling among others. Thus, this may involve verification of instrumental accuracy and work-up procedures.

Step ii. Analysis of raw data

The analysis of raw data should be tailored to meet the objectives of monitoring. For discrete sampling, instantaneous values can be converted to means, maxima and minimum or standard deviations over chosen interval. Data from continuous logging and processing can be reduced to 3-min, hourly or other relevant intervals, as means, maxima and minima, standard deviations or variances. For continuous and composite sampling, time-and flow-averaged values over the period of sampling can be determined. The values may then be expressed in terms of mass concentration. Trends in values that indicate process malfunction and the need for corrective action should be noted.

Step iii. Monitoring Report

For major investigations, the report should include an executive summary, giving an overview of the investigation, which covers the objectives, conclusions and recommendations. The options for operations and process improvement, with estimated costs, together with the advantages and disadvantages, should be presented in a way that enables the management to make the best decision about any further action. The following format may be useful while writing the monitoring report:

- ⊙ Introduction: This entails giving the background and reasons for the investigation and objectives. Procedures adopted to meet the objectives
- ⊙ Sampling programme: This involves giving relevant diagrams of the plant, the apparatuses used and the sampling and analytical procedures
- ⊙ Results: These should generally be presented in standard graphic forms after analysis of the raw data such as tables, graphs etc.
- ⊙ Discussion: This should provide a clear interpretation of the results, the implications and the reasons for the anomalies (if any)
- ⊙ Conclusions: This must always be confirmed by the results obtained from the monitoring programme and not be based on subjective thinking.
- ⊙ Recommendations should be based on the conclusions
- ⊙ References, where appropriate, should be given to substantiate the monitoring report.

18.3 Environmental Auditing

Environmental auditing is an organisation's means of gathering environmental information to see whether or not the organisation is environmentally sound. The main objective is to assess an organisation's activities and services in relation to:

- ⊙ Compliance with relevant statutory and internal requirements
- ⊙ Promoting good environmental management
- ⊙ Establishing the performance baseline for developing an environmental management system (EMS)
- ⊙ Maintaining credibility with the public
- ⊙ Raising staff awareness and enforcing commitment to environmental policy, and
- ⊙ Exploring improvement opportunities

For Kenya, the Environment Management and Co-ordination Act of 1999 (EMCA, 1999) requires that an environmental audit study be undertaken on:

- i. On-going projects commenced prior to the coming into force of these regulations,
- ii. New projects undertaken after completion of an EIA study report. It is the responsibility of the project proponent to undertake the Environmental Audit study. They are thus expected to take all reasonable measures to mitigate any undesirable effects whether anticipated or not contemplated in the EIA report.
- iii. However, an environmental audit can also be undertaken in the interest of an individual or a member of the public after showing reasonable cause to National Environment Management Authority (NEMA).

Types of Environmental Audits

On the basis of why, when and by whom auditing is done, two major types of audits can be distinguished:

i. Compliance or Control Audit

This kind of audit is used by regulatory bodies such as the National Environment Management Authority (NEMA) whenever it deems it necessary to check compliance with specific environmental practices or to verify self-auditing reports. A control audit may for example confirm that an environmental management plan of a project is being adhered to. It may also verify the adequacy of the environmental management plan in mitigating negative impacts of a project. The Environmental Management and Co-ordination Act, 1999 under section 68(4) requires the owner of a premise or the operator to prepare and submit an environmental audit report to NEMA.

ii. Self or System Audit

Unlike regulatory audits that are usually motivated by compliance to legally prescribed environmental practices, self-audits are conducted internally by organisations in order to continuously improve on their environmental management practices. Thus, the existence of an organisational Environmental Management System is necessary. Further, environmental audits can take various forms depending on the organisational aspects being examined (Table 1).

Table 1: Nature of Environmental Audits

Nature of Audit	Purpose
Waste Audit	Provides assurance to corporate management that the environment and public are protected against acute or chronic hazards
Occupational, Health and Safety Audit	Ensures that workers are protected from being hurt or killed in an accident or gradually harmed as a result of long-term adverse working conditions, including protection from acute or chronic health hazards.
Product Safety Audit	To provide assurance to corporate management that consumers are protected from being hurt or killed by the purchase or use of a product.
Risk Audit	Focuses on preventative measures that can be taken to reduce the level of risk an organisation has
Energy Audit	Examines energy use in an organisation with a view of identifying areas that may require improvement.

Other more specific examples of environmental audits could include:

- ⊙ Audits on disaster mitigation mechanisms for example, auditing the mitigation mechanisms for primary schools in land slide prone areas in Muranga District.
- ⊙ Noise pollution and reduction measures in Nairobi's Central Business District
- ⊙ Audits on environmental performance of Government ministries
- ⊙ Water use audits in selected service or production firms.

As an example, the following questions would be critical when conducting a product safety audit (Box 1), while the focus on clean production mechanisms is outlined in Box 2.

Box 1: Product Safety Audit Sample Questions

- i. Does the organisation have in place any laws, policies, regulations that govern product production?
- ii. What is done to ensure that acceptable product quality is attained?
- iii. Which mechanisms are in place to ensure that the product is safe for consumption?
Are there any guidelines on packaging and contamination prevention?
- iv. Does the organisation have an environmental management committee?
- v. Is environmental management an integral part of the firm's production mandate?
- vi. To whom is the firm accountable when it comes to environmental management?
- vii. Does the organisation undertake routine environmental reporting?
- viii. What is the attitude of the organisation on environment and auditing?
- ix. What can be done to improve the situation?

Box 2: Cleaner Enterprise Programme (CEP)¹ Audit Methodology

Key elements in this approach are:

1. Securing top management commitment to audit requirements
2. Appointing a waste minimization team and training it in waste reduction audit and regulatory compliance
3. Conducting waste surveys
4. Identifying and brainstorm on problem areas
5. Identifying areas for improvement
6. Selecting the most techno-feasible waste minimization opportunities
7. Analysing and reviewing the present environmental and business practices (knowledge)
8. Developing and evaluating waste minimization initiatives (creativity)
9. Developing an Environmental Management Plan
10. Implementing waste minimization measures
11. Monitoring and targeting the project performance

Source: Kenya National Cleaner Production Centre (KNCPC): The Cleaner Production Enterprise Programme, 2004. UNIDO/UNDP/GoK.

18.4 Planning and Executing an Environmental Audit

Auditing generally requires the following preliminary activities:

- ⊙ Commitment to Environmental Audit by the top management of the organisation
- ⊙ The scope of the audit must be defined in terms of audit site, boundary, objectives and areas.
- ⊙ The client appoints the audit management committee whose primary duties are to secure the necessary logistics and resources for the audit, oversee the audit process, and appoint an audit team leader (a lead auditor). The team leader prepares an audit protocol, to ensure that all that is needed is adequately covered and documented. The main responsibility of the leader is to ensure successful conduct and completion of the audit study as stipulated in the terms of reference.
- ⊙ In conjunction with the committee, the team leader appoints the audit team members. The appointment process has to ensure the team possess the overall experience and expertise needed to conduct the audit. In case the audit includes several sites, site facilitators have to be selected along with the

¹The CEP brings together industrialists, regulators, Kenya National Clean Production Centre and consultants to solve environmental issues relating to production systems

audit team members to provide support to the audit team.

Procedure for Conducting an Environmental Audit

An Environmental Audit is typically undertaken in three phases outlined below.

Phase I. Pre-Audit Activities

The main objective of pre-audit activities is to develop an audit plan for the on-site activities and to make the necessary arrangements for the on-site audit. This may require making an initial site visit in order to familiarise with it and operations, prepare the audit protocol and questionnaires. An audit protocol acts as a guide or a checklist to ensure that all relevant issues are covered, standards of performance are in place, list of hazardous materials on site are documented and list of wastes is available. Another pre-audit document is the "Client Request Form". The form details all relevant documents that the lead auditor would require from the organisation or facility, to be included in the final report as appendixes. These include company registration certificate, past activities and history, ISO certification (if any), Kenya Bureau of Standards licence, business permit(s), and process flow diagrams. The flow diagrams should detail the kind of raw materials, products and wastes generated.

The audit plan should address the questions of:

- ⊙ Where: Audit site and boundary
- ⊙ What: Scope and objectives
- ⊙ How: Questionnaires, interviews, observation of sites and facilities, sampling and laboratory analysis of defined environmental variables, photography and content analysis from secondary data. Participatory approaches (for example participatory rural appraisal and participatory action research) are also important in determining the effect of facility or project on the public.
- ⊙ Who: Audit team and site facilitation arrangement
- ⊙ When: Audit schedule and milestones

Phase II On-site Audit

The onsite audit constitutes the actual auditing. The main objectives are to verify legislation and regulatory compliance, assess internal policy and procedural conformance, establish current practice status and identify areas for improvement. Although an audit does not need to cover all aspects of the environment at once, in Kenya the National Environment Management Authority (NEMA) has provided

guidelines on what an audit study must cover. Although facilities differ, the following areas are accepted as generally cutting across facilities and must be covered in any audit study to be submitted to NEMA:

- ⊙ Socio-economic aspects of the facility, which includes such items as taxes, operation bills, gender distribution of employees, corporate social responsibility practices, etc.
- ⊙ The details of equipment, machinery and their functions
- ⊙ Records and level of staff awareness on environmental health and safety issues
- ⊙ The designation and responsibilities of those operating the facility
- ⊙ Organogram to show material and energy flow within the system
- ⊙ The proficiency of operators in terms of working hours and arrangements
- ⊙ Disaster preparedness and management plans for the facility
- ⊙ Inspection history of the facility
- ⊙ General house keeping such as sources of leakages within the manufacturing process; condition of the factory floor in terms of liquid spillage and clean-up responsibilities.
- ⊙ Environmental Management Plan including Waste management procedures.
- ⊙ Evaluation of compliance to established environmental laws, policies and guidelines.
- ⊙ Conclusions and Recommendations.

Like any good research study, logistical and ethical requirements should be adhered to at all stages of auditing. Good practice demands that the following issues be addressed:

- ⊙ Opening of the meeting consisting of personal introduction of the team members, presentation of the audit scope and objectives, outline the audit approach and methodology and address any questions or concerns of the site personnel. It is important to ensure that a good rapport with the site personnel is established during the opening of the meeting.
- ⊙ Document review of environmental policy, operation procedures, monitoring records, health and safety including occupational accident records, minutes of environmental committee meetings, staff training records and previous audit reports among other documents. The documents are reviewed to evaluate whether the contents are current, properly completed, meet relevant policy and legal requirements, signed and dated.
- ⊙ Detailed site or facility inspection using the audit protocol (check list) to find out evidence on such areas as conformance with national legislative requirements, conformance with internal policies, procedures and guidelines,

status of operational practice.

- ⊙ Staff interviews so as to obtain current and past practices, awareness of requirements and expectations, compliance with (or lack of it) statutory and departmental requirements, comments and suggestions.
- ⊙ Review audit evidence before leaving the site or facility in terms of information relevance and adequacy. While reviewing the evidence, any finding, which is not clear to the audit team should be substantiated. The audit team also evaluates at this stage areas of non-compliance (if any) requiring immediate mitigation and those requiring follow up.
- ⊙ Close the audit meeting by examining the summarised audit findings together with the site or facility manager. The audit team leader should also highlight the system strengths and weaknesses while identifying areas requiring immediate mitigation and those for follow up. Any staff concerns and questions relevant to the audit should also be addressed before the audit team leaves the site or facility. Schedule of reporting the findings should also be agreed upon between the audit team and the site management.

Phase III: Post-Audit Activities

The objective of post audit activities is to produce an audit report with findings and recommendations and also formulate an action plan for areas requiring improvement. The activities can be divided into four areas:

i. Collation of information and follow up of outstanding issues

The information that should be organised includes completed questionnaires, operational documents, on-site audit protocols, environmental reports, process flow diagrams and facility (site) drawings. Copies of records, photographs and detailed inspection and interview notes should also be organised as well.

ii. Preparation of the audit report

Naturally, at the completion of the audit exercise and, prior to preparing the audit report, the audit team should meet with the auditee's management so as to obtain a clear understanding and acknowledgement of the factual basis of the audit findings. Preliminary findings are shared and disagreements resolved professionally. However, the final decision on the audit findings remains the responsibility of the lead auditor, and must not contravene audit requirements and guidelines as stipulated by NEMA. An audit report should generally consist of an executive summary, introduction and background of the audit, audit scope and objectives, description of audit approach and methodology, summary of audit findings, environmental management plan (EMP), recommendations and conclusions. According to the National Environment Management Authority, an environmental audit report shall contain but not be limited to the following information:

- ⊙ Type of activity being audited
- ⊙ An indication of materials used, and the final products, by products, and waste generated
- ⊙ The past and present impacts of the project
- ⊙ The responsibility and proficiency of the operators of the project
- ⊙ Existing internal control mechanisms to identify and mitigate activities with a negative environmental impact
- ⊙ Existing internal control mechanisms to ensure the workers' health and safety,
- ⊙ The existence of environmental awareness and sensitisation measures, including environmental standards, regulations, laws and policies, for the
- ⊙ Status of compliance with environmental legislation of the land, for example EMCA, 1999 for Kenya
- ⊙ Status of conformity with internal environmental policies, procedures and guidelines
- ⊙ Status of good environmental practices implementations
- ⊙ Level of staff awareness of operational issues relating to environmental performance
- ⊙ Overall status of environmental performance
- ⊙ Detailed recommendations for corrective activities, their cost, schedule and mechanisms of implementation
- ⊙ A simplified (non-technical) summary of the audit outlining key findings, conclusions and recommendations.

iii. Circulation of the draft audit report for comments

It is the responsibility of the lead auditor to send the report to the client, who then determines its further distribution. Unless the client thinks otherwise, the auditor should also receive a copy of the report. Distribution of the report outside the auditee's organisation requires the consent of the client. Any comments received back by the audit team and are considered important should be incorporated before producing the final report. The final report should be submitted in ten (10) copies either spiral or hard bound to NEMA, one (1) copy to client, and one (1) copy to consultant.

iv. Following up an environmental audit report action plan

Upon endorsement of the audit report by NEMA, the action plan formulated in the report is operationalised with appropriate targets and objectives for environmental improvements. This should be done in consultation with all key stakeholders. Samples of environmental management plans are shown in tables 2, 3 and 4. Tables 3 and 4 represent the format normally followed according to the EA regulations.

Table 2. Sample of an Environmental Management Plan for a Tented Camp

Activity	Identified Impacts	Mitigation Measures	Responsibility
Premises	Contamination by roof or pipe leakage	Regular inspection of the buildings	Proponent
Energy supply	Electrical circuits LGP leakage	Regular inspection of the installations	Proponent
Water supply	Destruction of materials by flooding	Regular inspection of the water pipes	Proponent
Incoming materials store	Pollution of the stores	Regular checking for leakages; Removal of leaking containers cleaning using dispersants	Proponent
General habitat	Impact on fauna and flora	Salvage threatened biota	Proponent
Occupational health and safety	Fire outbreaks	Install fire fighting equipment	Proponent
Land use and settlement	Pollution of the land and settled areas	Ensure Fire Extinguishers are serviced regularly Reduce pollution to minimal levels	Proponent

NB: A column on cost implications and time frame should be included.

Table 3. Sample of an Environmental Management Plan for a School

Activity	Identified Impacts	Mitigation Measures	Approx. Cost of Mitigation (Kshs)	Responsibility	Timing Target Date
Effluent discharge compliance	Non compliance of effluent discharge to natural water bodies	Carry out periodic sampling and analysis for compliance	Kshs.3,000	Principal	Annually
Energy supply	Electrical circuits LGP leakage	Regular inspection of the installations	10,000	Principal	One year
Operational health and safety	Fire outbreaks	Ensure Fire Extinguishers are serviced regularly	9,000	Principal	One year
Land use and settlement	Pollution of the land and settled areas by waste water	Reduce pollution to minimal levels	7,00	Principal	One year

Table 4. Sample Environmental Management plan for a Steel Industry

Potential Im-pacts	Mitigation Measure	Responsibility For Mitigation	Monitoring Plan	Frequency of Monitoring	Cost Kshs.
1. Workforce accidents by unsafe working practices	Policing of the workers to ensure provisions of relevant statutes are complied with.	Project propo-nent	Engage an EHS consult-ant	Monthly basis	20,000/=
2. Standard work provisions and exposure	Training of staff on EHS	Project pro-ponent/ EHS trainer	Contract an EHS training firm	2 employees to be trained per month	30,000/=
3. Deviation from standard workplace and EHS regulatory measures dur-	Adhere to the provisions of the waste management plan.	Project propo-nent / NEMA / Directorate of OHS Ministry of Labour	Environmen-tal Audit & Occupational Health and Safety Audit	Annually	20,000/=
ing operation					
4. Air, dust and noise pollution	Switching off of machines when not in use.	Project propo-nent	Comply with EMCA Act Public Health Act	Daily	NIL
5. Fire outbreak and oil spills	???	Private fire fight-	???		
6. Effluent wastes management during opera-	Construction of pre-treatment plant as a waste	ing stakeholder Project propo-nent	Comply with EMCA Act, Local Author-	Every two months During project operation	50,000/=
tion	management system through		ity Act on sewerage	period	20,000/=
	which the waste water shall be re-used or recycled				
7. Aesthetics of the project dur-	-Landscaping -Lawn management.	Project propo-nent	EMCA Act and Public Health Act compliance	During the project operation	30,000/=
ing operation					

18.5 Status of Environmental Monitoring and Auditing in Kenya

Environmental monitoring and auditing became a legislative requirement in Kenya following the passage of Environmental Management and Co-ordination Act in 1999. Like any other new legislative provision, its effective implementation remains a great challenge. The problems afflicting effective implementation of monitoring and auditing include: weak capacity of implementing agencies, lack of regulatory framework of professional practice and low levels of awareness among proprietors. Further, the National Environment Management Authority (NEMA) lacks adequate supply of skilled personnel and associated technology to be able to ensure compliance with audit regulations. The environmental authority cannot effectively review all the audit reports and make follow-up to ensure that recommended corrective measures are implemented.

The enforcement of monitoring and auditing requirements is also constrained by resistant proprietors. Most of the proprietors have not yet embraced the principle of sustainable development. They perceive environmental auditing as unnecessary expense and disincentives to development. Therefore, they do not accord monitoring and auditing the much needed attention and requisite resources. The problem is further compounded by lack of regulatory framework on monitoring and auditing. Therefore, there is no institutional framework to guarantee acceptable professional standards in monitoring and auditing practice from both the proprietors and professionals. As a result most audit reports are not standardized and are of low quality, despite the provisions of environmental audit regulation.

To effectively enforce monitoring and auditing provisions in Kenya, further concerted efforts should be made to build the capacity of the environmental authority, standardize and enforce professional practice and raise awareness among the proprietors. For capacity building in environmental auditing, quality control of accredited training institutions needs to be enforced. All public who transfer to NEMA must be allowed only after undergoing the three-week long Environmental Impact Assessment and Auditing course prescribed by NEMA. In addition, government should budget for more staff for NEMA to help effectively deal with audit reports and respond to customer concerns within acceptable time limits that would not unnecessarily interfere with businesses.

18.6 Conclusion and Recommendations

From an Environmental Impact Assessment point of view, Environmental Auditing is a management tool that aims to determine how far the activities carried out with respect to a project conform to the statements made in the EIA study report. A formal EIA audit can therefore only be commenced after partial or complete project implementation. Auditing also provides feed-back on the efficiency of the

EIA in terms of the nature and accuracy of impact predictions, and evaluates the effectiveness of the EIA process in order to identify areas that could be revised or refocused for future assessments of the same nature.

It is also worth noting that monitoring does not necessarily precede environmental auditing. For example, projects established prior to the EMCA, 1999 have to be audited, environmental weak points identified and corrected before a monitoring programme is established for future audits. As interdependent tools, the main objectives of environmental monitoring and auditing are to:

- ⊙ Check what actual impacts are occurring during project implementation
- ⊙ Ensure that the anticipated impacts are maintained within the levels predicted
- ⊙ Ensure that conditions of EIA approval are adhered to
- ⊙ Ensure that impacts that were not anticipated during scoping and impact prediction are effectively managed or mitigated before they become a problem
- ⊙ Ensure that the benefits expected from the EIA are achieved as the project proceeds
- ⊙ Optimise environmental protection through good practice at all stages of the project
- ⊙ Generate information that can be fed into other programmes such as state of the environment reports.
- ⊙ Provide information for periodic review and alteration of environmental management plans

Although Environmental Monitoring and Auditing are important tools for environmental management, their application in organizations is still low. This could be ascribed to several factors one of which is the tradeoffs that have to be made between economic gains and environmental protection. More often than not, most decisions tend to be tilted in favour of economic gains. As such desired benefits from Environmental Monitoring and Auditing programs in Kenya will depend to a great extent on demonstrated political and corporate will to enforce the required standards.

18.7 Review Questions

- i. Critically examine the kind of information you would collect if you were to conduct a waste audit of Dandora Site.
- ii. An environmental audit for any given facility is not necessary as long as a good environmental impact assessment was done. Discuss.
- iii. How would you go about auditing student safety in the halls of residence at your university?

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