



NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF SCIENCE AND TECHNOLOGY

COURSE CODE: ESM 342:

**COURSE TITLE: ENVIRONMENTAL IMPACT ASSESSMENT AND
ENVIRONMENTAL AUDITING**

YELLOW---SORTED
.START FROM NON-YELLOW

Course Code: ESM 342

Course Title: **Environmental Impact Assessment and Auditing**

Course Developer/Writer : Cecilia Medupin

National Open University of Nigeria,
Lagos State

Course Editor:

Programme Leader: Prof. Kehinde T. Obidairo
Dean, School of Science and Technology
National Open University of Nigeria,
Lagos State

Course Coordinator: Cecilia Medupin
National Open University of Nigeria,
Lagos State

NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria

Headquarters

14/16 Ahmadu Bello Way

Victoria Island

Lagos

Abuja Annex

245 Samuel Adesujo Ademulegun Street

Central Business District

Opposite Arewa Suites

Abuja

e-mail: centralinfo@nou.edu.ng

URL: www.nou.edu.ng

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Introduction

ESM 342: Environmental Impact Assessment and Auditing is a 2 credit course for ENVIRONMENTAL SCIENCE AND RESOURCE MANAGEMENT.

The course is broken into **2** modules and **7** study units. At the end of this course, a student is expected to be conversant with the following terms: environmental impact assessment, definition; environmental auditing; types of environmental audit, audit report, and the legislation. This course further provides insight on the audit processes and terms like the pre-audit preparation, main audit and post audit activities. In environmental impact assessment, students will learn the processes involved in carrying out an EIA, the stakeholders involved and the challenges of EIA faced by various nations. Through this course, students will be equipped to identify key requirements when either an audit is to be carried out or an environmental impact assessment. It is noteworthy that an Environmental audit cannot replace an EIA or vice-versa. EIA is carried out before a project is developed while an environmental audit is carried out on a developed project so as to monitor its progress and to maintain good activities.

The course guide, therefore, tells you briefly what the course: ESM342 is all about, the types of course materials to be used, what you are expected to know in each unit, and how to work through the course material. It suggests the general guidelines and also emphasises the need for self assessment and tutor marked assignment. There are also tutorial classes that are linked to this course and students are advised to attend.

What you will learn in this Course

The overall aim of this course, **ESM 342**, is to introduce students to the introduction of environmental impact assessment and environmental auditing and the variables associated with them. During this course, you will be equipped with definitions of environmental auditing, environmental impact assessment- terminologies such as screening, scoping, mitigation as well as different levels of operation in the environmental systems. The role of the environmental auditing is important to monitor projects that have been developed and to seek ways of maintaining such systems through compliance with legislative requirements and national or international standards. In this course the importance of legislation concerning the various tools are emphasized. For environmental impact assessment, it is important to realise that there are mandatory projects that require an EIA and those that do not require an EIA. There are various steps in the EIA which ensures that the project has little or no environmental impact on the land, water, air, soil, human beings, biodiversity etc. Finally, the course provides a brief presentation on qualities of a good environmental audit report and provides case study samples from various countries and companies.

Course Aim

This course aims to give students an in-depth understanding of environmental auditing and environmental impact assessment. It is hoped that the knowledge would equip students with the conceptual issues of environmental impact assessment and auditing and also provide practical examples through the case studies of environmental impact assessment from other countries.

Course Objectives

Note that each unit has specific objectives. Students should read them carefully before going through the unit. You may want to refer to them during your study of the unit to check on your progress. You should always look at the unit objectives after completing a unit. In this way, you can be sure that you have done what is required of you by the unit.

However, below are overall objectives of this course. On successful completion of this course, you should be able to:

- Define auditing and environmental auditing
- Differentiate between the various types of auditing
- Describe the stages of the audit process
- List the characteristics of a good audit report
- List the keys to a successful audit
- Explain the challenges of carrying out environmental audit in Nigeria
- Give an account of the laws concerning environmental audit and environmental impact assessment in Nigeria
- Describe the functions of FEPA in relation to environmental audit
- List the functions of FEPA in relation to environmental auditing

- Enumerate the role of NESREA as an environmental regulator

- Explain functions of the International Standard Organisation in environmental auditing
- Identify the shortcoming of environmental auditing in Nigeria
- Identify the shortcoming of EIA in Nigeria
- Compare the application of EIA in Nigeria with other developing nations

Working through this Course

To complete this course, you are required to read the units, the recommended text books, and other relevant materials. Each unit contains some self assessment exercises and tutor marked assignments, and at some point in this course, you are required to submit the tutor marked assignments. There is also a final examination at the end of this course. Stated below are the components of this course and what you have to do.

Course Materials

The major components of the course are:

1. Course Guide
2. Study Units
3. Text Books
4. Assignment File
5. Presentation Schedule

Study Units

There are 7 study units and 2 modules in this course. They are:

MODULE 1 ENVIRONMENTAL AUDIT

- Unit 1 Environmental Audit
- Unit 2 Environmental Audit Process
- Unit 3 Legal Aspects

MODULE 2 ENVIRONMENTAL IMPACT ASSESSMENT

- Unit 1 Environmental Impact Assessment
- Unit 2 EIA Processes
- Unit 3 Origin of EIA Practice

Unit 4 Case studies of EIA

Recommended Texts

These texts will be of immense benefit to this course:

The Presidency Federal Environmental Protection Agency National Guidelines for Environmental Audit *Decree 59,1992 as amended Decree No.14 of 1999.*

European Industrial Gases Association (2005)*Environmental Auditing Guide IGC Document 135/05/e, Revision of part of TN 515/95*<http://www.eiga.org>

1990 Constitution of the Federal Republic of Nigeria

Federal Environmental Protection Act of 1988

Environmental Impact Assessment Act of 1992

National Policy on the Environment of 1998

Standards Organisation of Nigeria Act of 1971

LASEPA Edict of 1996

Agenda 21

ISO 14001 Environmental Management Systems

Effluent Limitations Regulations of 1991

Pollution Abatement in Industries and Facilities Generating Wastes Regulations of 1991

National Guidelines for Environmental Audit of 1999

National Guidelines on Environmental Management Systems of 1999

Environmental Guidelines and Standards for Petroleum Industry in Nigeria

Assignment File

The assignment file will be given to you in due course. In this file, you will find all the details of the work you must submit to your tutor for marking. The marks you obtain for these assignments will count towards the final mark for the course. Altogether, there are 23 tutor marked assignments for this course.

Presentation Schedule

The presentation schedule included in this course guide provides you with important dates for completion of each tutor marked assignment. You should therefore try to meet the deadlines.

Assessment

There are two aspects to the assessment of this course. First, there are tutor marked assignments; and second, the written examination.

You are thus expected to apply knowledge, comprehension, information and problem solving gathered during the course. The tutor marked assignments must be submitted to your tutor for formal assessment, in accordance to the deadline given. The work submitted will count for 40% of your total course mark.

At the end of the course, you will need to sit for a final written examination. This examination will account for 60% of your total score.

Tutor Marked Assignments (TMAs)

You need to submit all the TMAs as provided in the ILMS in your portal. When you have completed each assignment, submit online and you can access your grades immediately before the deadline. If for any reason you cannot complete your assignment on time, contact your tutor before the assignment is due to discuss the possibility of extension. Extension will not be granted after the deadline, unless on exceptional cases.

Final Examination and Grading

The final examination for ESM 342 will be of 2 hours duration and have a value of 60% of the total course grade. The examination will consist of questions which reflect the self assessment exercise and tutor marked assignments that you have previously encountered. Furthermore, all areas of the course will be examined. It is also better to use the time between finishing the last unit and sitting for the examination, to revise the entire course. You might find it useful to review your TMAs and comment on them before the examination. The final examination covers information from all parts of the course.

Course marking Scheme

The following table includes the course marking scheme

Table 1 Course Marking Scheme

Assessment	Marks
Assignments each TMA (comprising of 20 questions) carries 10marks	Total = 10% X 4 = 40%
Final Examination	60% of overall course marks
Total	100% of Course Marks

Course Overview

This table indicates the units, the number of weeks required to complete them and the assignments.

How to get the most out of this course

In distance learning, the study units replace the university lecturer. This is one of the huge advantages of distance learning mode; you can read and work through specially designed study materials at your own pace and at a time and place that suit you best. Think of it as reading from the teacher, the study guide tells you what to read, when to read and the relevant texts to consult. You are provided exercises at appropriate points, just as a lecturer might give you an in-class exercise.

Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit and how a particular unit is integrated with the other units and the course as a whole. Next to this is a set of learning objectives. These learning objectives are meant to guide your studies. The moment a unit is finished, you must go back and check whether you have achieved the objectives. If this is made a habit, then you will significantly improve your chances of passing the course. The main body of the units also guides you through the required readings from other sources. This will usually be either from a set book or from other sources.

Self assessment exercises are provided throughout the unit, to aid personal studies and answers are provided at the end of the unit. Working through these self tests will help you to achieve the objectives of the unit and also prepare you for tutor marked assignments and examinations. You should attempt each self test as you encounter them in the units.

The following are practical strategies for working through this course

1. Read the course guide thoroughly
2. Organize a study schedule. Refer to the course overview for more details. Note the time you are expected to spend on each unit and how the assignment relates to the units. Important details, e.g. details of your tutorials and the date of the first day of the semester are available. You need to gather together all these information in one place such as a diary, a wall chart calendar or an organizer. Whatever method you choose, you should decide on and write in your own dates for working on each unit.
3. Once you have created your own study schedule, do everything you can to stick to it. The major reason that students fail is that they get behind with their course works. If you get into difficulties with your schedule, please let your tutor know before it is too late for help.
4. Turn to Unit 1 and read the introduction and the objectives for the unit.

5. Assemble the study materials. Information about what you need for a unit is given in the table of content at the beginning of each unit. You will almost always need both the study unit you are working on and one of the materials recommended for further readings, on your desk at the same time.
6. Work through the unit, the content of the unit itself has been arranged to provide a sequence for you to follow. As you work through the unit, you will be encouraged to read from your set books.
7. Keep in mind that you will learn a lot by doing all your assignments carefully. They have been designed to help you meet the objectives of the course and will help you pass the examination.
8. Review the objectives of each study unit to confirm that you have achieved them. If you are not certain about any of the objectives, review the study material and consult your tutor.
9. When you are confident that you have achieved a unit's objectives, you can start on the next unit. Proceed unit by unit through the course and try to pace your study so that you can keep yourself on schedule.
10. When you have submitted an assignment to your tutor for marking, do not wait for its return before starting on the next unit. Keep to your schedule. When the assignment is returned, pay particular attention to your tutor's comments, both on the tutor marked assignment form and also written on the assignment. Consult your tutor as soon as possible if you have any questions or problems.
11. After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives (listed at the beginning of each unit) and the course objectives (listed in this course guide).

Tutors and Tutorials

There are 8 hours of tutorial provided in support of this course. You will be notified of the dates, time and location together with the name and phone number of your tutor as soon as you are allocated a tutorial group.

Your tutor will mark and comment on your assignments, keep a close watch on your progress and on any difficulties you might encounter and provide assistance to you during the course. You must mail your tutor marked assignment to your tutor well before the due date. At least two working days are required for this purpose. They will be marked by your tutor and returned to you as soon as possible.

Do not hesitate to contact your tutor by telephone, e-mail or discussion board if you need help. The following might be circumstances in which you would find help necessary: contact your tutor if:

- You do not understand any part of the study units or the assigned readings.
- You have difficulty with the self test or exercise.
- You have questions or problems with an assignment, with your tutor's comments on an assignment or with the grading of an assignment.

You should try your best to attend the tutorials. This is the only chance to have face to face contact with your tutor and ask questions which are answered instantly. You can raise any problem encountered in the course of your study. To gain the maximum benefit from the course tutorials, prepare a question list before attending them. You will learn a lot from participating in discussion actively. GOODLUCK!

**ESM 342: ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL
AUDITING**

MEDUPIN, CECILIA
School of Science and Technology
National Open University of Nigeria
Victoria Island, Lagos

NATIONAL OPEN UNIVERSITY OF NIGERIA

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MODULE 1

Unit 1 Environmental Audit

Unit 2 Environmental Audit Process

Unit 3 Legal Aspects and Practice of Environmental Audit under Nigerian Law

MODULE 1**Unit 1 ENVIRONMENTAL AUDIT****CONTENTS**

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 - 3.3.5 Management Audit
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor Marked Assignment
- 7.0 Reference/Further Readings

1.0 INTRODUCTION

Globally, environmental protection has continued to be a central topic of discussion and a necessity for sustainable development. This calls for environmental audit to be carried out in existing industries and environmental impact assessment to be carried out on new, major projects as stipulated in the Federal Environmental Protection Agency Regulations. Following this growing need, there is an increasing need for existing industries to demonstrate good environmental management practice. In this unit, you will learn what environmental audit is, why it is necessary for enhancing environmental protection, types of environmental audit and their uses.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- define environmental audit
- list the objectives of environmental audit
- identify the types of environmental audit
- state the differences between the types of audit

3.0 MAIN CONTENT

3.1 Definition of Environmental Audit

An audit is the process of reviewing activities and records against defined standards or procedures to establish what is being done and how far the process is complying with requirements.

FEPA National Guidelines for Environmental Audit in Nigeria defines environmental audit as “*a management tool consisting of a systematic, documented, periodic and objective evaluation of environmental performance, management systems and equipment with the aim of firstly, **facilitating management control of environmental practices** and secondly, **assessing compliance** with an operations or activity's environmental policies, including **meeting regulatory requirements**”.*

It can also be defined as “*the process of **reviewing activities and records against defined standards or procedures to establish what is being done and how far the process is complying with requirements**”.*

3.2 OBJECTIVES OF ENVIRONMENTAL AUDIT

The objectives of Environmental Audit include:

- a. gather information (either verbally or written) on the facilities' process, potential risks and management procedures
- b. better management of resources and improved environmental performance
- c. ensure compliance with regulatory requirements
- d. encourage organisations to regulate their environmental practices

3.3 TYPES OF ENVIRONMENTAL AUDIT

There are various ways by which environmental audit can be grouped. This could be broadly classified based on **how** audits are to be carried out as follows: self-audit, internal audit and external audit.

- **Self audit:** This involves the audit carried out by selected members of a team from the unit by which an audit is to be carried out. This could be by the senior operatives in the unit being audited.
- **Internal audit:** This involves the audit carried out by selected members of staff from various units of an organisation to audit a particular unit, but not the unit being audited. The aim is to identify and report problems without bias.
- **External audit:** This involves the audit carried out by selected team from outside the establishment and may be assisted by employees of the organisation being audited. External auditors could be Consultants or Regulators. It is important especially where 3rd party benchmarking and neutrality is required.

However, environmental audits can be classified based on **what** is to be audited in an organisation. This could include: Regulatory Compliance Audit, Process Safety Audit, Occupational Health Audit, Liability Audit and Management Audit.

3.3.1 Regulatory Compliance Audit

The Regulatory Compliance Audit is used to measure a company's/facility's compliance status in relation to the current environmental regulations, laws and requirements. This is important for all companies in Nigeria (National Guidelines for Environmental Audit in Nigeria). It identifies areas of non-compliance and seeks ways to ensure future compliance. The frequency of this type of audit varies. It could be quarterly for in-house auditors, biannually for external auditors or as when required.

3.3.2 Process Safety Audit

This type of audit identifies with the health and safety issues in the company's processes. It identifies the hazards and quantifies the risks arising from the process. The process safety audit looks into the management procedures for accidents and emergencies. This audit is carried out in compliance to laws regarding health and safety best practice.

3.3.3 Occupational Health Audit

This type of audit investigates issues that concern the occupational exposure of workers to pollution (e.g. noise, air) and physical disabilities. It audits the company staff for protective equipment/clothing, assesses occupational exposure of the process operations and recommends the training of staff on basic protective requirements of staff. The company's medical personnel is included as part of the audit who will provide relevant information concerning pollution levels and long-term medical conditions.

3.3.4 Liability Audit

When a building/facility is to be acquired, it is important that a liability audit is carried out on the property or facility. This is to ascertain the environmental problems that could be on the facility and determines the short-term or the long term problems of the facility and makes suggestions for remediation. The frequency of liability is about three months.

3.3.5 Management Audit

The management audit is important as it looks at the environmental management issues of a facility, assesses the company's hierarchy, policies and the goals of the environment in that facility. This type of audit is more inclined to documentation of procedures and audits the company's environmental performance measured against standards. Corrections following this audit bring about an improved environmental performance and implementation. The frequency of management audit is about four years as recommended by the Department of Petroleum Resources in the "Environmental Guidelines and Standards for the Petroleum Industry in Nigeria".

4.0 CONCLUSION

Environmental audit is a tool which is used in carrying out environmental responsibilities by evaluating and monitoring financial and production performance. The various types of audits available enable management to be specific in areas that needs to be audited. It enables information to be gathered, measured against standards and regulations and enhances compliance with regulatory requirements.

5.0 SUMMARY

In this unit you have learnt that environmental audit is a management tool which involves documentation and evaluation of environmental performance. It aims at gathering information on facilities and people in order to protect them and identifies the types of audit. Compliance to legal requirements is key in environmental audit and encourages support from senior management for a successful implementation.

6.0 TUTOR-MARKED ASSIGNMENT

1. In your own words, define an environmental audit.

2. The Regulatory Compliance Audit is an important tool which is included in all other types of environmental audit. Discuss the reasons for this.
3. What are the differences between an external audit and an internal audit?
4. Briefly describe each of the following:
 - a. Liability audit
 - b. Management audit
 - c. Occupational Health Audit
 - d. Process Safety Audit

7.0 REFERENCE/FURTHER READINGS

The Presidency Federal Environmental Protection Agency National Guidelines for Environmental Audit *Decree 59,1992 as amended Decree No.14 of 1999.*

European Industrial Gases Association (2005)*Environmental Auditing Guide IGC Document 135/05/e, Revision of part of TN 515/95*<http://www.eiga.org>

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3.6 Keys to a successful audit

3.7 Benefits of carrying out an environmental audit

3.8 Challenges of carrying out environmental audit in Nigeria

4.0 Conclusion

5.0 Summary

6.0 Tutor Marked Assignment

7.0 Reference/Further Readings

1.0 INTRODUCTION

The Audit Process is the main aspect in environmental auditing. The process is a series of *systematic and documented* steps in a function or activity. It is at this stage that all preparations, actual auditing and post audit activities take place. It involves the identification of what needs to be audited, the definition of the scope, identification of roles and responsibilities, carrying out the audit and the production of a report thereafter occurs. It follows the steps: **PLAN- DO- CHECK- ACT**. The **planning** aspect of auditing looks into the scope and commitment requirement prior to carrying out an audit; **doing** involves carrying out the audit which includes the pre-audit, site audit and post audit activities; **checking** is the process of verifying improved performance and assessing the cost and benefits of implementing the revised process and **acting** takes place when the improvements are installed, standardised, introduce the improvement into other areas of the organisation. An environmental audit is important as it helps to provide valuable information which helps the company to meet the agreed standards, to meet the agreed standards of performance as defined by company policy and to stay ahead of legislative requirements.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the major steps in an environmental audit
- Describe the requirement for a preparing an audit
- Identify areas that can be audited in a given site
- Give reasons why the management needs to be involved in the audit process
- Describe how a good environmental report should look like

3.0 MAIN CONTENT

3.1 Scope

The scope of an audit determines the extent at which an audit is to be carried out in a facility. It involves clarifying audit site/boundary, objectives and identifies areas to be audited. This implies that the management needs to be involved in the scope definition. The success or failure of the audit is determined by the commitment of management to the audit process including the implementation of the outcomes/recommendation from the audit report.

3.2 Objectives of Audit

The objectives of an audit could be to:

- investigate information such as the history of the facility including previous environmental damage
- Examine current company practices e.g. review
 - management of resources like raw materials
 - pollution control (air, water, and land)
 - handling, storage and disposal of chemical and other hazardous substances
 - housekeeping (water, energy, paper consumption, training)
- Verify compliance to legislation and company policy, permits, in-house policies, etc
- Assess internal policy and company conformance
- Identify areas for improvement opportunities

3.3 Pre- Audit process

This is the most important stage in the whole audit process. Critical planning at this stage will determine the success of the initial and subsequent audits. At the pre-audit stage, the audit team is selected, there is the need for management commitment, information regarding site activities are queried, documentation concerning compliance to legislation and company policies. Pre-audit process involves

- determine the scope of the audit
- selection of team
- obtain information
- management commitment

3.3.1 Audit Team Selection

This involves selecting audit team members which includes a members from the facility being audited, the external auditor who is certified, other team members could be selected from other areas not been audited and must have skills that are relevant to the audit process such as research, interview, data collection and report writing. It is at this selection that responsibilities are shared and each member must understand their roles. The team members of an environmental audit could include the following people: the client, audit team leader (selects the team and briefs them on the purpose of the audit and the areas to be audited. He could be an environmental regulator or a certified auditor) the auditor (this person is responsible for a particular area allocated for the audit exercise), the auditee (this is the organisation or facility being audited) and observer (this could be trainee auditors or company's consultants)

3.3.2 Audit Area Selection

This involves the selecting the areas to be audited such any of the following: Air quality, Water, Electricity, Material use, Waste management practices, Noise impacts, Accidents and Emergency records and systems in place for management, Public response and complaints, Pollution control facilities in the company, staff training on environmental awareness.

3.3.3 Pre-audit Information.

At this stage, questions are asked either orally or in the form of questionnaires so that pre-information is gathered in order to determine the level of investigation that would be required at the main audit. Some of this information could in the form of document or involved pre-audit site visit. The information gathered could include the site history/geology, personnel, operational procedures, storage which are sent about 2- 3 weeks in advance of the audit exercise so as to determine the level at which the audit is to be carried out. Selections of topics to be focussed upon in the course of the audit exercise which are related to subject areas in the facility are collated in a **checklist**.

3.3.4 Management Commitment

It is important that the management is involved in the audit exercise. This is because of the scope of the audit, potential interruptions of certain activities and personnel during the course of the exercise and potentially, interviews could be requested from staff. Following the audit exercise too, the management will have the responsibility of implementing the new changes from the audit outcome. Cooperation is required from members of staff in terms of agreement and approval of the audit in order to achieve success. Depending on the size of the company, there should be a written agreement for conducting an audit.

3.4 Conducting an Environmental Audit

3.4.1 Preliminary Meeting

This is the on-site meeting which comprise of the management and the audit team members. In this meeting, team members are introduced to each other, the scope and objective of the audit are itemized and the areas or processes that require attention are discussed. In this meeting, the approach and methodology are discussed, questions asked by staff personnel are answered and it is also in this meeting that staff support and cooperation are sought after, information requested in the form of questionnaires is reviewed and questions are asked by the auditors where necessary. In addition, the duration of the audit exercise is determined at this stage.

- Document review:

The following document could be reviewed and compared to information provided from questionnaires and checklist such as the company's Management policy and documentation, Permits and licenses and conditions attached to them, Operational procedures, Records (utility, inventory, monitoring, calibration, transportation, training etc.), Previous audit reports or EHS team meeting minutes.

3.4.2 Site inspection

At the inspection of sites, the auditor finds out issues about non-compliance and may identify matters which are relevant to the audit but were not identified in the planning stage. During on-site audit activities, it is important to work with a procedure which consists of steps which must be followed by the auditor to ensure that there is consistency in the implementation of the audit and the reporting of results.

Considerations for on-site audits

- Reconcile onsite activities with records kept.
- Interview relevant members of staff regarding current practices (this could be senior management or support personnel)

- Assess compliance with statutory and departmental requirements.
- Be flexible when applying audit procedures as different situations demand diverse judgement.
- During on-site audit, it is important to address all areas within the scope of the time allocated for the exercise.
- Pictures, diagrams, maps etc. are very useful to support findings and to highlight good practices. While this is very good practice, it is important to obtain permission from the management and respect safety requirements.

3.4.3 Review audit exercise

At this stage, the audit team reviews data that had been audited on site, verifies them and evaluates the findings.

- In **data collection**, information collected through interviews or by documentation which are provided by the auditees, auditors' notes and observation, pictures, maps, diagrams and other related items are collated and organised in such a way that they can be retrieved easily. These data have the purpose of supporting audit findings and provide bases for verification.
- The **verification** of audit data is important so as to guarantee that the documents produced are all genuine and valid and this must be carried out under the direct supervision of the audit team.
- After verification, the findings need to be **evaluated** against the objectives established for the audit i.e. using regulatory requirements, standards or company requirements. This stage ensures that all issues and problems have been covered and those which require immediate attention are identified. Those which require mitigation approaches for management are also discussed. Questions could be asked by the organisation's representative, feedback provided as to the conduct of the audit and the audit team can inform the organisation when the report will be ready. Following these activities, a debriefing material is produced for the closing up meeting.

3.4.4 Closing meeting

At the closing meeting, the audit team and auditees and all who had participated in the preliminary meeting come together again and review all that had been carried out during the audit and to discuss the observation. It is at this meeting that matters are resolved. The audit team shall provide an overview of the findings and indicate when the final report will be completed. All documents that had been collected prior to the audit or during the audit are at this time returned back to the organisation. The closing meeting is very critical to the implementation of findings on site; hence the manner of communication has to be cordial, yet firm. This implies acknowledging the co-operation of site personnel, highlighting the positive aspects first before discussing the shortcomings, no matter how minor it is.

3.5 Post Audit Activities

These are the activities that take place "out-of-site" after the site audit had been completed. It involves:

- 3.5.1 Preparing a report-A draft report contains the audit findings, recommendations and provides action plans for the implementation or improvement of default areas. This draft is issued to the company thereby providing an important opportunity for the management of the unit being audited to see and comment upon a draft of the audit report before it is revised with the

points clarified where possible and inaccuracies corrected. The draft report is then revised and a final report is issued and a follow up meeting is conducted if necessary.

3.5.1.1 Characteristics of a good report

- a. It should state the factual findings including compliance to standard, policy and legal requirements
- b. It should include recommendations for remedial or improvement actions.
- c. It should be accurate i.e. the findings must be free from errors
- d. It should be clear
- e. The language used should be simple and easy to understand
- f. It should be succinct i.e. straight to the point
- g. The draft report should be prepared on time and delivered at least a week after the audit had been carried out. The final report should be ready within 4-5 weeks of the closing meeting.

3.5.1.2 Contents of an audit report

Ideally, an audit report should not be lengthy, but should be about 25 to 30 pages depending on the number of areas audited. It should contain the following information:

- a. Contents list
- b. Executive summary
- c. Introduction
- d. Purpose and Scope of the audit
- e. Methodology
- f. Discussion and analysis of the findings
- g. Reference to items for corrective action
- h. Actions and recommendations
- i. Conclusion
- j. The distribution list
- k. Records of the audit programme
- l. List of participants

3.5.1.3 Characteristics of a good auditor/audit team

- The facts should be presented in the report and not personal opinions
- They must ensure accuracy, consistency and objectivity in the performance of audits
- Professionalism should be demonstrated in the face of auditee's open hostility or diversionary tactics.
- The environmental auditor should have suitable education and professional experience to carry out their duties including: communication skills, work scheduling and planning, data analysis and finding, and audit report writing.

3.5.2 Action plan- This involves identifying the corrective actions indicated in the audit report and doing something about them. It goes on to identifying the scale of the problem, take preventive action or assess the effectiveness of a remedial action. Some of the corrections that have been indicated could be carried out easily within the facility within a given time/period

and with limited resources while some could demand more resources in terms of man-power or have serious financial implications. It is at this stage that management commitment is vital to implementing improvement actions and monitoring progress on the facility. At this stage, the facility can structure out a plan for the implementing the recommendation and decide a way forward for compliance.

3.6 Keys to a successful audit

An audit is said to be successful if it works in line with the following:

- 3.6.1 Support from management
- 3.6.2 Participation by all parties
- 3.6.3 Auditor independence and objectivity
- 3.6.4 Agreement on procedures and scope
- 3.6.5 Implementation of action plans and remediation

3.7 Benefits of carrying out an environmental audit

3.7.1 Management

- ✓ Demonstrates a visible commitment to improving an organisation's environmental performance
- ✓ A foundation for the development of environmental management policies or efforts to improve existing plans;
- ✓ Identifies environmental risks, impacts and opportunities
- ✓ Reviews management controls and systems and associated liabilities and risks from past and present activities of the site or surroundings and implementation of recommendations
- ✓ Reviews processes and plant operating procedures or an activity's current environmental standards of operation and company environmental management procedures, including emergency response planning, monitoring and reporting system and planning for future changes in Processes or Regulations;
- ✓ Increases actions to be undertaken by an organization or activity to meet environmental goals such as sustainable development, recycling and efficient use of resources

3.7.2 Financial

- ✓ Prevention of financial losses through remediation
- ✓ Prevents the closure of an organization or activity as result of government restrictions or negative publicity caused by bad management or monitoring of the environment;
- ✓ Assesses of financial implications of environmental issues, liabilities and impact of new regulation
- ✓ Identify areas where costs can be saved (e.g. through energy conservation. minimisation, improved use of raw materials, process changes, waste reduction, reuse and recycling etc)

3.7.2 Legal

- ✓ To measure and improve an organization or activity's compliance with environmental Legislation and regulations such as operating permits, air emission standards, effluent Standards, waste management standards thus avoiding legal sanctions against an organization or activity or its management under prevailing laws and regulations;
- ✓ Provides evidence of the implementation of environmental management in court if requested.

3.7.4 Training

- ✓ To facilitate the sharing of best environmental practices
- ✓ To increase in the awareness of the management and staff of an organization regarding environmental policies and responsibilities
- ✓ Assessment of training, knowledge and awareness of employees

3.7.5 Reporting

- ✓ Provision 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, shareholders and other stakeholders

3.8 Challenges of Environmental Audit in Nigeria

- ✓ Poor compliance by business organisation
- ✓ Pollution of the environment by industry remains a major problem
- ✓ Weak enforcement by regulatory agencies
- ✓ Low environmental awareness within the business community
- ✓ Environment issues given sufficient little or no attention by senior management of business organizations
- ✓ Fire brigade approach
- ✓ Revenue generation drive of State Environmental Protection Agencies
- ✓ Lack of manpower and poor technical competence within business organisation and regulatory bodies
- ✓ Multiple regulators at the Federal, States and Local Government Levels
- ✓ Low quality reports by consultants
- ✓ Ethical issues

4.0 CONCLUSION

The audit process is a critical aspect of environmental auditing. It involves adequate planning and execution. In order for the process to succeed, there is a need to involve key human resources that will carry out their roles effectively. It is important to reconcile documented information with actual information observed and collected during the audit exercise.

5.0 SUMMARY

In this unit you have learnt the major steps necessary to be taken when carrying out an environmental audit- the pre-audit preparations, main audit activity and the post-audit requirements, and the keys to a successful audit. Some of the benefits in carrying out an environmental audit include: compliance to legislative requirements, financial, staff commitment and minimisation of environmental risks. Environmental audit also helps the company to stay ahead of the requirements placed on them by law.

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the main objectives of carrying out an environmental audit?
2. Make a list of the participants in the selection of an audit team.
3. A management's consent prior to an audit is required. Give reasons for this.
4. An audit data needs to be verified and evaluated. Discuss.
5. What are the attributes of a good environmental audit report?
6. Limited environmental awareness is one of the challenges of environmental protection in Nigeria. Do you agree/disagree? Discuss.

7.0 REFERENCE/FURTHER READINGS

The Presidency Federal Environmental Protection Agency National Guidelines for Environmental Audit *Decree 59, 1992 as amended Decree No.14 of 1999.*

European Industrial Gases Association (2005) *Environmental Auditing Guide IGC Document 135/05/e, Revision of part of TN 515/95*<http://www.eiga.org>

MODULE 1**UNIT 3 LEGAL ASPECTS AND PRACTICE OF ENVIRONMENTAL AUDIT
UNDER NIGERIAN LAW****CONTENTS**

1.0 Introduction

2.0 Objectives

3.0 Main Content

3.1 1990 Constitution of the Federal Republic of Nigeria

3.2 FEPA Act (Environmental Audit under the EIA Decree 86 of 1992)

3.3 Environmental Audit under the EIA Decree 86 of 1992

3.4 National Environmental Standards and Regulations Enforcement Agency (NESREA)

3.5 FEPA subsidiary instruments

3.5.1 Pollution Abatement in Industries and Facilities Generating Wastes
Regulations 1991

3.5.2 The Management of Solid and Hazardous Wastes Regulations of 1991

3.5.3 The Hazardous Waste Criminal Provisions Decree 42 of 1988

3.5.4 The National Effluents Limitations Regulations S.1. of 1991

3.5.5 National Guidelines for Environmental Audit in Nigeria of 1999

3.5.6 National Guidelines on Environmental Management Systems of 1999

3.5.7 Nigeria's Agenda 21

3.5.8 National Policy on Environment

3.5.9 Standards Organisation of Nigeria Decree No. 56 of 1971

3.5.10 ISO 14000 Standards and Environmental Audit

4.0 Conclusion

5.0 Summary

6.0 Tutor Marked Assignment

7.0 Reference/further readings

1. INTRODUCTION

Environmental law gears human actions on the basis of the principle of prevention, the polluter-pays' principle and the principle of co-operation. The establishment of regulatory bodies and governmental agencies have to be in place for the effective enforcement of policies, laws and regulation and are been enforced by the regulators. Prior to 1988, there were no laws in force to regulate industrial pollution or hazardous wastes. Although the existing environmental legislation only focussed on the protection and conservation of economically important natural resources (E.g. Oil Pipeline Act 1956, Forestry Act 1958, Sea Fisheries Act 1990, Endangered Species Act 1990, Mineral Oil (Safety) Regulations 1963, Oil in Navigable Waters Act 1968). Following the illegal dumping of toxic wastes in Koko, in the former Bendel State, in 1987, the Nigerian Government promulgated the Harmful Wastes Decree which provides the legal framework for the effective control of the disposal of toxic and hazardous waste into any environment within the confines of Nigeria. This was immediately followed by the creation of a regulatory body, the Federal Environmental Protection Agency (FEPA) in 1988.

2. OBJECTIVES

At the end of this unit, you should be able to:

- describe the functions of FEPA in relation to environmental audit
- list the functions of FEPA in relation to environmental auditing
- enumerate the role of NESREA as an environmental regulator

3.0 MAIN CONTENT

3.1 1990 Constitution of the Federal Republic of Nigeria

S. 20 of the Constitution provides that:

“The state is empowered to protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria”

S.17 (3) (c) provides that:

“The State shall direct its policy towards ensuring that the health, safety and welfare of all persons in employment are safeguarded and not endangered or abused”

3.2 Federal Environment Protection Agency (FEPA) Decree 58 of 1988

FEPA was created by Decree 58 of 1988 as the overall body charged with the responsibility of protecting the environment in Nigeria in cooperation with Federal and State Ministries, Local Governments, statutory bodies. To put this into action a National Policy on the Environment was developed. This is the main working document for the preservation and protection of the Nigerian environment. States and Local Government Councils were also encouraged to establish their own environmental regulatory bodies for the purpose of maintaining good environmental quality as it applies to their particular terrain.

The functions of FEPA include establishing and prescribing national guidelines, criteria and standards for:

- i. water quality
 - ii. air quality and atmospheric protection
 - iii. noise levels
 - iv. gaseous emissions and effluent limits
 - v. ozone protection
- The agency was also empowered to monitor and control hazardous substances, supervise and enforce compliance.
 - FEPA scrapped in 1999 and its functions taken over by a newly created FME who now administer and enforce environmental laws in Nigeria

3.3 Environmental Audit under the EIA Decree 86 of 1992

S.16 of the EIA Act empowers the Agency to design and implement “follow-up programs” in respect of an environmental assessment process of a project. A follow-up program is defined by the Act as a program for:

- a. verifying the accuracy of the environmental assessment of a project
- b. determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project

The Federal Ministry of Environment requires an environmental audit to be conducted every 2-3 years

3.4 National Environmental Standards and Regulations Enforcement Agency (NESREA)

The National Environmental Standards and Regulations Enforcement Agency (NESREA) was established by an Act of the National Assembly on 30th July 2007

- NESREA Act repealed FEPA Act of 1988
- NESREA is an arm of the Ministry of Environment charged with the responsibility of enforcing environmental Laws, regulations and standards and deterring people, industries and organization from polluting and degrading the environment

NESREA's authority includes the following:

- Enforcement of environmental standards, regulations, rules, laws, policies and guidelines
- Protection and development of the environment, biodiversity conservation and sustainable development in Nigeria
- Liaison with relevant stakeholders within and outside Nigeria
- Develop guidelines, regulations and standards on the environment other than in the oil and gas sector
- to establish programmes for setting standards and regulations for the prevention, reduction and elimination of pollution and other forms of environmental degradation
- to collect and make available basic scientific data on environmental standards through publications and other appropriate means.
- to charge fees for their services.
- Coordinate and liaise with stakeholders, within and outside Nigeria, on matters of environmental standards, regulations and enforcement.

The Agency has powers to:

- prohibit processes and use of equipment or technology that undermine environmental quality
- conduct field follow-up of compliance with set standards and take procedures prescribed by law against any violator
- establish mobile courts to expeditiously dispense cases of violation of environmental regulation

3.5 FEPA – Subsidiary Instruments

These are supplementary regulatory instruments which support the main legislation of FEPA. These are described below as follows:

3.5.1 Pollution Abatement in Industries and Facilities Generating Wastes Regulations 1991

This regulation prescribes how pollution can be controlled in an industry or facility and restricts the release of toxic substances to air, land or water of Nigeria's ecosystems, not to be beyond the limits approved by FEPA. It states that an industry or facility should install pollution monitoring units which should be monitored by a capable person or a body accredited by the Agency. In addition, it demands the adoption of in-plant waste reduction and pollution prevention strategies and provides a requirement for carrying out environmental audits. In the case of accidental discharge, this should be reported to the nearest Agency within 24 hours.

S.21: *“The Agency shall demand environmental audit from existing industries and environmental impact assessment from new industries and major developmental projects and the industries shall comply within 90 days of the receipt of the demand”.*

3.5.2 The Management of Solid and Hazardous Wastes Regulations of 1991

This law gives a comprehensive list of dangerous and hazardous wastes, the contingency plans and emergency procedures, guidelines for groundwater protection, toxic waste tracking programme, record keeping and environmentally-sound technologies for waste disposal.

3.5.3 The Hazardous Waste Criminal Provisions Decree 42 of 1988

3.5.4 The National Effluents Limitations Regulations 1991

This Regulation describes the activities necessary for implementing the Regulation.

S1 (1) of the regulation states that every industry shall install anti-pollution equipment for the detoxification of effluent and chemical discharges emanating from the industry.

S1 (2) ensures monitoring and compliance to FEPA Regulations

S1 (3) ensures that the operator provides information concerning the treatment of effluent and discharges to the nearest water body.

Failure to comply with the Regulation will result in a penalty as described by the Courts.

The Regulation further describes the waste water guidelines to be used for all categories of industries in Nigeria in order to ensure environmental protection. Selected industries include: Agriculture, chemical plant, mining and metallurgy, Food processing, Dye stuff and dye intermediates, Brewery, Automotive factory, Petroleum exploration, Refinery, Pharmaceuticals, Plastics and Synthetics, Pulp and paper, Sugar Processing, Metal Working Plating and Finishing and Textile Mills

Table1: Some Effluent Limitation Guidelines in Nigeria for all categories of industries

Parameters	Limit for discharge into surface water (mg/l)	Limit for land application (mg/l)
Temperature	Less than 40°C within 15	
pH	6-9	6-9
Total suspended solids	30	-
Total dissolved solids	2,000	2,000
Chloride	600	600
Sulphate	500	1,000

3.5.5 National Guidelines for Environmental Audit in Nigeria of 1999

3.5.6 National Guidelines on Environmental Management Systems of 1999

3.5.7 National Policy on the Environment of 1998

The goals of the policy are to:

- a. secure a quality environment which is adequate for good health and well-being
- b. conserve and use environmental resources for the benefit of present and future generation
- c. restore, maintain and enhance the ecosystem
- d. raise public awareness and promote understanding of the environment
- e. collaboration with other countries and international agencies on environmental protection

Strategies to achieve sustainable development of industry include:

- a. ensuring that EIA reports are submitted by all proposed industrial enterprises prior to approval of licenses to operate
- b. initiating periodic environmental audits of major industries and compiling inventory of pollutants

3.5.8 Nigeria's Agenda 21

Nigeria's Agenda 21 Programme seeks to:

- a. integrate environment into development planning at all levels of government and the private sector
- b. commence a transition to sustainable development
- c. address sectoral priorities, plans, policies and strategies for the major sectors of the economy
- d. foster regional and global partnerships

S.21 of the Nigeria's Agenda 21 Programme relates to "managing of chemicals, hazardous, toxic and radioactive wastes"

✓ The **goal** is "to attain full compliance with international regulations, standards and guidelines on the management of chemicals, hazardous toxic and radioactive wastes"

✓ **Strategies** to achieve the goal include:

- assisting industries to change to cleaner production methods and adopt waste minimisation technologies
- carry out environmental audits of existing industries to improve hazardous and toxic waste manage
- adopting the polluter pays principle

3.5.9 Standards Organization of Nigeria Decree No. 56 of 1971

SON was established by Decree No. 56 of 1971 and its functions include the following:

- ✓ organise tests and ensure compliance with approved standards
- ✓ undertake investigations into the quality of facilities, materials and products
- ✓ establish a quality assurance system including certification of factories, products and laboratories.
- ✓ ensure reference standards for calibration, verification of measures and measuring instruments.
- ✓ compile an inventory of products requiring standardisation.
- ✓ compile Nigerian standards and specifications,
- ✓ register and regulate standard marks and specifications
- ✓ undertake preparation and distribution of standards samples
- ✓ establish and maintain laboratories
- ✓ co-ordinate and co-operate with corresponding national or international organisations to achieve uniformity in standards' specifications

3.5.10 International Organization for Standards (ISO) and Environmental Audit

ISO 14000

The ISO 14000 family addresses "Environmental management".

It carries out the following functions:

- Minimizes harmful effects on the environment caused by its activities
- Helps companies to achieve continual improvement of its environmental performance.
- ISO offers a wide-ranging portfolio of standardized sampling, testing and analytical methods to deal with specific environmental challenges
- It has developed more than 350 International Standards for the monitoring of such aspects as the quality of air, water and soil.
- Encourages the inclusion of environmental aspects in product design and development
- Helping to meet the new challenge of climate change with standards such as ISO 14064:2006 and ISO 14065:2007 standards for greenhouse gas verification and accounting

SON implements, audits and certifies ISO 14000 Standards in Nigeria

4. CONCLUSION

The goal of environmental laws and policies is to protect the environment for present and future generations. There are specific regulations for each aspect of the environment including land, air and water, natural resources and, the control and the release of emissions. These laws are enforced mostly by governmental bodies and agencies. Non-compliance could lead to serious penalties which could be financial or could lead to the closure of operations.

5. SUMMARY

In this unit, you have learnt the various laws and policies that pertain to environmental audits and environmental impact assessment. You have also learnt more about the FEPA Decree and the enforcing agency, NESREA and their functions. Other subsidiary instruments strengthen FEPA Decrees.

6. TUTOR MARKED ASSIGNMENTS

1. Outline the functions of FEPA in relation to environmental auditing
2. Enumerate the duties of NESREA
3. Explain functions of the International Standard Organisation in environmental auditing

7. REFERENCES

- 1990 Constitution of the Federal Republic of Nigeria
- Federal Environmental Protection Act of 1988
- Environmental Impact Assessment Act of 1992
- National Policy on the Environment of 1998
- Standards Organisation of Nigeria Act of 1971
- LASEPA Edict of 1996
- Agenda 21
- ISO 14001 Environmental Management Systems
- Effluent Limitations Regulations of 1991
- Pollution Abatement in Industries and Facilities Generating Wastes Regulations of 1991
- National Guidelines for Environmental Audit of 1999
- National Guidelines on Environmental Management Systems of 1999
- Environmental Guidelines and Standards for Petroleum Industry in Nigeria

MODULE 2

- Unit 1 Environmental Impact Assessment
- Unit 2 EIA Processes
- Unit 3 Origin of EIA
- Unit 4 Case Studies of EIA Practice

MODULE 2**Unit 1 ENVIRONMENTAL IMPACT ASSESSMENT****CONTENTS**

1. Introduction
2. Objectives
3. Main Content
 - 3.1 Definition of Environmental Impact Assessment
 - 3.2 Functions of Environmental Impact Assessment
 - 3.3 EIA Decree 86, 1992
 - 3.4 Objectives of Environmental Impact Assessment
4. Conclusion
5. Summary
6. Tutor Marked Assignment
7. Reference/further readings

1. INTRODUCTION

The main purpose underpinning environmental impact assessment (EIA) is to plan, organise and coordinate the tasks necessary to carry out each phase of the EIA process and to produce a report that will effectively report the issues that will inform decision making. This decision will determine if a project should move forward or not with its development. It requires a lot of specialist and managerial skills. This concept has made EIA to be one of the most adopted environmental tools by governments and development institutions globally. The decision made therefore helps to minimize environmental costs and consequently sustain the environment for the future.

EIA is widely applied, but has been primarily applied to development projects.

2. OBJECTIVES

At the end of this unit, the learners should be able to:

- define environmental impact assessment
- list the objectives of EIA
- explain the laws of EIA application in Nigeria

3. MAIN CONTENTS

3.1 Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is an instrument used to determine the impact of a development on the surrounding environment. These impacts are measured for air, land, water, humans and animals. EIA is carried out on projects which are categorised in the EIA law to involve large public investments in areas such as infrastructure and to ensure that environmental aspects are addressed and potential problems are foreseen at the appropriate stage of project design. EIA should be seen as an integral part of the planning process and initiated at the project's inception. The EIA identifies problem areas and outlines alternatives as well as mitigating approach to potential problems either during construction, operation or decommissioning phases of the development.

Various definitions have been given to EIA as follows:

- An **environmental impact assessment** is an appraising of the possible positive or negative impacts that a proposed project may have on the environment, together consisting of the environmental, social and economic aspects.(Ref)
- The International Association for Impact Assessment IAIA1999 defines an environmental impact assessment as "the process of **identifying, predicting, evaluating** and **mitigating** the biological, technical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made (IAIA, 1999).

A distinguishing feature of EIA, when compared to other environmental management tools, is that it is anticipatory. The anticipatory nature of EIA provides a means of ensuring that projects conform to required levels of environmental performance and in doing so improve the sustainability of the proposals and enhance the probability of gaining consent. EIA can highlight when a project is:

- likely to result in irreversible environmental damage;
- causes adverse effects on valued ecosystem, landscapes and other environmental features;
- could result in adverse health effects on a community;
- provides an opportunity for environmental or social improvements

3.2 **Functions of EIA**

- to ensure that decision makers consider the ensuing environmental impacts when deciding whether or not to go on with a project.
- It is an information provision tool which provides information to the key decision makers that will determine whether a project should be given consent. The environmental information is one of the many factors that will be taken into account, and it may or may not have a significant influence on the final decision.

3.3 **Nigeria and EIA Decree 86 of 1992**

The Nigerian EIA legislation was promulgated into Federal legislation in 1992 under **EIA Act Decree No.86**. It demands from the public or private sectors of the economy not to undertake or embark on any public projects or activities without prior consideration of their environmental effects at the early stages if the projects. It introduced environmental considerations into development project planning and execution, prescribes guidelines for EIA Studies and spells out the project areas and

sizes of projects requiring EIA It also ensures that consultations with the Regulators and locales residing where the development is to take place are being consulted.

3.3.1 EIA at the State Government Level

Each of the 36 States of the Federation can make laws on environmental protection and may also set up environmental protection agencies

- Federal Capital Territory (Abuja Environmental Protection Board Act, empowers the Board to request an EIA for a development project)
- Lagos State Environmental Protection Agency Law of 1996
- Lagos State Environmental Pollution Control Law

The Lagos State Physical Planning and Development Regulations of 2005 require a Developer to submit together with the application for development permit, a detailed Environmental Impact Analysis Report for the following projects:

- a) Oil and gas pipeline depots and installation
 - b) Refineries
 - c) Large scale industrial developments
 - d) Roads, rail lines, seaport and airport development
 - e) Large scale educational institutions
- Akwa Ibom State (The Akwa Ibom State Environmental Protection and Waste Management Agency Act (EPWMA) empowers the Agency to conduct pre and post EIAs of projects and make recommendations for corrective measures)

Exercise:

Find out the various environmental laws operating in your state?

3.4 The Objectives of EIA

This is to ensure that the environmental implications of major developments are identified.

- S.1 of the Decree states the objectives of any EIA before making an application as follows:
 - a. to determine if the proposed development is likely to significantly affect the environment and this would be carried out by the Government of the Federation, State or Local Government
 - b. to implement the appropriate policies in all areas where the proposed development is to take place and these must also be consistent with the State and LGA laws and decision processes
 - c. to develop procedures for information exchange, notification and consultation when proposed developments are likely to have significant environment effects on bordering towns and villages.

- d. to consider the extent, nature or location of a proposed project or activity is such that is likely to significantly affect the environment.
- S. 2(2) states that

“Where the extent, nature or location of a proposed project or activity is such that is likely to significantly affect the environment, its environmental impact assessment shall be undertaken in accordance with the provisions of this Decree.”
 - S.4 of the Decree describes the constituents of an EIA with at least the following minimal matters as follows:
 - *a description of the proposed activities;*
 - *a description of the potential affected environment including specific information necessary to identify and assess the environmental effects of the proposed activities;*
 - *a description of the practical activities, as appropriate;*
 - *an assessment of the likely or potential environmental impacts on the proposed activity and the alternatives, including the direct or indirect cumulative, short-term and long-term effects;*
 - *an identification and description of measures available to mitigate adverse environmental impacts of proposed activity and assessment of those measures;*
 - *an indication of gaps in knowledge and uncertainty which may be encountered in computing the required information;*
 - *an indication of whether the environment of any other State, Local Government Area or areas outside Nigeria is likely to be affected by the proposed activity or its alternatives;*
 - *a brief and non-technical summary of the information provided that have been provided above*

3.4.2 **Mandatory Projects for EIA under Decree 86 of 1992**

This section, based on the EIA Decree provides a list of projects that will require an EIA and include: oil refineries, large waste and waste water disposal and treatment facilities, large extensive agricultural units and industrial facilities, transportation and power generation.

- a. **Agriculture** - Land development schemes covering an area of 500 hectares or more
- b. **Airport** - Construction of airports (having an airstrip of 2,500 meters or more)
- c. **Drainage and Irrigation** –
 - Drainage of wetland, wild-life habitat or of virgin forest covering an area of 100 hectares or more.

- Irrigation schemes covering an area of 5,000 hectares or more.
- d. **Land Reclamation**-Coastal reclamation involving an area of 50 hectares or more.
- e. **Fisheries** –land based aquaculture covering an area of 50 hectares or more.
- f. **Forestry**
- Conversion of hill forest land to other land use covering an area of 50 hectares or more.
 - Logging covering an area of 500 hectares or more.
 - Conversion of mangrove swamps for industrial, housing or agricultural use covering an area of 50 hectares or more.
- g. **Housing**
- h. **Industry**
- Chemical- Where production capacity of each product or of combined products is greater than 100 tonnes/day
 - Petrochemicals all sizes
Non-ferrous primary smelting - Aluminum - all sizes / Copper - all sizes
 - Non-metallic -Cement - for clinker throughput of 30 tonnes/hour and above/ Lime - 100 tonnes/day and above burnt lime rotary kiln or 50 tonnes/day and above vertical kiln.
 - Iron and steel-requires iron ore as raw materials for production greater than 100 tonnes/day; or using scrap iron as raw materials for production greater than 200 tonnes per day.
 - Shipyards -Dead Weight Tonnage greater than 5000 tonnes.
 - Pulp and paper industry-Production capacity greater than 50 tonnes/day
- i. **Infrastructure**
- Construction of hospitals with outfall into beachfronts used for, recreational purposes/Industrial estate development for medium and heavy industry covering an area of 50 hectares or more/ Construction of Expressways, national highway, new township
- j. **Ports**
- Construction of ports/Port expansion involving an increase of 50 percent or more in handling capacity per annum.
- k. **Mining**

- Mining of materials in new areas where the mining lease covers a total area in excess of 250 hectares.
- Ore processing, including concentrating for aluminum, copper or gold.
- Sand dredging involving an area of 50 hectares or more.

l. **Petroleum**

m. **Power Generation and Transmission**

n. **Quarries**

o. **Railways**

p. **Transportation**

q. **Resort and Recreational Development**

r. **Waste Treatment and Disposal**

- Toxic and Hazardous Waste
- Municipal Solid Waste-
- Municipal Sewage

s. **Water Supply**

- Construction of dams, impounding reservoir with a surface area of 200 hectares or more.
- Groundwater development for industrial, agricultural or urban water supply of greater than 4,500 cubic metres per day.

4. CONCLUSION

Environmental impact assessment aims to minimise the negative impact of environmental activities as a result of projects. Some developments which require EIA, according to the law are referred to as “mandatory” and give the scope to which an EIA should be conducted. The EIA identifies problem areas and outlines alternatives as well as mitigating approach to potential problems either during construction, operation or decommissioning phases of the development.

5. SUMMARY

From this unit, you have learnt how to define an environmental impact assessment in various ways. Furthermore you have an understanding of why an EIA needs to be carried out and the mandatory projects that require an EIA.

6. TUTOR MARKED ASSIGNMENT

1. Define environmental impact assessment
2. List 4 main objectives of EIA.
3. List 5 projects that are mandatory to EIA process and give reasons for your answers.

7. REFERENCE/FURTHER READINGS

- 1990 Constitution of the Federal Republic of Nigeria
- Federal Environmental Protection Act of 1988
- Environmental Impact Assessment Act of 1992
- National Policy on the Environment of 1998
- Standards Organisation of Nigeria Act of 1971
- LASEPA Edict of 1996
- Agenda 21
- ISO 14001 Environmental Management Systems
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- Pollution Abatement in Industries and Facilities Generating Wastes Regulations of 1991
- National Guidelines for Environmental Audit of 1999
- National Guidelines on Environmental Management Systems of 1999
- Environmental Guidelines and Standards for Petroleum Industry in Nigeria

Unit 2

EIA PROCESS

1. Introduction
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 - 3.1 Sketch of EIA process
 - 3.2 General Principles and Procedures of EIA Legislation
 - 3.3 Stakeholders in the EIA Process
 - 3.4 Role of an interdisciplinary EIA team
 - 3.5 Contents of an EIA document
 - 3.6 Challenges of EIA system and Practice in Nigeria
4. Conclusion
5. Summary
6. Tutor Marked Assignment
7. Reference/Further Readings

UNIT 2

EIA PROCESS

1. INTRODUCTION

The EIA process describes the stages at which an environmental assessment can be made and the consequences of not following the stages. The EIA process includes the consideration of alternatives, screening, scoping, Baseline study, Prediction of impacts, mitigation measures, public consultation, submission of EIA report, monitoring and audit.

2. OBJECTIVES

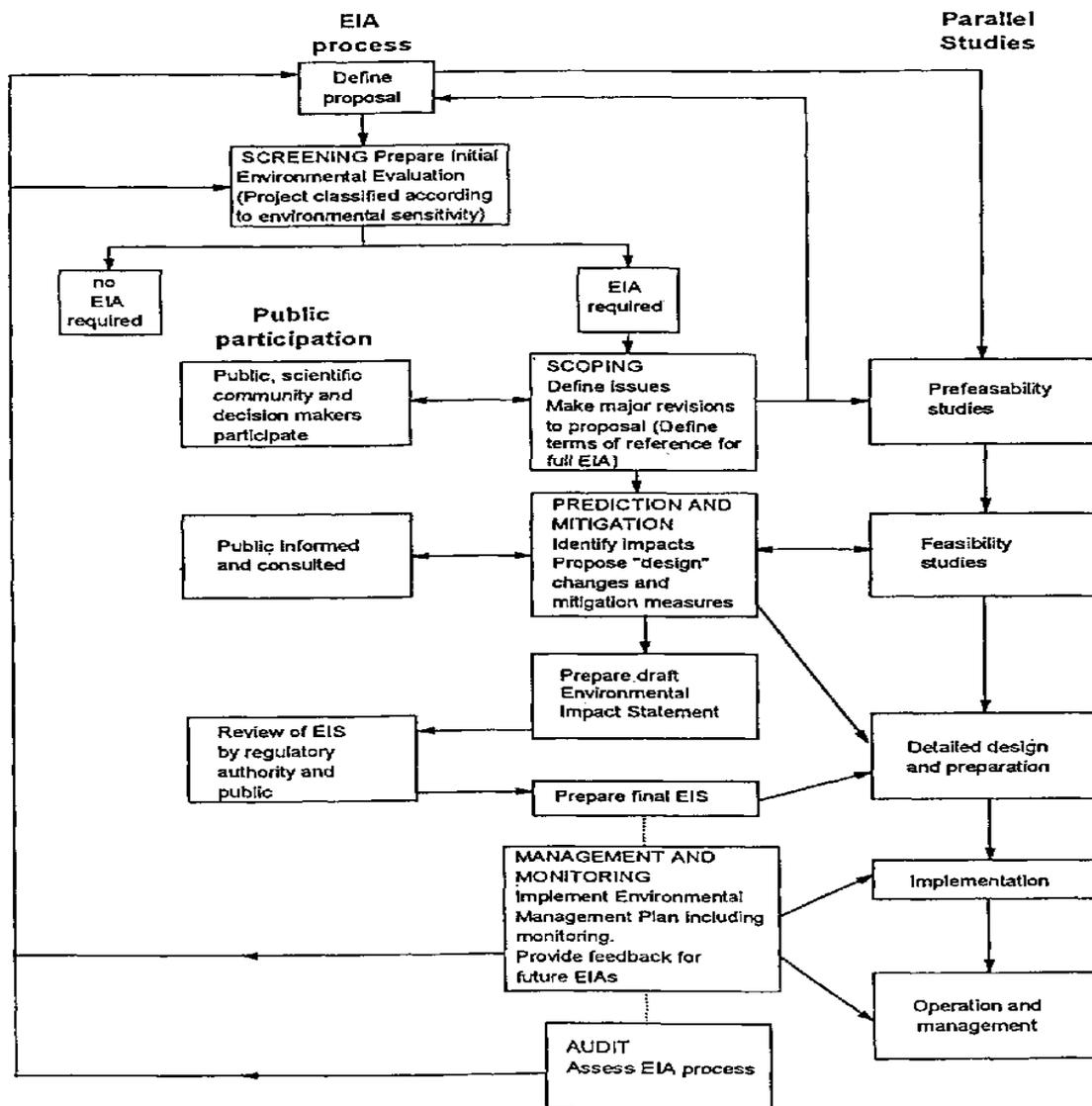
At the end of this unit, you should be able to:

- describe the EIA process
- list the principles and procedures of EIA Legislation
- explain the shortcomings of EIA in Nigeria

3. MAIN CONTENTS

3.1 EIA PROCESS

The diagram below signifies the EIA process, illustrating the various steps in the process with the feedback loops that will generate changes to the project and re-evaluate environmental effects.



3.2 General Principles and Procedures of EIA Legislation

The list below outlines the basic steps in the EIA process especially for a new development/project

1. Consideration of alternatives

2. Screening
3. Scoping
4. Baseline study
5. Prediction of “likely significant” impacts
6. Proposed mitigation measures
7. Public consultation
8. Submission of EIA report
9. Grant of consent by a competent authority
10. Monitoring and Audit

3.2.1 Consideration of alternatives

EIA should start early by providing an environmental input on the decisions on what is to be constructed and where it is to be located. This provides the best opportunity to avoid significant environmental effects by steering clear of environmentally sensitive locations and selecting designs and processes that have a reduced environmental impact.

3.2.2 Screening

Screening refers to the decision as to whether an EIA is required or not. **Screening of all projects (physical work or activity) must take place. Three categories of projects are defined:**

- a. Category I projects – EIA is mandatory (as described in Section 3.4.2 above)
- b. Category II projects – Screening determines whether or not EIA is required
- c. Category III projects – EIA is not required.

Procedural Guidelines for all projects requiring EIAs have been designed by the Federal Ministry of Environment (FMEnv), Housing and Urban Planning.

If a project requires EIA, a draft EIA report must be submitted to the FMEnv.

The EIA report in its presentation must contain;

- Executive Summary
- Project Justification
- Project and Process Description
- Description of Project Environment / Baseline Data
- Identification of Associated and Potential Impacts
- Mitigation measures
- Environmental Management Plan
- Conclusion and Recommendations
- Bibliography / References

3.2.3 Scoping

The purpose of scoping is to identify projects that are likely to have significant environmental effects. The identification of key effects is usually undertaken using a combination of professional judgement and gathering of other people’s opinions, particularly the determining authority and government agencies. The advantage of seeking a scoping opinion is that the developer will have some assurance that the issues being addressed by the EIA will be those that are considered important by the determining

authority when a decision is to be made on the project. To an extent, the scoping stage is carried out throughout the process, especially in cases when an unacceptable environmental effects may lead to the redesign of a project, hence the scope of the EIA will also change.

3.2.4 Baseline Study

A baseline study is required for project proposals where there is strong evidence that the proposed development will impact on the environment negatively. This study will establish the inventory of the site itself and can include ecological survey for biodiversity, pollution impacts e.g. ground noise disturbance, archaeological surveys to ascertain special sites of cultural heritage, etc. This study can vary from case to case depending on the project proposed for development. The baseline study is important as it may bring about project modification or non-approval of the project in view.

3.2.5 Assessing impacts

The assessment of impacts is one of the main purposes of EIA because the environmental effects of a development proposal are predicted.

The first element in assessing impacts is to understand the baseline conditions: In this case, it is important to know how the environment will be in the absence of the development and then to be able to predict how the conditions of the proposed development will be in the future. The baseline conditions will normally be established by consulting existing publications and undertake surveys on the site and the surrounding area. The scope of the survey would have been determined during the scoping stage of the EIA.

The second element in assessing impacts is to predict the magnitude of the impact: The change in environmental conditions generated can be carried out using variety of techniques. Where possible, the changes should be expressed in qualitative terms-E.g. models could be used to predict changes in noise levels or air pollution. In some cases too, the techniques used too may rely on professional judgement and consultation with appropriate stakeholders. Not all environmental impacts can be predicted accurately and some account may need to be taken of the uncertainties associated with the predictions.

The third element in assessing impacts is to assess the significance of the impacts: At this stage, you determine if the impact predicted is considered to have significant environmental effect. The possible change noticed at the prediction of impacts will be compared with the standard for the environment. It is based on this measurement that the significance of the impacts is then used to communicate whether the impact is of minor, moderate or major significance.

3.2.6 Mitigation

When the significant effects are identified, the developer and the consultants may then decide to bring about elimination or reduction of the impacts in order for the development to be approved. The means of mitigation the environmental effects should follow a systematic process and comply with standard requirements.

3.2.7 Public Consultation with Stakeholders

Consultation with stakeholders is essential during the EIA process. Public consultation documents seek to communicate the anticipated impacts and proposed mitigations of the project's impact and disclosure report should describe the environmental, socioeconomic and community health effects of the project.

3.2.8 Review and Decision making

The findings of the EIA are written up in an environmental statement and submitted together with the application for consent for approval. The EIA regulator crosschecks the document for adequate information and evaluates it. The information is evaluated for its relevance to the decision to be made, reliability in terms of information provided and the interpretation of data and sufficient to form a sound basis for a decision.

3.3 Stakeholders in the EIA Process

An EIA will involve a number of different stakeholders. Successful EIAs are characterized by a clear efforts being made to actively involve the team members. The following groups will be typically involved:

- 3.3.1 Project Proponents/Project Developers—These are originators of the project; they are responsible for undertaking the EIA but will usually employ a consultant to take full or partiality for it. They will indicate their interest, location and ensure that their proposal is in line with regulatory requirements.
- 3.3.2 Consultants- These are usually employed to undertake the EIA. This is likely to involve a large multidisciplinary team. Selected consultants should be registered, accredited and competent to collate information and write reports. For large and complex projects this could cover up to 15 different disciplines.

In successful EIAs the team is led and coordinated by an EIA project manager who has the responsibility of:

- ensuring that the EIA stays on schedule and on budget;
- providing quality control for the work provided by other members of the team;
- coordinating consultation with other stakeholders;
- working with the project design team to resolve environmental problems; and
- ensuring that the report resulting from the EIA is coherent and defensible

- 3.3.3 The General Public: Affected and interested members of the public provide inputs to the EIA and decision making processes.

3.3.4 The Non-Governmental Organisations (NGOs) – These provide inputs to the EIA and decision making process

3.3.5 Government agencies- State, Local and Federal Ministries provide specialist inputs into the EIA and decision making process. The government has a major role to play in providing a national framework for integrating development and conservation. The government should:

- Establish a comprehensive system of environmental law and provide for its implementation and enforcement by all stakeholders.
- Review the adequacy of legal, political and administrative controls concerning implementation and enforcement mechanisms, recognising the local approaches.
- Ensure the national policies, development plans and programmes, budgets and other decisions take full account of their effects on the environment.

Among these groups listed above, the key decision makers include the Project Developers, Environmental Consultants and Regulators .

3.4 Role of an interdisciplinary EIA team

In an EIA proposal, there could be a number of potential environmental impacts which could be physical, chemical, biological, social, cultural and economic impacts. The team members will be selected for the process based on their areas of specialisation and this is the role of the EIA Project Manager. This team will bring about multiple view points of the potential impacts of the proposed development. An interdisciplinary team consists of a group of people, trained in different fields, who interact to produce a coordinated EIA report. The EIA Project Manager has the primary task of drawing together the findings. Often, the lack of an interdisciplinary approach results in an EIA report that lacks real synthesis, containing a number of specialist studies with little cross-referencing. Members of an interdisciplinary team will be chosen for their complementary perspectives and technical expertise in analysing the environmental and social impacts that are of concern. In some cases, specialist consultants in the various areas are invited as special/technical experts.

3.5 Contents of an EIA Document

S.4 of the EIA Decree, 1992 states that an EIA shall include the following matters as a minimum including:

- i. A description of the proposed activity including: information on the site, design and size of the project;
- ii. An assessment of the likely or potential environmental impacts of the proposed activity including the direct, indirect, cumulative, short-term and long-term effects in order to avoid, reduce and, if possible, remedy significant adverse effects;
- iii. the data required to identify and assess the main effects which the project is likely to have on the environment;
- iv. A description of practical alternatives as appropriate studied by the developer and an indication of the main reasons for choice made, taken into account the environmental effects;

- v. A brief non-technical summary of the information provided (i-iv above)

3.6 Challenges of EIA system and practice in Nigeria

- Inconsistent environmental management policies
- Poor environmental awareness within the business community
- Weak regulatory framework
- Weak organisational structure to enforce EIA system
- Multiple regulators at the Federal/State levels
- Alternatives rarely considered
- Low quality reports
- Manpower issues and technical competence
- Public consultation seldom enforced
- Lack of funding
- Lack of coordination
- Non-cooperation of local communities

4. CONCLUSION

Environmental Impact Assessment is an important tool that should be used prior to development. There are categories of projects that will require an EIA to be carried out and are referred to as mandatory projects. It is important that the legal requirements for an EIA are understood by the proponents prior to a project development. If the process is followed accordingly, a lot of problems, social, environmental, economic, financial would be prevented.

5. SUMMARY

In this unit, you have learnt the definitions of EIA and the Nigerian Legislation regarding the use of the instrument. Also, you have learnt the origin and applications of EIA processes from various countries. You also have learnt that the EIA involves a lot of stakeholders, as a result when carrying out an EIA; the process could take a long time to execute. However, when an environmental impact assessment process is when carried out effectively by the concerned stakeholders will mitigate environmental problems or bring about a change in a process design.

6. TUTOR MARKED ASSIGNMENT

1. What are the reasons for carrying out an EIA?
2. Enumerate the challenges of EIA application in Nigeria
3. Why is it important to consult with the general public during an EIA process?
4. What are the basic principles of an EIA Process? Explain briefly any 4 of them.

7. REFERENCES/FURTHER READINGS

- 1990 Constitution of the Federal Republic of Nigeria
- Federal Environmental Protection Act of 1988
- Environmental Impact Assessment Act of 1992
- National Policy on the Environment of 1998
- Standards Organisation of Nigeria Act of 1971
- LASEPA Edict of 1996
- Agenda 21
- ISO 14001 Environmental Management Systems
- Effluent Limitations Regulations of 1991
- Pollution Abatement in Industries and Facilities Generating Wastes Regulations of 1991
- National Guidelines for Environmental Audit of 1999
- National Guidelines on Environmental Management Systems of 1999
- Environmental Guidelines and Standards for Petroleum Industry in Nigeria

UNIT 3

ORIGIN OF EIA AND THE SPREAD THROUGHOUT THE WORLD

4. INTRODUCTION

Environmental Impact Assessment began to be used in the 1960s as part of a rational decision making process. It was first conceived in the United States. It was a reaction to project planning and decision making based on economic efficiency and engineering feasibility at the expense of the environment. EIA was made legislation in the US in the National Environmental Policy Act (NEPA) 1969. NEPA (1969) set a requirement for the environmental effects of federal actions to be assessed prior to a decision being taken. It has since evolved as it has been used increasingly in many countries around the world. Some of these include: Australia, China, Egypt, European Union, India, New Zealand, Unites States and Nigeria.

The spread in some countries include:

- Canada (1973)
- Australia (1974)
- Colombia (1974)
- West Germany (1975)
- France (1976)
- Philippines (1977)
- European Commission Directive (1985)
- United Kingdom (1988)
- Kazakhstan (1991)
- Nigeria(1992)

By 1996, it was estimated that over 100 countries had national EIA systems. (Sadler, 1996)

5. OBJECTIVES:

At the end of this unit, you should be able to

- give a brief history of EIA in some countries
- outline the EIA process in individual countries
- List the shortcoming of EIA in some of the countries described in the unit

6. MAIN CONTENT

3.1 Australia

The history of EIA in Australia could be linked to the enactment of U.S. National Environment Policy Act (NEPA) in 1970, which made the preparation of environmental impact statements a requirement. In Australia, the EIA procedures were introduced at a State Level prior to that of the Commonwealth (Federal), with a majority of the states having divergent views to the Commonwealth (Elliot et al, 2009). One of the pioneering states was New South Wales, whose State Pollution Control Commission issued EIA guidelines in 1974. At a Commonwealth (Federal) level, this was followed by passing of the Environment Protection (Impact of Proposals) Act in 1974. The Environment Protection and Biodiversity Conservation (EPBC) Act 1999 superseded the Environment Protection (Impact of Proposals) Act 1974 and is the current central piece for EIA in Australia on a Commonwealth (Federal) level. An important point to note is that this Commonwealth Act does not affect the validity of the States and Territories environmental and development assessments and approvals; rather the EPBC runs as a parallel to the State/Territory Systems (Elliot et al, 2009). Overlap between federal and state requirements is addressed via bilateral agreements or one off accreditation of state processes, as provided for in the EPBC Act.

The Commonwealth Level

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places-defined in the EPBC Act as matters of 'national environmental significance'. Following are the eight matters of 'national environmental significance' to which the EPBC Act applies (Dept of Environment, Australia, 2010):

- I. World Heritage sites;
- II. National Heritage places;
- III. Ramsar wetlands of international significance;
- IV. Listed threatened species and ecological communities;
- V. Migratory species protected under international agreements;
- VI. The Commonwealth marine environment;
- VII. Nuclear actions (including uranium mining); and
- VIII. National Heritage.

In addition to this, the EPBC Act aims at providing a streamlined national assessment and approval process for activities. These activities could be by the Commonwealth, or its agents, anywhere in the world or activities on Commonwealth land; and activities that are listed as having a 'significant impact' on matters of 'national environment significance (Dept of Environment, Australia, 2010).

The EPBC Act comes into play when a person (a 'proponent') wants an action (often called a 'proposal' or 'project') assessed for environmental impacts under the EPBC Act, he or she must refer the project to the Department of Environment, Water, Heritage and the Arts (Australia). This 'referral' is then released to the public, as well as relevant state, territory and Commonwealth ministers, for comment on whether the project is likely to have a significant impact on matters of national environmental significance (Dept of Environment, Australia, 2010). The Department of Environment, Water, Heritage and the Arts assess the process and makes recommendation to the Minister or the Delegate for the feasibility. The final discretion on the decision remains that of the Minister, which is not solely based on matters of 'national environmental significance' but also the consideration of social and economic impact of the project (Dept of Environment, Australia, 2010).

The Australian Government Environment Minister cannot intervene in a proposal if it has no significant impact on one of the eight matters of 'national environmental significance' despite the fact that there may be other undesirable environmental impacts ^[12]. This is primarily due to the division of powers between the States and the Federal government and due to which the Australian Government environment minister cannot overturn a state decision.

There are strict civil and criminal penalties for the breach of EPBC Act. Depending on the kind of breach, civil penalty (maximum) may go up to \$550,000 for an individual and \$5.5 million for a corporate body or for criminal penalty (maximum) of seven years imprisonment and/or penalty of \$46,200 (Dept of Environment, Australia, 2010).

3.2 China

The Environmental Impact Assessment Law (EIA Law) requires an environmental impact assessment to be completed prior to project construction. However, if a developer completely ignores this requirement and builds a project without submitting an environmental impact statement, the only penalty is that the environmental protection bureau (EPB) may require the developer to do a make-up environmental assessment. If the developer does not complete this make-up assessment within the designated time, only then is the EPB authorized to fine the developer. Even so, the possible fine is capped at a maximum of about US\$25,000, a fraction of the overall cost of most major projects (Wang, 2007).

3.3 Egypt

Environmental Impact Assessment (EIA) is implemented in Egypt under the umbrella of the Ministry of state for environmental affairs. The Egyptian Environmental Affairs Agency (EEAA) is responsible for the EIA services. In June 1997, the responsibility of Egypt's first full time Minister of State for Environmental Affairs was assigned as stated in the Presidential Decree No.275/1997. From thereon, the new ministry has focused, in close collaboration with the national and international development partners, on defining environmental policies, setting priorities and implementing initiatives within a context of sustainable development. According to the Law 4/1994 for the Protection of the Environment, the Egyptian Environmental Affairs Agency (EEAA) was restructured with the new mandate to substitute the institution initially established in 1982. At the central level, EEAA represents the executive arm of the Ministry.

The purpose of EIA is to ensure the protection and conservation of the environment and natural resources including human health aspects against uncontrolled development. The long-term objective is to ensure a sustainable economic development that meets present needs without compromising future generations' ability to meet their own needs. EIA is an important tool in the integrated

environmental management approach. In this country therefore, EIA must be performed for new establishments or projects and for expansions or renovations of existing establishments according to the Law for the Environment (EEAA, 2010)

3.4 European Union

The European Union has established a mix of mandatory and discretionary procedures to assess environmental impacts (Watson, 2003). European Union Directive (85/337/EEC) on Environmental Impact Assessments (known as the EIA Directive) (EC Directive, 1985) was first introduced in 1985 and was amended in 1997. The directive was amended again in 2003, following EU signature of the 1998 Aarhus Convention. In 2001, the issue was enlarged to the assessment of plans and programmes by the so called Strategic Environmental Assessment (SEA) Directive (2001/42/EC), which is now in force (Watson, 2003). Under the EU directive, an EIA must provide certain information to comply (EC Directive, 2001). There are seven key areas that are required:

- a. Description of the project
 - o Description of actual project and site description
 - o Break the project down into its key components, i.e. construction, operations, decommissioning
 - o For each component list all of the sources of environmental disturbance
 - o For each component all the inputs and outputs must be listed, e.g., air pollution, noise, hydrology
- b. Alternatives that have been considered
 - o Examine alternatives that have been considered
 - o Example: in a biomass power station, will the fuel be sourced locally or nationally?
- c. Description of the environment
 - o List of all aspects of the environment that may be affected by the development
 - o Example: populations, fauna, flora, air, soil, water, humans, landscape, cultural heritage
 - o This section is best carried out with the help of local experts, e.g. the RSPB in the UK
- d. Description of the significant effects on the environment
 - o The word significant is crucial here as the definition can vary
 - o The word 'significant' needs to be defined
 - o The most frequent method used here is use of the Leopold matrix (WHAT IS?)
 - o The matrix is a tool used in the systematic examination of potential interactions
 - o Example: in a wind farm development a significant impact may be collisions with birds
- e. Mitigation
 - o This is where EIA is most useful
 - o Once the significant effects of the environment have been completed, the areas with the greatest impacts will be identified.
 - o Using this information ways to avoid negative impacts would be developed
 - o It is best to work with the developer at this stage as they know the project best
 - o Using the wind farm example again construction could be out of bird nesting seasons
- f. Non-technical summary (EIS)
 - o This section is a summary that does not include jargon or complicated diagrams
 - o It should be understood by the informed lay-person
 - o It is important that the information is available to the public
 - o The EIA will be in the public domain and be used in the decision making process
- g. Lack of know-how/technical difficulties
 - o This section is to advise any area of weakness in knowledge

- It can be used to focus areas of future research

3.5 India

The Ministry of Environment and Forests (MoEF), of India have the responsibility for carrying out Environmental Impact Assessment in India. The main environmental laws in the nation are:

- Water Act(1974)
- The Indian Wildlife (Protection) Act (1972)
- The Air (Prevention and Control of Pollution) Act (1981) and
- The Environment (Protection) Act (1986).

The responsible body which coordinates these laws is the **Central Pollution Control Board**. Environmental Impact Assessment (EIA) studies need a significant amount of primary and secondary environmental data. The primary data are those which need to be collected in the field (field data) to define the status of environment (like air quality data, water quality data etc.). The secondary data are those data which have been collected over the years and can be used to understand the existing environmental scenario of the study area (documents/historical data). The environmental impact assessment (EIA) studies are conducted over a short period of time. Environmental trends based on few months of primary data have its own limitations. Ideally, the primary data has to be considered along with the secondary data for complete understanding of the existing environmental status of the area. In many EIA studies, the secondary data needs could be as high as 80% of the total data requirement.

Another shortcoming in the collection of EIA data is the multiple agencies involved in data collection e.g. ecology, geology etc. There is not a single agency that harmonises information collected in order to make them available in a single place and manner required by the EIA practitioner. This in turn adversely affects the time and efforts required for conducting the environmental impact assessments (EIAs) by project proponents and also timely environmental clearances by the regulators. With this background, Environmental Information Centre (EIC) was set up to serve as a professionally managed clearing house of environmental information that can be used by the Ministry of Environment and Forests, project proponents, consultants, NGOs and other stakeholders involved in the process of environmental impact assessment in India. The EIC therefore caters for these needs by creating and disseminating organized environmental data for various developmental initiatives all over the country. The centre stores data in GIS format and makes it available to all environmental impact assessment studies and to EIA stakeholders in a cost effective and timely manner.

3.6 New Zealand

In New Zealand, EIA is usually referred to as *Assessment of Environmental Effects* (AEE). The first use of EIA's dates back to a Cabinet minute passed in 1974 called Environmental Protection and Enhancement Procedures. This had no legal force and only related to the activities of government departments. When the Resource Management Act was passed in 1991, an EIA was required as part of a resource consent application. Section 88 of the Act specifies that the AEE must include "such detail as corresponds with the scale and significance of the effects that the activity may have on the environment". While there is no duty to consult any person when making a resource consent application (Sections 36A and Schedule 4), proof of consultation is almost certain to be required by local councils when making a decision about whether or not to publicly notify the consent application under Section 93.

3.7 Russian Federation

In 2004, the state authority responsible for conducting the State EIA in Russia was split between two Federal bodies:

- a. Federal service for monitoring the use of natural resources – a part of the Russian Ministry for Natural Resources and Environment and
- b. Federal Service for Ecological, Technological and Nuclear Control.

The main problem concerning State EIA in Russia is the clear differentiation of jurisdiction between the two above-mentioned Federal bodies.

The two main pieces of environmental legislation in Russia are: The Federal Law ‘On Ecological Expertise, 1995 and the ‘Regulations on Assessment of Impact from Intended Business and Other Activity on Environment in the Russian Federation, 2000 (Department of Environment, cited 2010).

3.8 Unites States

Under United States Environmental Law, an Environmental Assessment (EA) is compiled to determine the need for an *Environmental Impact Statement* (EIS), and originated in the **National Environmental Policy Act (NEPA)**, enacted in 1969. NEPA requires that reasonable statements as to the prospective impacts be disclosed in advance. The purpose of NEPA process is to ensure that the decision maker is fully informed of the environmental aspects and consequences prior to making the final decision.

An ***Environmental Assessment (EA)*** is an environmental analysis prepared pursuant to the National Environmental Policy Act to determine whether a federal action would significantly affect the environment and thus require a more detailed *Environmental Impact Statement (EIS)*. The release of an Environmental Assessment results is either a *Finding of No Significant Impact (FONSI)* or an *Environmental Impact Statement (EIS)*.

The Environmental Assessment is a concise public document for which a federal agency is responsible that serves to:

- briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI
- aid an agency, compliance with the act when no EIS is necessary
- facilitate preparation of a statement when one is necessary

The Environmental Assessment includes brief discussions of the need for the proposals of alternatives as required by Section 102(2) (E) NEPA, of the environmental impacts of the proposed actions and alternatives, as well as a listing of agencies and persons consulted. The agency must approve an EA before it is made available to the public. The EA is made public through notices of availability by local, state, or regional newspapers, etc.

There is a **30** day review period required for an Environmental Assessment, and the document is made available for public commentary.

Usually, an agency will release either a *Draft Environmental Assessment* (Draft EA) or a *Draft Environmental Impact Statement* (DEIS) for comment. Interested parties and the general public have the opportunity to comment on the draft, after which the agency will approve the “Final Environmental Assessment” (Final EA) or *Final Environmental Impact Statement* (FEIS).

Commenting on the Draft EA is typically done in writing, submitted to the lead agency as defined in the Notice of Availability. Draft EIS require public hearings, so comments can be made in person, as well as in writing. Occasionally, the agency will later release a "Supplemental Environmental Assessment" (Supplemental EA) or a *Supplemental Environmental Impact Statement* (SEIS), especially if the project parameters or environmental conditions or effects change substantially after the issuance of the Final EA or FEIS.

The adequacy of an EIS can be challenged in federal court. Major proposed projects have been blocked because of an agency's failure to prepare an acceptable EIS. Several state governments that have adopted some laws under NEPAs. These state laws impose EIS requirements for particular state actions. An example of a state law is that of the Californian Environmental Quality Act which refers to the required environmental impact studies as **environmental impact reports**. (Sive et al...)

It is worthy of note that the state requirements are yielding huge data not just upon impacts of individual projects, but also shed light on scientific areas that had not been sufficiently researched. For example, in a seemingly routine *Environmental Impact Report* for the city of Monterey, California, information came to light that led to the official federal endangered species listing of Hickman's potentilla, a rare coastal wildflower.

The structure of a generic Environmental Assessment is as follows:

- a. Summary
- b. Introduction
 - o Structure
 - o Background
 - o Purpose and Need for Action
 - o Proposed Action
 - o Decision Framework
 - o Public Involvement
 - o Issues
- c. Alternatives, including the Proposed Action
 - o Alternatives
 - o Mitigation Common to All Alternatives
 - o Comparison of Alternatives
- d. Environmental Consequences
- e. Consultation and Coordination

7. CONCLUSION

8. SUMMARY

9. TUTOR MARKED ASSIGNMENT

1. Outline the stages of EIA in the European Union
2. Describe the EIA process in Australia
3. Compare the shortcomings of EIA in India with that of the United States

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UNIT 4

CASE STUDIES OF EIA PRACTICE

1.0 INTRODUCTION

Case studies based on EIA Reports are one of the best means of relating EIA training to local conditions and realities. In particular, appropriate case studies offer lessons and insights on EIA strengths and weaknesses locally. They are valuable for a number of purposes, including:

- demonstrating the institutional arrangements and procedures for EIA
- implementation in a given country;
- illustrating how the main steps and activities of the EIA process are carried out locally;
- considering the environmental settings and types of impacts that are typically addressed in EIA practice; and
- highlighting key trends and issues of EIA practice, including areas where capacity needs to be improved.

In this unit, case studies from a private organisation (NOKIA), a developed nation (Finland) and a developing nation (Sudan) were discussed.

2.0 AIMS

At the end of this unit, the students should be able to:

- establish the different challenges encountered from the various EIA case studies

- compare EIA practices with that obtained in their locality

3.0 MAIN CONTENTS

3.1 REDUCING CO₂ EMISSIONS WITH CLEVER USE OF MOBILE TECHNOLOGIES (BY NOKIA) 2009

Over one billion people today own and use Nokia devices and services. We have great possibilities to contribute to reduction of CO₂ emissions with some simple and easy everyday actions. To demonstrate the possibility and the power of combined individual actions, we have made some calculations and assumptions based on people's behavior. Let's assume that just 10% of people using Nokia devices - that's around 110 million people - would do the following with Nokia devices and services for one year:

- Use their mobile device for attending a meeting once instead of travelling to the meeting by plane.
- Use their mobile device to work remotely once a week instead of driving to work
- Use their mobile device instead of buying a separate music player, camera, video recorder, fixed line telephone, PC and a car navigator

With these actions just 10% of people using our devices could reduce global CO₂ emissions by over 170 million tonnes. This is about the same amount as the annual CO₂ emissions of the countries of Denmark and Belgium combined.

These savings are naturally dependant on how people behave and what kind of individual choices they make. The above represents a small percentage of all the mobile device users globally, and even they could be doing more.

For example, additional savings could be achieved if people used digital services instead of buying physical products. A good example is music. Downloading digital music instead of buying a CD can reduce the energy and CO₂ emissions of delivering music to consumers by 40-80%. Also the use of mobile GPS and maps can help in reducing the traffic related emissions.

Nokia as a company has a role to play in this by reducing energy consumption in our operations, making energy efficient devices and giving people tools to reduce their own footprint. For example, recently we have launched a service for sustainable lifestyle, the Green Explorer, helping people make more sustainable choices when travelling. It's a free Nokia service and available from Ovi.

Main assumptions:

- 1) Average one way air travel: 3000 km; emission factor 0.12 kg CO₂ per km
- 2) Average one way home - office commuting distance 16 km; emission factor 0.15 kg CO₂ per km
- 3) Life cycle CO₂ equivalent emissions are based on figures published by the equipment manufacturers. The used figures are for three year lifecycle and are annualized for our example.
- 4) Source: International Energy Agency 2006 data.
- 5) Source: "The energy and climate change impact of different music delivery methods" by CarnegieMellon University, Lawrence Berkeley National Laboratory, and Stanford University

3.2 Case study of an EIA in Finland, development of Highway 1 (E18)

Jantunen, J Uusimaa Regional Environment Centre

The case study shows the main stages of an EIA procedure and provides a short overview of the difficulties encountered during the EIA, how they were overcome and the benefits of the EIA.

The national Highway 1 is part of the European road E18, which is the most important east-west road corridor in Finland. The E18 is a central element of the Nordic Triangle, which links the Nordic capitals to each other, to Russia and to central Europe, and it are part of the TEN networks. The section of Highway 1 between Salo and Lohja (63 km) is narrow, winding and unsafe. According to the Finnish Road Administration, the road is running short of capacity. Already in the 1960s, the Road Administration began planning to develop this highway to a motorway standard. A preliminary design with several alternatives was completed in 1988 and in 1990 the Ministry of Transport made a decision on a project for a motorway between Salo and Lohja and chose the alternative for the final design. The Road Administration worked on completing the final design during 1992 and 1993, before Finland joined the European Union in 1995 and before the Finnish EIA legislation came into force on 1 September 1994. However, in accordance with the Finnish EIA legislation, this project was still subject to a mandatory EIA.

The EIA procedure in Finland

In the Finnish EIA procedure the developer first prepares an assessment programme, which contains information on the project, alternatives to the project and how the assessment will be carried out. The assessment programme is already subject to public participation. On the basis of further studies and opinions given on the assessment programme, the developer prepares an assessment report where information on the project and the alternatives are presented, together with a comprehensive evaluation of their environmental impacts. This report is again subject to public comment. The report will be attached to decision-making material. The authorities are not allowed to make any decision on a permit or a plan until the assessment procedure has been concluded. The task of investigating environmental impacts falls to the developer. A coordinating authority is responsible for coordination of the assessment procedure, reviewing reports and related duties. In this particular EIA the coordinating authority was the Uusimaa Regional Environment Centre. In the EIA Decree there is a detailed list of different project types that always require the assessment procedure. The list is based on the lists in the EIA Directive (85/337/EC with amending 97/11/EC) and the UNECE Convention on EIA in a Transboundary Context (1991). The EIA procedure can also be applied in individual cases to a project not included on the list or it can be applied to modifications of a completed project that will probably have significant adverse environmental impact. The Ministry of the Environment is responsible for making these case-by-case decisions on whether to apply the assessment procedure. However, for nuclear power projects it is the Ministry of Trade and Industry who makes these decisions.

Screening

In the case of national Highway 1, the Road Administration was not willing to start the whole design process for the road from the beginning, so there were only two main alternatives in the EIA. The first alternative was a 63 km motorway from Salo to Lohja. The details of the alignment were not fixed and there was the possibility that minor changes would be needed in certain places, mostly because of spots with high conservation value. The other alternative was a *do the minimum* alternative, that is, just upgrade the existing roads. Because of the motorway alternative, it was clear that the project was subject to an EIA, in accordance with the Finnish legislation and the EIA Directive.

Identification and scoping

The new road would pass through important natural areas and would cause changes to both the natural landscape and cultural landscape areas. There were also several important groundwater areas, as well as lakes and rivers, to be considered.

The scoping was focused on identifying the most sensitive and important areas and on analysing the changes that would result because of the building of the road. The EIA was focused on national and regional impacts. The most important goal was to determine the impacts of a new motorway and the impacts of just upgrading the existing roads. The feasibility study had already assessed quite comprehensively the local impacts. However, later it was seen that the EIA paid too little attention to the local impacts. In one area with high landscape values there were some alternative alignments proposed and these were assessed in more detail.

According to the Finnish legislation on EIA, the EIA procedure is also subject to public participation. Several different interest groups were consulted and the opinions were very diverse, depending on the interest group or the location of the group. This was also one of the first EIA procedures in Finland and especially nature conservation associations were actively involved in seeing what the EIA procedure meant in practice.

Baseline data

The earlier investigations and traffic forecasts done during the feasibility study were updated and some new supplementary surveys were made. The existing roads were mapped and biotope mapping was done when needed. Groundwater surveys were also updated and more information on the transport of dangerous chemicals was collected.

Potential impacts from noise and emissions were assessed closely and there were inquiries and interviews of local people to assess social impacts. Landscape analysis was done in both rural environments and more densely populated villages. Different scenarios were used to look at impacts on community structure and economics: what factors increase economic growth and what kinds of impacts will they have on employment.

Additionally, possible changes in the status of local municipalities and in their physical land use planning were studied.

Impact study and assessment

In the Finnish EIA legislation there are requirements for an EIA report. The EIA report covered the environmental aspects that were determined to be the most significant during the scoping phase. A new motorway has significant advantages and disadvantages. The upgrading of the existing roads however will have minor consequences as compared with a totally new motorway. A new motorway will help ease problems on the existing roads, but just upgrading the existing roads will not be an effective solution to traffic problems. In general, the upgrading of existing roads means that the already existing problems will increase and the people living next to the roads will suffer even more. In economic terms, the new motorway was seen to be the better solution. The most significant adverse impact of the new motorway will be the loss of biodiversity. The new motorway will also cause fragmentation in some lake areas, as well as in one important recreation area. Moreover, the motorway will change the landscape especially in rural areas with high cultural values.

On the other hand, the new motorway will have a positive economic impact on some municipalities and it will boost development in some villages next to the existing roads. A negative impact though is that some areas that are now quiet areas will be affected by the traffic noise from the new motorway. However, the number of people overall suffering from traffic noise will decrease. In the EIA it was

shown that the upgrading of the existing roads will have significant adverse impacts on some villages next to the existing roads. On the other hand, the upgrading of these roads will allow for the implementation of ground water protection, which will reduce risks of ground water contamination.

When completed, the assessment report was subject to public comments. Local municipalities and other authorities were quite satisfied with the assessment report but the general public and the local associations were more critical. They suspected that the EIA favoured the new motorway alternative. The Uusimaa Regional Environment Centre reviewed the report and stated that the EIA had been done in accordance with the Finnish EIA legislation and that it was sufficient. However, the Regional Environment Centre pointed out that the concern about the neutrality of the EIA was not groundless. In its statement, the Centre suggested guidelines for future environmental studies needed in different planning and permit processes for the motorway.

After the EIA

The EIA was completed in 1996. The Finnish Road Administration proceeded to work on the final design of the project. In 1995 Finland became a member of the EU and it then had to implement the Habitats Directive. During the EIA procedure, the Finnish Nature Conservation Act, which implements the Habitats Directive, was not yet in force and Finnish authorities paid too little attention to species listed in Appendix 4(A) of the Habitats Directive. Some local people found evidence of flying squirrels, which are listed in Appendix 4(A), close to the planned motorway. The Road Administration ordered a report on flying squirrels for the entire road section. According to the report, 47 occurrences of flying squirrels close to the planned motorway were recorded, of which 29 were in the immediate vicinity of the road. This resulted in a long legal process that delayed even further the construction of the new motorway.

Another surprise was a shooting range located in an area of a proposed interchange. A high concentration of lead was detected in the soil. According to the amended EIA decree, the disposal of heavily leaded soil is subject to a mandatory EIA. This meant a new EIA procedure for the cleaning up and disposal of the leaded soil, which resulted in even more delays.

Currently, all the plans for the project have been ratified, there are no more legal proceedings, and the motorway is under construction.

Benefits of the EIA

This particular EIA case was far from ideal. The main problem was that the alignment for the motorway alternative was chosen before the EIA started. This caused misunderstandings among some of the groups involved. There were also discussions with the European Commission about the lack of alternatives in regard to the flying squirrel.

Maybe the biggest benefit in this case was that the EIA ensured that environmental issues were taken into account in the planning procedures and the decision-making process. This resulted in modifications to the project, so that it was more environmentally friendly, which made it easier for the project to be accepted, and also more in line with the national legislation. In this case the EIA helped to identify environmentally sensitive areas and significant issues so that they could be taken into account and the adverse impacts could be reduced to an acceptable level. Some positive outcomes of the EIA are: an important recreation area was saved by building a tunnel, most habitats of the flying squirrel were saved by small changes in design, groundwater areas were protected, long sections of the road run through deep rock cuttings and the planned primary measure for noise control is terrain modification. For environmental reasons, landscape bridges have been planned for the longest bank sections. Surface water runoff from the road area will be treated and there will be controlled channelling of this water into the natural water system. There will be limitations on

construction work in waterway sites during the spawning season of fish and the nesting season of birds. This particular case is a good example of how to apply an EIA when the planning procedure and decision-making process have reached the point where it is not possible to start again from the very beginning.

Lessons learned

An important point is to be sensitive to the new information and not to rely too much on the old information. Nature is dynamic and it is not always easy to identify immediately all the important species listed in the Habitats Directive. If you receive a hint about something, check it out and don't ignore it. Natura 2000 sites and the species listed in Appendix 4(A) of the Habitats Directive are very important factors in planning and decision-making.

Be aware of the legislation. If you have a major infrastructure project, it will take many years, if not decades, to carry it out. When a country becomes a member of the EU, totally new environmental legislation needs to be implemented. This is what happened in Finland. New legislation will probably be applied to some projects, maybe even more than once, and each time new legislation is applied, there is the possibility that new groups will have the right to appeal your project. Don't choose an alternative too early. There should be several alternatives. Try to identify the main interest groups (?) and impacts of the project (?), because these are important when looking at different alternatives. A detailed design with obvious alternatives might go to waste and you can lose valuable time if you need to begin the procedure again.

3.4 Environmental Impact Assessment From A Sudanese Perspective By Osman Mirghani Mohamed Ali

INTRODUCTION

The history of the EIA process in Sudan as well as its *status quo* are reviewed. Examples are cited of EIAs conducted and appraised in the light of legislation, participation, environmental sustainability and capacity building. Emphasis is laid upon developmental projects related to the Nile System in Sudan.

Problems negatively impacting the efficiency of the EIA process in Sudan fall into internal and external categories. The former are related to the origin, procedure and fate of the EIA as follows:

- legislation and institutional aspects of EIA;
- lateness of the EIA in the project cycle;
- inadequate time allotted for completion of EIA ;
- composition of the EIA Team and qualification of team members ; and
- fate of the accomplished EIA

Environmental Assessment In Sudan

A history of EIA in Sudan shows that the report of the Equatorial Nile Project (ENP) of 1954 is probably the first ever environmental impact assessment endeavour carried out in the developing world (Moghraby, 1997). That was an EIA in function but not in name! Recent environmental and socio-economic evaluations were also carried out (Moghraby, 1982; Moghraby & El Sammani, 1985). It is worth-mentioning that EIA requirements were first introduced by the World Bank in 1989 through its Operational Directive 4.01 on Environmental Assessment, now Operational Policy 4.01 (Freestone, 1996).

Sudan is currently embarking on ambitious developmental programmes such as rehabilitation of agricultural schemes, construction of transcountry roads, digging of irrigation canals, building and heightening of dams and extraction and transportation of crude oil as well as a number of new industries. Each of these projects could have diverse and significant environmental impacts. For each of these projects an EIA is either in progress or is planned.

Features Of The Process Of EIA In Sudan

Legislation

As most of the developing projects in Sudan are sponsored and implemented by overseas donors, it is the donors who require and usually supervise the implementation of particular EIAs. Sudan itself has not legislated for EIA as a mandatory requirement as is the case, for example, in the German Act on the Assessment of Environmental Impacts (Tier, 1998). Instead, there are over 150 natural resources laws and sectoral regulations dealing with health, water supply, land tenure, game, protected areas, fisheries and marine resources and other sectors of natural resources. More recently, Sudan has taken a remarkable step towards promulgating comprehensive environmental legislation, the *Environmental Protection Policy Act*, awaiting the signature of the President before being implemented, which states that: 'Any large developmental project, which construction might negatively impact the quality of the environment should undergo an Environment Feasibility Study (EFS).' Stipulated in the EFS is the requirement for the following information:

- effect of proposed project/action on the environment;
- any unavoidable negative environmental impact; and
- available alternatives for proposed actions.

Agencies Conducting Eia

For an effective implementation of an EIA two pre-requisites are vital:

- proper qualification of the conducting agency and
- its independence and non-polarity.

Unfortunately, these two conditions are not strictly observed. An array of agencies and consultants are available, all claiming to be qualified and experienced in conducting EIAs for all types of projects. As for the second condition, in a particular irrigation project, the constructing firm entrusted with the implementation of the rehabilitation protocol won the tender for carrying out the EIA for the same project. This no doubt undermines the integrity of the bidding authority and blemishes the value and goal of the process itself.

The Timing Of The Eia

The implementation of an EIA has to insure that, should an adverse environmental impact be foreseen, the necessary corrective measures are formulated in the early stages of preparation of the proposed project. The prerequisite of this is that the EIA should be started and accomplished before the proposed date of the project execution. However, this is not always the case. In Zimbabwe the EIA was carried out for the proposed Osborne Dam while the construction of the dam was already under way with the engineers, surveyors and other staff working on the dam site! (ICEA, 1989). In Sudan, the rehabilitation of canals and other irrigation structures as well as the construction of the pump stations in all four schemes of the Northern Province Irrigation Rehabilitation Project were in progress when the tenders for the EIA were opened! This delay in starting the EIA process happened even though the feasibility study of the Rehabilitation Project was conducted 16 years ago! In both cases such efforts cannot be deemed as EIA and can only rank as environmental evaluation studies (EES). The time factor affects the quality of EIA in so far as the lateness of the EIA would not permit

meticulous, integrated conduct of the assignment, nor would it allow for application of the recommended mitigation procedures.

Participation

The participation of the local people and NGOs will no doubt act as a safeguard ensuring that the EIA has not overlooked the envisaged impacts on the community concerned. This participatory involvement should begin from the point of the project identification and continue throughout the project cycle. However, this is loosely, if at all, adhered to. Similar to the findings of Gutman (1997), public participation, with a few exceptions, did not rank high among the EIAs. It was either ruled out, omitted by the EIA team or was acknowledged as too late and too limited. Such practices as the coopting of local expertise in the EIA team and in the administration of questionnaires are not enough. This calls for remedial measures such as spelling out in the EIA Act that the participation of the local people is of equal importance and inseparable from the process itself. Concomitant with that, if not prior to it, is the training of NGOs, CBOs and affected groups to take part in the EIA protocols. Good EIAs are expected to contribute to the final project design, give the public a say in the project, and add to overall environmental awareness among involved parties (Gutman, 1997).

The Fate Of The Eia

Bad as it is not to undertake an EIS, it is worse to ignore the results of an EIA once accomplished. The monitoring of mitigation measures calls for a responsible body. Such an agency as the environment management agency (PEA) is lacking in Sudan. The HCENR, if institutionally upgraded and financially supported, could fill that gap. Otherwise, questions as to

- who will implement the findings of the EIA?
- who will supervise the implementation? and
- who will supervise the implementation? remain unanswered.

The Federal System

The federal governing system adopted by Sudan casts heavy shadows over the EIA process. Conflict over natural resources could occur between various States. The devolution of the Comprehensive Environmental Legislation to State levels needs the executive power to make it effective. It is suggested that the Central Government should have a stronger grip on policies, legislation, foreign affairs and coordination.

Recommendations

- The country should hasten its steps towards the adoption of the NEAP and the signing of the EPA.
- Qualified firms, institutions and personnel should be involved in EIA. The quality of EIA should comply with ISO 14001.
- Manuals and EIA software should be available in English and, if possible, in Arabic languages.
- Manuals and software should be tailored to Sudanese circumstances or to similar developing countries.

- The HCENR should be upgraded institutionally and supported financially.
- Research and training institutes such as the Institute of Environmental Studies should be supported to be the focal point of all EIAs in Sudan.
- Popular participation should be an integral part of the EIA.
- EIAs should be open to competition by consultants firms via invitation to tender.
- It should be obligatory for overseas implementing firms to consult with Sudanese experts to enhance the Environment Assessment (EA) capabilities in the country.
- Enough time should be available between the completion of the EIA and the execution of the project.
- Social and economic issues should receive equal weight as the natural environment.

4 CONCLUSION

The unit gives an overview of how EIA is practised in other countries/organisations and sheds light into the problems and benefits of carrying out an EIA. It is anticipated that in years to come, more governments will approve of alternative ways of carrying out a smooth EIA process through the legislative processes. Furthermore, you are encouraged to explore (through the internet) other case studies on the practices of environmental impact assessment to get more understanding of the challenges.

5 SUMMARY

Following the case studies highlighted in this unit, you now know the practices of EIA from Finland and from Sudan. You have gained knowledge of their legislation and their EIA practices. You will, from this unit, understand that the process of EIA are detailed and involve a lot of interactions with various stakeholders, such that, a breach in any of the processes will cause a significant problem in subsequent process and also delay the application time. Some recommendations have also been made following the Sudan's case study which could also be applied in similar circumstances.

6 TUTOR MARKED ASSIGNMENT

1. What are the challenges of EIA in your country? How does it compare with EIA in other developing nations?
2. What process(es) should be put in place by the Federal Government in order to ensure the successful implementation of EIA?

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