ENVIRONMENTAL SCIENCE

Unit IV: Environmental Management

After studying this unit, you will learn the following concepts:

a. Scope of environmental management

b. Concept of sustainable development

c. Environmental impact assessment

d. ISO: standards related to environmental management

e. Environmental interference for establishing industries

Introduction and Meaning of Environmental Management

Environmental Management is the process of controlling any potential negative impact on the external environment from the activities in concern. It also means increasing those initiatives which may have a positive effect. The activities of modern 'economic and technological' man have disturbed the harmonious relationships between the environment and human beings. Environmental management is thus, the process to improve the relationship between the human beings and environment which may be achieved through check on destructive activities of man, conservation, protection, regulation and regeneration of nature. Example: If the natural resources are overexploited, it will affect socio-economic development of a nation. Thus, environmental management involves socio economic developments on one hand and maintenance of environmental quality on other hand.

a. Scope of environmental management:

1. Environmental Perception and Public Awareness
2. Environmental Education and Training
3. Resource Management
4. Control of Environmental Degradation and Pollution
5. Environmental Impact Assessment

b. Concept of sustainable development:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The overall goal of sustainable development (SD) is the long-term stability of the economy and environment; this is only achievable through the integration and acknowledgement of economic, environmental, and social concerns throughout the decision-making process. The key principle of sustainable development underlying all others is the integration of environmental, social, and economic concerns into all aspects of decision making.

c. **Environmental Impact Assessment**:

Environmental assessment (EA) is the assessment of the environmental consequences (positive and negative) of a plan, policy, program, or actual projects prior to the decision to move forward with the proposed action. In this context, the term "environmental impact assessment" (EIA) is usually used when applied to actual projects by individuals or companies and the term "strategic environmental assessment" (SEA) applies to policies, plans and programmes most often proposed by organs of state. Environmental assessments may be governed by rules of administrative procedure regarding public participation and documentation of decision making, and may be subject to judicial review. The purpose of the assessment is to ensure that decision makers consider the environmental impacts when deciding whether or not to proceed with a project. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made". EIAs are unique in that they do not require adherence to a predetermined environmental outcome, but rather they require decision makers to account for environmental values in their decisions and to justify those decisions in light of detailed environmental studies and public comments on the potential environmental impacts.

The Process of EIA

1. **Identifying and Defining the Project or Activity**: Although this step may seem relatively simple, defining a "project" for the purposes of an EIA can become complex and even controversial if a mining project is large, has several phases, or involves multiple sites. The goal of this step is to define the project with enough specificity to accurately determine the zone of possible impacts and to include activities that are closely connected with the proposal so that the entire scope of environmental impacts is evaluated.

2. **Screening**: The screening process determines whether a particular project warrants preparation of an EIA. The threshold requirements for an EIA vary from country to country – some laws provide a list of the types of activities or projects that will require an EIA, others require an EIA for any project that may have a significant impact on the environment or for projects that exceed a certain monetary value. In some cases, particularly if the possible impacts of a project are not known, a preliminary environmental assessment will be prepared to determine whether the project warrants an EIA.

3. **Scoping**: Scoping is a stage, usually involving the public and other interested parties, that identifies the key environmental issues that should be addressed in an EIA. This step provides one of the first opportunities for members of the public or NGOs to learn about a proposed project and to voice their opinions. Scoping may also reveal similar or connected activities that may be occurring in the vicinity of a project, or identify problems that need to be mitigated or that may cause the project to be cancelled.

4. **Preparing Terms of Reference**: The Terms of Reference serve as a roadmap for EIA preparation and should ideally encompass the issues and impacts that have been identified during the scoping process. A draft Terms of Reference may be made available for public review and comment. Public review at this early stage of the process provides a key opportunity to ensure that the EIA is properly framed and will address issues of community concern.

5. **Preparing Draft EIA**: A draft EIA is prepared in accordance with the Terms of Reference and/ or the range of issues identified during the scoping process. The draft EIA must also meet the content requirements of the overarching EIA law or regulations. This step will ideally engage a wide range of technical specialists to evaluate baseline conditions, predict the likely impacts of the project, and design mitigation measures.

6. **Public Participation**: Best EIA practice involves and engages the public at numerous points throughout the process with a two-way exchange of information and views. Public participation may consist of informational meetings, public hearings, and opportunities to provide written comments about a proposed project. However, there are no consistent rules for public participation among current EIA systems. Even within a particular country, there can be variations in the quality and extent of public involvement in the EIA process, depending on the type of project being considered, the communities that may be affected, or government agencies that are overseeing the project.

7. **Preparing Final EIA**: This step produces a final impact assessment report that addresses the viewpoints and comments of the parties that reviewed the draft EIA. These comments may prompt revisions or additions to the text of the draft EIA. In some cases, the final EIA will contain an appendix summarizing all of the comments received from the public and other interested parties and provide responses to those comments.

8. **Decision**: A decision to approve or reject a mining project is generally based on the final EIA, but in some instances, an environmental clearance may be just one step in the mine permitting process. The decision may be accompanied by certain conditions that must be fulfilled, such as posting a reclamation bond or filing an Environmental Management Plan.

9. **Administrative or Judicial Review**: Depending on the jurisdiction, there may be opportunities for a party to seek administrative and/or judicial review of the final decision and the EIA process. An appeal may address procedural flaws in the EIA process, such as a failure to hold any required public hearings, or may point to substantive issues that the decision-maker failed to consider. A country's judicial review or administrative procedure act, or sometimes the EIA law itself, will usually identify the kinds of issues that can be raised in an appeal and the type of relief that may be granted.

10. **Project Implementation**: Provided all regulatory requirements are met and permits are obtained, mine development will proceed following the project decision and once opportunities for administrative and/or judicial review are exhausted.

11. **Monitoring**: Monitoring is an important part of project implementation. Monitoring serves three purposes:

    i. ensuring that required mitigation measures are being implemented;

    ii. evaluating whether mitigation measures are working effectively;

    iii. validating the accuracy of models or projections that were used during the impact assessment process.

d. ISO: standards related to environmental management:

ISO 14000 is a family of standards related to environmental management that exists to help organizations (a) minimize how their operations (processes, etc.) negatively affect the environment (i.e., cause adverse changes to air, water, or land); (b) comply with applicable laws, regulations, and other environmentally oriented requirements; and (c) continually improve in the above. The current version of ISO 14001 is ISO 14001:2015 which was published in September 2015. ISO 14000 is similar to ISO 9000 quality management in that both pertain to the process of how a product is produced, rather than to the product itself. As with ISO 9001, certification is performed by third-party organizations rather than being awarded by ISO directly. The ISO 19011 and ISO 17021 audit standards apply when audits are being performed. The requirements of ISO 14001 are an integral part of the European Union's Eco-Management and Audit Scheme (EMAS). EMAS's structure and material requirements are more demanding, mainly concerning

performance improvement, legal compliance, and reporting duties. Some other ISO standards related to environmental management are as follows:

1. ISO 14001 Environmental management systems - Requirements with guidance for use
2. ISO 14004 Environmental management systems - General guidelines on implementation
3. ISO 14006 Environmental management systems - Guidelines for incorporating ecodesign
4. ISO 14015 Environmental assessment of sites and organizations
5. ISO 14020 series (14020 to 14025) Environmental labels and declarations
6. ISO 14030 discusses post-production environmental assessment
7. ISO 14031 Environmental performance evaluation—Guidelines

The Guidelines are applicable for use in the selection of sites for such activities as:

a. New manufacturing or processing industries located within designated industrial estates or in greenfield areas;
b. Expansion of existing manufacturing or processing industries which are located adjacent or close to environmentally sensitive areas or receptors;
c. Facilities for waste management including waste recovery, recycle, treatment and disposal;
d. Extraction and production of natural resources such as minerals and rocks; and
e. Facilities for animal husbandry in feedlots or concentrated animal feeding operations.

The guidelines may also be adapted for special activities such as:

a. Cottage industries traditionally associated with and operated by members of a local community, where such industries are conserved as traditional practices which are unique and promoted as a tourist or cultural attraction; and

b. Industries which have very high potential to cause significant loss of life or damage due to fire and explosion (such as, plants manufacturing highly explosive materials or chemicals including ammunition) and the release of chemicals which are known to be highly toxic or known carcinogens.

8. ISO 14040 series (14040 to 14049), Life Cycle Assessment, LCA, discusses pre-production planning and environment goal setting.
9. ISO 14046 sets guidelines and requirements for water footprint assessments of products, processes, and organizations. Includes only air and soil emissions that impact water quality in the assessment.

e. Environmental interference for establishing industries:

The Environmental Quality Act, 1974 (EQA), and various regulations made under it, require that the carrying out of any activity which is likely to result in the release or discharge or emission of any pollutant which is likely to have an impact to the environment, is required to obtain the relevant comment, consent or approval of the Director General of Environmental Quality of the Department of Environment (DOE). These consent or approvals are in respect of:

a.   **Site suitability assessment** or *'Peniliaian Awal Tapak'* (for an industrial plant or prescribed activity);

b.   **Environmental Impact Assessment (EIA)** report (for prescribed activities under Section 34A of the EQA);

c.   **Written permission** (to construct a prescribed premise under Section 19 of the EQA);

d.   **Written approval** (for installation of incinerator, fuel burning equipment and chimney under the Environmental Quality (Clean Air) Regulations, 1978); and

e.   **License** (to use and occupy prescribed premises and prescribed conveyances under Section 18 of the EQA, or for contravention of the acceptable conditions specified under Section 21 of the EQA).

The present guidelines are to be used in conjunction with a submission to the DOE under item (a) for Site Suitability Assessment or in short 'AS PAT'. Such an application is made when an industrial plant, 'prescribed premise' or a 'prescribed activity' is proposed at a selected site, and the consent of the DOE is first sought prior to confirmation of the site. The application is to be made using the form, *'AS PAT 1-12 FORM: Preliminary Site Assessment for Development Project'*, also known in Bahasa Malaysia as *'Borang AS PAT 1-12: Penilaian Awal Tapak Bagi Projek Pembangunan'*.

Submission of the application is to be made to the respective State DOE office where the project is proposed to be located. The general procedures for submission of the application and the procedures related to those environmental requirements that need to be fulfilled is described in Section 6 of the Guidelines.