Environmental Management Plan (EMP)

EIA and EMP

- EIA is a decision making tool to analyze environmental impacts;
- EIA Identifies alternatives and public consultation inputs;
- EIA, along with other studies provides input to better project design.
- **EIA is a Process - Not a Product**
- The effective implementation of EIA findings and recommendations will help in the preparation and implementation of appropriate EMP.
- EMP is an action plan and it is based on results of EIA.

Definition

- Environmental management plan (EMP) consists of the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental impacts, offset them, or reduce them to acceptable levels.
- Environmental Management plan is an essential element of EIA report.
- EMP should have the following components:
  - Identify the set of responses to potentially adverse impacts;
  - Determine requirements for ensuring that those responses are made effectively and in a timely manner; and
  - Describe the means for meeting those requirements.

Scope of EMP

- Management and mitigation measures;
- Institutional arrangements;
- Implementation and supervision responsibilities;
- Monitoring and evaluation requirements;
- Implementation schedule;
- Training needs and budget ;
- Includes measures to consider during project implementation and operation;
- Provides actions to be taken to implement these measures.

Goals of EMP

Develop procedures to implement project's mitigation measures & monitoring requirements.

Aims of an EMP are to:

- Provide auditable commitments to practical and achievable strategies and design standards;
- Develop an integrated plan for comprehensive monitoring and control of project impacts;
- Ensure the community that the environmental management of the project is acceptable.

Purpose of EMP

- Minimize negative impacts;
- Enhance positive impacts;
- Ensuring environmentally sustainable planning, construction and operations management;
- Reduce problems & delays during project implementation;
- Improve overall project quality;
- Add value to the project.

Importance of EMP

- An instrument for implementing environmental management commitments, conditions, and requirements of project.
- Promotes self-regulation & integration of environmental issues in planning and operations.
- Addresses relevant environmental management issues,
- Can be drafted in a consultative manner.
- Incorporates regulatory requirements.
- Facilitates environmentally sustainable development and decision-making process. It is:
  - Able to form the basis for consultation and negotiation of outcomes;
  - Flexible;
  - Comprehensive;
  - Updatable;
  - A tool for promoting accountability

What EMP Covers?

- Documents, methods & procedures to achieve environmental objectives and targets of EIA.
- Identifies environmental performance indicators to measure progress towards achieving targets and objectives.
- EMP is based on compiled information and data during environmental screening/EIA.
- Summarizes targets, objectives and regulations.
- Nominates the individuals responsible and gives target dates.

Elements of EMP

- Description of mitigation measures. How they will be implemented.
- Description of “residual” environmental concerns (after mitigation). How they will be managed.
- Program for monitoring environmental concerns and indicators.
- Identification of who will be responsible and who will be accountable for implementing of the EMP.
- Developing a monitoring plan including items to be monitored, when, frequency, and by whom.
- Preparing cost estimate for implementation of EMP.
- Identifying the sources of funds, as well as potential training needs, if any.

Mitigation

The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, Specifically:

- Identifies and summarizes all anticipated significant adverse environmental impacts
- Describes--with technical details--each mitigation measure, including the type of impact to which it relates and the conditions under which it is required, together with designs, equipment descriptions, and operating procedures, as appropriate;

Monitoring

- Environmental monitoring during project implementation provides information about key environmental aspects of the project, particularly the environmental impacts of the project and the effectiveness of mitigation measures. Such information enables the borrower to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed.
- Specifically, the monitoring section provides
  - A specific description, and technical details, of monitoring measures, including the parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and
  - Monitoring and reporting procedures to (i) ensure early detection of conditions that necessitate particular mitigation measures, and (ii) furnish information on the progress and results of mitigation.

Capacity Development and Training

- To support timely and effective implementation of environmental project components and mitigation measures, the EMP should include the existence, role, and capability of project management and the responsibilities of the governmental agencies.
- Specifically, the EMP provides:
  - Specific description of institutional arrangements--who is responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training).
  - Methods to strengthen environmental management capability in the agencies responsible for implementation, most EMPs cover one or more of the following additional topics:
    - Technical assistance programs,
    - Procurement of equipment and supplies, and
    - Organizational changes.

Implementation Schedule and Cost Estimate

- For all three aspects (mitigation, monitoring, and capacity development), the EMP will include:
  - An implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and
  - The capital and recurrent cost estimates and sources of funds for implementing the EMP. These figures are also integrated into the total project cost tables.

Contents of an EMP

- Brief introduction of project design
- Major Findings of EMP/screening
- Environmental Impacts Overview
- Regulatory/legal frame work
- **Environmental Management Proposed**
  - Operation phase activities
  - Implementation Arrangements
  - Institutional Arrangements
  - Monitoring Mechanism
  - Reporting System
  - Environmental Training and Management Budget

Some of the Aspects (baseline) Covered

- Water
- Air
- Soil
- Noise
- Damage to Flora and Fauna
- Disruption to Users
- Worker's Accident Risks
- Workers' Health Risks including Hygiene
- Enhancement of natural and man-made features

EMP Adds More Value

- Reduces unforeseen issues/ problems
- Improves relations with local communities
- Prevents delays and stoppages
- Prevents legal disputes
- Saves time and costs
- Provides good publicity
- Reduces financial costs

EMP Implementation

- In Large and complex projects, we should technically establish environmental management unit (EMU) as a part of the PMU.
- Establishment and funding of EMU is essential for environmentally sustainable development of large and complex projects.
- Small projects require environmental screening, scoping, assessment and an EMP, but not an EMU.

Responsibilities of Project Staff

- Prepare environmental screening or EIA for the project, as required.
- Identify major environmental impacts and respective mitigation measures.
- Develop EMP for implementation of identified mitigation measures.
- Work with project team to ensure mitigation measures are implemented (Monitoring);
- Prepare periodic monitoring and evaluation reports.
- Identify potential EMP shortcomings.
- Revise and update the EMP, as needed.

Example

Issue	Impact *(c) construction phase* *(o) operation phase*	Significance	Mitigation Measure *(c) construction phase* *(o) operation phase*	Monitoring	Monitoring Responsibility
Water Resources	- No impact (c)				
	- Risk of aquifer pollution due to leakages from the unloading areas, bioreactor, and improper storage of fertilizers (o)	- *Major (neg)*	- *The design and implementation should consider complete lining/insulation of solid waste accumulation areas, fertilizers storage area, and the bio-reactor* - *Select project site not in the sand dunes areas or in areas of shallow water table*	*Monitoring water quality in the downstream wells for NO3, etc monthly*	*EQA, MOH, PWA*
	- Increase in water consumption due to needed water supply for processing and for cleaning and reduction of infiltration areas (o)	- *Moderate (neg)*	- *Apply water conservation where possible* - *Apply for independent water supply source*	- *Tariff structure*	- *CMWU or Municipality*

Example: Environmental Management Plan

A. Mitigation: operational Phase

Issue/Environmental Component	Potential Environmental Impacts	Proposed Mitigation Measures	Institutional Responsibility	Costs
Air	Generation of dust	•Backfill exposed construction site as soon as possible •Limit stockpile height of topsoil to 2m maximum •Construction materials shall be covered during transportation by truck	Site manager Environmentalist	50,000 ETB
Water	Water quality change from sedimentation	•Develop progressive rehabilitation plan or schedule to address exposure of degraded areas •Implement erosion prevention mechanisms	>>	6,000 USD

Example: Environmental Management Plan

For a Power Plant Construction Project in X-land

B. Monitoring: Construction Phase

Potential Environmental Impacts	What *parameter is to be monitored?*	Where *is the parameter to be monitored?*	How *is the parameter to be monitored?*	When *is the parameter to be monitored?*
Damage to vegetation	Clearing techniques and relocation procedures utilized; record of fees to environmental fund	Power plant site, pipeline and transmission line routes	Visual and by comparison with pre-construction photo survey	Monthly throughout construction period
Loss of fertile topsoil and soil erosion	Soil storage procedures and location	Soil storage sites	Visual	Weekly during site preparation and construction period
Air pollution by dust	Dust level	All active construction sites	Visual	During construction
Noise from construction works	Noise level, dB[A]	All active construction sites	Measurements by a licensed organization using certified measurement devices	During construction

Example: Environmental Management Plan
B. Monitoring: Operation Phase

Potential Environmental Impacts	What *parameter is to be monitored?*	Where *is the parameter to be monitored?*	How *is the parameter to be monitored?*	When *is the parameter to be monitored?*
Generation of dust	Dust level	At mining sites	Visual/ Dust Measuring Device (PCA-PCO)	Weekly
Water quality change from sedimentation	Water turbidity level, Level of suspended particles	Water body found down below the site	Visual	Monthly

“Good environmental management means good project management”

