Chemonics Egypt

Elements of Environmental Assessment: Presentation and Compiled Resource Material

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CONTENTS

What is Environmental Assessment

Environmental assessment and related procedures have been identified as key-mechanisms to translate the principles and criteria of sustainable development into practical strategies and action.

IT CAN:

- Modify and improve design
- Ensure efficient resource use
- Enhance social aspects
- Identify measures for monitoring and managing impacts
- Inform decision-making
- Provide justification for a proposal

What is Environmental Assessment
(Continued)

In order to incorporate environmental considerations into a decision or a decision-making process, it is necessary to develop a complete understanding of the possible and probable consequences of a proposed action.

What is Environmental Assessment
(Continued)

Environmental assessment implies the determination of the environmental consequences or **impact** of proposed projects or activities. IMPACT means change – any change – positive or negative from a desirability standpoint.

An environmental assessment is therefore, a study of probable changes in the various socioeconomic and biophysical characteristics of the environment which may result from a proposed or impending action.

How to Perform Environmental Assessment

1. It is necessary to Develop a complete understanding and clear definition of the proposed action:
   - What is to be done?
   - Where?
   - What kinds of materials, labor, and/or resources are involved?
   - Are there different ways to accomplish the original purpose?

2. It is necessary to gain a complete understanding of the affected environment:
   - What is the nature of the biophysical and/or socio-economic characteristics that may be changed by the action?
   - How widely might some effects be felt?
   - The boundary of the work site?
   - A mile?
   - The next state?

3. It is necessary to envision the implementation of the proposed action into that setting and to determine:
   - Possible impacts on the environmental characteristics.
   - Quantifying these changes whenever possible.

4. It is necessary to report the results of the study in a manner such that the analysis of probable environmental consequences of the proposed action may be used in the decision-making process.

Elements of Environmental Assessment

1. Determine agency activities associated with implementing the action or the project.

2. Identify environmental attributes (elements) representing a categorization of the environment such that changes in the attributes reflect impacts.

3. Evaluate environmental impact, i.e., the effects of the activities (1, above) on the attributes (2, above).

4. Report findings in a systematic manner.

Elements of Environmental Assessment (continued)

1. Project Actions:

Project Actions:

A comprehensive list of activities associated with implementing the project or action throughout its life cycle should be developed.

Necessary level of detail would depend upon the size and type of project.

Elements of Environmental Assessment (continued) Project Actions

Example: Actions related to construction Projects

Site Access/Delivery
- **Railroad**
- **Road**
- **Water**
- **Air**
- **Pipeline**

Support Facilities Operation
- **Asphalt plant**
- **Aggregate production**
- **Concrete operations**
- **Foundry & metal shop**
- **Fuel storage and dispensing**
- **Material storage**
- **Personnel support**
- **Utilities provision**
- **Solid waste disposal**
- **Sewage disposal**

Site Preparation
- **Clearing and grubbing**
- **Tree removal**
- **Existing Structure removal**
- **Demolition debris disposal**

Excavation
- **Topsoil stripping**
- **Excavation**
- **Backfill**
- **Channeling and dredging**
- **Hauling**

Quarrying and Subsurface Excavation
- **Cutting and drilling**
- **Loosening**
- **Hauling**
- ***Drainage***

Foundations
- **Base course**
- **Footings**
- **Compaction**
- **Piling**
- **Foundation mats**
- **Groundwater control**

Bituminous Construction
- **Hauling**
- **Mixing**
- **Placing and spreading**
- **Compaction**
- **Curing and sealing**

Concrete Construction
- **Hauling**
- **Mixing**
- **Placing**
- **Finishing**

Masonry Construction
- **Hauling**
- **Forming**
- **Mortar mixing**
- **Placing Finishing**

Steel Construction
- **Hauling**
- **Erecting**
- **Finishing**

Timber Construction
- **Hauling**
- **Pest/insect protection**
- **Cutting and shaping**
- **Erecting**
- **Finishing**

Finishing – General
- **HVAC (heating, ventilation, and air conditioning)**
- **Electrical**
- **Plumbing**
- **Cleanup operations**
- **Landscaping**
- **Painting**

Elements of Environmental Assessment (continued)

2. Environmental Attributes:

Environmental Attributes:

Consisting of both natural and man-made factors, the environment is admittedly difficult to characterize because of its many attributes (elements) and the complex interrelationships among them. Anticipated changes in the attributes of the environment and their interrelationships are defined as potential impacts.

Definition: Variables that represent characteristics of the environment are defined as attributes, and changes in environmental attributes provide indicators of changes in the environment.

Elements of Environmental Assessment (continued)

Environmental Attributes (Continued):

Air

- Diffusion Factor
- Particulates
- Sulfur oxides
- Hydrocarbons
- Nitrogen oxide
- Carbon monoxide
- Photochemical oxidants
- Hazardous toxicants
- Odors

Water

- Aquifer safe yield
- Flow variations
- Oil
- Radioactivity
- Suspended solids
- Thermal pollution
- Acid and alkali
- Biochemical oxygen demand (BOD)
- Dissolved oxygen (DO)
- Dissolved solids
- Nutrients
- Toxic compounds
- Aquatic life
- Fecal coliforms

Land

- Soil stability
- Natural hazard
- Land-use patterns

Ecology

- Large animals (wild and domestic
- Predatory birds
- Small game
- Fish, shellfish, and waterfowl
- Field corps
- Threatened species
- Natural land vegetation
- Aquatic plants

Sound

- Physical effects
- Psychological effects
- Communication effects
- Performance effects
- Social behavior effect

Human Aspects

- Lifestyles
- Psychological needs
- Physiological systems
- Community needs

Economics

- Regional economic stability
- Public sector review
- Per capita consumption

Resources

- Fuel resources
- Nonfuel resources
- Aesthetics

Elements of Environmental Assessment (Continued)

Environmental Attributes

Example: Processes, including Human Activity which Modify Landforms

Elements of Environmental Assessment (Continued)

3. Determining Environmental Impact

Determining Environmental Impact

The distinction between “environmental impact” and “change in an environmental attribute” is that changes in the attributes provide an indication of changes in the environment.

In a sense, the set of attributes must provide a model for the prediction of all impacts. The steps in determining environmental impact are :

1. Identification of impacts on attributes.

2. Measurement of impacts on attributes.

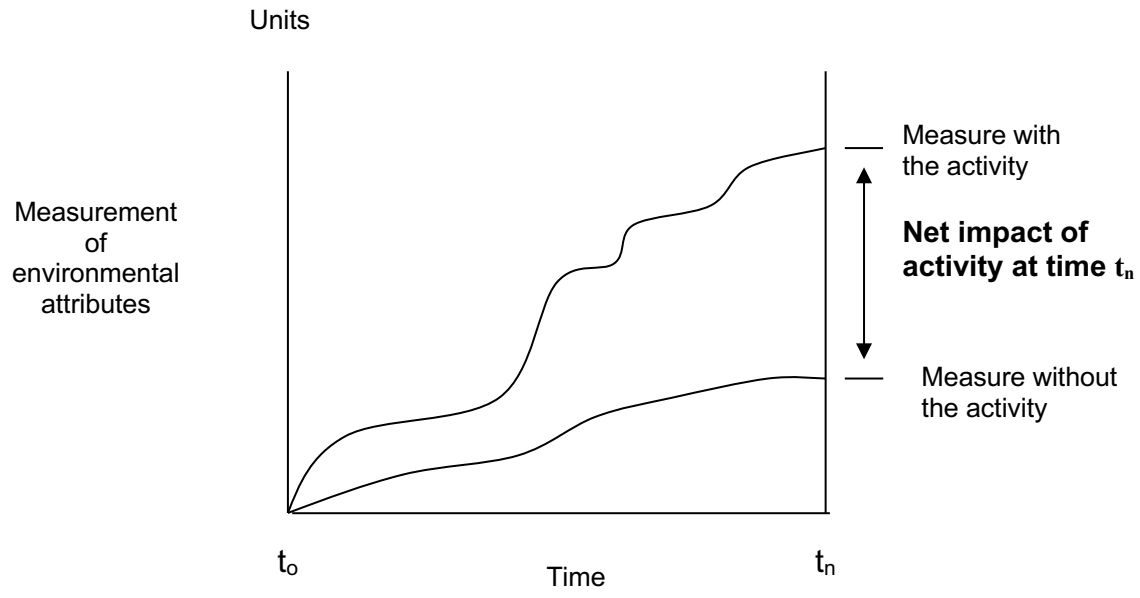
3. Aggregation of impacts on attributes to reflect impact on the environment.

Elements of Environmental Assessment (Continued)

3. Determining Environmental Impact

With and Without the Project

The conditions for estimating environmental impact are measurement of attributes with and without the project or activity under consideration a a given point in time. The following figure indicates the measure of an attribute with and without an activity over time. From this example, it can be seen that the measure of the attribute may change over time, without the activity. Therefore, the impact must be measured in terms of the "net" change in the attribute at a given point in time.



Elements of Environmental Assessment (Continued)

3. Determining Environmental Impact

Identifying Impacts

The list of environmental attributes that might be evaluated is practically infinite because any characteristic of the environment is an attribute. Therefore, it is necessary to reduce the number of attributes to be examined. Thus, duplicative, redundant, difficult to measure, and obscure attributes may be eliminated in favor of those that are more tractable.

Elements of Environmental Assessment (Continued)

4. Reporting findings

Reporting findings

Results of the impact analysis process are documented as one of the following:

1. An assessment
2. A finding of no significant impact
3. A draft statement
4. A final statement

Elements of Environmental Assessment (Continued)

4. Reporting findings

Example (1): A portion of the impact matrix for a major construction project.

Elements of Environmental Assessment (Continued)

4. Reporting findings

Example (2): Model Table for Impacts Summary

Attribute Descriptor Package

Reference: McGraw-Hill, Inc
Environmental Assessment, R.K. Jain (et al), 1993.

Effective Monitoring Programs

- Have realistic sampling programs
- Use relevant sampling methods
- Collect quality data
- Have compatibility of old and new data
- Have cost-effective data collection
- Are innovative
- Use appropriate databases
- Use multidisciplinary interpretation
- Report internally and have external checks
- Respond to third party input
- Present data to the public

Steps in Developing a Monitoring Program

- Identify the scope
- Define the objectives
- Decide how information will be used
- Define the boundaries and select sites
- Select the key indicators
- Define how the data will be analysed and presented
- Decide the level of accuracy required in the data
- Consider the relationship between the new data and existing data
- Record and respond to data provided by the community
- Set minimum requirements for monitoring

Administrative Compliance Summary

Review Factor	Meets Standards		Remarks
	Yes	No	
Interdisciplinary Preparation			
EIS			
Format			
Page Limits			
General Content			
Cover Sheet			
Summary			
Table of Contents			
Purpose & Need Clear			
Alternatives Examined			
Affected Environment			
Environmental Consequences			
List of Preparers			
Distribution list			
Index			
Appendix			
Original Studies			
Data Supports EIS			
Not Overly Lengthy			

Recommendation:

Approve _____ Disapprove _____

Signature: _____

Date: _____ Title: _____

Concur: _____ Nonconcur: _____

Signature: _____
(Responsible Official)

Title : _____ Date: _____