Core EIA Skills:

Characterizing the baseline situation,
Identifying Environmental Impacts
&
Principles of Environmental Mitigation and Monitoring

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Core EIA Skills

After the screening step, the core skills for the EIA Process are:

1. characterizing the baseline situation;
2. identifying (and evaluating) potential adverse impacts
3. developing mitigation and monitoring measures to address these impacts

These are closely related. . .
Impact evaluation process

1. Understand the activities being proposed
2. Identify the potential adverse impacts typical of these activities & know how they arise
3. Based on the potential impacts, identify which elements of the baseline situation are important
4. Characterize the baseline

And then
5. Given:
   1. the baseline conditions,
   2. the project concept/design, and
   3. How the adverse impacts arise,
   decide which impacts are of concern

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Impact evaluation: an example

1. Proposed intervention:
   irrigation scheme
   (wing dam diversion type • water-intensive crops • high fertilizer use, unlined canals & open-channel irrigation)

2. Key potential impacts:
   - Excessive diversion of water
   - Salinization of soils
   - Contamination of groundwater & downstream surface water

3. Key elements of baseline:
   - River flow volume, variability
   - Soil & water characteristics & groundwater depth
   - Downstream uses
Impact evaluation: an example

Baseline characterization

- **River flow volume, variability**
  - Will divert 3% of normal flow
  - low-year flows are 50% of normal
  - River is not over-utilized downstream

- **Soil characteristics & groundwater depth**
  - Soils are well-drained but relatively high in salts; groundwater 2m depth

- **Downstream uses**
  - Key water source for community domestic use & livestock, immediately downstream.

Therefore:

Impacts of Concern:
- Salinization
- Downstream contamination

Little Concern:
- Excess Diversion

Why?
How do I learn about potential impacts?

Each sectoral write-up presents *mitigation options matched to impacts*.

The *annotated bibliographies* provide links to key additional resources.

Available on the ENCAP website at [www.encapafrica.org](http://www.encapafrica.org)

**Next session:** hands-on exercise with the *Small-Scale Guidelines*
Where do I obtain information about the activities? The baseline situation?

1. YOUR ORGANIZATION TALK to staff who know the project, and know the sites.

   OBTAIN project documents and information

2. DIRECT OBSERVATION
   Go to the site(s)!

3. UTILIZE OTHER LOCAL TALENT & KNOWLEDGE
   communities, government, counterparts

Aren’t we forgetting something?

What about reports by donor organizations and international agencies?
What about government statistics? GIS databases?

All these sources can be useful (and sometimes necessary)

But good local information is the most important input to preliminary assessment.

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Why direct observation?

We need to **SEE**

- Are latrines close to water supplies?
- Is there a drainage problem?

*Visual inspection is the quickest and best way to check issues of location, scale and proximity that determine many impacts.*

We need to **LISTEN**

- Is there a land tenure problem?
- How often does the river flood?

*Stakeholders and local communities have local knowledge that you need.*

And, impacts depend on what those affected value and need!

Talk to men and **women.** Women’s perceptions on environmental matters are critical and distinct.

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Wait!

What if I can’t travel to the sites?

If at all possible, DON’T make the preliminary assessment a desk exercise.

But if you can’t visit the sites/area, you need:

→ **MAPS** and **PHOTOS** to help you visualize the environment.

→ to **TALK** to people who have been there
Do I need tools to evaluate impacts?

A number of simple tools exist to systematize field observations, think through potential impacts, and to help evaluate their significance.

A number of more complex tools exist to predict and assess the significance of impacts in full EIA studies. (Used by specialized consultants)

We focus on the simple logical process of impact evaluation, supported by one tool: The Small-Scale Guidelines. This is sufficient for most preliminary assessment needs.
Mitigation, Monitoring and Verification….

A critical part of environmentally sound design and management

Mitigation is…

- The implementation of measures designed to reduce the undesirable effects of a proposed action on the environment

Monitoring…

- Environmental and activities measurements to tell you if your mitigation measures are sufficient and effective

Verification…

- Tells you if the mitigation measures are being implemented

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# How does mitigation reduce adverse impacts?

<table>
<thead>
<tr>
<th>Type of mitig measure</th>
<th>How it works</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention and control</td>
<td>Fully or partially prevent an impact/reduce a risk by:</td>
<td>PREVENT contamination of wells, by SITING wells a safe distance from pollution sources</td>
</tr>
<tr>
<td>measures</td>
<td>▪ Changing means or technique</td>
<td>Add wastewater treatment system for a coffee-washing station and train in proper OPERATIONS</td>
</tr>
<tr>
<td></td>
<td>▪ Changing or adding design elements</td>
<td></td>
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<tr>
<td></td>
<td>▪ Changing the site</td>
<td></td>
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<tr>
<td></td>
<td>▪ Specifying operating practices</td>
<td></td>
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<tr>
<td>Compensatory measures</td>
<td>Offset adverse impacts impacts in one area with improvements elsewhere</td>
<td>Plant trees in a new location to COMPENSATE for clearing a construction site</td>
</tr>
<tr>
<td>Remediation measures</td>
<td>Repair or restore the environment after damage is done</td>
<td>Re-grade and replant a borrow pit after construction is finished</td>
</tr>
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</table>

... and sometimes you may need to redesign the project to modify or eliminate problem components

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SITING & DESIGN FEATURES to PREVENT impacts

- **Water Supply (Well provision)**
  - **Potential impacts:** Contamination of water supplies; spread of disease
  - **Mitigations needed:**
    - Fence to keep out livestock
    - Site away from contamination sources
    - Provide separate water point for livestock

What is wrong with this intervention?

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Proper treatment system OPERATIONS

- Agric Processing (Coffee Washing)
  - Potential impacts:
    Contamination of water supplies; excessive water draw
  - Mitigations:
    Wash water recycling
    Basic wastewater treatment (pictured)

→ Proper treatment operation is essential
Must I mitigate EVERY impact?

NOT NECESSARILY

Mitigation is directed at two targets

- **Serious impacts**
  - First, the most serious impacts identified should **ALWAYS** be mitigated

- **Easily mitigated impacts**
  - After addressing the most serious impacts, there may be other impacts for which mitigation is easy and low-cost

Prioritize!
Prevention is best

Where possible, PREVENT impacts by changes to site or technique.

CONTROL of impacts with operating practices is more difficult to monitor, sustain.
Monitoring and Indicators

- Environmental monitoring is a necessary component of mitigation and should be a part of project results reporting.
  - Otherwise how do you know mitigation is working?

- Indicators are chosen to
  - Measure the most serious impacts
  - Show whether mitigation measures are effective
Indicators: sometimes complex, often simple

- Indicators *may* require laboratory analysis or specialized equipment & techniques
  - *Water quality testing for fecal coliform, heavy metals*
  - *Automatic cameras on game paths for wildlife census*
  - *Etc.*

- But *indicators are often VERY SIMPLE. . .*

- . . . especially for small-scale activities

*Simple indicators can be more useful and appropriate than more complicated ones!*

For example
Examples of simple indicators

Erosion measurement.

Topsoil loss from slopes upstream in the watershed (top) is assessed with a visual turbidity monitor (bottom).

Surface sewage contamination

Visual inspection behind the latrine (top) reveals a leaking septic tank (bottom).

What are the limitations of this indicator?
Design of monitoring

- Monitoring requires **SYSTEMATIC** measurement of indicators to **distinguish the impacts of the activity from other factors**

  This requires decisions about:
  
  1. Location of measurement
  2. Timing & frequency of measurement
  3. Other factors

For example
Design of monitoring

Example:
Water quality impacts of agric. processing

1. **Location**
   Water samples should be taken at the intake, and downstream of seepage pits.

2. **Timing & frequency**
   Samples at different locations should be taken at the same time. Samples should be taken at **high & low flow** during the processing season.

3. **What else?**
Verification (this is USAID’s job)

Monitoring in its simplest form is answering a series of questions –

- Did we do what we said we’d do?
- How effective were our mitigation measures?
- Were project assumptions correct?
- How can we improve our activity?

Verification may be “from the desk” or by field visit
Ways to evaluate implementation of mitigation

Mitigation measure is:
“Clinic staff shall be trained to and shall at all times segregate and properly incinerate infectious waste.”

Desk assessment:
USAID might ask the partner to report:

- Percentage of staff trained?
- Spot inspections of waste disposal locations carried out? The result of these inspections?

In the field. . .

Inspection shows clearly that waste is segregated at point A but not being incinerated as required at point B.
Mitigation and Monitoring Plans

- Mitigation and monitoring requirements are set out in Environmental Mitigation and Monitoring Plans (EMMPs)
  - Also called Environmental Management Plans, or Mitigation and Monitoring Plans
  - Coming up in Session 13

⚠ Effective mitigation and monitoring requires IMPLEMENTING the Mitigation and Monitoring Plans
Making Mitigation & Monitoring effective

For mitigation and monitoring to be effective, it must be:

- **Realistic.**
  M&M must be achievable within time, resources & capabilities.

- **Targeted.**
  Mitigation measures & indicators must correspond to impacts.

- **Funded.**
  Funding for M&M must be adequate over the life of the activity.

- **Considered early.**
  Preventive mitigation is usually cheapest and most effective. Prevention must be built in at the design stage.

- **Considered early.**
  If M&M budgets are not programmed at the design stage, they are almost always inadequate!
Mitigation and monitoring in the project lifecycle

Mitigation and monitoring is a part of each stage of any activity.

- **Design**
  1. Decisions made regarding site and technique to minimize impacts
  2. Operating practices designed

- **Construct/Implement**
  1. Implementation of design decisions.
     Monitoring of construction
  2. Where required, **capacity-building for proper operation**

- **Operate**
  (may include handover)
  1. Operating practices implemented
  2. Monitoring of:
     - Operating practices
     - Environmental conditions

- **Decommission**
  (in some cases)
AFR’s key resource for mitigation and monitoring

Guidelines for Small-Scale Activities in Africa
Covers more than 20 typical development sectors

Each sectoral write-up presents mitigation options matched to impacts.

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Next session: hands-on exercise with the Small-Scale Guidelines