



**USAID**  
FROM THE AMERICAN PEOPLE



# **Session 4:**

## **Core Environmental Impact Assessment Skills**

### **Part I:**

**Characterizing the baseline situation**  
**Identifying environmental impacts**  
**Principles of environmental mitigation**

# Core EIA Skills for Environmental Compliance

**Baseline  
Characterization**



Employed in developing the IEE---  
but also critical to making  
mitigation responsive to local  
environmental conditions

**Identifying Impacts  
of Concern**







**Mitigation &  
Monitoring Design**



Key skills  
for implementing IEE  
conditions

# Impact evaluation process: THEORY

-  **1** Understand the activities being proposed
-  **2** Research 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** these elements of the baseline



**Given:**

- 1. the baseline conditions,**
  - 2. the project concept/design, and**
  - 3. How the adverse impacts arise,**
- decide which impacts are of concern**

# Impact evaluation process: 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



# Assessing impact: EXAMPLE

4

## Baseline characterization

- *River flow volume, variability*
  - Will divert 3% of normal flow
  - low-year flows are 50% of normal
  - Downstream abstraction is <10% of total flow volume.
- *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.

5

Therefore:

**Impacts of  
Concern:  
Salinization  
Downstream  
contamination**

**Little Concern:  
Excess  
Diversion**

***Why these  
conclusions?***

# Question:

*Why are these concepts relevant to me? I'm not developing Initial Environmental Examinations.*



- IEE conditions often require Implementing Partners to identify issues of concern particular to a site & respond with appropriate, specific mitigation measures.
- C/AORs & M&E specialists must be able to evaluate if IP actions are appropriate

**For example. . .**

# Medium scale construction. . .

**ACTIVITY:**  
**Development of institutional compound/ training facility**  
(perimeter wall, offices & classrooms, canteen, genset & fuel storage, latrine block, etc.)



## IEE Conditions:

1. No construction permitted in protected areas or relatively undisturbed ecosystem areas.
2. Construction & facilities operation may not (a) result in significant adverse impacts on ecosystem services or (b) adversely affect the quality of surface or groundwater tapped for domestic use.

**The baseline situation determines the relevance of these conditions & specific issues of concern mitigation must address**

# Inspection of baseline conditions at the site identifies issues of concern for mitigation. . .

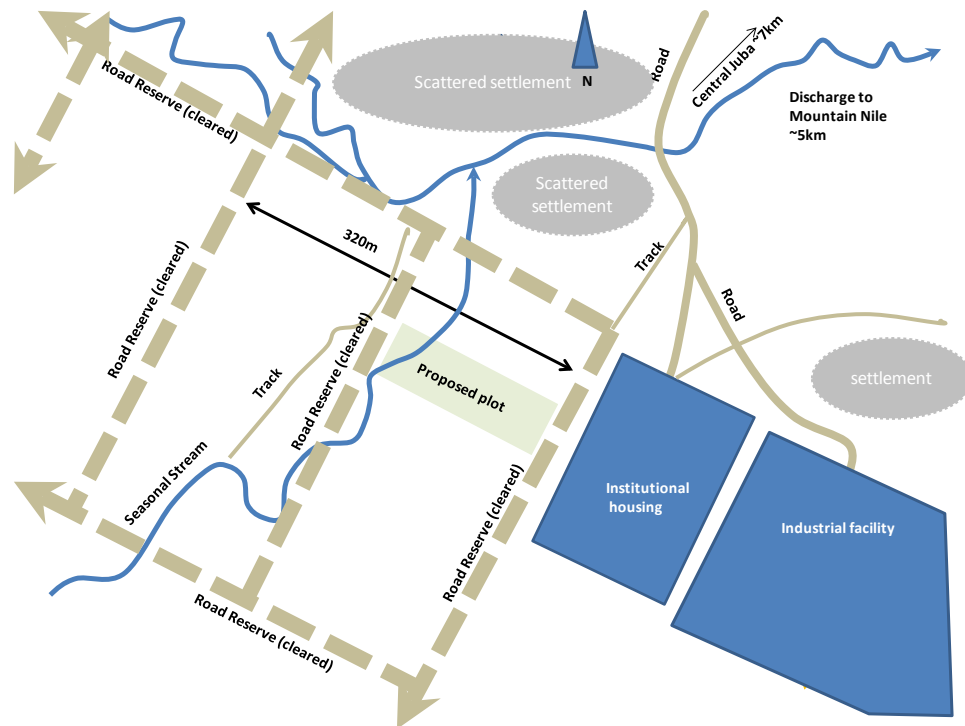
1: Site is in area already allocated for development---ecosystem integrity already disrupted.

2a: Key ecosystem service provided by the land is area drainage

*Implication: design must assure no reduction in stream capacity & no alteration to local drainage patterns.*

2b. likely domestic use of surface water just downstream of the facility; potentially shallow groundwater also.

*Implication: must prevent additional siltation of stream, gray and brown water discharge, fuel leaks.*





# Where do I obtain information about the 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)!** Look up publicly available satellite imagery before you go.
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**

# 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.

# What if I can't travel to the sites?



**If at all possible, DON'T make the site characterization 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



# Mitigation and Monitoring

**A critical part of the EIA process—and of environmentally sound design and management**

## **Mitigation is. . .**

**The implementation of measures designed to eliminate, reduce or offset the undesirable effects of a proposed action on the environment.**

## **Monitoring . . .**

**Environmental and activities measurements to tell you if your mitigation measures are:**

- 1. Being implemented**
- 2. Sufficient and effective**

# How does mitigation reduce adverse impacts?

Type of mitig measure	How it works	Examples
<b>Prevention and control measures</b>	Fully or partially prevent an impact/reduce a risk by: <ul style="list-style-type: none"><li>▪ <i>Changing means or technique</i></li><li>▪ <i>Changing or adding design elements</i></li><li>▪ <i>Changing the site</i></li><li>▪ <i>Specifying operating practices</i></li></ul>	PREVENT contamination of wells, by SITING wells a safe distance from pollution sources  Add wastewater treatment system to the DESIGN of a coffee-washing station and train in proper OPERATIONS
<b>Compensatory measures</b>	Offset adverse impacts impacts in one area with improvements elsewhere	Plant trees in a new location to COMPENSATE for clearing a construction site
<b>Remediation measures</b>	Repair or restore the environment after damage is done	Re-grade and replant a borrow pit after construction is finished

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

# 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?*



# Proper treatment system OPERATIONS

## Agricultural Processing (Coffee Washing)

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



**Proper treatment system  
operation is essential**

**Stream  
(community  
water supply)**





# Must EVERY impact be mitigated?

## Mitigation specified by the IEE/EA must be implemented

Often IEE conditions require judgment in designing specific mitigations. In this case, apply the following principle:

**Prioritize!**

### Potentially serious impacts/issues

These must **ALWAYS** be mitigated to the point that the impact is non-significant

### Easily mitigated impacts

Then, there may be other impacts for which mitigation is easy and low-cost



# Effective mitigation usually requires a MIX of mitigation techniques

## Example: ROAD REHABILITATION

### Some typical adverse impacts:

- Alteration of natural watershed drainage
- Erosion of road surface materials into habitats, productive agricultural land
- Roadside gully formation → damage to adjoining land
- Dust → respiratory problems, crop damage
- Inappropriate extraction of materials for road surfacing
- Increase in disease transmission (HIV)
- Increased non-sustainable logging, charcoal extraction



# Combining mitigation techniques: Road rehabilitation

## Some typical good-practice mitigations

**Avoid steep grades, Follow contours**

**Siting**

**Culverts or Rolling dips for water drainage and diversion**

**Side drainage to prevent flooding washout**

**Slope stabilization via plantings, grading/terracing & riprap**

**Dust reduction barriers**

**Paving of vulnerable stretches**

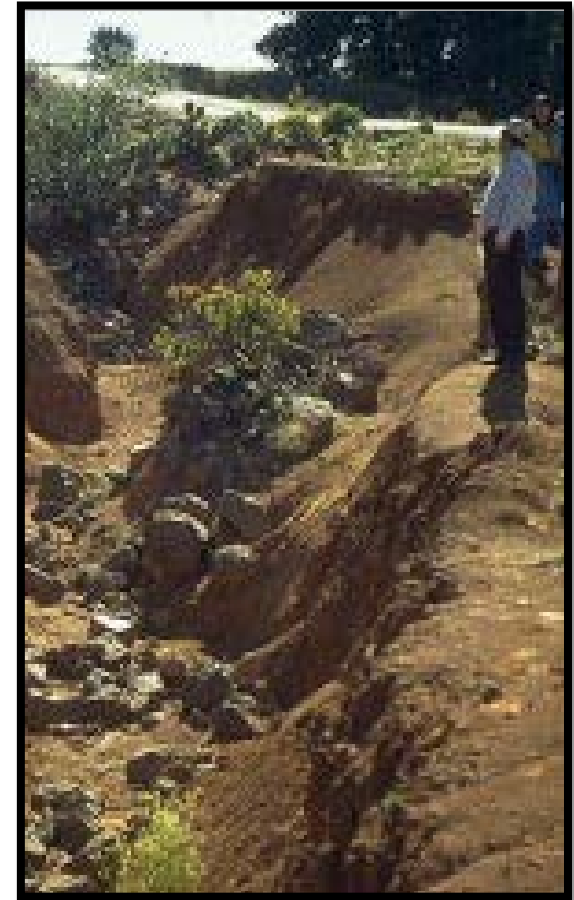
**Design elements**

**Community Maintenance**

**Operating Practice**

**Grading/planting/draining borrow pits**

**Remediation**



**Gullying can be serious!**



# Prevention is best

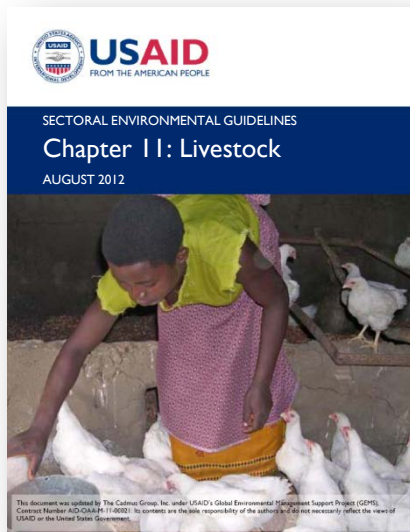


**Where possible, PREVENT impacts by changes to site or technique.**

**CONTROL of impacts with Operation & Maintenance (O&M) practices is more difficult to monitor, sustain.**

# How do I learn about potential impacts and mitigation measures?

## KEY RESOURCE: USAID's Sectoral Environmental Guidelines



- Covers more than **20 typical development sectors**
- Each sectoral write-up identifies **potential impacts & discusses how they arise.**
- Impacts are matched to **mitigation actions.**
- The **annotated bibliographies** provide URL links to **additional key resources**
- Over 2012-13, AFR, LAC, Asia Guidelines being consolidated into a “global version.”
- See [www.usaidgems.org](http://www.usaidgems.org).



# Summary

- **Environmental compliance (and achieving ESDM) requires “core EIA skills”**
  - Baseline characterization
  - Identifying impacts of concern
  - Mitigation design
  - Monitoring (coming up)
- **Effective mitigation design is site-specific. It requires a knowledge of the baseline situation.**
- **Mitigate by prevention where you can.**