INSTITUTE OF ENGINEERING
DEPARTMENT: CIVIL

Bachelor of Engineering (Civil Engineering)

Environment Impact Assessment

OECE-105

8th Semester

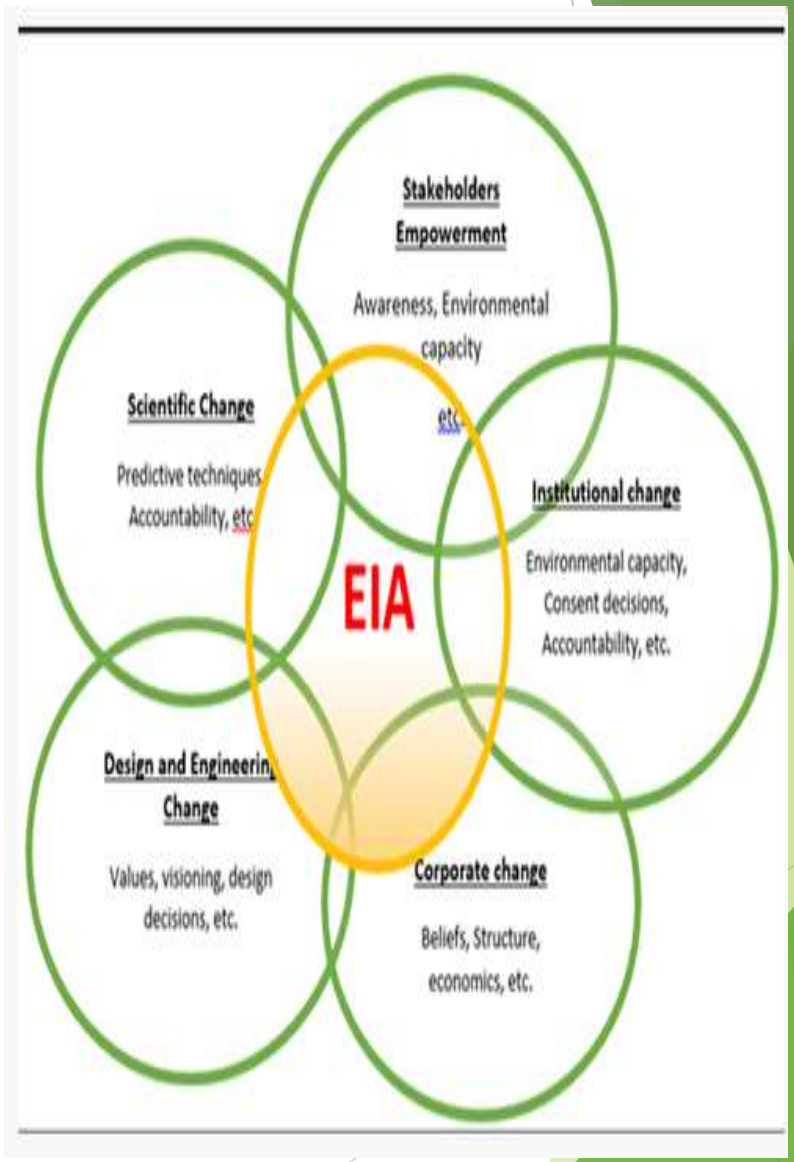
Introduction

DISCOVER . LEARN . EMPOWER

Introduction

Course Outcome

CO Number	Title	Level
1	Interpret options for evaluating environmental and social impacts	Remember
2	Understand the purpose of developing follow-up procedures, and options for designing these procedures	Understanding



OBJECTIVE OF THE TOPIC

1. To make students learn about Drastic effects on environment due to various on going projects
2. To give them the knowledge of various EIA techniques in India.
3. To help them learn the need for safe health and assessment of environment.
4. Help the students understand the safety of environment against Mega Projects.

FAQs

1. Why is EIA Conducted before the start of project is EIA carried out for various civil projects in India.
2. What are the various acts that are constituted in EIA Scheme in India?
3. What is the need of having a EIA Audit Policy?
4. Briefly Explain the features of EIA Audit Policy in India.
5. What is 1986 Draft EPA Policy? Give the Statement for same

Review: Definition of EIA

✓ Environmental Impact Assessment is

A formal process for identifying:

- **likely effects of activities or projects on the ENVIRONMENT, and on human health and welfare.**
- **means and measures to mitigate & monitor these impacts**

Environment is broadly interpreted: physical, biological, and social.

In EIA, the term "impacts" is used instead of "effects of activities."

What is an impact?

Why did EIA start?

- By the early 1960s in the US and other industrial countries, it was clear that something was wrong Silent Spring by Richeal Carison

1966: New York City buried under a sea of smog.

Cuyahoga River burns in 1966 (3rd time). Cleveland, Ohio, U.S.

"30 Years of Environmental Progress," USEPA, 2000.

What was happening?

- **Looking back from today, the causes were obvious:**
  - *Population Growth*
  - *Natural Resource Pressures*
  - *Urbanization*
  - *Industrialization*
  - *Unrestrained profit motive*
- **These forces were all combining to create unprecedented environmental damage**

What is an impact?

The impact of an activity is a deviation (a change) from the baseline situation that is caused by the activity.

The baseline situation is the existing environmental situation or condition in the absence of the activity.

The baseline situation is a key concept in EIA.

More…

To measure an impact, you must know what the baseline situation is.

The baseline situation

In characterizing the baseline situation, many environmental components MAY be of interest

The components of interest are those that are likely to be affected by your activity—or upon which your activity depends for its success

Water	*Quantity, quality, reliability, accessibility*
Soils	*Erosion, crop productivity, fallow periods, salinity, nutrient concentrations*
Fauna	*Populations, habitat*
Env Health	*Disease vectors, pathogens*
Flora	*Composition and density of natural vegetation, productivity, key species*
Special ecosystems	*Key species*

The baseline situation

The baseline situation is not simply a "snapshot."

Describing the baseline situation requires describing both the normal variability in environmental components & current trends in these components.

This chart of groundwater levels shows both variability and a trend over time.

Both are part of the groundwater baseline situation.

Types of impacts & their attributes

The EIA process is concerned with all types of impacts and may describe them in a number of ways

- **Direct & indirect impacts**
- **Short-term & long-term impacts**
- **Adverse & beneficial impacts**
- **Cumulative impacts**

- **Intensity**
- **Direction**
- **Spatial extent**
- **Duration**
- **Frequency**
- **Reversibility**
- **Probability**

But all impacts are NOT treated equally.

Specifically,

! **It is ESSENTIAL in EIA to focus on the most significant impacts.**

Don’t waste effort & time analyzing and discussing impacts that are less important.

What is an activity?

We are discussing the impacts of activities.
What are activities?

✓ **An activity is:**

a desired accomplishment or output

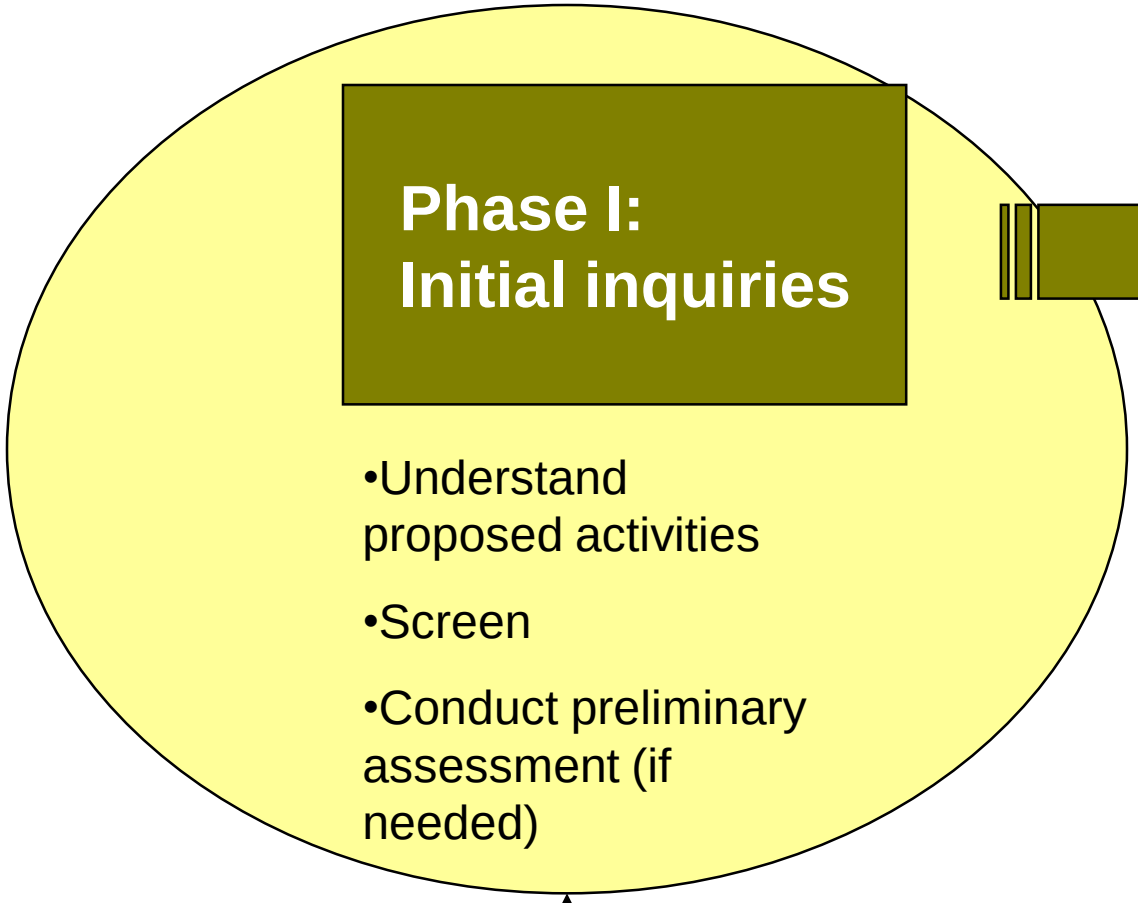
E.g.: a road, seedling production, or river diversion to irrigate land

Accomplishing an activity requires a set of actions

ACTIVITY:	ACTIONS:
market access road rehabilitation	Survey, grading, culvert construction, compaction, etc. . .

A project or program may consist of many activities

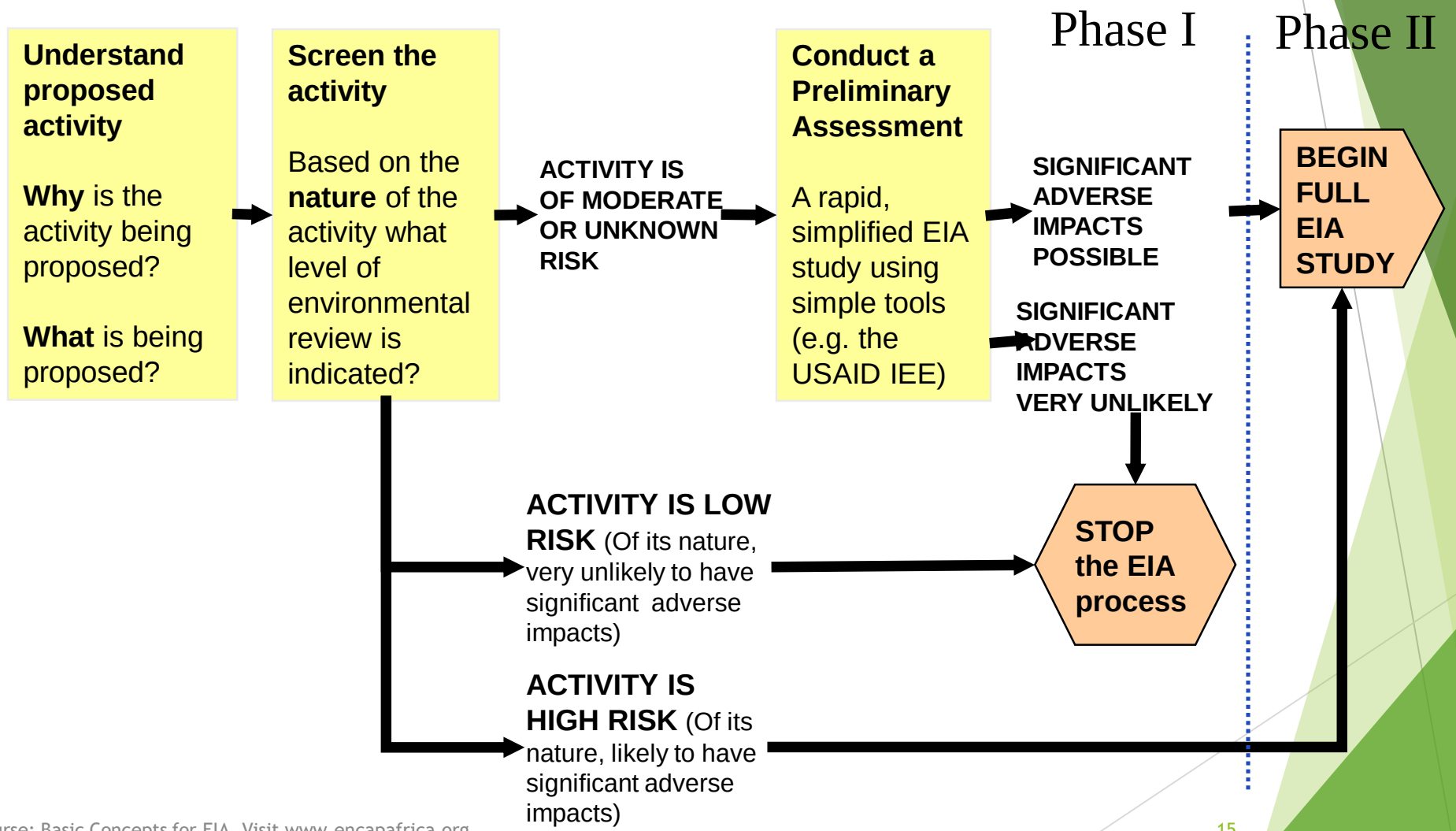
The EIA process



Phase II:
Full EIA study (if needed)

- Scope
- Evaluate baseline situation
- Identify & choose alternatives
- Identify and characterize potential impacts of proposed activity and each alternative
- Develop mitigation and monitoring
- Communicate and document

Phase 1 of the EIA Process



Phase 1 of the EIA process:

Understand the proposed activity

Understand the proposed activities

Why is the activity being proposed?

What is being proposed?

ALL EIA processes begin with understanding WHAT is being proposed, and WHY.

The question
"WHY IS THE ACTIVITY BEING PROPOSED?
Is answered with the development objective (D.O.).

"buildin~~g~~ a road" **Not a D.O.!**

"increasing access to markets" **Is a D.O.**

"If we don't understand it, we can't assess it!"

We must understand the Development Objective to identify environmentally sound alternatives

Phase 1 of the EIA process:

Understand the proposed activity

Understand the proposed activities

Why is the activity being proposed?

What is being proposed?

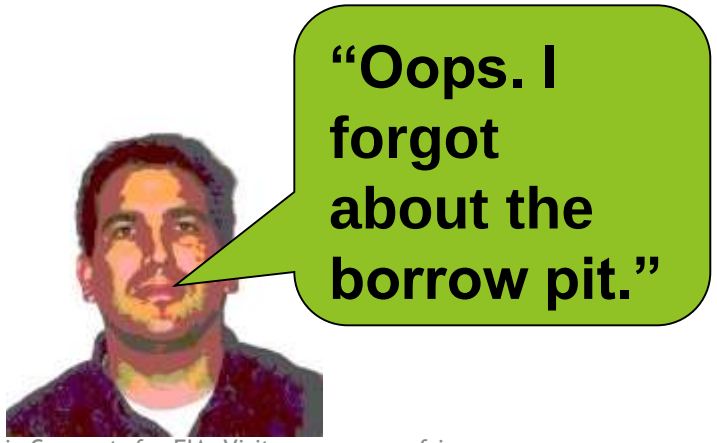
Once we understand the development objective, we must fully understand WHAT is being proposed.

This includes associated actions!

PRIMARY ACTIVITY:
construction of diversion dam & irrigation canal

ASSOCIATED ACTIONS:

- **Survey**
- **negotiate land tenure**
- **construct borrow pit**
- **establish construction camp**
- **construct temporary diversion structure**
- **dispose of soil, debris**



Phase 1 of the EIA process:

Screen the activity

Screen each activity

Based on the **nature** of the activity, what level of environmental analysis is indicated?

SCREENING is the process of asking a very basic set of questions about the nature of activity.

These questions:

- **do NOT require analysis.**
- **do NOT require detailed knowledge about the proposed sites, techniques or methods**

Example screening questions:
Does the activity involve:

- **Penetration road building?**
- **Large-scale irrigation?**
- **Introduction of non-native crop or agroforestry species?**

Phase 1 of the EIA process:

Screen the activity

Screen each activity

Based on the **nature** of the activity, what level of environmental analysis is indicated?

screening classifies the activity into a RISK CATEGORY:

VERY LOW RISK	**EIA process ends**
VERY HIGH RISK	**Do full EIA study**
MODERATE OR UNKNOWN RISK	**Do preliminary assessment**

The outcome of the screening process determines the next step in the EIA process

Phase 1 of the EIA process:

Screen the activity

! **Each donor agency and national EIA law has its own set of screening questions.**

✓ **Screening is the topic of an upcoming module**

Phase 1 of the EIA process:

The Preliminary Assessment

Conduct a Preliminary Assessment

A rapid, simplified EIA study using simple tools (e.g. the USAID IEE)

The purpose of a preliminary assessment is to provide documentation and analysis that:

- **Allows the preparer to determine <u>whether or not significant adverse impacts are likely</u>**
- **Allows the reviewer to agree or disagree with the preparer's determinations**
- **Sets out mitigation and monitoring for adverse impacts**

! Screening determines whether the preliminary assessment is necessary

Phase 1 of the EIA process:

The Preliminary Assessment

Typical Preliminary Assessment outline

1. Background (Development objective, list of activities)

2. Description of the baseline situation

3. Evaluation of potential environmental impacts

4. **Mitigation & monitoring**

5. **Recommended Findings**

For each activity it covers, a preliminary assessment has 3 possible findings:

- **The project is very unlikely to have significant adverse impacts. (EIA process ends)**
- **With specified mitigation and monitoring, the project is unlikely to have significant adverse impacts**
- **The project is likely to have significant adverse impacts (full EIA study is required)**

What is mitigation?

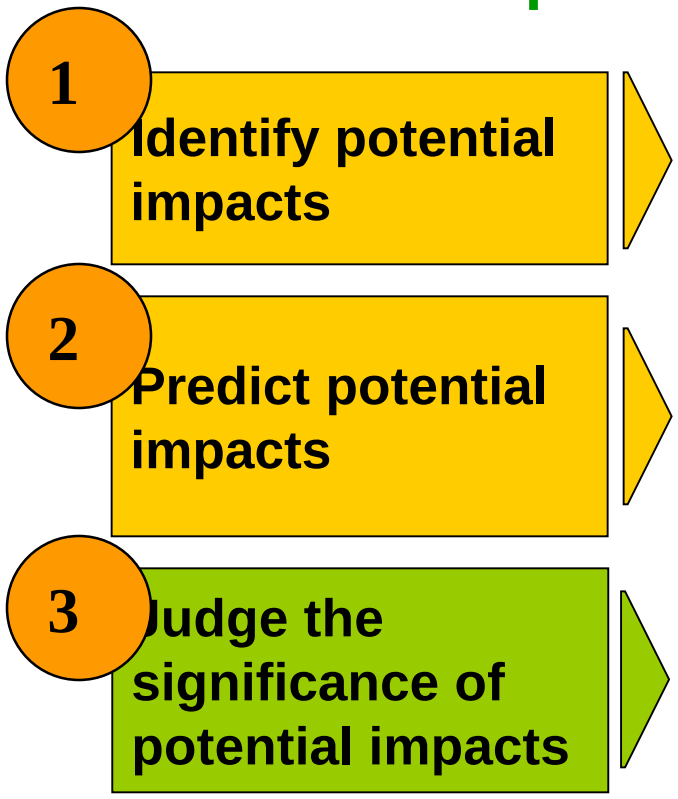
Mitigation is. . .

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

Mitigation is the topic of an upcoming module!

To arrive at findings: Identify, Predict and Judge

Arriving at the FINDINGS in a preliminary assessment requires 3 steps:



Many resources describe the potential impacts of typical small-scale activities.

Determine which potential impacts are likely to become actual, and quantify these impacts to the extent possible.

Determine whether the predicted impacts are indeed significant!
THIS WILL OFTEN DEPEND ON HOW EFFECTIVE THE PROPOSED MITIGATION MEASURES ARE!

✓ Subsequent modules. . .

- **Present tools to assist in identifying & predicting impacts**
- **Discuss the factors involved in judging significance**

We only proceed to Phase II of the EIA process

if

Phase I indicates that a FULL EIA STUDY is required

Most small-scale activities do not require a full EIA study!

Phase 2 of the EIA process:

The Full EIA study

The full EIA study has very similar objectives and structure to a preliminary assessment.

However, the full EIA study differs in important ways:

- **A formal scoping process precedes the study to ID issues to be addressed**
- **Analysis of environmental impacts is much more detailed**
- **Alternatives* must be formally defined. The impacts of each alternative must be identified & evaluated, and the results compared.**
- **Public participation is usually required.**
- **A professional EIA team is usually required.**

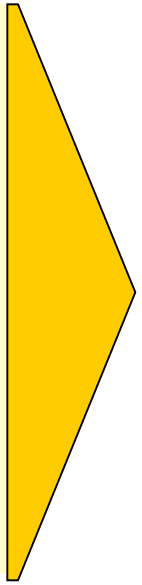
**includes the project as proposed, the no-action alternative at least one other real alternative*

Phase 2 of the EIA process:

The Full EIA study

With a few additions, the basic outline of the preliminary assessment is the template for the steps involved in a full EIA study:

1. **Background (Development objective, list of activities)**
2. **Description of the baseline situation**
3. **Evaluation of potential environmental impacts**
4. **Mitigation & monitoring**
5. **Recommended Findings**



Basic steps of the full EIA study

- **Scope**
- **Evaluate baseline situation**
- **Identify & choose alternatives**
- **Identify and characterize potential impacts of proposed activity and each alternative**
- **Compare alternatives**
- **Develop mitigation and monitoring**

Communicate & Document throughout

Phase 2 of the EIA process:

The Full EIA study

✓ In summary,

The full EIA study is a far more significant effort than the preliminary assessment.

It is reserved for activities for which screening or the preliminary assessment shows that significant impacts are likely.

Who is involved in EIA?

Sponsor of the activity
(usually commissions/conducts the EIA)

Regulatory agencies/
Review authorities

Broad-based public

Communities (men & women)
Civil society
Private Sector

Public consultation is usually only REQUIRED for full EIA studies.

However, it is good practice for preliminary assessments because:

- Predicting impacts is FACILITATED by broad-based public consultation; Judging significance is very difficult without it.
- Transparency and accessibility require disclosure to stakeholders

Making EIA effective

To be an effective tool for ESD, EIA must be:

- a Integral part of the project development cycle.
  - **EIA is undertaken early enough to affect project design**
  - **Mitigation and monitoring developed in the EIA process is implemented.**
- Honest
  - **The full EIA study must consider real alternatives**
  - **Impacts must be assessed honestly.**
- Transparent & accessible
  - **The EIA products must be clear and accessible to key actors.**

References

1. Environment Impact Assessment by Lawrence DP
2. Source Book on EIA – World Bank
3. Internet Sources – Google, Wikipedia & Slide Share.

THANK YOU