Introduction to ESIA

- Environmental and Social Impact Assessment (ESIA) is a comprehensive framework used to evaluate both environmental and social consequences of development projects, ensuring sustainability, regulatory compliance, and community acceptance.
- It goes beyond traditional Environmental Impact Assessment (EIA) by integrating social dimensions such as livelihoods, health, and cultural heritage.
- Purpose: To ensure projects are environmentally sustainable and socially responsible
- End Product: Produces an Environmental and Social Management Plan (ESMP) that outlines mitigation, monitoring, and enhancement measures.

Definition of ESIA

- United Nations Economic Commission for Europe (UNECE 1991) as ‘an assessment of the impacts of a planned activity on the environment’.

- The definition adopted by the International Association for Impact Assessment (2009) is ‘the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of proposed development proposals prior to major decisions being taken and commitments made’.

- ESIA involve assessments of aspects of the environment and society (e.g. landscape, heritage, air, soil, biodiversity, Indigenous people) that are likely to be significantly affected by a proposed project.

Background of ESIA

- 1970s – Birth of EIA: 1972 Stockholm Conference (UN): First global recognition of the need for environmental protection in development projects.
- 1980s – Global Adoption: Many countries institutionalized EIA in legislation for infrastructure, industrial, and energy projects.
- 1990s – Emergence of ESIA: World Bank & IFC Guidelines: Required inclusion of social impact assessment (SIA) alongside environmental studies.
- 2000s – Institutionalization: UNEP and other development agencies consider it as framework
- 2010s – Alignment with Sustainability Goals: ESIA frameworks aligned with UN Sustainable Development Goals (SDGs).
- Present Day –ESIA is now a global standard for large-scale development projects

Key Elements of ESIA

- **Scoping Study** – Identifies risks, stakeholders, and priorities.
- **Baseline Studies** – Collects environmental and social data (air, water, soil, biodiversity, demographics, livelihoods).
- **Impact Prediction & Evaluation** – Assesses magnitude, duration, and significance of impacts.
- **Mitigation Measures** – Proposes strategies to avoid, reduce, or offset negative impacts.
- **Stakeholder Engagement** – Ensures participation of affected communities, NGOs, and government bodies.
- **ESMP (Environmental & Social Management Plan)** – Provides actionable steps for monitoring and compliance

Key Process Elements of ESIA

(i) Initial screening of the project and scoping of the assessment process

(ii) Examination of alternatives

(iii) Stakeholder identification (focusing on those directly affected) and gathering of environmental and social baseline data

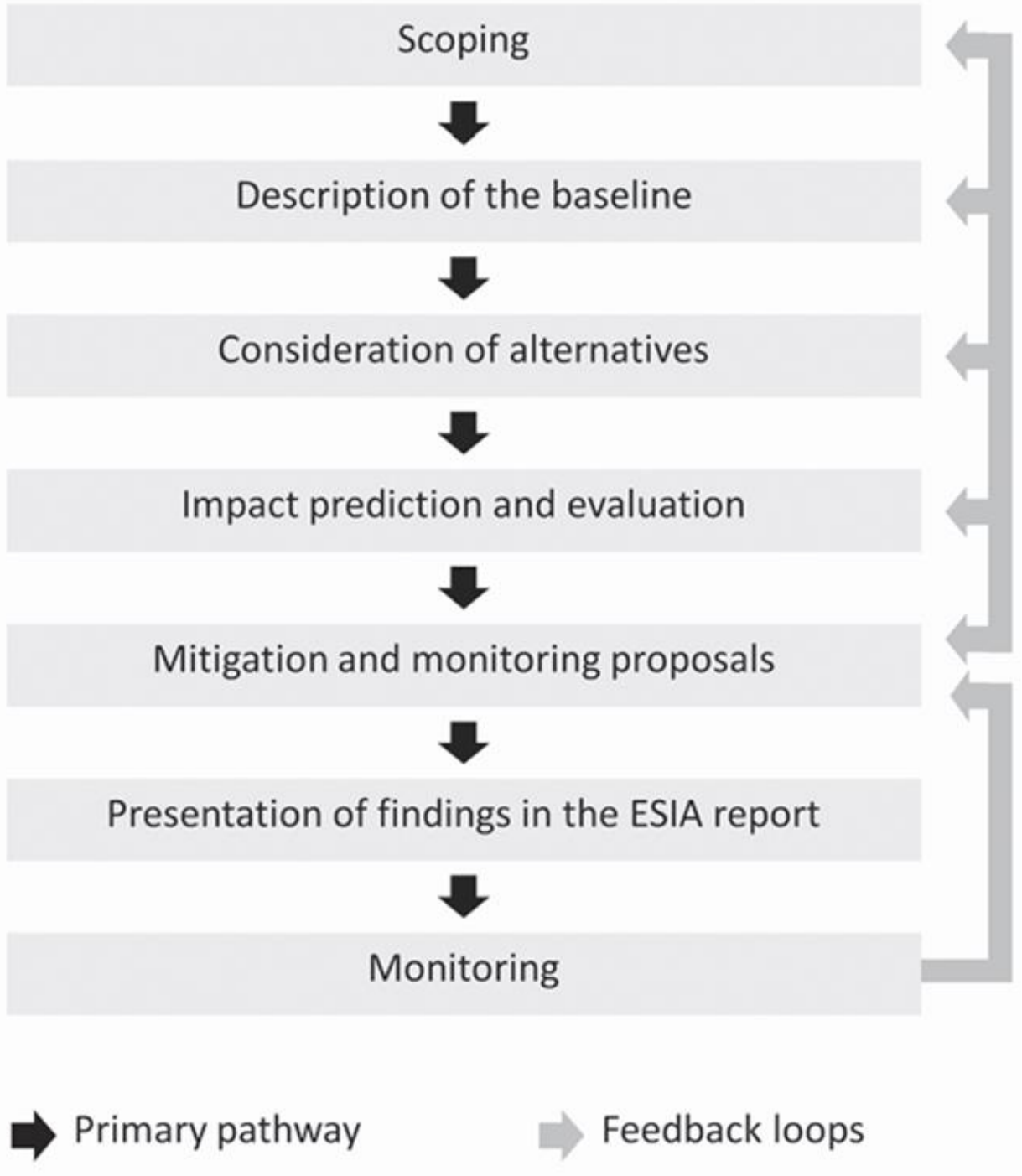
(iv) Impact identification, prediction, and analysis

(v) Generation of mitigation or management measures and actions

(vi) Significance of impacts and evaluation of residual impacts

(vii) Documentation of the assessment process (i.e., ESIA report).

ESIA Process



Scoping

Scoping in ESIA is the critical first step that defines the boundaries, priorities, and focus of the assessment.

Aim

- To consider and agree at an early stage (when the project type, location and/or design are still relatively amenable to modification): key receptors, impacts and project alternatives; the scope of the ESIA in time and space; the methodologies to use; and whom to consult;
- To ensure that resources and time are focused on important impacts and receptors
- To establish early communication between the developer, consultants, consenting authority, statutory consultees and other interest groups who can provide advice and information;
- To warn the developer of any constraints which may pose problems if not discovered until later in the ESIA process.

Scoping

Purpose of Scoping

- Identify Key Issues: Pinpoints environmental and social impacts most relevant to the project.
- Set Boundaries: Defines geographic, temporal, and thematic scope of the ESIA.
- Engage Stakeholders: Ensures community voices, government agencies, and NGOs contribute to shaping the study.
- Guide Methodology: Determines which baseline studies, models, and tools are needed.
- Prevent Delays: Avoids surprises later in the project approval process.

Example: Highway Project Scoping

- Environmental Issues: Air pollution, noise,
- Social Issues: Land acquisition, resettlement, impacts on roadside businesses.
- Boundaries: 5 km buffer zone around the highway alignment, covering both ecological and community impacts.
- Stakeholders: Local residents, transport authorities, environmental NGOs.

Baseline Study

- The term usually refers to the collection of background information on the environmental and socio-economic setting for a proposed development project, and it is normally one of the first activities undertaken in an ESIA
- Baseline data could be used to characterize the pre project state
- Cause and Effect studies would then be undertaken to predict how stated variables would change as a result of project activities
- Subsequently, following start-up of the project, monitoring would be used to determine the actual impact conditions
- Baseline study plays a key role from project initiation to final design and setting up the operational standards.
- It provides the “reference point” against which future impacts are predicted, evaluated, and monitored.

Baseline Study

Purpose of Baseline Study

- Establishes current status of the environment and communities.
- Provides quantitative and qualitative data for impact prediction.
- Helps identify sensitive receptors (ecosystems, vulnerable groups, cultural sites).
- Forms the foundation for mitigation and monitoring plans.

Example: Baseline Study for a Hydropower Project

- Environmental: River flow data, fish species diversity, sediment load.
- Social: Number of households in project area, health facilities, education levels.
- Cultural: Sacred sites along the river, traditional fishing practices.

Alternatives

- Alternatives (or options) are increasingly being considered within ESIAs.
- Some of the alternatives include alternative project locations, project designs, forms of project operation and access routes; renewable or low carbon energy sources; emission reduction technologies; use of alternative water supplies; alternative options for waste disposal; and water consumption offsets to reduce total demand for water resources.
- The impacts of the alternatives are typically assessed in parallel with those of the proposed project; compared against the proposed project; and a justification is provided for why the proposed project is being put forward, especially when an alternative is likely to have fewer significant negative social or environmental impacts.

Alternatives

Purpose of Alternatives

- Avoid or minimize impacts: By comparing different options, projects can reduce environmental damage and social disruption.
- Promote sustainability: Encourages adoption of cleaner technologies and better site selection.
- Enhance transparency: Demonstrates to stakeholders that all reasonable options were considered.
- Support decision-making: Provides evidence for regulators, financiers, and communities.

Example: Industrial Plant ESIA

• Location Alternative: Site A (near river, risk of water pollution) vs. Site B (away from river, higher transport costs).
• Technology Alternative: Coal-fired boilers vs. natural gas vs. biomass.
• Design Alternative: Compact layout vs. expanded layout with green buffer zones.
• No-Project Alternative: No plant → avoids pollution but loses economic benefits.

Mitigation

Mitigation in ESIA refers to the strategies and measures designed to avoid, minimize, reduce, or offset the adverse environmental and social impacts of a project.

- Mitigation aim to avoid, minimize, remedy or compensate for the predicted adverse impacts of the project.
- Different mitigation measures will be needed in relation to specific impacts on different environmental and social components.
- The ESIA should propose detailed measures for each impact, indicate how they would actually be put in place, and propose how they might be modified if unforeseen impacts arise.
- In addition to mitigation, opportunities for environmental enhancement (improvement of current environmental conditions and features) should be sought in ESIA. For instance, projects may seek to reduce flood risk or enhance biodiversity.

Mitigation

Purpose of Mitigation

- Reduce risks of legal disputes, community opposition, and funding rejection.
- Enhance positive impacts while controlling negative ones.
- Ensure projects remain environmentally sustainable and socially acceptable.

Hydropower Project Mitigation

•Environmental: Fish ladders to maintain migration routes, sediment management.
•Social: Resettlement action plan, livelihood restoration programs.
•Physico-Chemical: Water quality monitoring, controlled sediment release.

Presentation of Findings and Proposals in ESIA Report

- The information presented in the ESIA report must be clear and, at least in the non-technical summary, should be in a form that can be understood.
- Presentation methods vary between components, but can include the use of maps, graphs/charts, tables and photographs.
- The ESIA report must be an integrated document, and this will necessitate assessing one component in relation to others, e.g. to evaluate its relative importance, and ensure that potential conflicts of interest have been addressed.

Monitoring

- Monitoring can be defined as the continuous assessment of environmental or social variables via the systematic collection of specific data in space and time.
- It can be continuous but more commonly involves periodic repeat data collection.
- Monitoring in ESIA can include:
- Baseline monitoring – which may be carried out over seasons or years to quantify ranges of natural variation and/or directions and rates of change that are relevant to impact prediction and mitigation.
- Compliance monitoring – which aims to check that specific conditions and standards are met.
- Impact and mitigation monitoring – which aims to compare predicted and actual (residual) impacts, and hence to determine the effectiveness of mitigation measures.

Monitoring

Purpose of Monitoring

- Verify compliance: Ensures project follows environmental and social commitments.
- Measure effectiveness: Evaluates whether mitigation measures are working.
- Support adaptive management: Provides data for corrective actions.
- Detect changes: Identifies unforeseen impacts early.
- Build trust: Demonstrates transparency to stakeholders and financiers.

Impact Prediction and Evaluation

Impact Prediction and Evaluation in ESIA is the stage where the potential consequences of a project are forecasted, quantified, and judged for their significance.

- Impact prediction and evaluation is fundamental to ESIA, and the likely impacts of a project should be considered for all environmental and social components.
- Impact prediction should include assessment of:

  # Direct/primary impacts – that are a direct result of a development;

  # Indirect/secondary impacts – that may be ‘knock-on’ effects of (and in the same location as) direct impacts, but are often produced in other locations and/or as a result of a complex pathway;

  # Cumulative impacts– that accrue over time and space from a number of developments or actions, and to which a new project may contribute.

Impact Prediction and Evaluation

Purpose of Impact Prediction and Evaluation

- Anticipate environmental and social changes due to project activities.
- Distinguish between positive and negative impacts.
- Provide a basis for mitigation measures and monitoring.
- Support transparent decision-making for regulators, financiers, and communities.

Example: Hydropower Project

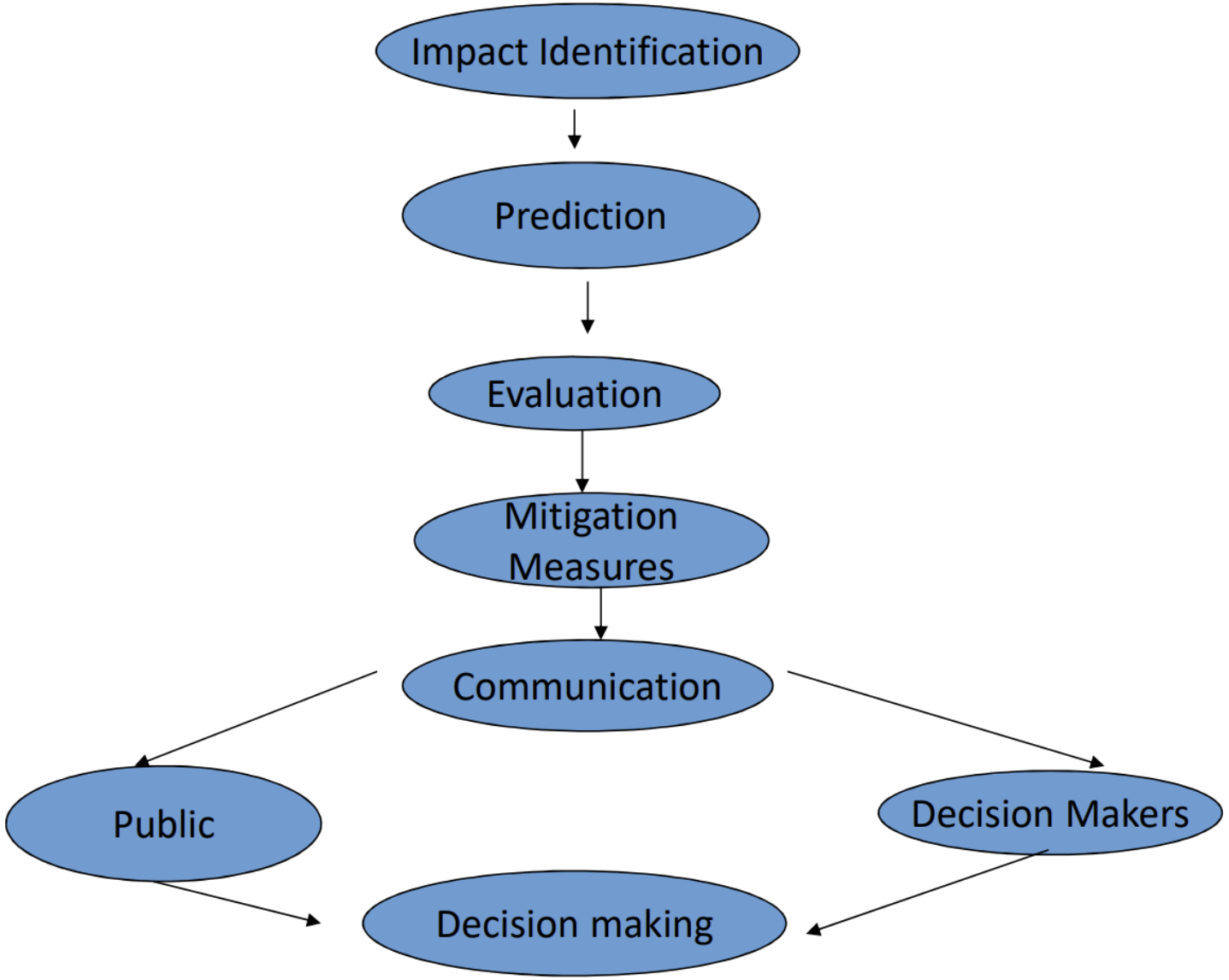
•Predicted Environmental Impact: Reduced downstream flow: fish population decline.

•Predicted Social Impact: Displacement of 200 households: livelihood disruption.

•Evaluation:

- Fish decline - significant, long-term, negative.
- Household displacement -highly significant, requires resettlement plan.
- Electricity generation -positive, regional benefit.

Impact Analysis



Impact Identification

- First task or activity
- Knowledge concerning the nature and extent of impacts
- Different environmental settings
- Emphasis on identifying impact

Impact Prediction and Measurement

- Involves estimation of likely nature or characteristics of impacts in quantitative / qualitative terms
- Prediction techniques
    - Mathematical models
    - Physical small-scale model
    - Nature of these effects on humans, animals or plants

Impact Interpretation or Evaluation

- The magnitude of the Impact
- How important is this change?

IMPACT

- Spatial dimension

  Impact can occur in the vicinity of a project. As for example: odour problem of tannery industries

  Impact can occur at considerable distances. As for example:acid rain in Scandinavia due to hydro carbon combustion in UK

- Temporal dimension

  Some impacts occur immediately, such as noise level from construction work causing irritation to nearby people

  Some impacts may occur after a long period of time. Example: accumulation of heavy metal in aquatic organisms from industrial discharges

- Beneficial/Adverse impact

  Some impacts are beneficial. Example: flood protection, employment etc.

  Some are adverse, e.g. loss of habitat etc.

- Reversibility

  Some impacts are irreversible, e.g. loss of agricultural land.

  Some are reversible. Example: rise of noise level during construction would return to normal level after construction is ceased.

- Socio-political dimension

  Societies are made up of groups and individuals with differing interests and values

  People/experts conducting EIA may reflect different values than local interest groups

  Study team's own perception/political influence/lack of knowledge may lead to differences between groups

Exercise

- Potential Impacts of Upazila Road Projects
- Impacts of Upazila Drainage and Embankment Project

- ➢ Ecological Impacts
- ➢ Physico-Chemical Impacts
- ➢ Human interest related impacts
- ➢ Human interest related impacts