Economical Evaluation of EIA

Introduction

- Economic evaluation of EIA refers to assessing the financial costs and benefits of conducting an EIA and implementing its recommendations.
- It includes direct costs (consultancy, surveys, hearings), indirect costs (delays, administrative processes), and mitigation/monitoring costs (pollution control, safety measures).

Example: Textile Industry

- **Direct Costs**: Consultancy fees for wastewater treatment feasibility studies.
- **Indirect Costs**: Time spent in government approval processes.
- **Mitigation/Monitoring Costs**: Installation of effluent treatment plants (ETPs).
- **Economic Benefit**: Compliance with international standards allowed exports to EU markets, increasing revenue.

Purpose

- **Cost Savings**: Helps to determine whether the financial costs of conducting an EIA and implementing its recommendations are balanced by the long-term economic benefits.
  Example: Avoided fines, improved resource efficiency.
- **Risk Reduction**: Minimizes environmental accidents, community conflicts, and reputational damage, thereby saving money for industries and governments.
- **Long-Term Sustainability**: Ensures projects remain viable by aligning with national policies, donor requirements (World Bank, ADB), and Sustainable Development Goals (SDGs).
  Example: Coastal Towns Climate Resilience Project.
- **Policy Justification**: Provides evidence for governments and investors that EIA is not a bureaucratic hurdle but a strategic investment tool.
- **Economic Sustainability & Development** Demonstrates that EIA is not just a compliance tool but an economic investment that ensures projects contribute positively to long-term development goals.
- **Resource Efficiency**: Promotes optimal use of land, water, and energy. Example: Industrial estates in Dhaka adopted EIA recommendations to optimize water recycling, cutting costs by 30%.
  Example: Fakir Knitwears invested US $ 1.7 million, enabling reuse of 438 000 m^3/year of treated water.

Environmental Protection and Economic Growth are not Contradictory but Complementary

Evaluation Methods

- Cost–Benefit Analysis (CBA)
- Cost-Effectiveness Analysis (CEA)
- Multi-Criteria Analysis (MCA)
- Lifecycle Costing (LCC)

<u>Extension or broader version</u>

- Utility Analysis (CUA)
- Cost-Minimization Analysis (CMA)
- Cost-Consequence Analysis (CCA)
- Social Cost–Benefit Analysis (SCBA)

Source: Brousselle, A., & Lessard, C. (2011). *Economic evaluation, Economic evaluation and modelling methods*.

Cost–Benefit Analysis (CBA)

- CBA is a systematic method that compares the **total expected costs** of a project (including mitigation) with its **total expected benefits** (economic, social, and environmental).
- It translates environmental impacts into monetary terms, allowing decision-makers to judge whether a project is **economically viable and environmentally sustainable**.
- Monetary valuation of both costs and benefits.
- Compares total costs.
- Identify net present value (NPV)

Example: Textile factories installing effluent treatment plants (ETPs) incur upfront costs but gain export competitiveness and avoid penalties.

Cost-Effectiveness Analysis (CEA)

- CEA is a method that identifies the **least-cost option** to achieve a specific environmental objective when benefits are difficult to monetize.
- Identifies the least-cost option to achieve a specific environmental objective.
- Unlike Cost–Benefit Analysis (CBA), which converts both costs and benefits into monetary values, CEA focuses only on **cost per unit of outcome achieved**.
- CEA is especially valuable in EIA when **benefits are intangible or non-marketable**.
- Efficiency of achieving outcomes relative to cost.
- Identifies the least-cost
- Identify cost effectiveness ratio (CER)

Example: Choosing between different wastewater treatment technologies based on lowest cost per unit of pollution reduced.

Difference Between CBA and CEA ?

Multi-Criteria Analysis (MCA)

- MCA is a decision-making tool that evaluates projects using **multiple criteria:** Economic, Environmental, and Social rather than relying solely on monetary values.
- Evaluates projects using both quantitative (Economic) and qualitative (social, environmental) indicators.
- MCA is valuable when **impacts are multidimensional and cannot be reduced to a single monetary figure**.
- It ensures that EIA decisions reflect **economic efficiency, environmental sustainability, and social equity** simultaneously.
- Involves costing analysis, social survey and community involvement.
- **Example**: **Urban Transport Project in Dhaka**

Criteria:

  - Cost (weight 30%)
  - Environmental impact (weight 40%)
  - Social acceptance (weight 30%)

- Alternatives:

  Elevated expressway- Costly but environmentally sustainable

  Bus Rapid Transit (BRT)- Cost less, socially accepted, environmentally sustainable

Lifecycle Costing (LCC)

- LCC is an economic evaluation method that assesses the **total cost of a project across its entire lifespan** from planning and construction to operation, maintenance, and decommissioning.
- In EIA, it ensures that projects are not only environmentally sound but also economically viable throughout their entire lifecycle.
- LCC shifts focus from **short-term affordability** to **long-term sustainability**.
- Estimate costs for each stage**:** Capital costs (construction, land acquisition), operating costs (energy, labor, monitoring), maintenance costs (repairs, upgrades), end-of-life costs (decommissioning).
- **Example**: Hydropower projects where decommissioning and resettlement costs are factored into total economic evaluation.