7. Environmental Impact

Mitigating measures

I. Benefit enhancing measures (selection and implementation)
II. Adverse Impact mitigating measures (selection and implementation)
7. Environmental Impact Mitigating measures

The purpose of mitigation measures is to avoid, reduce or minimize unwanted impacts and enhance beneficial impacts.

Selection of alternatives is also a form of mitigation in terms of impact, cost and technology.
Definition of mitigation

Mitigation is . . .

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

Mitigation is a key part of the EIA process. It is essential to achieving environmentally sound design.

Source: ENCAP EA-ESD
Course: Mitigation & Monitoring
Different types of mitigation measures act in different ways to reduce adverse impacts:

<table>
<thead>
<tr>
<th>Type of measure</th>
<th>How it works</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention &amp; Control measures</td>
<td>Fully or partially prevent an impact/reduce a risk by:</td>
<td>PREVENT contamination of wells, by SITING wells a minimum distance from latrines.</td>
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<tr>
<td></td>
<td>• Changing means or technique</td>
<td>Implement health education program</td>
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<td></td>
<td>• Changing the site</td>
<td>Initiate public awareness prog.</td>
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<tr>
<td></td>
<td>• Specifying operating practices</td>
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<tr>
<td>Compensatory measures</td>
<td>Offset adverse impacts in one area with improvements elsewhere</td>
<td>Plant trees in a new location to COMPENSATE for clearing a construction site.</td>
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<tr>
<td>Remediation/Corrective 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>
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</table>
Example of Mitigation:

**Operating practices** to prevent & control impacts

- **Irrigation**
  - **Potential impact:** salinization of soils
  - **Mitigation:** avoid water-logging by using improved on-farm water management, including placement of drainage structures.
Example of Mitigation:

**Change of site** to prevent & control impacts

- Rural road construction
  - **Potential impact:** route traverses nesting area for a threatened species of bird
  - **Mitigation:**
    Re-route road to avoid nesting site.
    Also, minimize construction noise and other disturbance during nesting season
Reliability of mitigation measures: site & technique changes vs. operating practices

- **PREVENTION** of impacts by changes to site or technique is the most reliable approach to mitigation.

- **CONTROL** of impacts with operating practices is less reliable, because the practices must be continued after hand-over of the activity.
Do I mitigate EVERY impact?

NOT NECESSARILY.

Mitigation is directed at two targets.

1. **serious impacts**

   First, the most serious impacts identified by the EIA process should ALWAYS be mitigated.

2. **easily mitigated impacts**

   After addressing the most serious impacts, there may be small impacts for which mitigation is easy and low-cost.
A Framework of Impact Mitigation

Desirable

AVOIDANCE

Alt. Sites/Technology

MITIGATION

Actions

COMPENSATION

Use as last resort

Undesirable
7. Environmental Impact Mitigating measures

Characteristics of Impact Mitigation Measures

Proposed mitigation measures should be able to describe;

1. the impact it will avoid, mitigate or compensate when implemented,
2. an assessment of the effectiveness of protection measures,
3. the next best alternative,
4. the cost of the protection measures,
5. and the implementation plan for putting the measure into practice.
7. Environmental Impact Mitigating measures

<table>
<thead>
<tr>
<th>Activity</th>
<th>Likely Beneficial Impact</th>
<th>Benefits Augmentation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction phase</td>
<td>Employment generation</td>
<td>Involve local people with particular focus on gender equality</td>
</tr>
<tr>
<td></td>
<td>✓Skilled – 1000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓Semiskilled – 2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓unskilled - 1500</td>
<td></td>
</tr>
<tr>
<td>Operational phase</td>
<td>All weather road facility, development of growth (urban) centers</td>
<td>Apply bioengineering techniques in landslide prone areas, develop footpaths along the road corridors</td>
</tr>
</tbody>
</table>
Implementation of Mitigation Measures:

- should be cost effective and locally applicable and can be proposed during different stages of project implementation.

  - Pre-construction (such as compensation for land acquisition),
  - Construction (such as planning and designing activities),
  - Operational stages (such as maintenance activities).

- The cost is usually about 10% of the total cost of the project (although it depends on the nature, size, location etc. of the project)