

Name: Saishma Bhandari

Roll number: 103117086

Cycle Test 1 / CEPE 24

1.

a) Dam Construction Project

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Direct Impact

1. Acquiring land around the surface water source affects the production of crops from the ^{surrounding} agricultural land.
2. Diversion of the surface water for building dam.
3. Noise pollution due to the use of heavy equipments.
4. Destruction of flora and fauna.
5. Resettlement of the inhabitants around the project area.
6. Compaction of soil due to movement of heavy vehicles / vibrating instruments.

Indirect Impact

1. Increase in water depth.
2. Modification of water table in the surrounding area.
3. Submergence of land surrounding the project area.
4. Developmental activities such as hydropower projects, irrigation facilities set up.
5. Provide employment opportunity to people living nearby.
6. Increase in the flow of tourism.
7. Fishing industry prospers.

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b) Coal-fuel based power plant project:

Direct Impact	Indirect Impact
1. The pollutants emitted from chimneys increase air pollution, the ^{polluted} hot water discharged from boilers affect the water.	1. The pollutants affect the aquatic life as well as the flora and fauna present nearby.
2. Acquiring land for construction, affects the production of crops surrounding the agricultural land.	2. Development of surrounding area due to laying roads.
3. Noise pollution due to the use of heavy equipments in project.	3. Disappearance of species such as migratory birds, animals.
4. Substantial amount of generation of solid waste.	4. Loss of biodiversity in the area.
5. Increases the economy due to production of fuel electricity. Loss of farms and houses that might lie along the map of road.	5. Contamination of soil, ground, water, surface by chemicals emitted from power plant. 6. Project gives opportunity of employment to many people.

The various factors to be considered for assessing the significance of impact of any project activity are:-

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- A. **Magnitude** - It addresses the question related to the rate of recovery or adaptability if the impact comes under irreversible type and so on.
- B. **Prelvalence** - An isolated action might produce a low importance impact and magnitude however a number of them result in wide spread effect. This should be properly considered otherwise even though individual action doesn't produce any significant impact but might be problematic.
- C. **Duration and Frequency** - An impact might be long-term or short-term. This should be considered before hand because mostly short-term eff impacts can be perceived but not the long term.
- D. **Risk** - The risk, a decision-maker has taken should be properly well-known and understood.
- E. **Importance** - Not all impacts are equally important. The most significant impact must be studied well.
- F. **Mitigation** - The solution for each impact must be analyzed.

3.

→ The criteria for adopting EIA Methodologies are as follows:-

General

- It includes simplicity, that is the method chosen should be simple to understand.

* Flexibility

- The method should be flexible to any modifications in a project.
- The method should be done quickly also in a limited budget.

Impact Identification

- It includes comprehensiveness, specificity, isolation of project and time and duration.

The method should identify specific impact that is the most important and the one that needs more attention.

Impact Measurement

- The method should have commensurate units, explicit indicators etc.

Impact Interpretation and Evaluation

- The method should possess explicit criteria, should address uncertainty and risk, need to have depth of analysis. It should also have provision for alternative comparison.



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Impact communication:

- The impact that is identified should be addressed ^{effectively} to affected parties, the key issues should be pointed out along with the summary.

In as For ~~The~~ 'Tunnel construction in hill ranges', the most ~~is~~ important methodology we can use for EIA report is descriptive checklist method for identifying the impacts as well as to address the correct methods for measuring the impacts.

T Also, the tunnel project will be encountered with many challenges, the simulation models helps to identify the possible long-term impacts which might create catastrophe in near future if not addressed.

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→ For a systematic approach for the study of prediction and assessment of impacts of any developmental activity on soil and ground water, we should follow the steps as illustrated below:-

Step 1 Delineation of Study Area



Step 2 Identification of activities that may have different types of impacts on soil/groundwater quantity



Step 3 Preparing description of existing situation



Step 4 Procurement of relevant standards for soil/groundwater



Step 5 Impact prediction for soil/groundwater environment



Step 6 Assessment of impact significance



Step 7 Identification and incorporation of mitigation measures

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- # Step 1: we have to select a study area such that it should be able to reflect the full reach of possible effects within the possible impact on soil and groundwater.
- # Step 2: Different types of impacts related to the activities have to be identified. Impacts on landforms, soil profile, soil composition, seismicity^{etc} should be studied well.
- # Step 3: Here we have to prepare the description of existing situation on soil and groundwater. Such as, description on groundwater system in study area, characterization of the presence of multiple groundwater system, depth of groundwater, aquifer transmissivity etc.
- # Step 4: The institutional measures such as land-use restrictions, soil quality standards, soil reclamation requirement, quality standards, regulations etc are to be used for determining impact significance and required mitigation measures. We should contact appropriate governmental agencies.
- # Step 5: We should quantify the anticipated impacts if possible otherwise we must use qualitative trend. There are three perspective for prediction namely:
qualitative, simple quantitative, specific quantitative.
- # Step 6: According to magnitude, duration and frequency, risk, prevalence, we must ~~assess~~ assess the impact significance.

Step 7: According to our significant impacts, necessary mitigation measures should be applied in order for our project to produce minimum ^{harmful} effects in environment.