Original Research Paper Engineering

Environmental Impacts and Their Effects on Various Enterprises

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KEYWORDS :

INTRODUCTION

The process of evaluating the likely environmental impacts of a development or proposed is known as Environmental Impact Assessment (EIA), taking into account inter-related socio-economic, human-health and cultural, both beneficial and adverse.

UNEP defines Environmental Impact Assessment (EIA) as a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. By using EIA both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.

Although legislation and practice vary around the world, the fundamental components of an EIA would involves Screening, Scoping, Assessment and evaluation of impacts and development of alternatives, Reporting the Environmental Impact Statement (EIS) or EIA, Review of the Environmental Impact Statement (EIS), Decision-making and Monitoring, Compliance, enforcement and environmental auditing.

TYPES OF ENVIRONMENTAL IMPACTS:

1. Direct Impact,
2. Indirect Impact,
3. Cumulative impacts and
4. Induced Impact

Direct Impacts:

These impacts occur through direct interaction of an activity with an environmental, economic component or social.

For example, a discharge of any industry or an effluent from the Effluent Treatment Plant (ETP) from the industrial estates into a river may lead to a decline in the quality of water in terms of Dissolved Oxygen (DO) or rise of water toxins.

Indirect Impacts:

These impacts on the environment, which are not a direct result of the project, often produced away from or as a result of a complex impact pathway. Secondary or even third level impacts are also known as Indirect Impacts.

For example, ambient air SO_2 rise due to stack emissions may deposit on land as SO_4 and cause acidic soils. Another example of indirect impact is the decline in water quality due to rise in temperature of water bodies receiving cooling water discharge from the nearby industry.

This may, in turn, lead to a secondary indirect impact on aquatic flora in that water body and may further cause reduction in fish population. Reduction in fishing harvests, affecting the income of fishermen is a third level impact. Such impacts are characterized as socioeconomic (third level) impacts.

The indirect impacts may also include growth- inducing impacts and other effects related to induced changes to the pattern of land use or additional road network, population density or growth rate (e.g. around a power project). In the process, air, water and other natural systems including the ecosystem may also be affected.

Cumulative Impacts:

Cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIA together with other projects causing related impacts. These impacts occur when the incremental impact of the project is combined with the cumulative effects of other past, present and reasonably foreseeable future projects.

Induced Impacts:

The cumulative impacts can be, due to induced actions of projects and activities that may occur if the action under assessment is implemented such as growth inducing impacts and other effects related to induced changes to the pattern of future land use or additional road network, population density or growth rate. Induced actions may not be officially announced or be part of any official plan. Increase in workforce and nearby communities contributes to this effect.

They usually have no direct relationship with the action under assessment and represent the growth- inducing potential of an action. New roads leading from those constructed for a project, increased recreational activities, and construction of new service facilities are examples of induce actions.

However, the cumulative impacts due to induced development or third level or even secondary indirect impacts are difficult to be quantified. Because of higher levels' of uncertainties, these' impacts cannot be normally assessed over a long time horizon. An EIA practitioner usually can only guess as to what such induced impacts may be and the possible extent of their implications on the environmental factors.

ENVIRONMENTAL IMPACTS:

There are two main types of Environmental impacts

1. ENVIRONMENTAL EFFECTS OF NUCLEAR POWER GENERATION
2. Environmental Impacts of Solar Power

ENVIRONMENTAL EFFECTS OF NUCLEAR POWER GENERATION

A nuclear power plant starts disturbing the environment during construction, and is common problem to any major enterprise, as for example, a non-nuclear power plant. Normal processes of plant construction as well as ancillary operations, not necessarily related to the nuclear nature of the power plant fuel, do disturb the surrounding environment. New roads, increasing traffic flow in the existing roads, excavations, cutting trees and other plants, frightened animals, are some of the environmental impacts to be expected from the construction of a power plant. In the case of a hydroelectric plant a large man-made lake which will replace free-flowing rivers is also to be built. In addition to all those impacts the builders of power plants should minimize, under the guidance of the legally competent authorities, disturbance to any prehistoric petrified plants and animals or to any archaeological remains of early civilizations, graveyards, monuments, ruins, aqueducts and so on. Site selection for nuclear power plants should be carefully made to avoid, or minimize to the extent possible, most of those impacts.

2. Environmental Impacts of Solar Power

Land Use

Water Use

Hazardous Materials

Life-Cycle Global Warming Emissions

Solar panel

Land Use:
The sun provides a tremendous resource for generating clean and sustainable electricity without toxic pollution or global warming emissions.

The potential environmental impacts associated with solar power — land use and habitat loss, water use, and the use of hazardous materials in manufacturing — can vary greatly depending on the technology, which includes two broad categories: photovoltaic (PV) solar cells or concentrating solar thermal plants (CSP).

The scale of the system — ranging from small, distributed rooftop PV arrays to large utility-scale PV and CSP projects — also plays a significant role in the level of environmental impact.

Water Use
Solar PV cells do not use water for generating electricity. However, as in all manufacturing processes, some water is used to manufacture solar PV components.

Concentrating solar thermal plants (CSP), like all thermal electric plants, require water for cooling. Water use depends on the plant design, plant location, and the type of cooling system.

CSP plants that use wet-recirculation technology with cooling towers withdraw between 600 and 650 gallons of water per megawatt-hour of electricity produced. CSP plants with once-through cooling technology have higher levels of water withdrawal, but lower total water consumption (because water is not lost as steam). Dry-cooling technology can reduce water use at CSP plants by approximately 90 percent. However, the tradeoffs to these water savings are higher costs and lower efficiencies. In addition, dry-cooling technology is significantly less effective at temperatures above 100 degrees Fahrenheit.

Hazardous Materials:
The PV cell manufacturing process includes a number of hazardous materials, are used to purify and clean the semiconductor surface. These chemicals, similar to those used in the general semiconductor industry, include hydrochloric acid, sulfuric acid, nitric acid, hydrogen fluoride, 1,1,1-trichloroethane, and acetone. The amount and type of chemicals used depends on the type of cell, the amount of cleaning that is needed, and the size of silicon wafer.

Thin-film PV cells contain a number of more toxic materials than those used in traditional silicon photovoltaic cells, including gallium arsenide, copper-indium-gallium-diselenide, and cadmium-telluride. If not handled and disposed of properly, these materials could pose serious environmental or threats on public health.

Life-Cycle Global Warming Emissions

By Generating electricity from solar energy. while there are no global warming emissions associated with, there are emissions associated with other stages viz., manufacturing, materials transportation, installation, maintenance, and decommissioning and dismantlement. Most estimates of life-cycle emissions for photovoltaic systems are between 0.07 and 0.18 pounds of carbon dioxide equivalent per kilowatt-hour.

REFERENCES

1. A.S. Paschoa Department of Physics, Pontifícia Universidade Católica do Rio de Janeiro, Brazil "ENVIRONMENTAL EFFECTS OF NUCLEAR POWER GENERATION" INTERACTIONS: ENERGY/ENVIRONMENT - Environmental Effects of Nuclear Power Generation - A. S. Paschoa, p 1-15
2. Road and the Environment: A Hand Book
3. **https://www.cbd.int/impact/whatis.shtml**
4. **https://www.environment.co.za/mining-2/effects-of-mining.html**
5. **http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/environmental-impacts-solar-power.html#bf-toc-0**