

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 7, Issue 5, May 2018

The Impact of Electrical Engineering in Solving Environmental Degradation Issues

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ABSTRACT: The necessity for sustainable development has introduced an environmental dimension to higher education programmes in the discipline of Electrical engineering. In order to ensure environmental compliance and protection from the beginning of the engineering design process, the ongoing process of integrating Electrical engineering with environmental practises provides tremendous chances to study and develop new approaches and methods. The modern power market faces a difficult demand for the consistent distribution and efficient use of electrical power. All around the world, both underground and overhead networks are used for the distribution and consumption of electrical power. While overhead systems are inexpensive, they are prone to a number of problems. In order to maintain exceptional reliability, utilities in developed countries favour subsurface distribution networks. In terms of overall cost, electrical insulation and mechanical shielding make a significant difference between an overhead and underground system. In addition to cost, insulation itself poses many problems of dielectric failure and corresponding faults.

KEYWORDS: Electrical Engineering, Environmental Degradation

I. INTRODUCTION

In today's world, the environment is crucial to human survival. The improvement of the human condition is one of the most consequential notions of our time. Therefore, sustainable development is probably one of the most pressing issues of our day. In a civilized society there is a vast scope for environmental engineering in order to bring revolutionary change in sphere of agriculture, scientific, industrial, social, economical and cultural area. [1]

The destruction of our natural environment is on the rise, and it will inevitably have long-term consequences for humanity. A number of suggestions for halting environmental degradation have been proposed in response to this problem by environmental experts. As a result, there are a number of options available for protecting the natural world against pollution and other forms of damage. Inadequate waste management is widely recognised as one of the main factors contributing to global environmental decline. Disposal of waste includes not only industrial waste but also the things we use and throw away every day. [2] Degradation of the natural world is a problem on a worldwide scale that touches every person. Many problems that adversely harm the environment come about as a result of persons' activities which are supposed to sustain their life. Many people's health has been negatively impacted by pollution caused by overpopulation and rising industry.

In the modern era, urbanisation, industrialisation, overpopulation, forest loss, etc., are the primary culprits in environmental degradation. Deterioration in the quality and quantity of natural resources is what is meant by "environmental pollution." Degradation of the natural environment is primarily caused by various human activities. [3] As a result, our ecosystem has undergone changes that are now dangerous for all forms of life. Vehicle and industrial emissions contribute to already high levels of air pollution by diluting the air with harmful pollutants. Most pollution occurs in cities because of fast population growth. Vehicle and industrial emissions, as well as waste products, are

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major contributors to air pollution. Water, air, and noise pollution have resulted from unchecked urbanisation and industrialisation.

Several eco-friendly innovations owe a great deal to the field of electrical engineering. Lower energy usage and less wasted heat are the results of more efficient energy conversion. Many machines' reduced energy consumption and improved performance can be directly attributed to the introduction of smarter controls. Many previously internal combustion engine-powered items have been converted to electric models because to advancements in battery technology and motor efficiency. One could go on and on listing examples. [4]

An important goal is to reduce energy consumption and costs while simultaneously aiding the planet's natural recovery from the damage people have inflicted upon it. This can be accomplished through thoughtful design and the use of eco-friendly energy-saving measures. By taking a close look at the company's energy usage and production processes, the company can make them more efficient and less wasteful. This process could be called eco reengineering. [5]

Environmental issues that engineers should consider include the following:

- **Waste**
It is important for engineers to be familiar with waste legislation and the problems they aim to address. Site waste management plans are a good example of a document that specifies engineers' roles and requires them to take the initiative to achieve excellence by minimising unnecessary steps.
- **Recycling**
Engineers should avoid overly rigid specifications and instead provide incentives to the supplier chain to enhance their use of recycled materials.
- **Environmental issues**
There must be a lot of environmental consideration placed into most projects. It is common practise to conduct environmental impact assessments and environmental surveys for this purpose. In certain cases, surveys may need to be conducted years before a project even begins, so engineers should get on top of these concerns as soon as possible. [6]

Effects of environmental degradation

- **Impact on human health**
Degradation of the natural world may have negative effects on human health. Pneumonia and asthma are just two of the respiratory illnesses that can be triggered by breathing hazardous air pollution. Air pollution is suspected to have contributed to the deaths of millions of people (Adakole and Oladimeji, 2006).
- **Loss of biodiversity**
Combating pollution, recovering nutrients, safeguarding water sources, and stabilising the climate are all ways in which biodiversity helps keep the ecosystem in check. There are several factors that contribute to the decline of biodiversity, including deforestation, global warming, overcrowding, and pollution. [7]
- **Ozone layer depletion**
The ozone layer shields Earth from the sun's UV rays. The depletion of the ozone layer is caused by the presence of chlorofluorocarbons and hydrochlorofluorocarbons in the atmosphere. Eventually, it will run out of fuel and send dangerous radiation hurtling back toward Earth (Buhag et al., 2010).
- **loss for the tourism industry**
The tourism industry, which depends on visitors for revenue, can take a major hit if the environment starts to deteriorate. Negative impacts on the environment, such as deforestation, biodiversity loss, excessive garbage dumps, and contamination of the air and water, can discourage visitors. [8]

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- Economic impact
Restoration of green cover, cleanup of landfills, and protection of endangered species are all examples of how the massive cost a country may have to bear due to environmental deterioration can have a significant economic impact. The loss of revenue from tourists is another possible economic effect. Clearly, there is a wide variety of potential causes of environmental damage. It is possible that our actions will add to the global environmental destruction if we are not vigilant. But there are things we can do to put a stop to it and take care of the planet we live in, like educating the public about environmental issues so they may become more attuned to their surroundings and better prepared to safeguard and preserve it for future generations. [9-10]

II. REVIEW OF LITERATURE

The answer lies inside the indigenous people's beliefs and their relationship with the land. First and foremost, we must learn to live in harmony with the millions of other species with which we share this world (McConnell & Abel, 2007). [11]

Neutra et al. (1991)[12] discovered that people who resided in close proximity to toxic waste sites experienced one or more distressing symptoms not seen in the control group. No statistically significant differences in cancer and birth defect rates between these residents and those in the control areas were discovered. Knowledge about the site and its toxins was more likely to cause symptoms like concern, melancholy, and uneasiness than chemical exposure. Despite claims by certain medical professionals that those living in close proximity to these locations do have higher rates of asthma and psychiatric disorders compared to those in control groups, these findings remain extremely contentious (Neutra et al., 1991).

Risk and recreancy in public decision making was the topic of discussion in Freudenburg (1993) [13]. A rise in institutional responsibility for risk management, he believes, has resulted in a system in which obligations are frequently disregarded. Increased decision-making frequency in risk analysis institutions is proposed by this idea. Recreancy, as defined by Freudenburg (1993), refers to the institutionalised avoidance of responsibility or the disregard for generally assumed commitments to the group. Individuals who read and understand scientific papers independently are now raising questions, but they are more likely to focus on the involvement of institutional players. Citizens are at a loss to know where to look for clear answers concerning data addressing environmental toxins in the absence of correlational data from an alternate institutional source that they can trust.

Objectives

- To study relationship between environmental degradation and economic development
- To study different causes of environmental degradation
- To study effect of environmental degradation
- To study environmental issues that engineers should consider

III. RESEARCH METHODOLOGY

Methodology refers to the study of how researchers in a certain discipline conduct their investigations. Methods and principles unique to a particular field of study are analysed theoretically. It typically includes things like paradigm, theoretical model, phases, and quantitative and qualitative methods. Secondary information gleaned from a variety of published sources was used in the writing of this study. Information used to write this research was culled from a wide range of sources on the web.

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IV. RESULT AND DISCUSSION

The below figure shows the numerous causes of environmental degradation. [14]

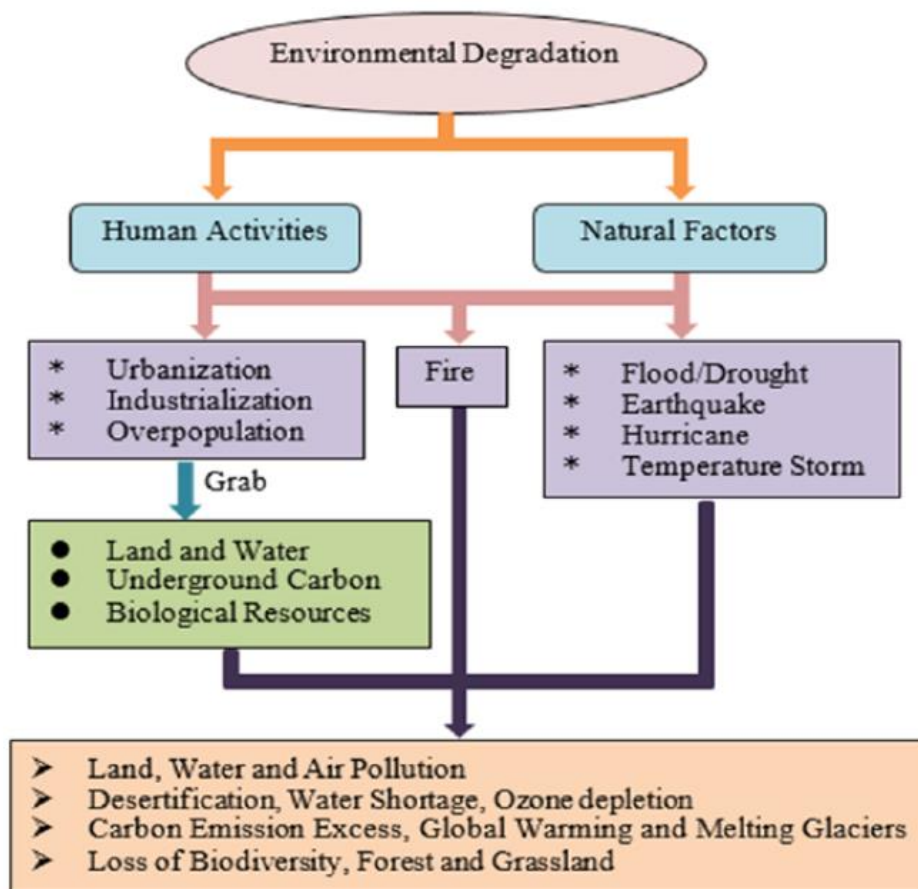


Fig. 1 Different causes of environmental degradation

In Fig. 2, we can see how the economic scale structure, method, and conservation policies structure of commerce and GDP output [[15]].

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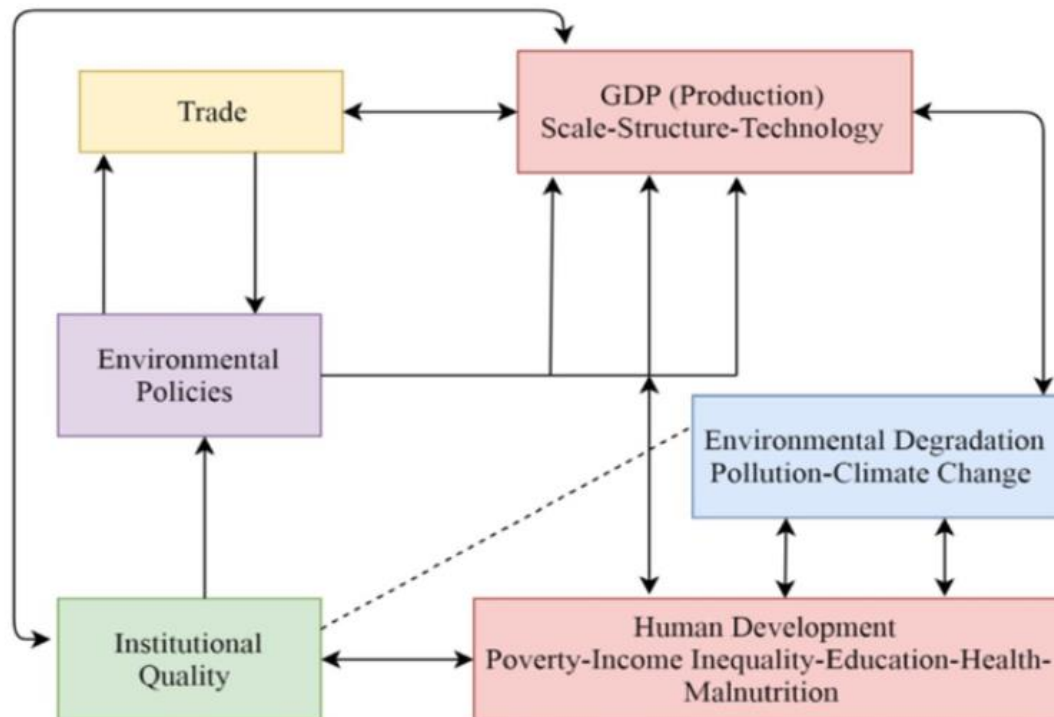


Fig. 2 Relationship between environmental degradation and economic development

V. CONCLUSION

Degradation of the natural world is a major problem that has to be addressed immediately. Some environments, depending on the extent of the devastation, may never be the same. Many species of flora and animals that once flourished there will perish forever. Overpopulation, urbanisation, and the increased demand for natural resources are often cited as the main drivers of environmental deterioration in India. City planners, businesses, and resource managers should all keep the environment in mind as they plot out the future of their respective sectors. Land degradation, deforestation, soil erosion, habitat destruction, and biodiversity loss are among India's most pressing environmental problems. Reducing, reusing, and recycling are three effective ways to lessen environmental damage.

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