

A STUDY OF FACTORS INFLUENCING DESERTIFICATION IN INDIA

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ABSTRACT

The environment, ecosystem and sustainable development have become the top priorities keeping the conservation, protection and preservation of resources in mind. There are many factors influencing the natural resources and causing exploitation of resources beyond limits. As a result, desertification has become a concern for the world. Global warming, changing climatic conditions, deforestation have a great deal of contribution towards desertification. However, there are differences found at the outset of regional geographic conditions. It is found that developing and developed economies have different factors, which lead to desertification. The present article aims to examine the key factors, which influence the high-level desertification in India. The study analyzes the influence of population explosion, climate change and human impact on desertification in India. The study is unique and significant since India is highly populated country. Agriculture is the backbone of Indian economy. It is imperative to understand the factors responsible for desertification to avoid the losses of agriculture minimize degradation of resources and increase their efficiency for sustainable development.

KEYWORDS

Desertification; Sustainable Development; Natural Resource Management; Global Warming; Climate

1. INTRODUCTION

The environment, ecosystem and sustainable development have become the top priorities keeping the conservation, protection and preservation of resources in mind. There are a lot of factors influencing the natural resources and causing exploitation of resources beyond limits. As a result, desertification has become a grave concern for the world (Mirzabaev, Wu, J. et al., 2019). Global warming, changing climatic conditions, deforestation have a great deal of contribution towards desertification. However, there are differences found at the outset of regional geographic conditions. It is found that developing and developed economies have different factors which lead to desertification. The present article aims to examine the key factors which influence the high-level desertification in India. The study analyzes the influence of population explosion, climate change and human impact on desertification in India. The study is unique and significant since India is highly populated country. Agriculture is the backbone of Indian economy. It is imperative to understand the factors responsible for desertification to avoid the losses of agriculture minimize degradation of resources and increase their efficiency for sustainable development.

2. BACKGROUND OF STUDY

Desertification is the outcome of land degradation taking place in the arid, semi-arid as well as dry sub-aria areas caused by a number of factors. It has remained a growing concern posing threat to the human life, animals, wildlife, forests and total ecosystem, environment by and large. It is not only restricted to India but experienced across the globe. The several studies indicate that there is a close association found amongst desertification, climate change and biodiversity. According to Ministry of Environment, Forest and Climate Change, Govt. of India, it is estimated that more than 24 billion tons of fertile soil as well as around 27,000 rare bio-species are lost every year globally. In addition, thousands of acres of land become non-productive posing threat to the field of agriculture which would further create food insecurity in future. Naturally, there is a crucial need to plan and execute long-term, result-oriented and time-bound policies at every level (Mouat, Thomas & Lancaster, 2019).

3. SCOPE AND SIGNIFICANCE

The Rio Earth Summit of 1992 conceptualized and formulated United Nations Convention to Combat Desertification (UNCCD). There were more than 195 countries participated in the Summit. It was found that “Desertification, along with climate change and the loss of biodiversity were identified as the greatest challenges to sustainable development.” In order to protect water, forests, productivity of land and maintain the balance of biodiversity, it is imperative for the various governments, NGOs, communities, business corporations and other stakeholders of society to join the hands and work together to save the green planet for future generation. NitiAayog, the arm of Government of India stated that there are more than 13 million hectares of forests being lost every year. The forests are the home for 80% terrestrial species including plants, animals. Additionally, it is the home to 1.6 billion people

of India to earn their bread and butter. The developing economies like India has a long way to introduce major reforms to control the desertification which is the root cause for inviting risks for ecosystem and biodiversity.

4. OBJECTIVES OF STUDY

The present study has the following predefined objectives:

- To examine the present status of desertification in India
- To identify the major factors causing the desertification in India
- To analyze the impact of desertification in India

5. PROBLEM STATEMENT

India is a developing economy. It has been going through the transformation phase. Once upon a time, India was well-equipped when it comes to natural resources, biodiversity, forestry, rainfall, healthy climate conditions, and availability of water. However, it has lost the glory of being ‘a golden bird’ in due course of time. The present article aims to identify the major factors responsible for the desertification in India since it has posed a threat to human life, animals and rare species which are diminishing day by day.

6. REVIEW OF LITERATURE

Human activities contribute to the environmental degradation include arable land growth and intensive use, poor irrigation practises, forest destruction, and overgrazing. These unsustainable land uses put immense stress on the environment by altering soil composition and hydrology. Overexploited drylands suffer badly from erosion, soil salinization, lower productivity, and decreased resilience to climatic variations. Land management is especially important in highly populated areas of developing countries, where population growth is putting increased pressure on marginal lands TERI (2018). Global warming from the buildup of carbon dioxide and other gases in the atmosphere caused by the combustion of fossil fuels threatens to complicate the picture in the future. As evaporation rates increase, rising global temperatures are likely to hasten the process of desertification.

Though desertification has been described, explained, classified and understood, less attention is paid in term of minimizing and mitigating the risks associated with it. Some of the studies have indicated that increasing human activities in the forms of overgrazing by livestock, inappropriate irrigation and outdated farming methods have a great deal of contribution in causing desertification. In addition, there are no real-time consistent indicators measuring the same. On the other hand, the limitations observed in sharing the actual outcomes as to how and to what extent the human and government efforts have been successful against the Land Degradation Neutrality target given by Sustainable Development Goals Framework 2030 (Zhang & Huisingh, 2018).

The consistent growth of population is another important factor responsible for the desertification. This is more dangerous in case of developing economies like India, China, and other countries. Once side, they need development, infrastructure, roads, dams, airports, highways etc. However, it has spoiled the eco-system, wildlife, and environment too. The growth is leading rapid agricultural expansion and land reclamation. The farmers are converting the surrounding desert into reclaimed land by applying their old inherited

traditional practices. Yet, agricultural expansion in the oasis mainly depends on non-renewable ground-waters. Soil salinization and vegetation loss have been accelerating since 2000 due to water mismanagement and improper drainage systems Masoud & Koike, 2006). In totality, semi-arid, arid as well as the dry sub-humid regions cover around 1.7 billion hectares in Asia. Growing deserts in China, India, Iran, Mongolia, and Pakistan, Syria's sand dunes, Nepal's sharply degraded mountainsides, and the Lao People's Democratic Republic's desertified and overgrazed highlands are among Asia's devastated places. In terms of the number of people impacted by dryness and drought, Asia is the most badly afflicted continent (Grainger, 1990).

7. DISCUSSION AND ANALYSIS

The growing population, commercial activities, industrialization, urbanization, changing climatic conditions and increased human interference paved the ways to desertification.

7.1 Factors Influencing Desertification in India:

Desertification is a severe environmental issue that might affect 35% of the earth's land surface and 32% of the world's population. Desertification refers to the decline of plant cover, soil degradation, and nutrient depletion in arid, semi-arid, and dry sub-humid environments. Desertification is caused by increasing deforestation, fire frequency, over-cultivation, overdraft of groundwater, water impoundment, animal-grazing. In addition, poor irrigation and water mismanagement also lead to the desertification. Moreover, several studies indicate that increased soil salinity and consistently changing global climatic conditions have also contributed to the great extent. In short, both human and natural factors are responsible for the present condition. If not taken care, it would pose a threat to the human life and nature.

- **Resalinization of Farmlands**

The human activities have a major share in the desertification. This is especially causing through the inappropriate methods of farming. This is more intensified leading to greenhouse gases, the use of pesticides, unlimited water supply to crops. The Excessive use of fertilizers and insecticides, pesticides as well as crop-changing patterns without giving appropriate recovery time, are all examples of unsustainable agricultural practices.

- **Deforestation:**

Arid-zone plant communities are typically scattered and sparse. The desert plant community is destroyed by fires and cutting trees for fuel. People who live in arid areas cut trees for food and utilize them as a supply of dry wood for sale to rural residents (Grove, 1973).

- **Poor Water Management**

The poor, defective and traditional methods of supplying water to crops lead to the desertification. Over-abstraction of groundwater without compensatory recharge has led to depletion of groundwater table.

- **Sand Erosion and Deposition**

Drifting sand and migrating sand dunes are a constant threat to prospective farmland, range plant life, roadways, towns, and other sites in severe wind erosion areas. Although erosion

and sand movement are the key drivers, the predominant effect is due to sand deposition rather than erosion (Hagedorn, 1977). Crops will be buried and agricultural land will be destroyed as a result of sand accumulation.

7.2 Impact of Desertification:

Burrell, Evans and Kauwe (2020) in their study analyzed the relationship between anthropogenic climate change and desertification. It is found that dry lands cover almost 41% of total land surface of the earth and up to 45% of total agriculture land in the world. These are the most vulnerable ecosystems responsible for climate change and desertification. Another finding includes inappropriate land use causing gradual changes in the climate variability, ecosystem as well as CO₂ fertilization. Their observation-based attribution study revealed that more than 6% of total world's dry land had gone under desertification from 1982 to 2015. The main reason was unsustainable land use practices compounded by anthropogenic climate change. “Despite an average global greening, anthropogenic climate change has degraded 12.6% (5.43 million km²) of dry lands, contributing to desertification and affecting 213 million people, 93% of who live in developing economies.”

Land degradation also can disrupt societal and political solidity as political and social forces magnify the stresses on the land that lead to desertification. Many people in dryland areas are unable to endorse themselves and their children due to loss of fertile soil, water, and other resources, both for subsistence and for commercial use. These relocated communities frequently migrate to cities or other countries, increasing population pressures and, in some cases, increasing the likelihood of social unrest (Huang, Zhang, Zhang, et al., 2020).

The Natural Heritage Institute in its report stated that the number of illegal immigrants from Mexico and other neighbouring countries have drastically increased raising the great concern for United States. In totality, country's 60% of territory is covered under degraded land. It is a matter of concern and red alarm in terms of desertification. The statistics of International Committee of Red Cross revealed that every year 25 million refugees have been fleeing degraded lands in the world (PRB, 2021).

FINDINGS OF STUDY

- Desertification is a major growing concern for developing economies like India. It has severe and long-lasting impact on human life, wildlife, agriculture.
- There are both human and natural factors responsible for the desertification in India. They have great influence on agricultural productivity, socio-economic conditions, rural-urban divide and exploitation of natural resources.
- Human activities have led in increasing and sensitizing the desertification. Deforestation, poor water management practices, non-scientific farming methods, concretization, animal-grazing and oversupply of water are primarily responsible for desertification.
- There is a lack of awareness, training, expertise and community involvement in managing the crisis.

8. CONCLUSION

The environment protection and conservation is the collective responsibility of government, society, communities, youths, experts and other stakeholders. The desertification, climate change, global warming, use of chemicals and fertilizers, deforestation and other human as well as natural activities have spoiled the ecosystem altogether. The sustainable development of people and planet is the need of an hour. The efforts such as watershed management, use of satellites, GPS, mapping technologies, training programs can minimize it.

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