International Journal of Engineering & Scientific Research
Vol.11 Issue 02, February 2023
ISSN: 2347-6532 Impact Factor: 6.660
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

A Review on the Loss of Biodiversity due to Land Subsidence in India

Dr Ranjeet Singh
Associate Professor of Botany
Pt. CLS Government College, Karnal
Email id: ranjeet.s71@gmail.com

Abstract:

Humans started using and consuming more resources than ever before which resulted in the upsetting the balance of nature and disturbing the status of biodiversity. It has been observed that on an average around 69% decline in global populations of mammals and other faunal groups since 1970 (WWF Report). But even than 1 million animal and plant species are now threatened with extinction due to development in the society. The exploitation of water resources and environment, increasing land development threatens to exacerbate existing land-subsidence problems in the country. It is the gradual and sudden sinking of surface layer of the earth due to removal of earth material. The subsidence is a world level problem and around 17,000 square mile area fall under 45 states in US badly affected by the subsidence of earth. The ground water withdrawals result in the reduction of aquifer-system, organic soil removal, mining and natural compaction are some of the main cause for such problem. The compaction at the point of rocks is due to the water holding the ground up and solid.Deforestation led to a loss of forest cover and vegetation, soil erosion, loss of biodiversity and other environmental problems are contributing a lot in the occurrence of such disaster. Due to this, the increased temperature and precipitation of that area resulted in the changes in the animal and plant species distribution. As a result of this, the composition of ecosystem disturbed for a longer time. The forest cover in Himalayas is reduced by 1072 square Kilometer as was in the year 2019.

Key Words: Deforestation, Environment, Subsidence, Ecosystem, Land

Introduction

The population of humans is continuously increasing on the earth and that's why the pressure on the planet goes on increasing at the high speed since many centuries. As a result of this, humans started using and consuming more resources than ever before which resulted in the upsetting the balance of nature and disturbing the status of biodiversity. It has been observed that on an average around 69% decline in global populations of mammals and other faunal groups since 1970 (WWF Report). But even than 1 million animal and plant species are now threatened with extinction due to development in the society (Global Assessment Report, 2019). Also the three-quarters of the land-based environment and the ocean environment (66%) have been significantly changed and modified these days. In our country, a major part of land surface and nearly 75% of freshwater resources are now devoted to crop or rearing of domestic animals. Environment and climate change deepens the impact of a lot of stressors on nature. Increasing population resulted in the overfished the oceans, deforestation, waterpollution, soil pollution, air pollution. Ultimately these are impacting biodiversity around the world level, national level and local level.In Asia, Borneo is home of more than 1,400 animal species, and 15,000 plant species. The exploitation of water resources and environment, increasing land development threatens to exacerbate existing land-subsidence problems in the country. It is the gradual and sudden sinking of surface layer of the earth due to removal of earth material. The subsidence is a world level problem and around 17,000 square mile area fall under 45 states in US badly affected by the subsidence of earth. The ground water withdrawals result in the reduction of aquifer-system, organic soil removal, mining and natural compaction are some of the main cause for such problem. The compaction at the point of rocks is due to the water holding the ground up and solid. But, if the water is withdrawn from the habitat, the rocks falls in on itself. You may not notice land subsidence too much because it can occur over large areas rather than in a small spot. In San Joaquin Valley situated in the agricultural area of California in the United States of America, the pumping of groundwater for **irrigation** has caused the land to drop at many small points. The 80 percent of the subsidence mishappening in the USA has occurred because of exploitation of underground water, increasing development of land and use of water resources leads to land-subsidence problems in the world. In arid Southwest, and in more humid areas underlain by soluble rocks such as limestone, gypsum, or salt, land subsidence is an often-overlooked environmental consequence of our land- and **water-use** practices.

Chapter Content and Conclusion

Land subsidence cases in the some parts of Joshimath which are sinking in Uttrakhand observed in 2018-19. The possible reasons for such problems in the region are seems to be many like the development of the water based power projects and the tunneling process in the mountain area are one of the cause in that area. Similarly, Deforestation led to a loss of forest cover and vegetation, soil erosion, loss of biodiversity and other environmental problems are contributing a lot in the occurrence of such disaster. Due to this, the increased temperature and precipitation of that area resulted in the changes in the animal and plant species distribution. As a result of this, the composition of ecosystem disturbed for a longer time.The forest cover in Himalayas is reduced by 1072 square Kilometer as was in the year 2019.

The loss of forest cover in different states of India due to various projects completed or in pipeline is as follows:-

Sr. No.	Name of the State(India)	No. of District	Forest cover loss (Sq. km)
1	Manipur	09	249
2	Arunachal Pradesh	16	257
3	Nagaland	11	235
4	Mizoram	08	186
5	Assam	03	107
6	Meghalaya	07	073
7	Tripura	04	004

Whereas in some state, the forest cover is increased by 02 Sq.Km in Uttarakhand, 09 Sq. Km in Himachal Pradesh, 29 Sq. Km in Jammu & Kashmir and 18 Sq. Km in Ladakh. In Himalayan Region, a study by Maharaj Pandit, a senior visiting fellow in collaboration with the National University of Singapore's Scholars Programme, has reported that by the end of this century, only 10 per cent of the Indian Himalayan land area would be covered by dense forests and vegetation. Such trend of environmental degradation was also noticed by several workers from 1972-2001. Similarly, the forest degradation rate in Western Himalaya's reported to be decreased from 61% to 16.8 % and in Eastern Himalaya's from 76.2 % to 38.7 % at the end of this century. The process of urbanization without any proper layout of the city, uncontrolled mining, big development projects and commercial and industrial extraction of timber prove to be as main cause of biodiversity loss and

environmental degradation in the area. The degradation due to natural phenomenalead to environmental degradation in the state over the last 30 years but recorded damage in the past five to six years count to be due to development projects in all the Himalayan range. The different rainfall pattern in Northeast Himalayan range (up to 11,500 mm/yr) and Northwestern Himalayan range (up to 3,000 mm/yr) result in the more soil erosion process in the Northeast hills (22.3%). Out of total geographical area of Himachal Pradesh state, around 34 % count under heavy soil erosion and around 16 % count under low soil erosion category. It resulted in the shifting of river path from its original flow area. The Teesta Rivernowadays flows from Darjeeling and Sikkim state to Bangladesh but earlier it was flow to join Ganga (Bihar).

In Leh area, the damage to the environment is mainly due to tourism and 250,000 tourists have visited the area in two months (June-July) in 2022. Such heavy movement of tourists in this area also led to the more construction activity in Leh Ladakh. In Uttrakhand, forest land of 50,000 hectares shifted into non-forest land due to development in the last three decades.From the year 1976 to 2023, there have been many studies on Joshimath and its surrounding areas and found that water seepage and percolation, construction work and deforestration were cited as the biggest reasons for land subsidence.

In Uttrakhand, the city Joshimath is located at over 6,000 feet in the Garhwal region of Himalayas mountain ranges in India. According to 2011 Census, the city had a population of 16,709 individuals and increased to 13,202individuals in the 2001 Census. This increase was found to be 27 percent between the two census and by the year 2023, the population of this area is estimated to be approximately 22,900 individuals. The city is a gateway to pilgrimage sites such as the Badrinath Temple and Hemkund Sahib, is the starting point for several mountain-climbing expeditions, and is situated near Auli, one of India's top highest area in Himalayas.

To avoid such disaster in the country, revised building regulations should also include earthquake-safe construction technologies and a mandated reduction of non-structural hazards in homes, schools, business centers, and offices must be implemented. These new building regulations will need to be strictly enforced to protect the built environment in the Himalayan region.

References:

1. Himalayan plunder(2023). Ecology changing for the worse due to loss of forest cover, drying springs. *Published in February 1-15, 2023, issue of Down To Earth magazine*
2. Anjal Prakash (2023).Damage to Himalayas can have severe impact. The Indian Express
3. *Tenzin Jamphel(2023). Special edition on the Himalayas, published in February 1- 15, 2023, issue of Down To Earth magazine.*
4. TaranDeol(2023). *Special edition on the Himalayas, published in February 1- 15, 2023, issue of Down To Earth magazine.*
5. *ShaileshShrivastava(2023). 46 years on, there is mountain of studies but Joshimath is still sinking, MONGABAY GLOBAL.*
6. *Census Report (2001, 2011). Office of Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India.*
7. *Anwesha (2020). Joshimath, Uttrakhand: Trekking Destination and Places to Visit, Moxtain.*
8. *Strategic Plan for Risk Reduction (2018). Uttrakhand State Disaster Management Authority, Government of Uttrakhand.*