

POPULAR ARTICLE**RECENT SOIL SCENARIO OF INDIA- PROBLEMS AND MITIGATION****Harmanpreet Kaur Gill and Sourabh Kumar**

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*Corresponding author: gill82167@gmail.com***ABSTRACT**

The soil is a crucial factor for better establishment and crop growth. The soil fertility, physical properties, chemical properties, and biological properties are vital for enhancing the productivity of crops. However, recently due to some problems like indiscriminate use of chemicals, lack of proper crop rotation, more industrialization, deforestation and other biotic or abiotic factors degrade the soil fertility and increase the problems like erosion, desertification, waterlogging, salinity etc. Adopting appropriate management strategies and government policies can help reduce the different problems of soil.

**INTRODUCTION**

Soil is three-dimensional (length, breadth, height) dynamic (Physical, chemical, biological) natural body that supports plant growth which has been formed by the action of climate and organism on parent material as conditioned by relief over some time. The soil composition contains 25% water, 25 % air, 5% organic, and 45% mineral matter. The soil is a crucial factor for better establishment and growth. The soil fertility, physical properties, chemical properties, and biological properties are vital for enhancing the productivity of crops. However, recently due to some problems like indiscriminate use of chemicals, lack of proper crop rotation, more industrialization, deforestation and other biotic or abiotic factors degrade the soil fertility and increase the problems like erosion, desertification, waterlogging, salinity etc. The different soil problems and their remedial measurements are discussed below:

DECLINING SOIL FERTILITY:

- Indian soils often have high potassium levels but low levels of nitrogen and phosphorus.

- The Indo-Gangetic plains, Central India, and North East India have low phosphorus levels.
- Additionally, there is a national shortage of nitrogen; however, it is worse in central and southern India than in the Gangetic plains.
- Long-term unbalanced fertilizer use has also been documented to have a negative impact on soil health.



- According to a 2017 analysis by the Fertilizer Association of India, the optimal N:P:K utilization ratio is 4:1; however, from 6:2.4:1 in 1990 to 6.7:2.7:1 in 2016, this ratio has decreased.
- According to the 54th report of the Parliamentary Standing Committee on Agriculture (2017–18), the imbalance in the use of fertilizers in agriculture is caused by a lopsided subsidy policy in favor of urea and excessive prices for other fertilizers.
- Indian soil is becoming less fertile due to extractive agricultural methods such as crop waste clearance and in-field burning (common in north-west India).

Management of soil fertility: By using green manure or growing legumes to fix nitrogen from the air through the process of biological nitrogen fixation, applying micro-dose fertilizer applications to replace losses through plant uptake and other processes, and minimizing losses through leaching below the crop rooting zone, soil fertility can be further increased. These practises improve soil structure and foster healthy, fertile soil.

WATERLOGGING

- Waterlogging is caused by the flat, saucer-shaped depressions that slow surface water circulation and cause rainwater to accumulate.
- Additionally, seepage from unlined canal systems or channels causes adjacent agricultural regions to flooding.

- Waterlogging affects over 12 million hectares of land in India.
- Water logging might be avoided and surplus water disposed of by providing room for horizontal and vertical drainage.



MANAGEMENT OF WATERLOGGING CONDITIONS: The water logging conditions can be managed by improving the soil structure, raising the soil level or making a raised bed, by managing the moisture by using plants, cover crops, the addition of organic matter and subsoiling.

INDUSTRIALIZATION

- Agriculture, forestry, grassland and grazing, and undeveloped regions with wild flora are all being steadily displaced by industrialization.
- For instance, opencast mining is a special concern since it affects a place's socioeconomic characteristics and changes the soil's physical, chemical, and biological characteristics.



- Additionally, the soil on a large land degrades because of the massive amounts of trash, overburden, tailings, and slimes produced by the mining industry.

MANAGEMENT STRATEGIES: Following practices may be adopted to reduce the effect of industrialization:

- Adoption of Good government practices to protect the local industry.
- The government should actively participate in industrial growth through co-owning businesses.
- Transportation facilities should be offered to facilitate simple product evacuation.
- Industrial zone creation will also provide a favourable environment with all the necessary infrastructure for industrialization.
- The creation of industrial banks is necessary to give industrialists access to credit.
- Government stability: To draw in international investment, the government must be stable.
- Local raw material exploitation: There should be local raw material exploitation for industries.

SALINITY

- In irrigated areas, salinity occurs due to excessive irrigation. Conversely, farmers who over irrigate their fields cause salt deposits because capillary action causes the groundwater level to increase. For instance, due to intensive irrigation, the soils in Punjab and Haryana are rendered unusable by salt and alkalinity.
- Consequently, it is essential to use water supplies wisely.



MANAGEMENT STRATEGIES TO REDUCE SALINITY: Reduced use of salty water, increased utilization of desalinated, recycled, and rain-harvested water, and avoiding over-irrigation can help in the reduction of salinity. Apart from this addition of organic material and

manure and use of mulch or cover crops may help to safeguard the ground surface against salinity.

DESERTIFICATION

- Due to human activity or climate change, desert-like conditions are spreading in arid and semi-arid areas. Excessive grazing, reckless tree cutting, societal pressures also aggravating this situation further.
- There is a chance that it will lead to increased wind erosion, decreased output, and more frequent droughts.



MANAGING DESERT LAND: Maintenance of soil fertility and health, promotion of resistance of land used for livestock grazing, increased biodiversity, better nutrient cycling, and minimising erosion may help to reduce the desertification process.

SOIL EROSION

- It is the loss of soil by natural factors, primarily water and wind, more quickly than its replacement can occur.
- It has an impact on the nation's overall economy and agricultural productivity.



MANAGEMENT STRATEGIES: Adoption of Contour farming, Reforestation, application of mulches, avoiding overgrazing, using plastic sheets and avoiding soil compaction may help reduce soil erosion.

CONCLUSION

The soil is a crucial factor for better establishment and crop growth. The soil fertility, physical properties, chemical properties, and biological properties are vital for enhancing the productivity of crops. However, recently due to some problems like indiscriminate use of chemicals, lack of proper crop rotation, more industrialization, deforestation and other biotic or abiotic factors degrade the soil fertility and increase the problems like erosion, desertification, waterlogging, salinity etc. Adopting appropriate management strategies and government policies can help reduce the different problems of soil.

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