

Environmental Issues

The rapidly growing population and [economic development](#) are leading to the **environmental degradation in India** through the uncontrolled growth of [urbanization](#) and [industrialization](#), expansion and massive intensification of [agriculture](#), and the destruction of forests. One of the primary causes of environmental degradation in the country could be attributed to rapid growth of population, which is adversely affecting the natural resources and environment. The uprising population and the environmental deterioration face the challenge of [sustainable development](#). The existence or the absence of favorable natural resources can facilitate or retard the process of socio-economic development. The three basic demographic factors of [births](#), [deaths](#) and [migration](#) produce changes in population size, composition, distribution and these changes raise a number of important questions of cause and effect. [Population Reference Bureau](#) estimated that the population of the world is nearly 6.14 billion in 2001. Contribution of [India](#) alone to this population was estimated to be 1.033 billion. It is estimated that the country's population will increase to about 1.26 billion by the year 2016. The projected population indicates that India will be the first most populous country in the world and China will be ranking second in the year 2050^[1]. India is having 18% of the world's population on 2.4% of world's total area has great increased the pressure on its natural resources. Water shortages, soil exhaustion and erosion, deforestation, air and water pollution afflicts many areas.

Major issues

Population growth and economic development are contributing to many serious environmental calamities in India. These include heavy pressure on land, [land degradation](#), forests, habitat destruction and loss of [biodiversity](#). Changing consumption pattern has led to rising demand for [energy](#). The final outcomes of this are [air pollution](#), [global warming](#), climate change, [water scarcity](#) and [water pollution](#).

Pressure on land

India faces the most acute pressure on its agricultural land. Today every million hectares of land supports about 7.27 million people. 43% of the land is currently under [cultivation](#); one of the highest in the world. A change in [land use](#) pattern implies variation in the proportion of area under different land uses at a point in two or more time periods. Over the past fifty years, while India's total population increased by about 3 times, the total area of land under cultivation increased by only 20.27% from 118,750,000 [hectares](#) ($1.187500000000 \times 10^{12} \text{ m}^2$) in 1951 to 142,820,000 hectares ($1.428200000000 \times 10^{12} \text{ m}^2$) in 2001.^[2] Most of this expansion has taken place at the expense of forest and grazing land. Despite past expansion of the area under cultivation, less agricultural land is available to feed each and every person in India. Out of total geographical area of 329,000,000 hectares ($3.290000000000 \times 10^{12} \text{ m}^2$), only 306,000,000 hectares ($3.060000000000 \times 10^{12} \text{ m}^2$) is the reporting area (the rest being unadministered).^[2] The land for non-agricultural uses like [housing](#), [industry](#) and others is increased from 9,360,000 hectares ($9.3600000000 \times 10^{10} \text{ m}^2$) in 1951 to 22,970,000 hectares

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$(2.29700000000 \times 10^{11} \text{ m}^2)$ in 2001.^[2] More than 19,400,000 hectares ($1.94000000000 \times 10^{11} \text{ m}^2$) are snow bound and remote leaving only 237,000,000 hectares ($2.37000000000 \times 10^{12} \text{ m}^2$) for [agriculture](#), [forestry](#), [pasture](#) and other [biomass](#) production. The area under cultivation had increased by about 30% until 1981 and thereafter declined marginally. The net sown area increased from 119,000,000 hectares ($1.19000000000 \times 10^{12} \text{ m}^2$) in 1950-51 to 140,000,000 hectares ($1.40000000000 \times 10^{12} \text{ m}^2$) in 1970-71 mostly through reclamation of old fallow and culturable [wastelands](#) and diversion of groves.^[2] The net area sown has increased marginally only from 140,000,000 hectares ($1.40000000000 \times 10^{12} \text{ m}^2$) in 1970-71 to 141,000,000 hectares ($1.41000000000 \times 10^{12} \text{ m}^2$) in 2000-2001, which indicates that the private efforts have peaked.^[2]

The extent of agricultural intensification and extensification is characterized by increase in cropping and irrigation intensity and higher usage of chemical fertilizers, pesticides and insecticides. Agricultural extensification and intensification is leading to land degradation, overexploitation of underground water resources, increased use of chemical fertilizers leading to eutrophication and water pollution. It has also resulted into [water logging](#), [salinization](#) and [alkalinization](#) of croplands and [eutrophication](#) of water bodies and ill health of oceans and thus reductions in biodiversity.

Land degradation

Direct consequences of agricultural development on the environment arise from farming activities, which contribute to soil erosion, land salination and loss of nutrients. The introduction of green revolution in the country has been accompanied by over exploitation of land and water resources and utilization of fertilizers and pesticides have increased many folds. Shifting cultivation has also been a major factor for land degradation. Leaching due to extensive use of pesticides and fertilizers is a major source of contamination of water bodies. Intensive agriculture and irrigation has contributed to land degradation; particularly salination, alkalization and water logging.

It is evident that most of the land in India is degrading, therefore affecting the productive resource base of the economy. Out of the total geographical area of 328,700,000 hectares ($3.28700000000 \times 10^{12} \text{ m}^2$), 175,000,000 hectares ($1.75000000000 \times 10^{12} \text{ m}^2$) are considered to be land degraded area.^[3] Water and wind erosion is the major contributor of over 141,300,000 hectares ($1.41300000000 \times 10^{12} \text{ m}^2$) to soil erosion, with other factors like water logging 8,500,000 hectares ($8.5000000000 \times 10^{10} \text{ m}^2$), alkali soil $\{ \{ \text{convert} | 3600000 | \}$, acid soil 4,500,000 hectares ($4.5000000000 \times 10^{10} \text{ m}^2$), saline soil including coastal sandy areas 5,500,000 hectares ($5.5000000000 \times 10^{10} \text{ m}^2$) furthermore adding to the situ degradation.^[3] While soil erosion by rain and river in hill areas causes landslides and floods, deforestation, overgrazing, traditional agricultural practices, mining and incorrect siting of development projects in forest covered areas have resulted in opening up of these areas to massive soil erosion. Ravines and gullies reported 4,000,000 hectares ($4.0000000000 \times 10^{10} \text{ m}^2$). Area subject to shifting cultivation reported 4,900,000 hectares ($4.9000000000 \times 10^{10} \text{ m}^2$) and riverine and torrents erosion due to floods and eutrophication due to agricultural run off reported 2,700,000 hectares

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($2.7000000000 \times 10^{10} \text{ m}^2$).^[3] The increasing intensification and extensification also results in salination, alkalization and water logging in irrigated areas. For achieving and maintaining food security and sustainable forestry, controlling of land/soil erosion is very much necessary.

Forests resources

With less than 2% of the world's total forest cover, India supports 18% of its population. The total area under forests was 675,540 square kilometres ($7.271452042904 \times 10^{12}$ sq ft) in 2001, which was about 21% of the total geographical area, as against the **National Forest Policy (NFP)** 1988 specification of a target of 33%. Even within this recorded area, only 416,810 square kilometres ($4.486505500789 \times 10^{12}$ sq ft), or only 12.68% of country's total land area, comprises dense forest with a crown density above 40%, thus reflecting a qualitative decline of forests in the country.^[4] The forest cover had been increased by 35,430 square kilometres ($3.81365346064 \times 10^{11}$ sq ft) from 640,110 square kilometres ($6.890086696840 \times 10^{12}$ sq ft) in 1993 to 675,540 square kilometres ($7.271452042904 \times 10^{12}$ sq ft) in 2001.^[4] In 2001, as compared to 1999, the total forest cover had increased by 38,240 square kilometres ($4.11611934335 \times 10^{11}$ sq ft). The states which shown considerable increase in forest covers are [Bihar](#), [Himachal Pradesh](#), [Karnataka](#), [Tamil Nadu](#), [Gujarat](#), [Maharashtra](#), [Punjab](#), [West Bengal](#) and [Rajasthan](#). The states, which have shown considerable decline in the forest cover area, were [Andhra Pradesh](#) and [Madhya Pradesh](#).^[4]

Environmental issues in India include various natural hazards, particularly [cyclones](#) and annual [monsoon](#) floods, population growth, increasing individual consumption, industrialization, infrastructural development, poor agricultural practices, and resource maldistribution have led to substantial human transformation of [India's](#) natural environment. An estimated 60% of cultivated land suffers from [soil erosion](#), waterlogging, and salinity. It is also estimated that between 4.7 and 12 billion tons of topsoil are lost annually from soil erosion. From 1947 to 2002, average annual per capita water availability declined by almost 70% to 1,822 cubic meters, and overexploitation of groundwater is problematic in the states of [Haryana](#), [Punjab](#), and [Uttar Pradesh](#). Forest area covers 19.4% of India's geographic area (637000 km²). Nearly half of the country's forest cover is found in the state of [Madhya Pradesh](#) (20.7%) and the seven states of the northeast (25.7%); the latter is experiencing net forest loss. Forest cover is declining because of harvesting for fuel wood and the expansion of agricultural land. These trends, combined with increasing industrial and motor vehicle pollution output, have led to atmospheric temperature increases, shifting precipitation patterns, and declining intervals of drought recurrence in many areas.^[1] *The Indian Agricultural Research Institute of Parvati' has estimated that a 3 °C rise in temperature will result in a 15 to 20% loss in annual wheat yields. These are substantial problems for a nation with such a large population depending on the productivity of primary resources and whose economic growth relies heavily on industrial growth. Civil conflicts involving natural resources—most notably forests and arable land—have occurred in eastern and northeastern states.*^[2]

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By contrast, water resources have not been linked to either domestic or international violent conflict as was previously anticipated by some observers. Possible exceptions include some communal violence related to distribution of water from the [Kaveri River](#) and political tensions surrounding actual and potential population displacements by dam projects, particularly on the [Narmada River](#).

