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**Unit-VI**

Human Population and Environment

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Human Population  
and Environment

Environmental

Acts

Unit-VI

Human Population and Environment,  
Environmental Acts and Field work

- Population Growth, variation among nations
- Population Explosion
- Role of Information Technology in environment and human health

- Water Act
- Air Act
- Wild life protection Act
- Forest Conservation Act

Field Work

- Visit to local area and document environmental assets

# Contents

- ❖ Human Population and Environment
  - ❖ Population Growth
  - ❖ Population variation among the nations
  - ❖ Population explosion

# Human Population and Environment

Increase in the number of individuals in the same species of life is known as population growth. Particularly human population growth required more resources and cause environmental problems.

Globally human population growth has grown from 1 billion in 1800 to 7.8 billion in 2020.

Growth of human population observed as four major periods or stages

- 1.An early period of hunters and gatherers
- 2.Early pre-industrial agriculture
- 3.The age of industrial revolution
- 4.The modern era

## **An early period of hunters and gatherers**

This period ranges between the first evolutions of humans on this planet to the beginning of agriculture.

During this period, it is estimated that the total population was probably less than a million, population density was about 1 person per 130-260 sq km in the most habitable areas, and the average rate of growth was perhaps less than 0.00011% per year

## **Early, pre-industrial agriculture**

This period began sometime between 9,000 BC and 6,000 BC and lasted approximately until the 16th century AD. The total human population of the world was approximately 100 million by 1AD that further increased to about 500 million by 1600 AD.

The population density increased greatly to about 1 or 2 people per sq km or even more. The average rate of growth was about 0.03%.

## **The age of industrial revolution**

The second and much more rapid increase in population started about 400 years ago with the industrial revolution associated with the advances in medicines and health care.

The average rate of growth by 1600 AD was about 0.1% per year.

## **The modern era**

Though the rate of population growth has slowed down in developed countries, but population still continues to increase rapidly in many parts of the world, particularly developing countries.

The average rate of growth reached 2% in the middle of the 20th century and has declined to 1.3% in 2002



<https://ourworldindata.org/world-population-growth>

## **Reasons for population growth**


The main parameters affecting the human population size

- ✓ Birth rate or Natality
- ✓ Death rate or mortality
- ✓ Immigration
- ✓ Emigration

Additional factors influencing the population growth are

- ✓ Spread of public health program throughout developing countries
- ✓ The control of famines and food production after world war II
- ✓ Green revolution caused a sudden rise in life expectancy and reduction in infant mortality
- ✓ Development of medicine etc.



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- ✓The 20<sup>th</sup> century witnessed an extraordinary growth of the world population from 1.65 billion to 6 billion.
  - ✓Dramatic reduction in mortality especially in the less developed regions triggered increase of average life expectancy over 20 years (41 years in 1950 and 64 years in 2000) and cause population growth.
  - ✓Currently one billion people are added in every 12 to 13 years to the world.

## **Variation of Population among the nations**

- ✓ Different regions or countries of the world vary in population.
- ✓ 58% of the population resided in Asia.
- ✓ Europe and north america accounts for 14%
- ✓ Africa had 13%

## **Variation of Population among the nations**

The distribution within the continents are also uneven.

- ✓ In Asia, China alone with 1.415 billion, India share is 1.354 billion
- ✓ Europe and north america accounts for 14%
- ✓ Africa had 13%

## World population (millions, UN estimates)

S.no	Top ten populous countries	2000	2015	2030
1	China	1,270	1,376	1,416
2	India	1,053	1,311	1,528
3	United States	283	322	356
4	Indonesia	212	258	295
5	Pakistan	136	208	245
6	Brazil	176	206	228
7	Nigeria	123	182	263
8	Bangladesh	131	161	186
9	Russia	146	146	149
10	Mexico	103	127	148
	<b>World total</b>	<b>6,127</b>	<b>7,349</b>	<b>8,501</b>

## Current population among various nations

Country	Population	Country	Population
1 China	1,442,627,314	11 Japan	126,248,832
2 India	1,388,145,394	12 Ethiopia	116,713,608
3 U.S.A.	332,159,972	13 Philippines	110,461,035
4 Indonesia	275,261,092	14 Egypt	103,509,269
5 Pakistan	223,505,471	15 Vietnam	97,863,382
6 Brazil	213,462,143	16 D.R. Congo	91,250,316
7 Nigeria	209,279,502	17 Turkey	84,884,397
8 Bangladesh	165,674,061	18 Germany	83,943,007
9 Russia	145,971,454	19 Iran	84,641,047
10 Mexico	129,746,410	20 Thailand	69,903,859

## World population of major areas by 1950-2050

Major Areas	Estimated population (in millions)			% Distribution		
	1950	2000	2050	1950	2000	2050
<b>World</b>	<b>2520</b>	<b>6054</b>	<b>8919</b>	<b>32.3</b>	<b>19.7</b>	<b>13.7</b>
More Developed regions	813	1192	1220	32.3	19.7	13.7
Less Developed regions	1706	4861	7699	67.7	80.3	86.3
Least developed Nations	197	663	1675	7.8	11.0	18.8
Africa	221	792	1803	8.8	13.1	20.2
Asia	1399	3669	5222	55.5	60.6	58.5
Latin America & Caribbean	167	519	768	6.6	8.6	8.6
Europe	548	728	632	21.7	12.0	7.1
North America	172	315	448	6.8	5.2	5.0
Oceania Countries	13	31	46	0.5	0.5	0.5

## **Population Explosion**

The rapid growth of population is perhaps the most obvious factor affecting the present and future national and regional development, but it is by no means the only population problem in the world today. The main problem is that of 'Population Explosion'.

The problem arises when the economic developments fails to maintain pace with population growth

## **Effects of population explosion**

The effect of population explosion is numerous some of them are

- ✓ Unemployment
- ✓ Low living standard of people,
- ✓ Hindrance in the process of development of economy
- ✓ Pressure on agriculture land,
- ✓ Low per capital income,
- ✓ Lack of basic amenities like water supply and sanitation, education, health, etc.,
- ✓ High crime rate
- ✓ Environmental damage,
- ✓ Migration to urban area in search of job,
- ✓ Energy crisis,
- ✓ Overcrowding of cities leading to development of slums.



**In order to overcome this problem of population explosion, a sound Population Policy is required with the following objectives:**

- ✓ Quick economic development and raising the per capital income.
- ✓ Significant reduction in birth rate, which is more fundamental and important by providing legal and fiscal motivations like raising age of marriage etc.
- ✓ Population explosion can be control by improvement in the quality of the population by providing better facilities in education, health, etc.
- ✓ The death rate should be brought down further, as high death rate results in waste of human energy and resources.
- ✓ Integrating population planning with economic planning.


## **Role of Information technology in Environment and Human Health**

- ✓ Information technology plays a major role in the field of environmental education and health.
- ✓ Information technology means collection, processing, storage and dissemination of information.

Environmental health and safety (EHS) software acts as a data management system for capturing, storing, and analyzing information related to occupational health and safety, waste management, and sustainability.

EHS solutions are primarily used by businesses to maintain regulatory compliance by monitoring environmental performance metrics, tracking inventory of dangerous materials, and performing inspections.

Safety professionals and compliance officers also use EHS software to guide risk management analysis and implement corrective actions.



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**A number of softwares have been developed to study about the environment and health.**

Gensuite

SafetySync

SHEQX

MyEasyISO

SiteDocs

Assignar


Wellsite Report

Donesafe

Certainty Software

IsoMetrix

Lighthouse HSE



The internet facilities, satellite information, world wide web and geographic information system are providing up to date information on various aspects of environment, weather and human and animal health.

Remotesensing and GIS can be used in

- Meteorological study
- Forestry
- Water resources and its quality analysis
- Land use and land cover
- Animal husbandory etc.

## **The water (Prevention and Control of pollution)act, 1974**

### **Aim:**

To prevent and control water pollution and to maintain/restore wholesomeness of water by establishing central and state pollution control board to monitor and enforce the regulations.

### **Members**

1 Chairman

5 officials

3 non officials

2 persons to represent companies

1 secretary

## **Functions of the central board**

- ✓ To promote cleanliness of streams and wells.
- ✓ Advise the central govt.
- ✓ Resolve disputes between states.
- ✓ Providing technical assistance and guiding.
- ✓ Organize comprehensive program.
- ✓ To establish laboratories.

## **Functions of state boards**

- ✓ Planning a comprehensive program.
- ✓ Advising the state govt.
- ✓ Conducting investigations and research.
- ✓ Inspecting waste water treatment plants.
- ✓ Prescribing standards for sewage.
- ✓ Establishing laboratories.

## **Powers of the Boards**

- ✓ Power to obtain information.
- ✓ Power to take samples.
- ✓ Power of entry and inspection.
- ✓ Power on prohibition on disposal of polluting matter into a stream or well.

## **Penalties**

- ✓ This act empowers the state boards to order closure or stop of electricity supply to the polluting unit.
- ✓ Non –compliance of the order may attract imprisonment for a term of one and half years to six years and fine which may extend to rupees five thousands per day, if the default continues.



# **THE AIR (PREVENTION AND CONTROL OF POLLUTION) ACT, 1981**

*[29th March, 1981.]*

Decisions were taken at the United Nations Conference on the Human Environment held in Stockholm in June, 1972, in which India participated, to take appropriate steps for the preservation of the quality of air and control of air pollution.

It is considered necessary to implement the decisions relate to the preservation of the quality of air and control of air pollution, the air act enacted by Parliament in the Thirty-second Year of the Republic of India in the year 1981.



THE AIR (PREVENTION AND CONTROL OF POLLUTION)  
ACT, 1981

ARRANGEMENT OF SECTIONS

CHAPTER I PRELIMINARY  
SECTIONS

1. Short title, extent and commencement.
2. Definitions.

**Definitions.—In this Act, unless the context otherwise requires,—**

- (a) air pollutant
- (b) air pollution
- (c) approved appliance
- (d) approved fuel
- (e) automobile
- (f) Board
- (g) Central Board
- (h) chimney
- (i) control equipment
- (j) emission
- (k) industrial plant
- (l) member
- (m) occupier
- (n) prescribed

## CHAPTER II CENTRAL AND STATE BOARDS FOR THE PREVENTION AND CONTROL OF AIR POLLUTION

3. Central Pollution Control Board.
4. State Pollution Control Boards constituted under section 4 of Act 6 of 1974 to be State Boards under this Act.
5. Constitution of State Boards.
6. Central Board to exercise the powers and perform the functions of a State Board in the Union territories.
7. Terms and conditions of service of members.
8. Disqualifications.
9. Vacation of seats by members.
10. Meetings of Board.
11. Constitution of committees
12. Temporary association of persons with Board for particular purpose.
13. Vacancy in Board not to invalidate acts or proceedings.
14. Member-secretary and officers and other employees of State Boards.
15. Delegation of powers.

## CHAPTER III POWERS AND FUNCTIONS OF BOARDS

16. Functions of Central Board.

17. Functions of State Boards.

18. Power to give directions.

### **Functions of the central board**

- ✓ To Advise the central government related to air quality.
- ✓ Providing technical assistance and guiding.
- ✓ Organize comprehensive program.
- ✓ To establish laboratories.

### **Functions of state boards**

- ✓ Planning a comprehensive program in relation of air pollution.
- ✓ Advising the state govt. in connection with air pollution.
- ✓ Conducting investigations and research.
- ✓ Inspecting the sources of air pollution.
- ✓ Establishing laboratories.

## **POWERS**

- Power to declare Air Pollution Control Areas.
- Power to establish standards for emission of air pollutants from Automobiles.
- Power to restrict use of certain industrial plants.
- Power of entry and inspection.
- Power to take samples.

## CHAPTER IV PREVENTION AND CONTROL OF AIR POLLUTION

19. Power to declare air pollution control areas.
20. Power to give instructions for ensuring standards for emission from automobiles.
21. Restrictions on use of certain industrial plants.
22. Persons carrying on industry, etc., not to allow emission of air pollutants in excess of the standard laid down by State Board.
- 22A. Power of Board to make application to court for restraining persons from causing air pollution.

### SECTIONS

23. Furnishing of information to State Board and other agencies in certain cases.
24. Power of entry and inspection.
25. Power to obtain information.
26. Power to take samples of air or emission and procedure to be followed in connection therewith.
27. Reports of the result of analysis on samples taken under section 26.
28. State Air Laboratory.
29. Analysis.
30. Reports of analysis.
31. Appeals.
- 31A. Power to give directions.



## CHAPTER V FUND, ACCOUNTS AND AUDIT

32. Contribution by Central Government.

33. Fund of Board.

33A. Borrowing powers of Board.

34. Budget.

35. Annual report.

36. Accounts and audit.



## CHAPTER VI PENALTIES AND PROCEDURE

37. Failure to comply with the provisions of section 21 or section 22 or with the directions issued under section 31A.
38. Penalties for certain acts.
39. Penalty for contravention of certain provisions of the Act.
40. Offences by companies.
41. Offences by Government Departments.
42. Protection of action taken in good faith.
43. Cognizance of offences.
44. Members, officers and employees of Board to be public servants.
45. Reports and returns.
46. Bar of jurisdiction.

## CHAPTER VII MISCELLANEOUS

47. Power of State Government to supersede State Board.

48. Special provision in the case of supersession of the Central Board or the State Boards constituted under the Water (Prevention and Control of Pollution) Act, 1974.

49. Dissolution of State Boards constituted under the Act.

50. [*Omitted*].

51. Maintenance of register.

### SECTIONS

52. Effect of other laws.

53. Power of Central Government to make rules.

54. Power of State Government to make rules.

# **The Environment (Protection) Act, 1986**

## **CONTENTS**

### **CHAPTER-I**

#### **Preliminary**

1. Short title, extent and commencement
2. Definitions

### **CHAPTER II**

#### **Reserved Forests**

3. Power of Central Government to take measures to protect and improve environment
4. Appointment of officers and their powers and functions.
5. Power to give directions.
6. Rules to regulate environmental pollution.

## **CHAPTER III**

### **Prevention, Control and Abatement of Environmental Pollution**

7. Persons carrying on industry, operation, etc. not to allow emission or discharge of environmental pollutants in excess of the standards.
8. Persons handling hazardous substances to comply with procedural safeguard.
9. Furnishing of information to authorities and agencies in certain cases.
10. Power of entry and inspection.
11. Power to take sample and procedure to be followed in connection therewith.
12. Environmental Laboratories.
13. Government analysts.
14. Reports of Government analysts.
15. Penalty for contravention of the provisions of the act and the rules, orders and directions
16. Offences by companies.
17. Offences by Government Departments.

## **CHAPTER IV**

### **Miscellaneous**

18. Protection of action taken in good faith.
19. Cognizance of offences.
20. Information, Reports or Returns.
21. Members, Officers and Employees of the authority constituted under section  
3 to be public servants
22. Bar of Jurisdiction.
23. Power to delegate.
24. Effect of other laws.
25. Power to make rules.
26. Rules made under this act to be laid before parliament.



**Questions?**

**Thank You**