Module 6
Human Population Change & Environment

By

Dr. V. Sai Saraswathi.,

Asst. Prof. (Sr.).,

SAS, VIT, Vellore Campus.

Contents

- Urban environmental problems;

- Consumerism and waste products;

- Promotion of economic development

- Impact of population age structure

- Women and child welfare & Women empowerment.

- Sustaining human societies: Economics, environment, policies and education.

Population of India (2020)

View live population, charts & trends: ***Population of India***

India Population
1,380,004,385

Yearly Change
+ 0.99%

Global Share
17.71%

Global Rank
2

Exponential Growth and the Rule of 70

The Rule of 70

70 / % growth   = doubling time

70 / doubling time = % growth

- For example, if you hear that the population of your town is growing by 2% per year, that means it will double in just 35 years! (70/2=35)

- It works in reverse, too: divide 70 by the doubling time to find the growth rate. If you hear that U.S. population is due to double in 70 years, you know that it's increasing at 1% per year (70/70=1). Isn't it amazing that just a 1% annual increase can cause a doubling in 70 years?

Population characteristics and variation

- **Exponential growth:** when a quantity increase by a constant amount per unit time, eg. 1, 3,5, 7 … it is called linear growth.

- **Doubling time:** the time needed for a population to double its size at a constant annual rate is known as doubling time.

    (Td) = 70/r

  - Td – Doubling time
  - r   - annual growth rate.

Fertility in India: Global View

- A Total Fertility Rate (TFR) of **2.1 represents the Replacement-Level Fertility**: the average number of children per woman needed for each generation to exactly replace itself without needing international immigration. A value below 2.1 will cause the native population to decline.

PREGNANT_WOMAN TOTAL FERTILIY RATE (TFR)

2.2(Live Births per Woman, 2020)

India & TFR 2019

- During Independence, India was still one of the most populous countries with 350 million people.

- That was the reason it became the first developing country to start a family planning programme in 1951.

- Since then, the country's population has quadrupled, with 1.37 billion people in 2019.

- Population scientists have postulated a threshold to the number of births to keep population under control.

- This is expressed as the total fertility rate (TFR), which is the average number of children a woman of childbearing age must have.

- Population above TFR means growth, while that below TFR means decline. At TFR, population is maintained.

- For Homo sapiens, a 2.1 TFR would keep the country's population stable. The number accounts for one child per mother, one per father, and an extra 0.1 for children who die in infancy and women who die before childbearing age. The UN Population Division terms this as the replacement-level fertility.

- "If replacement-level fertility is sustained over a sufficiently long period, each generation will exactly replace itself without any need for the country to balance the population by international migration," says the UN.

- India is very close to this point now, as many states have, in fact, TFR below 2.1. This means India's population is about to hit the replacement level. Or, there will be no effective population growth. India's official data suggests this.

India - TFR

- The National Family Health Survey (NFHS)-4, conducted in 2015-16, found India's TFR had reached 2.2. Most Indian states had already achieved or were below 2.1 TFR. Himachal Pradesh, West Bengal, Maharashtra, Punjab, Tamil Nadu, Kerala, Karnataka and Andhra Pradesh had TFR well below the replacement level.

- The exceptions were Bihar (3.4), Uttar Pradesh (2.7), Jharkhand (2.6), Rajasthan (2.4), Madhya Pradesh (2.3), Chhattisgarh (2.2), Assam (2.2) and some north-eastern states.

- According to it, population in the 0-19 age bracket has already peaked due to sharp decline in TFR across the country.

- The Economic Survey, in fact, suggested massive reorientation of public infrastructure like schools to prepare for less population.

- **Total fertility rate (TFR):** it is defined as the average number of children that would be born to a woman in her lifetime if the age –specific birth remains constant.

- **Infant Mortality rate:** it is important parameter affecting the future growth of the population.

- It is the % of infants died out of those born in a year.

INFANT MORTALITY RATE

• Infant Mortality Rate and Deaths of Children under 5 Years Old in India

INFANT MORTALITY

26.6 (infant deaths per 1,000 live births)

DEATHS UNDER AGE 5

32.9(per 1,000 live births)

https://www.worldometers.info/demographics/india-demographics/

Un Projection – Infant Mortality Rate

- India infant mortality rate from 1950 to 2020. United Nations projections are also included through the year 2100.

- The current infant mortality rate for India in 2020 is 29.848 deaths per 1000 live births, a 3.48% decline from 2019.

- The infant mortality rate for India in 2019 was 30.924 deaths per 1000 live births, a 3.36% decline from 2018.

- The infant mortality rate for India in 2018 was 32.000 deaths per 1000 live births, a 4.24% decline from 2017.

- The infant mortality rate for India in 2017 was 33.416 deaths per 1000 live births, a 4.07% decline from 2016.

UN projection –IMR- Globe & India

India Infant Mortality Rate 1950-2020

India - Historical Infant Mortality Rate Data

Year	Infant Mortality Rate	Growth Rate
2020	29.848	-3.480%
2019	30.924	-3.360%
2018	32.000	-4.240%
2017	33.416	-4.070%
2016	34.833	-3.910%
2015	36.249	-3.760%
2014	37.666	-3.620%
2013	39.082	-5.040%
2012	41.157	-4.800%
2011	43.232	-4.580%
2010	45.307	-4.380%

Similar Countries Ranked by Infant Mortality Rate

Country Name	2020 Infant Mortality Rate
Nigeria	59.181
Pakistan	59.109
Cameroon	58.309
Angola	58.240
Lesotho	57.539
Mauritania	51.346
Zambia	43.107
Sudan	40.935
Kiribati	40.541
Papua New Guinea	39.809
Eswatini	38.811
Myanmar	36.406
Timor-Leste	35.024
Kenya	34.056
Ghana	33.701
Djibouti	31.603
India	**29.848**
Bolivia	27.945

Replacement level: important concept of dynamics or demography.

- Two parents – two children will be replaced by their offspring.

- But due to mortality this replacement level will change.

- Developing nation the infant mortality is high and life expectancy is low.

- **Age structure:** people belonging to different age group classes like

  - 0-14 pre-reproductive

  - 15-44 reproductive

  - 45 year above- post reproductive.

India: Census 2001 data

**POPULATION IN DIFFERENT AGE GROUPS AND
THEIR PROPORTIONS TO TOTAL POPULATION**

Age group	Population	Percentage
All Ages	1,028,610,328	100.0
0 - 4	110,447,164	10.7
5 - 9	128,316,790	12.5
10 - 14	124,846,858	12.1
15- 19	100,215,890	9.7
20 - 24	89,764,132	8.7
25 - 44	284,008,819	27.6
45 - 64	139,166,661	13.5
65 - 79	41,066,824	4.0
80+	8,038,718	0.8
Less Than 18	422,808,543	41.1
Less than 21	492,193,906	47.9
Age no stated	2,738,472	0.3

Source : **C2 and C14 Table, India, Census of India 2001.**

Age Structure

- Age- sex structure is one of the most important characteristics of population composition. Almost all population characteristics vary significantly with age.

- Age statistics form an important component of population analysis, as most of the analysis is based on age-sex structure of the population.

- The usefulness of age data is more noticeable when it is cross classified by variables like marital status, literacy educational attainment, economic activity which vary with age in different patterns.

- Apart from purely demographic concerns, the age- sex data structure is required for age specific analysis of data for planning, scientific, technical and commercial purposes.

- The dependency ratio, which is the ratio of economically active to economically inactive persons, is dependent on age composition.

- India has one of the largest proportions of population in the younger age groups in the world. 35.3% of the population of the country has been in the age group 0-14 years at the Census 2001.

- 41% of the population account for less than 18 years of age.

- Three types of pyramid

    - Pyramid shaped

    - Bell shaped

    - Urn shaped

    Zero population growth: when birth + immigration in the population are just equal to death + emigration it is called **zero population growth.**

- **Male- female ratio:** the ratio of girl and boy should fairly balanced in a society to flourish.

Life Expectancy in India

- Life expectancy: it is a average age that a newborn infant is expected to attain in a given country.

  eg. 40- 55 years above.

BOTH SEXES

70.4 years(life expectancy at birth, both sexes combined)

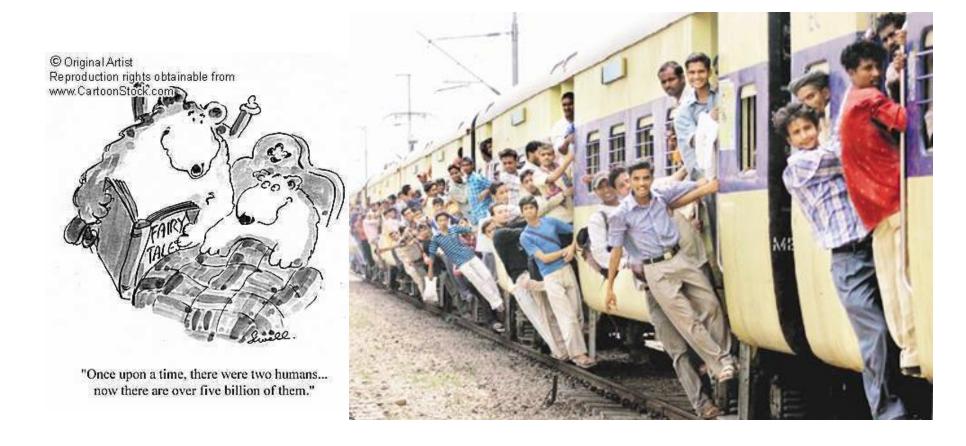**FEMALES**

71.8 years(life expectancy at birth, females)

MALES

69.2 years(life expectancy at birth, males)

Demographic Transition
related to economic development

- **Pre- industrial phase**: characterized by high growth and death rates and net population is low.

- **Transitional phase:** occurs with advent of better hygiene and medical facility – reducing death rate, birth rate remains high.

- **Industrial phase:** fall in the birth rate thereby lowering of growth rate.

- **Post – industrial phase:** during zero population growth is achieved.

Population explosion

"Once upon a time, there were two humans... now there are over five billion of them."

Thank YOU