

1. Concept of Demography

Demography (from prefix demo- from Ancient Greek *dēmos* meaning "the people", and -graphy from *graphō*, "writing, description or measurement") is the statistical study of populations, especially human beings.

Demography encompasses the study of the size, structure, and distribution of these populations, and spatial or temporal changes in them in response to birth, migration, aging, and death. As a very general science, it can analyze any kind of dynamic living population, i.e., one that changes over time or space (see population dynamics). Demographics are quantifiable characteristics of a given population.

Demographic analysis can cover whole societies or groups defined by criteria such as education, nationality, religion, and ethnicity. Educational institutions usually treat demography as a field of sociology, though there are a number of independent demography departments.

Formal demography limits its object of study to the measurement of population processes, while the broader field of social demography or population studies also analyses the relationships between economic, social, cultural, and biological processes influencing a population.

2. Thomas malthus theory of population

The Malthusian Theory of Population is a theory of exponential population growth and arithmetic food supply growth. Thomas Robert Malthus, an English cleric, and scholar, published this theory in his 1798 writings, *An Essay on the Principle of Population*.

He believed that through preventative checks and positive checks, the population would be controlled to balance the food supply with the population level. These checks would lead to the Malthusian catastrophe.

The Malthusian theory explained the following

1. Population and Food supply Thomas Malthus theorized that populations grew in geometric progression. A geometric progression is a sequence of numbers where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio. For example, in the sequence 2, 10, 50, 250, 1250, the common ratio is 5. Additionally, he stated that food production increases in arithmetic progression. An arithmetic progression is a sequence of numbers such that the difference between the consecutive terms is constant. For example, in series 2, 5, 8, 11, 14, 17, the common difference of 3. He derived this conclusion due to the Law of Diminishing Returns.

From this, we can conclude that populations will grow faster than the supply of food. This exponential population growth will lead to a shortage of food.

2. Population Control

Malthus then argued that because there will be a higher population than the availability of food, many people will die from the shortage of food. He theorized that this correction would take place in the form of Positive Checks (or Natural Checks) and Preventative Checks.

These checks would lead to the Malthusian catastrophe, which would bring the population level back to a 'sustainable level.'

A. Positive Checks or Natural Checks

He believed that natural forces would correct the imbalance between food supply and population growth in the form of natural disasters such as floods and earthquakes and human-made actions such as wars and famines.

B. Preventative Checks

To correct the imbalance, Malthus also suggested using preventative measures to control the growth of the population. These measures include family planning, late marriages, and celibacy.

Malthusian trap

The Malthusian Trap (or “Malthusian Population Trap”) is the idea that higher levels of food production created by more advanced agricultural techniques create higher population levels, which then lead to food shortages because the higher population needs to live on land that would have previously used to grow crops.

Even as technological advancement would normally lead to per capita income gains, theorizes Malthus, these gains are not achieved because in practice the advancement also creates population growth. Once the population exceeds what food supplies can support, this supposedly creates a Malthusian crisis with widespread famine as well as rampant disease. This ends up decreasing the population to earlier levels.

The reality, however, has been that population growth has not itself created the crisis that Malthus predicted. We will discuss the ways in which the Malthusian Trap has been disproven in the following section.

Criticism on the Malthusian theory of population

1. Population Growth

The gloom and doom forecasts put forward by Malthus have not played out. In Western Europe, populations have grown (not at the rate Malthus predicted) and food production has also risen because of technological advancements.

2. Food Production

Thanks to many technological advancements, food production has dramatically increased over the past century. Often, the food production rate has grown higher than the population growth rate. For example, during the 1930s in the US, 25% of the population worked in the agricultural sector while the total GDP was less than \$100 billion to the GDP. Today, less than 2% of the population works in the agricultural sector, while the total GDP is over \$14 trillion.

3. Global Trade

The limited availability of land at the time was the basis for Malthus’ theory on food production constraints. However, thanks to globalization, we can trade goods and services for food, which increases the amount of food a country can consume.

4. Calculations

Malthus did not provide calculations for the geometric growth of populations and the arithmetic growth of food. Since then, experts have pointed out that the growth rates are not consistent with Malthus’ predictions.