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Validity of Malthusian Theory of Population in 20th Century in Terms of Using Scientific Technology to the Economic Growth and Strength

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Abstract

In the late eighteenth century, in 1798, England's renowned economist Thomas Malthus, in his book '*Essay on the Principal of Population*'[1], propounded a stirring theory about population, according to his name, it is called the Malthusian Population Theory. [1] Malthus discussed the problem of population increase in the food supply and the scarcity of production rule. According to Malthus, population increases in geometric rates and food production increases at arithmetical rate. In the twentieth century, we will see how logical the population theory of Malthus is in today's world and how unreasonable. Although the population theory of Malthus is somewhat true for the underdeveloped countries. Due to the development and use of science and technology in the present world, the population theory of Malthas has been criticized by various modern economists.

Keywords: Malthus; Theory of Population; Growth of Population; Food Production; Developing Countries; Developed Countries.

[1] The book ***An Essay on the Principle of Population*** was first published anonymously in 1798, but the author was soon identified as Thomas Robert Malthus. The book predicted a grim future, as population would increase geometrically, doubling every 25 years, but food production would only grow arithmetically, which would result in famine and starvation, unless births were controlled.

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1. Introduction

What is the current world population? It is not a matter of argument, but everybody can say about 7.53 billion and it will reach 9.53 billion within 2050. All these additional people need additional food, extra water, land and power resources. This population growth affects the geographical location of a country, the economy of the government, the infrastructure and the social organization etc.

But in the developed world the population growth is going down but it is higher in other countries of the world. And the conflicting property of this population is the first to offer the theory of Malthus. In 1798, he examined his book '*Essay on the Principal of Population*' and discussed the growth of population and the relationship of assets. The issue of the population theory of Malthus is that when the production of cereals increases at arithmetical rate, the population grows at the geometrical rate[2].

2. Arithmetical Progression

1, 2, 3, 4.....^{n}. That means it increases in mathematical rules. Malthus explains that it increases the mathematical progression in transitional clause.

For example, 1 + 2 + 3 + 4 + 5 = 15, increases the production of food in this mathematical system. Which is termed as slow sluggishness in food production.

In fact, if the food production increases at a rate of 1, 2, 3, 4, 5 in this mathematical rate, on the other hand, if the population increases at double rate, then increasing population and the demand for food for the additional people is a difficult thing to meet.

3. Geometrical Progression

1x2, 2x2, 4x2, 8x2……..^{nx2}. So, the population increases in the geographical rate than the production of food. According to the above discussion, if the population is increased by 10 percent in two years, then food will not be increased to that excess population but the demand for food will increase for the additional 20 percent for the additional 10 percent population of the country.

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[2] Arithmetic progression means that a quantity increases linearly as time proceeds; geometric progression means that it increases as the square of time. Malthus' theory claims that populations always tend to increase in geometric progression, while the means of subsistence increase in arithmetic progression. Population growth is then limited through shortage of subsistence.

In the example the assumption is that initially the means of subsistence are sufficient to support the population but are outstripped in the fourth generation. The numerical example is built on s = 0.25. 2^{x}

According to the theory of Malthus, suppose 1 million metric tons of rice is required daily for a country's population. If after five years, the population of the country increases one-fold, then the demand for food will increase two fold, that will require 2 million metric tons of rice for one-fold population. But it is not possible to produce more food rather than the population.

In **Figure-1** we can see Malthus's arithmetical progression and geometrical progression. Where OM is the balance between food supply and population growth.

The figure below shows the population growth in the left segment and food production in the bottom segment where food production is shown as 1, 2, 3, 4, 5 thus 8. In contrast to the production of food, population 1, 2, 4, 8 has increased twice in this way.

According to Malthus, food production increased at arithmetical rate, but population increased at geometrical rate. Here is the picture shown by.

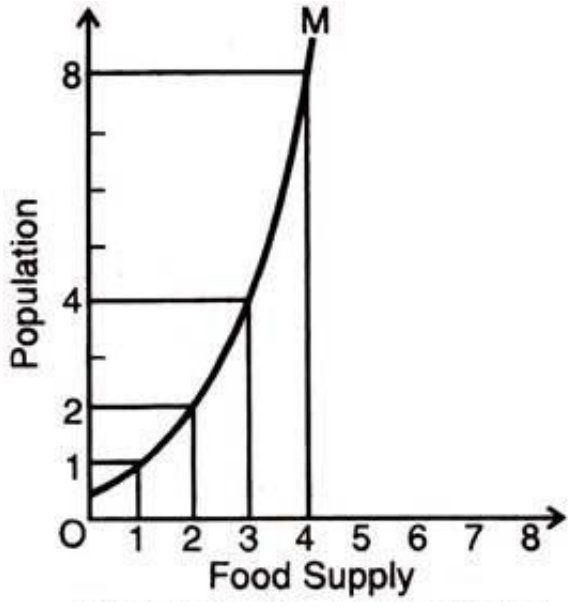

Figure-1: Malthus's Theory of Population

We can explain Malthusian theory by a graph where upper line indicates the increasing rate of population and bottom line indicates the food supply or resources rate for the demand of food of the population. The graph of increasing population and food supply is given below (**Figure-2**).

In 1779, Thomas Malthus wrote:

Famine seems to be the last, the most dreadful resource of nature. The power of population is so superior to the power of the earth to produce subsistence for man, that premature death must in some shape or other visit the human race. The vices of mankind are active and able ministers of depopulation. They are the precursors in the great army of destruction, and often finish the dreadful work themselves. But should they fail in this war of extermination, sickly seasons, epidemics, pestilence, and plague advance in terrific array, and sweep off their thousands and tens of thousands. Should success be still incomplete, gigantic inevitable famine stalks in the rear, and with one mighty blow levels the population with the food of the world. [3]

Notwithstanding the apocalyptic image conveyed by this particular paragraph, Malthus himself did not subscribe to the notion that mankind was fated for a "catastrophe" due to population overshooting resources. Rather, he believed that population growth was generally restricted by available resources:

The passion between the sexes has appeared in every age to be so nearly the same that it may always be considered, in algebraic language, as a given quantity. The great law of necessity which prevents population from increasing in any country beyond the food which it can either produce or acquire, is a law so open to our view...that we cannot for a moment doubt it. The different modes which nature takes to prevent or repress a redundant population do not appear, indeed, to us so certain and regular, but though we cannot always predict the mode we may with certainty predict the fact. [4]

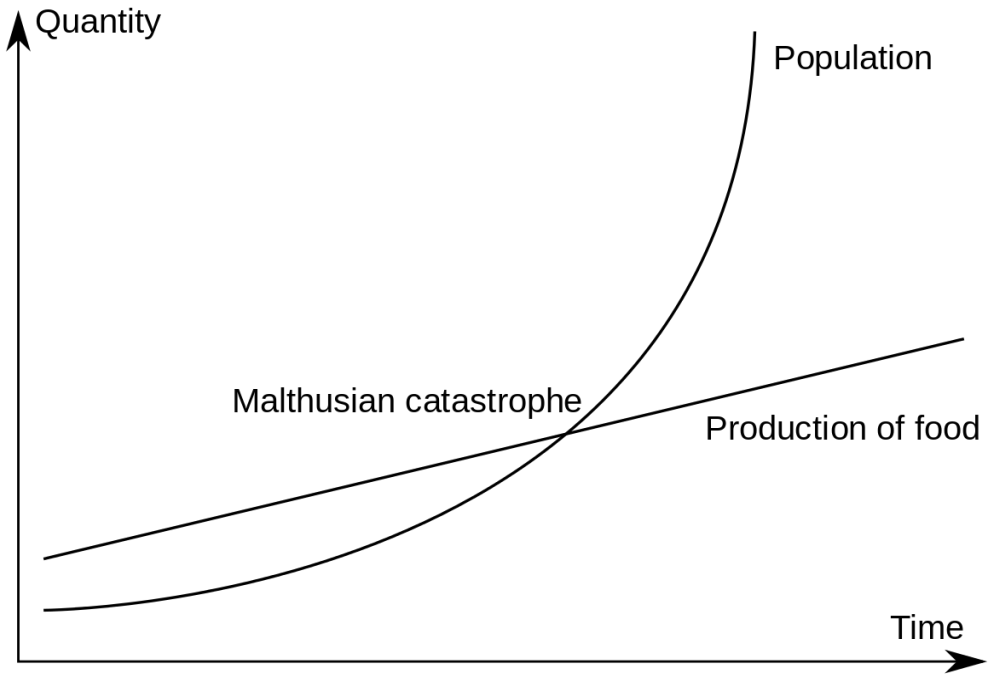

Figure-2: Malthusian theory of Population and Food Production

In this **Figure-2** we are seeing that the upper line (Population) is going up whereas the bottom line (Food supply) is falling down than the increase of population.

Malthus's population theory meant that food production increases in mathematical rates, which means that the population increases gradually, on the other hand, the population grows at a geometric rate or faster. Naturally the population increases faster than the food supply. This is because the only source of food supply is ground. But due to limited supply of land, it is not possible to increase food production rapidly. As a result, the rate at which the population increases, the production of food can increase.

According to Malthus, population is rapidly increasing due to natural fertility, and in every country the population doubles in every 25 years. But the production of cereal crops cannot increase rapidly due to decreasing production rules in the field. This results in a time when the population surpasses the amount of food production and population problems arise in the country. In such a situation, natural disasters such as food, famine, pestilence, war, misery etc. arose in the country.

As a result of these disasters, some parts of the population disappear and the balance between population and food production is restored. Thus, due to famine, food shortage, epidemic, some parts of the population were wiped out as a natural means of controlling the population of the Malthus population.

But due to the effective use of natural resources in population control, the balance of food supply and population is very momentary. The desire to produce a child's son is so strong that population increases and then reaches food supply. Thus, population growth and natural disruption system continues to circulate.

The population theory of Malthus is explained with the help of diagrams below

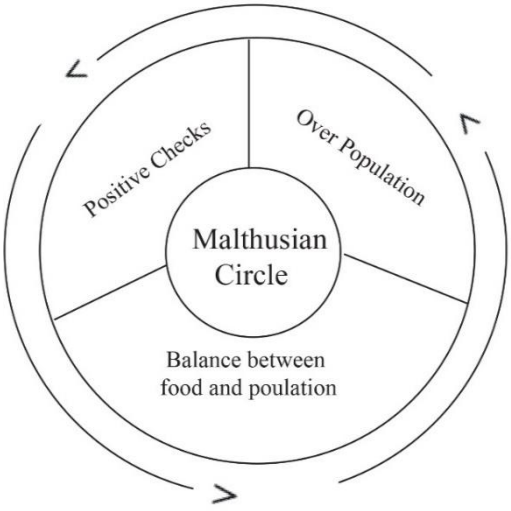

Figure-3: Malthusian Cycle

This rounded image above is called the Malthusian Cycle. The diagram first shows balance between food and population. But the population always tend to surpass food supply. As a result, there is a lot of urgency soon. Then the natural methods of population control work and the excess population disappears and the balance between the population is restored. But this temporary balance arises only once again. So the natural methods of population control are not able to establish stable balance between population and food supply. Moreover, according to Malthus, it is noteworthy that natural methods are not effective in population control. For this, according to Malthus, emphasizing the use of preventive measures that control the population. Child marriages can control population growth by successfully eliminating polygamy, moral restraint, adopting birth control, etc. Malthus's doctrine of population is briefly known as Malthism.

4. Validity of Malthus Theory in 20th Century Economy

Although the population theory of Malthus created a stir in the contemporary era, the theory later faced many criticisms. In modern times, Malthus's population theory has been criticized.

Especially in the 20th century, due to the spread of science and technology, there is a similarity between population growth and food production. As a result, the population theory of Malthus is being more criticized in this century. The criticism or its validity in this century is given below:

4.1. Historical Authenticity

Although the theory of Malthus proved somewhat true in contemporary terms, this doctrine is not acceptable at present. When reviewing the history of the population of different countries, especially the western countries, it is seen that in the late nineteenth century and early twentieth century, the population of western countries has decreased rather than increasing population. So the prediction of Malthus has been proved to be false. In Table-1 we can see the comparison of population growth of developing countries in 1995 and 2017.

Country Name	Growth Rate at Year 1995	Growth Rate at Year 2017
United States	1.2	0.7
Singapore	3.0	0.1
Finland	0.4	-0.2
Spain	0.4	0.2
Norway	0.5	0.9

France	0.4	0.4
Latvia	-1.4	-1.0
Andorra	1.9	-0.4
Croatia	0.4	-1.2
Greece	0.5	-0.1
Virgin Islands (US)	0.5	-0.2
Greenland	0.5	-0.0
British Virgin Islands	2.1	1.7

Table-1: Population Growth of Developing Countries in 1995 and 2017 [4]

4.2. Scientific Innovations and False Predictions

When Malthus preached the theory, the industrial revolution just started in England. Later, in the United Kingdom and other European countries, due to industrial revolution and scientific innovation, Malthus could not understand the potential for food production in developed countries, which has multiplied, so Malthus's prediction about population has proved to be false.

4.3. The Mathematical Rate of Food Production has been Proved Wrong

According to Malthus, food production increases in mathematical rates. But this idea is not correct. Malthus promoted his doctrine based on the gradual increase in production. But the development of unprecedented science of the nineteenth century has created new production techniques and machines in the field of agriculture, which has facilitated production growth. This new era has not been reflected in the Plain of Malthus.

4.4. Population Increases in Geometry Rate Is Not Correct

According to Malthus, the population increases in geometric rates, but this idea is not correct. Because the population does not always increase at geometric rates. As the quality of life improves, population growth

decreases. In fact, many of the developed countries of the western world are facing a decreasing population problem. So the population always grew at a geometric rate. This concept of Malthus is not correct.

4.5. Comparison of Food with Population Only

Malthus judged the population only in terms of food production. But in reality, the population should be compared with the overall wealth of the country. In addition to food items, there may be other resources of a country. But compared to the population of Malthus, only food items have been compared. He did not think of other resources of the country.

4.6. Population Growth Is Not Bad at All

Malthus considers population growth to be worse. But this idea is not correct. Because the human child is not only born with hungry belly but also comes with two hands. In some cases, population growth is helpful in increasing the country's production. This truth was not realized by Malthus.

4.7. The Unequal Distribution of Resources Is the Main Problem, Rather Than the Population

According to professor Seligman, the population is not only numerical problems, but also its efficient production and equitable distribution of problems. In fact, if the population is efficient and the resources of the state are distributed equally, then population problems do not arise.

4.8. Malthus Neglected the Quality of the Population

The quality of the population has been neglected in the theory of Malthus. Malthus only considered the numerical aspect of the population. If a certain population is illiterate, inefficient, and superstitious, it can cause problems for the country. Again, if this population is educated, efficient and industrious, then it will become a property without being burdened for the country. Malthus did not consider the quality of the population in his theory.

5. Conclusion

For the above reason, the population theory of Malthus is termed as erroneous and defective. Industrial revolution and advances in science will increase the standard of living of human life, eliminate the sorrow, Malthas rams in place of this optimistic notion of the nineteenth century.

The essence of the theory of monotheism and suspicion, Malthus. The horrific and dreadful future message about the future of humanity has been proven false because of the advancement of science. That is why this theory is not acceptable to modern economists.

However, despite the various error deficiencies, the basic authenticity of Malthus's population theory in the developing countries of Bangladesh is undeniable.

References

1. Thomas Malthus, 1798, An Essay on the Principle of Population
2. Thomas Malthus, 1798. An Essay on the Principle of Population Chapter VII, p. 61
3. Thomas Malthus, 1798. An Essay on the Principle of Population. Chapter IV.
4. Population Growth World Bank Data https://data.worldbank.org/indicator/SP.POP.GROW

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