Population Backfire: Hindsight to Malthusian Catastrophe

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Abstract
The basic tenet of Economics lies in the scarcity principle and unlimited nature of human wants, but allocating a definite amount of resources to satisfy the growing per capita needs in an economy is a difficult task. Things become more complicated when the population pressure generates backfire. The global population has increased to 7.8 billion, and it is essential to ensure sufficient food supply for the growing human population as well as for other species without destroying ecological balance is a serious matter to consider. An evaluation of Malthusian population theories has great importance in this context. This paper intends to analyze the Malthusian theory of population and what happens if population backfire happens and also looks into the intensity of positive checks on population along with the Malthusian trap and its effect on the present as well as the future generation.

Keywords: Malthusian Catastrophe, Population growth, Food supply, Population backfire and Invisible population.

Introduction

In the 18th century itself, Malthus envisaged that population is growing out of hand at a geometric rate, but the corresponding food production is only increasing at an arithmetic rate. He pointed out that if it continues in the same pattern, a catastrophic eventuality will take place globally where human beings will find it very difficult to survive. He was of the view that if population and food supply grow in such a specified pattern, and if the people are not adopting preventive checks to reduce the population, nature itself tries to rationalize the population pressure globally through positive checks like wars, famines, epidemics and so on which leads to a situation of Malthusian Catastrophe. Though a great deal of criticisms has been received by him throughout his career, the recent pandemic COVID 19 underline that a check on population is happening all over the world. Along with Malthus, there were a lot of thinkers, sociologists, and economists who have also foreseen the problems of population backfire. The economists like David Ricardo and John Stuart Mill agreed with Malthusian population theory, and E.A. Wrigley's work has supported Malthus' theory by pointing out that British economy before the industrial revolution as an "Organic Economic System," characterized by decreasing returns to scale,

where population movements set standards of living to the subsistence level. An exact explanation of depletion of resources is given by Farrell as, "We just keep buying gas guzzlers, keep investing retirement money in Exxon Mobil, keep making more and more babies, forever in denial of the widening gap between perpetual economic growth and more babies living on a planet of rapidly diminishing resources" (Farrell, 2013). These are only a few; there are many others who supported and accepted Malthusian theories.

Population Pressure on Food Security and Water Availability

The countries faced two world wars and many natural calamities over the century, but the size of the population and its pressure is finding new heights globally. Consequently, human needs are increasing alarmingly; at the same time, the major source of resources is either exhausted or being contaminated. Agriculture lands and paddy fields are being converted into non -agricultural forms such as real estates, and other constructions lead to the erosion of pure water sources, which in turn considerably reduces the per capita availability of drinking water. As per the research conducted by ICAR, India's per capita water availability is estimated to further decline to 1,465 cubic meters by 2025, and if it declines further to around 1,000-1,100 cubic meters, then India could be declared as a water-stressed country. So efforts should be taken to maintain our water sources from over exploitation.

Development propagators would claim that everything will be alright on citing the data on increasing agricultural yield achieved through the adoption of modern technologies. But, in fact, we are slowly moving towards the Malthusian trap without knowing the dangers ahead. '*The Malthusian Trap or Malthusian Theory argues that gains in food production lead to an increase in population, which results in food shortages as the ever-growing population takes over land meant more crop production*' Higher level of food production achieved by the use of intensive technology is good. Still, we will face shortages of food in the future not only due to the fast-growing population but to the lengthening of life spans of the people in consonance with the expansion of health facilities. It necessitated the provision of shelter and other amenities to protect the dependent population that would again lead to the conversion of the land once used for cultivation.

Similarly, the over-extraction of resources also leads to degradation of the environment too. The literature shows that, as we try to increase agriculture productivity, population pressure also increases, and a chain of actions and counter actions take place in the economy, which finally pulls the whole world into a catastrophic eventuality. A report by the Food and Agriculture Organisation of the United Nations (FAO) pointed out that global food production needs to increase by 70 percent if the population reach 9.1 billion in 2050*. The overuses of agro-food land ultimately create problems such as exhaust of ground water aquifers, shrinkage of terrestrial, fresh water sources or drinking water availability, soil degradations, and climatic variations.

Similarly, if the pressure for food increases, it will produce a negative impact on food intake qualitatively and quantitatively and lead to many health-related problems. According to the FAO estimates in 'The State of Food Security and Nutrition in the World,' 2019 (SOFI, 2019) report, 194.4 million people are undernourished in India. By this measure, 14.5% of the population is undernourished in India. Also, 51.4% of women in reproductive age between 15 to 49 years are anemic. Further, according to the report, 37.9% of the children aged below five in India are stunted (too short for their age), while 20.8% suffer from wasting, meaning their weight is too low for their height. Malnourished children have a higher risk of death from common childhood illnesses such as diarrhea, pneumonia, and malaria. The Global Hunger Index 2018 ranks India at 103 out of 119 countries based on three leading indicators, the prevalence of wasting and stunting in children under 5 years, under 5 child mortality rate, and the proportion of undernourished in the population.

Population and Resource Imbalance in India: What we missed?

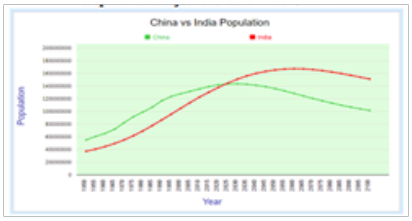
India stood as the second-largest populated country just behind China and endowed with demographic dividend, and also adds new births to its population by 1.1% annually. As a developing economy as well

as a highly populous country, we have to explore the relevance of Malthusian theory in the current scenario. Since 2000, we are taking serious policy measures to curb the population pressure, but to reach a situation of population stability, which is more or less copes up with environmental balances and food security is yet to achieve. A copious part of Indian population comprises of the invisible population who are not accounted officially in the accounting activities or fall outside the purview of government documents (For example: For 2011, India's Census missed 27.85 million people, a population roughly the size of the state of Punjab at the time. The homeless and those who stay on the road side, wandering people, too tend to get left out of electoral rolls, www.livemint.com, Monday, 20 April 2020). This invisible population often gets ignored while framing policies, but they too have their own basic needs to subsist in the economy. They need food, water, clothing, and shelter to survive in this World. Still, when we try to equate food security or estimate per capita holding of food based on available food and size of the population, we will land on wrong conclusions because the invisible population lies outside the purview of the official data set. The main reason for such a conclusion is that our accounting is mainly on the documented population only, i.e., population which comes under official statistics. Thus, counting the actual or real population of a country, we should have to add the documented population along with the invisible population (Documented population + Invisible population). The malthusian theory will have more relevance in the context when the invisible population and their daily requirements for subsistence are taken into consideration. According to the current statistics, the population of India stood at 133.92 crores, but there arise the question of missing numbers. Whether these groups are properly represented in our population figures, or they are missed out is also a serious matter of concern. Enhanced life span and high dependency ratio in the population tables are also a prominent matter to consider. Demographers point out that by 2030 India's demographic structure is likely to alter, and in the next four decades, the elderly population (60+) will triple in India (James, 2011).

In the examination of the linkage or imbalance between population growth and food supply, not only the production or supply side of food but also its distributional pattern should play a pivotal role. In India, we are enjoying food security and a copious number of food-deprived people due to distribution inefficiencies. The major cause of deprivation is the unequal distribution pattern existing in the economy. The self-centered or selfish nature persists in the minds of few human beings forced them to grab and appropriate more resources beyond their requirements, which in turn reduces the availability of food to fellow beings. Such accumulations lead to cut-throat competition and ruthless exploitation of resources, which puts excessive pressure on the environment, which in turn demolishes the sustainability of the environment and its production capabilities. Even if the equity in the distribution exists in the economy, a mismatch in the population figures and food supply will arise when we try to incorporate the invisible population, dependency figures, and future population into the data set. But, even in the present day, all countries are generally relaying on the official data set for the estimation of food and population figures and will entrap in mistaken generalizations.

A comparison of population figures, as well as food grain production, is examined through two different figures given below. Figure 1, explains population growth that takes place in India and China since 1950 and projects 2100. Figure 2 and table1 examines the trends of food grain production in India from 2013-2017.

Figure 1: Population Projections: India and China



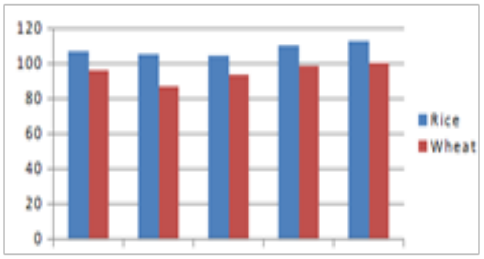
Source: United Nation Department of Economic and Social Affairs, 2018

Table 1: The trend in Food Grain Production in India from 2013-2018 (Million tonnes)

Crops	Production (in Million Tons)				
	2013-14	2014-15	2015-16	2016-17	2017-18
Rice	106.65	105.48	104.32	110.15	112.91
Wheat	95.82	86.52	93.50	98.38	99.70

Source: Department of Agriculture, Cooperation & Farmers Welfare

Figure 2: The trend in Food Grain Production in India from 2013-2017 (Million tonnes)



Source: Department of Agriculture, Cooperation & Farmers Welfare

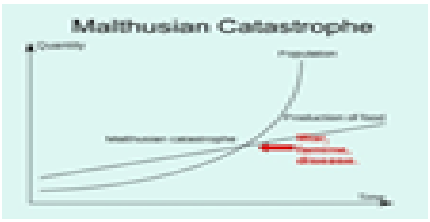
It is apparent in figure 1, that the Indian population would surpass China by 2025-30. We are experiencing an exponential population growth since 1950, and the population projection indicates that it will reach its maximum in 2060-65, which is about 170 cr. In table 1 and figure 2 it is clear that the food grain production increases at an arithmetic rate. The production of rice is increased from 106.65 million tons to 112.91 million tons (2013-14 to 2017-18), and the production of wheat is increased only from 95.82 million tons to 99.70 million tonnes.

It is crystal clear that the production of food grains is increasing at a very slow rate comparing to population growth. But in the future, it will be a strenuous task for us to equate the demand for food with our increasing population cohorts. More innovative technologies should be evolved to maintain quantity and quality of food grain production ample in size, and proper planning should be made to curb the pressure of growing population.

Malthusian Catastrophe in the Current Scenario

The superimposition of figures 1 and 2 points out that the population is increasing at an exponential or geometric rate and food grain production at an arithmetic rate, which proves the basic tenet of the Malthusian population and such a move will end in Malthusian Catastrophe. Malthus, in his essay "Principles of Population" (1798), rightly pointed out that even after 200 years of population growth and food supply will be in the ratio 259:9, after three decades, it will be 4096:13. After 2000 years, the ratio will move in such a direction, which is not even possible to calculate.

Figure 3: Malthusian Catastrophe



Excessive population pressure often exerts severe strain on the natural resources, whether it is land, water or air, and so on. Consider the case, when the population increases the number of vehicles used per capita in terms of two-wheeler or four-wheelers will also increase at an alarming rate. According to a study conducted in the United States, with 7.7 billion global populations, around 1.4 billion cars will be on the road, and it may reach 2 billion by 2020. Such an over the pressure of population and vehicle density produce excessive strain on nature in the form of noise and air pollution. Similarly, the use and disposal of plastic to produce a far-reaching impact upon nature. The ruthless exploitation of non-renewable natural resources to satisfy the increasing demands of the growing population too produces serious problems. Nature has its law, as is clear from the wordings of Franklin D. Roosevelt, the 32nd President of the United States from 1933 till 1945, "Men and Nature must work for hand in hand, the throwing out of balance of the resources of nature throws out of balance also the lives of men." The whole world is now under the threat of the pandemic COVID 19, lakhs of people lost their lives, and lakhs are suffering from the attack of this virus. Table 2 gives a detailed explanation of the death toll faced

by different countries as a result of COVID 19, as well as the number of people infected by the virus. The fatality rate shows the dangerous situation we are facing, and a considerable decline in the population figures takes place as a result of such a pandemic underline the adoption of positive checks of population controls as envisaged by Malthus in his theory.

Table 2: Covid 19: A Detailed Picture of Total Cases and Deaths

Nations	Total Cases	Deaths
World	5,404,512	343,514
United States	1,618,757	96,909
Italy	230,158	32,877
Spain	235,400	26,834
France	142,482	28,379
United Kingdom	261,188	36,914
Brazil	363,211	22,666
Russia	362,342	3,807
India	145,380	4,167

Source: WHO COVID-19 Dashboard

Inter face with the issue of Malthusian Catastrophe Efforts to confront the issue of Malthusian Catastrophe

India's government has introduced various population policies since 1952, but our population pressure continues to rise even today. It is a hopeful fact that some of the south Indian states are moving towards the path of declining population growth, but still, the total population of India is mounting up. The National Population Policy, 2000 tries to attain a stagnant pace in population growth by 2045. But the current trend of the population reveals that it is going to be an arduous task for the government. So, it is essential to employ intensive efforts and prudent family planning programs to save the country not to be slipped into the so-called Malthusian trap. A new initiative in the population policy is also essential, which will incorporate the invisible section of the population. Subsidiary policies should also be framed to deal with population pressures in an apt manner. Proper contraceptive education should be imparted to the people, and its feedback should be monitored regularly. The process of awareness programs about the importance of population control should start from the slums and the villages. The government can properly channelize the initiatives of local self-government institutions to educate and create awareness among the public from the grass-root level.

Increase the production of food is the eternal solution to the problems of food security, but it should be done without compromising the quality of food that we produced. The wastage of food and its minimization is the other important factor that was seriously jeopardizing our efforts in the attainment of food security. This is one of the main goals of sustainable development, which was adopted by the UN in September 2015, which came into effect from January 1st, 2016. Out of the 17 Sustainable Development Goals (SDGs), Goal 12 focuses on this as to "Ensure sustainable consumption and production patterns, contains a wide range of targets, one of which is closely related to Think. Eat. Save. And SDG Target 12.3 seeks to halve global food waste at retail and consumer levels, as well as to reduce food loss during production and supply. To measure food waste and losses, two indices have been proposed: Food Waste Index (FWI) and (FLI). Proper development of all these, as well as its application, will do more benefit to society.

To combat the Malthusian problem, food supply bottlenecks should also be resolved .while comparing with developed countries, our yield of food crops is considerably less. Even though there is a quick increase in productivity after 1965 because of the usage of wide yielding varieties of seeds, fertilizers, and other methods embedded in the green revolution, the food grain production has not risen to our expectation to meet the growing demands. The main reason for that riddle situation is the absence of adequate sophistication in the Indian agricultural system. Agricultural mechanization and modernization should be boosted to rectify this problem along with the efficient land reforms. Proper remedies should be evolved through scientific research to mitigate the ill effects of climate change on life and life forms. While discussing the population growth, it is important to consider some of the non-Malthusian concepts too. One variable that requires urgent attention is the impact of the enormous growth of the population on the quality of the environment

and its production potentials. For meeting their needs, humans' beings are ruthlessly exploiting and contaminating nature. The externalities of such harsh behavior will aggravate the upcoming catastrophe. When countries strive towards growth, pollution, too, came as a residue of it; Earth has a carrying capacity to accommodate a given level of population and human activities. If they move beyond the limit, it will, in turn, result in calamities.

To recapitulate, the population theory of Malthus has great relevance in the contemporary global scenario in the aftermath of the COVID pandemic that dismantles the living conditions of every walks of life. The increasing rate of population in India and across the world will find it difficult to balance with the food grain production. Associated with this, all the negative externalities of the population growth will also add fire to the existing situation. Irrespective of all types of bottlenecks, both the rate of growth of population and consumption is sky rocketing day by day. It would make us maintain the goal of sustainable development an impossible task. A developing country like India with diverse ethnicity and culture, actions that emanate from the top level of government won't be effective and fruitful. Active participation of local government is a pre-requisite for the success of population control as well as the devising of new methods to increase food supply. It is so crucial to focus both supply and demand-side constraints to resolve the issue rather than sticking on the population control alone.

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