



Original Article

A Geographical Study of Growth of Agricultural Production and Population

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Abstract

"A Geographical Study of Growth of Agricultural Production and Population," examines the critical relationship between agricultural development and demographic changes within the Solapur District, India, from 1971 to 2011. Agriculture, defined as the cultivation of soil, growing and harvesting of crops, and domestication of animals, is highlighted as the primary sector that provides essential human needs. This research addresses the acute problem of rapid population increase outpacing agricultural production, which is a significant challenge for planners given limited land resources. Through data collection, processing, tabulation, and cartographic techniques, this study determined the percentage change in population and food production. Key findings revealed a stark disparity: the population of Solapur District increased by over 64% during the four decades, while food production rose by only 38.2%. This leads to an alarming nearly 30% deficit in food supply. Although per capita cereal availability has increased due to agricultural modernization and irrigation, per capita pulse availability has declined, compounded by high population growth and land conversion to cash crops. The abstract also underscores the impact of income disparities on food consumption, significant iron deficiency, and child malnutrition within the district, attributing these issues to low per capita income, inadequate food production, and faulty distribution patterns.

Keywords: agriculture, land, crops, population growth, food production.

Introduction

Food, clothing, and shelter are the basic needs of humans in daily life; among these, food is the most significant need for humans. In the absence of shelter and clothes, a man can prolong his life for a considerable period, while on the other hand, this indicates that food is essential for the existence of man. Food quality, human health, and other mental, physical, and spiritual characteristics are influenced to a greater extent. As we know from the definition of geography, humans are the central point of study on Earth. All dimensions of knowledge, directly or indirectly, are intimately associated with mankind's welfare. In contrast, mathematics, Physics, Chemistry, Medical Science, Social Science and Economics are all associated with identifying and solving the problems of humans inhabiting the Earth's surface. Currently, due to improvements in medical facilities, the death rate has declined substantially, while the birth rate has remained largely constant or declined very slowly due to social awareness. As a result, the population of countries such as India is increasing at a very rapid rate, resulting in serious and acute problems before the planners. All efforts to improve the situation were thrown out of the gear. At the same time, agricultural production is also increasing, but the growth of agricultural production is not keeping pace with the growth of the population, since we know that the resources and means of the earth are limited and fixed, and cannot be

If so, then the increase in agricultural land, in particular, will be at the cost of deforestation, which is not desirable in the present situation. To retain ecological balance, any kind of development is desirable, and no doubt it must be without disturbing the ecological balance. This clearly indicates that sustainable development should be carried out in every field in general, and in the agricultural sector in particular. The relationship between agricultural production on the one hand and growth and existing population on the other are important parameters for in-depth analysis to precisely understand the nature of agricultural problems in a particular region.

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Land is the most significant component of a region's natural resources. The importance of agriculture in the economic development of any country, whether rich or poor, is borne out by the fact that it is the primary sector of the economy that provides the basic ingredients necessary for the existence of mankind. Agriculture also provides most of the raw material, which when transformed into finished products, serves as a human race. In an agrarian economy, agriculture plays a strategic role from several perspectives.

In addition to supplying food, agriculture provides raw materials for various industries. Agriculture generates an export surplus to earn a foreign exchange. Agriculture is not only a supplier of goods for domestic and export needs but also a supplier of production factors such as capital and labor. The ideas that form the intellectual and emotional bases of agricultural fundamentalism have deep roots in human history. Throughout most of its existence, humankind has been either a pastoral

The Choice of the Topic

Among the various problems, the agricultural problem stands, perhaps at the first rank. India is an agricultural country in which approximately two-thirds of the population is engaged in the agricultural sector. Agriculture is the main source of the economy in India, and a sizable proportion derives its livelihood from agriculture itself. Even today, many studies pertaining to agriculture have been conducted at the National and International levels. Undoubtedly, such studies furnish the basis and fundamental information, which give generalization of the

problems and their magnitude at local or regional levels, enabling us to understand their problems very clearly.

Study region

The drought-prone area in Maharashtra average abuts one trend in the geographical area of the site: the entire Solapur region. The Solapur district, which occupies the southern part of Maharashtra, lies between 17 °10' N and 18 °32' N latitudes and 17 °42' E and 76 °12' E latitudes. The topography of the region, comprising long, low uplands separated by the shallow basin, has an elevation of about 550m above the mean sea level.

Objectives

1. Determine the proportion of agricultural land to total geographical land and study the availability of infrastructural and geographical factors on which the development and growth of agriculture depend.
2. Determine the percentage change in the population and food production.

Methodology

Data collected from different sources were processed, and the proportions and percentages were calculated. The processed data were tabulated, and cartographic techniques were applied to represent the data according to the requirements. The choropleth maps were prepared. Some data were represented through graphs, charts, and bar graphs. The represented data were interpreted and analyzed to determine the following:

Table No. 1 Percentage changes in population and Food Production 1971-2011

Thasil	Population 1971	Population 2011	Population % Change	Food Production in tones	Total food in tons 2011	Food Production % change 1971-2011
Karmala	151493	254847	68.2	3640	4536	24.6
Madha	192710	327165	69.7	2585	4731	83
Barshi	262716	360449	37.2	3485	6367	82.7
N.solapur	487134	1080841	21.9	3321	2708	-0.81
Mohol	142334	271132	90.5	3890	6951	78.7
Malshiras	107823	482214	47.2	3175	5209	64.1
Sangola	155516	291040	87.1	2620	2354	-0.89
Mangalwedha	107823	2000232	85.7	2490	3767	51.3
Pandharpur	187813	501105	66.8	3120	2400	-0.76
S.Solapur	133343	231836	73.9	3300	3716	12.6
Akkalkot	206678	314666	52.2	2890	3659	26.6
District Total	2253840	4315527	63.67	34516	46398	38.2

Source: socio-economic abstract of solapur district 1971-2011

Percentage Changes in Population and Food Production 1971-2011

It is now necessary to provide information on food production in the region under study over the last four decades. It is noted from Table 8.2 that food has undoubtedly also increased for the same period only to 382 percent, which is much lower than the population growth for the district as a whole. This is because the land resources are the same and cannot be expanded further. If they are expanded, forest land will be converted into agricultural

land, which is not desirable in the present situation, because land under forest is already negligible. Food production is increasing at a much lower rate than population growth. In a region such as Solapur, there is only 2.4% of the area under good forest; hence, there is no scope for increasing land for higher food production. In addition, there was insufficient rainfall to raise agricultural productivity for the district as a whole, and the total food was produced 34516 tons in 1971, which increased to 46398 tons in 2011. (Fig.1)

Similarly, the growth pattern of food was also observed for different tahsils in the Solapur district. It was

highest for Mohol tahsil because of better irrigation facilities, and lowest for North Solapur tahsil because of low irrigation facilities. The growth rate of food production has varied significantly in this region. Karmala, South Solapur, Mohol, Pandharpur, and Akkalkot Tahsils showed a higher growth rate in food production than the average growth rate in the region. Barshi, Malshiras, Sangola, Mangalwedha, and North Solapur Tahsils have shown lower growth rates in food production than the region as a whole.

In short, it may be concluded that during the last four decades, the population of Solapur District has increased by more than 64 percent, whereas food production has increased to only 38.2 percent during the same period. This gap between the population growth rate on the one hand and food production is remarkable. This must be considered an alarming problem before the region under study, as it is clear from the fact that there has been an almost 30 percent deficit in food supply in the region under study.

Agricultural production, despite various efforts being made by the government of India to enhance per unit agricultural production in order to feed the teeming millions every decade. Undoubtedly, the region under study is in a position to make it self-sufficient in food, because abundant irrigation facilities are being made available. Simultaneously, subsidies are being made available for farmers to purchase fertilizer and high-yield varieties of seeds, ensuring higher agricultural production per unit of land. Therefore, changes in agricultural production for various grains during successive decades have also resulted in an impressive increase in the growth of food grains.

Income and Nature of the Food

According to a report published by the Tata Fundamental Research Centre, Mumbai, variation in the income of the population also affects food consumption. According to the economic characteristics, the population can be divided into four classes:

1. The lower poor economic class saves a very insufficient diet, subject to serious undernutrition; nearly 20% of the population is included in this class in the Solapur district.
2. The poor class, comprising 30% of the population, is subjected to nutrition.
3. The middle class comprises 45% of the population in society; it is assumed that this class enjoys an adequate diet without excessive consumption of food. The diet of this class is generally based on the nutritional norms.
4. The rich class: consisting only five to ten percent population due to high income, they can afford rich nutritional food from the sources other than food grains.

According to an economic survey of the Solapur district (2007-2008), nearly 70 percent of the family population suffers from iron deficiency. The death rate in children of below five years was caused by malnutrition and was highest in the region under study. According to Dastane (Glimpses of Maharashtra), nearly 57% of rural populations and 55% of urban populations are unable to

meet the minimum calorie standard requirement. Low per capita income, decreased food production, and faulty distribution patterns of food grains are important reasons for this.

Conclusion

Solapur District experienced a significant increase in population of over 64% between 1971 and 2011, while food production during the same period only increased by 38.2%. This substantial gap between population and food production growth is considered an alarming problem, indicating an almost 30% deficit in food supply within the region.

Despite efforts by the Indian government to enhance per-unit agricultural production through modernization, the use of high-yield seed varieties, fertilizers, and increased irrigation facilities, which have led to an impressive increase in food grain growth, the region still faces challenges.

Regarding per capita availability, cereals increased from 261 g/day in 1971 to 369 g/day in 2011. Mohol Tahsil showed the highest cereal availability. However, pulse availability decreased from 35 g per capita per day in 1971 to 30 g per capita per day in 2011, falling short of the standard requirement of 50 g per day. This decline in pulse availability is attributed to high population growth and the diversion of land to cash crops.

Overall food availability per capita per day for the region increased from 303 g in 1971 to 399 g in 2011. However, income disparity significantly affects food consumption. Approximately 20% of the population in Solapur District belongs to the lower poor economic class, suffering from insufficient diets and serious undernutrition. Another 30% were considered poor and subjected to nutritional deficiency. An economic survey of the Solapur district (2007-2008) revealed that nearly 70% of families suffer from iron deficiency, and the death rate in children under five due to malnutrition is the highest in the region. Low per capita income, decreased food production, and faulty distribution patterns were identified as major reasons for these nutritional deficiencies.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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