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Growth of Population as related to area under crops in Coimbatore District (Madras State)*

by

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Introduction: "The tendency of power of every species including the human one is to increase at a geometric rate, while under the most favourable circumstances usually to be found, its subsistence increases at an arithematic rate", said Malthus (1792). One of the darkest spots on the face of the earth but which was systematically hidden or covered over by the dominant groups is the existence of the great demographic areas of starving population, which dominate enormous regions. Food is the nation's biggest problem. According to a recent United Nation's Survey, 80 per cent of the people of the world have never had and will not have in the foreseeable future what an American or European family takes for granted as a good square meal. Till now the countries have concentrated on agricultural development on modern scientific lines and large scale industrialisation with foreign technical aid. But experience during the last decade and half has shown that in the desparate race between population growth and economic development, the latter has been losing. The addition to national income generated by both these approaches have been more than swallowed up by the increasing number of new mouths. Thus the biggest barrier in the path of rapid economic development is the existing large population. The country cannot lower her standard on living any further. Nor can any one suggest raising the death rate. So the way out appears to be rapid economic development and a drastic reduction in the birth rate.

Coimbatore district being a main centre for textile industries and allied industries it was a conventional saying in the past that "Coimbatore grows more cotton than food". The area under food and non-food crops from 1941—'42 to 1960—'61 has not shown much difference. But the present day food scarcity and the prevailing conditions in this district has made the people to think about the ways and means of tackling the problem. Whatever may be the external factors affecting this situation, the seriousness when viewed with a bit of agricultural bias, the pattern of variation of area under food and non-food crops and the overwhelming population

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including the emigrants from the neighbouring districts and states due to industrialisation may be the real contributing factors for the present food crisis in particular.

Methodology: The decennial population from 1891 to 1961 was taken and the growth rate was studied by means of applying the orthogonal polynomial method. The effect of population (x_1) and the area under non-food crops (x_2) on the area under food crops (Y) in the district over a period of time (x_3) was studied by means of multiple regression type of function fitted by conventional gauss multipliers.

Results and discussion: When the growth rate over a period of seven decades was analysed there was a general increasing trend in the values. This increasing trend and its rate of increase, if determined, will be of immense use for the planners to have an idea about the quantum requirements of food, clothing and other needs. So, concentration was laid in the determination of the increasing trend so as to give a mathematical model. When by adopting the orthogonal polynomial method trend determination was applied with more unbiasedness and with greater significance, the trend was found to be quadratic with coefficients of variable and the constant to be positive. The equation obtained was:

$$Y = 27{\cdot}82\ x^2 + 5{\cdot}90\ x + 1780{\cdot}42$$

From the equation it can be inferred that for any value of 'x', namely time, the population (Y) will be in the increasing trend always. With the larger coefficient for x^2 and the constant being very high, the rate of increase was steady and tremendous and when estimated for the year 1971 and 1981 the values would be 40,82,000 and 46,21,000 respectively. In the year 1981 the population in this district under the prevailing normal conditions will be 1·5 times of that in 1951. So the drastic growth will lead to added complications and everlasting problems, if left unchecked.

Since the growth of population is on the upward trend and as Coimbatore district is progressing in industrialisation at a rapid phase, particularly in textile industry, which in turn paves the way for large scale conversion of fertile lands to non-food crops like cotton, the study on the effect of these two factors over time on area under food crops was made by means of multiple regression. The correlation coefficient between area under crops and the area under non-food crops, interpolated population and the time for the 20 years i. e., from 1941—'42 to 1960—'61 were worked out, vide table below.

Table of correlation coefficients.

	Y	x_1	x_2	x_3
Y	1·00000	0·06105	— 0·32857	— 0·31454
x_1		1·00000	0·48042	0·53594
x_2			1·00000	0·98983
x_3				1·00000

Where Y = Area under food crops
x_1 = Area under non-food crops
x_2 = Population
x_3 = Time

The negative correlation coefficients between the area under food crops and the population as well as with time indicated that in the course of time when there was a sudden and steady increase in the population the area under food crops decreased considerably. This aspect is, still true with the positive correlation between area under non-food crops and the population over the very same period. This decreasing trend of area under food crops with an upward trend in area under non-food crops in this district is explainable because of the growing industrialisation and large scale need for cotton to feed the textile mills which are numerous in this district.

The extence of high inter-correlation between the independent variables, can be used in a better way for analysing the area under food crops when the values are expressed in terms of an equation. So the multiple regression equation was worked out with the same variables. The following equation was obtained.

$$Y = 1504{\cdot}2 + 0{\cdot}31754\, x_1 - 0{\cdot}06572\, x_2 - 0{\cdot}41967\, x_3$$

The equation showed that for every one per cent increase in area under non-food crop there is a corresponding increase in area under food crops by 0·32 per cent. Since b_2 and b_3 are negative the influence of population and time is independently acting at a negative rate while keeping all other factors at constant level. Though b_1 is positive it is less than one and hence it is acting at a diminishing rate. The cumulative effect of all the three factors on the area under food crops is also at a negative scale since $\leqslant$ bi is — 0·16875. Of the two negative values i. e., b_2 and b_3, the value of b_3 is more significant than the value of b_2, indicating that as time goes on the area under food crops will be reduced, which in turn will result in an increase in the area under non-food crops.

The achievements of the industrial sector during the last 10 years are impressive particularly in comparison with the situation before India became free. The index of industrial production of cotton textiles showed an increase from 100 in 1951 to 111·1 in 1959. As against a per capita annual consumption of about 11 yards of cloth in 1951 the figure for 1959 was about 16 yards.

It was also argued by one school that noval schemes to retared population growth are unnecessary in India because of the rapid increase in national income that can now be expected from industrialisation. The per capita annual income has increased from Rs. 246/- in 1951 to Rs. 286/- in 1961, in terms of 1948—'49 prices showing an increase of 14 per cent. During the same period the population has increased by 21·5 per cent.

From the above facts it can be inferred that Coimbatore, being the Manchester of South India, would have increased her industrial nature. This being the main cause, the area under food crops has reduced giving way to non-food crops. But the population also increased at an enormous rate resulting in the food crisis. The population growth may also be accounted for by the emigrants who are coming to this district from neighbouring districts as well as from other States seeking employment in industries. The plans to expand the industrialisation of our country will, in turn, increase the number of industries in this district also in due course. The growth of industries will reduce the area under food crops further. The high negative value of b_0 factor that is time on area under food crops may be due to the above reason.

Conclusions: The national income as well as the per capita income can be increased if more attention is paid to industrialisation. But the population growth model from the study showed that the population will grow indefinitely, if left unchecked. To cope up with this, there are two alternatives:

(i) to fix the acreage under commercial crops so as to meet our needs and devote more area to food crops and

(ii) to check the population growth. Otherwise we will only be facing a food crisis in the foreseeable future.

REFERENCE

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