

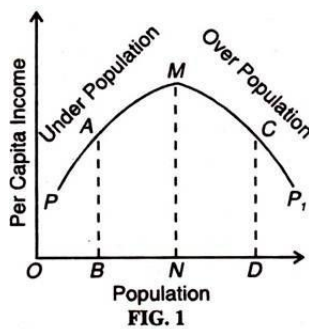
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 Topic : Explanation of Optimum Theory of Population with graph

Explanation to the Optimum Theory of Population:

Given these assumptions, the optimum population is that ideal size of population which provides the maximum income per head. Any rise or diminution in the size of the population above or below the optimum level will diminish income per head.

Given the stock of natural resources, the technique of production and the stock of capital in a country, there is a definite size of population corresponding to the highest per capita income. Other things being equal, any deviation from this optimum-sized population will lead to a reduction in the per capita income.

If the increase in population is followed by the increase in per capita Population income, the country is under-populated and it can afford to increase its population till it reaches the optimum level. On the contrary, if the increase in population leads to diminution in per capita income, the country is over-populated and needs a decline in population till the per capita income is maximised. This is illustrated in Fig. 1



In the figure population is measured along the horizontal axis and per capita income on the vertical axis. In the beginning there is under-population and per capita income increases with population growth, the per capita income of OB population is BA; which is less than the maximum per capita income level NM. The ON size of population represents the optimum level where per capita income NM is the maximum.

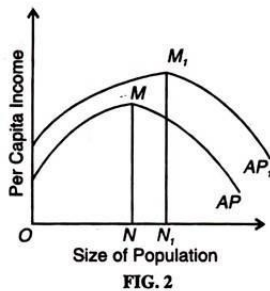
If there is a continuous increase in population from ON to OD then the law of diminishing returns applies to production. As a result, the per capita production is lowered and the per capita income also declines to DC due to increase in population. Thus ND represents over-population. This is the static version of the theory.

But the optimum level is not a fixed point. It changes with a change in any of the factors assumed to be given. For instance, if there are improvements in the methods and techniques of production, the output per head will rise and the optimum point will shift upward.

What the optimum point for the country is today, may not be tomorrow, if the stock of natural resources increases and the optimum point will be higher than before. Thus the optimum is not a fixed but a movable point.

This is explained in terms of Cannan's theory. According to Cannan, "At any given time, increase of labour up to a certain point is attended by increasing proportionate returns and beyond that point further increase of labour is attended by diminishing proportionate returns."

The per capita income is the highest at the point where the average product of labour starts falling. This point of maximum returns is the point of optimum population. This is illustrated in Figure 2.



The size of population is measured on the horizontal axis and the average product of labour on the vertical-axis. AP is the average product of labour or income per head curve. Upto ON, increase in population leads to a rise in the average product of labour and per capita income.

Beyond ON, the average product of labour and per capita income fall. Hence when population is ON, the per capita income is the highest at point M. Thus, ON is the optimum level of population. To the left of ON, the country is under-populated and beyond ON, it is over-populated.

However, ON is not a fixed point. If due to inventions there are improvements in the techniques of production, the average product of labour might increase and push the level of per capita income upward so that the optimum point rises. This is shown in Figure 2 where the AP1 curve represents the higher average product of labour and point M1 shows the maximum per capita income at the new optimum level of population ON1.

Dalton's Formula:

Dalton has deduced over-population and under- population which result in the deviation from the optimum level of population in the form of a formula. The deviation from the optimum, he calls maladjustment. Maladjustment is a function of two variables, the optimum level of population O and the actual level of population A. Then the maladjustment is

$$M = \frac{A - O}{O}$$

When M is positive, the country is over-populated, and if it is negative, the country is under-populated. When M is zero, the country possesses optimum population. Since it is not possible to measure O, this formula is only of academic interests.

Criticisms

- No evidence of optimum level.
- Impossible to measure optimum level.
- Optimum level is vague.
- Correct measurement of per capita income is not possible.
- Neglect the Distributional aspect of increase in per capita income.