An Assignment on-

OPTIMUM THEORY OF POPULATION

Course NO-204

Course Name: Population Geography

Submitted to-
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**Introduction**

Human has a tendency to increase population number much rapidly in proportion to his mean income and capability of looking after the children. For this reason, population needs to be checked at certain points. Though many social scientists and economists do not believe that Malthus disaster is helpful or appropriate to control population, but they believe that human has the knowledge and ability to reach optimum population in a convenient way, and thus optimum theory of population has come to light. (Rouf, Bilah and Rahman, 2007)

**History of Optimum population Theory**

The optimum theory of population was propounded by Edwin Cannan in his book Wealth published in 1924 and popularized by Robbins, Dalton and Carr-Saunders. Unlike the Malthusian theory, the optimum theory does not establish relationship between population growth and food supply. Rather, it is concerned with the relation between the size of population and production of wealth. The Malthusian theory is a general theory which studies the population problem of a country in keeping with its economic conditions. Thus the optimum theory is more realistic than the Malthusian theory of population. (Gupta, 2010)

It is also called modern theory of population. In recent years, Prof. Robbins, Dalton and Carr- Saunders have refined and polished the theory and put it in a more presentable form. This theory is an improvement over the Malthusian Theory.

**Statement of the Theory**

The founders of the theory state it as-

"Given the natural resources, stock of capital and the state of technical knowledge, there will be a definite size of population with the per capita income. The population which has the highest per capita income is known as optimum population".
- **Optimum Population**: The economists like Carr Saunders considered 'optimum population' as that which produces maximum welfare. On the other hand, Prof. Cannan defined this theory in terms of 'return to labour'. He remarked, “Knowledge and circumstances remaining the same, there is what may be called maximum return when the amount of labour is such that both an increase and decrease in it would diminish proportionate return.” Similarly, Bounding has rightly observed, “Optimum population is that at which standard of living is maximum.

- **Under population**: If the actual population in a country is less than the optimum or ideal population, there will not be enough people to exploit all the resources of the country fully. Thus, the population and the per capita income will be lower. In other words, if the per capita income is low due to too few people, the population is then under population.

- **Over Population**: If the actual population is above the level of optimum population, there will be too many people to work efficiently and produce the maximum goods and the highest per capita income. As a result, the per capita income becomes poorer than before. This is the stage of over population. In other words, if the per capita income is low due to too many people, the population under these circumstances would be over population.

**Assumptions of the Theory**

The optimum theory is based on two important assumptions:

1. The proportion of working population to total population remains constant as the population of the country increases.
2. As the population of a country increases, the natural resources, the capital stock and state of technology remain unchanged.
Diagrammatic Representation of the Theory

In the diagram I volume of population is shown along OX axis and income per head along OY-axis. OS is the income per head which gives only subsistence wage rate to the population. This level of wages puts the minimum limit to the income per head.

The subsistence income per head can prevail with two levels of population.

1. When population is too small to exploit the country's resources with maximum efficiency. This is the level of OA population.

2. When population is too large and the efficiency falls to give only a subsistence income to the labor force. This is the level of OC population.

OB shows optimum population which uses the available resources to give itself the maximum income per head. For a population less than OB, income per head increases with the increase in population. For a population higher than OB, income per head can increase with the decrease in population through preventive checks.

The dotted curve in the diagram shows the level of income per head with an improvement in technology or expansion of foreign trade. This will help to raise the income curve and generate population growth until wages are once again equal to subsistence level.

Figure: Diagrammatic Representation of Optimum Population Theory
Dalton’s Formula

Prof. Dalton expresses the theory in the form of a formula which is given below:

\[ M = \frac{A - O}{O} \]

where:
- \( M \) — Maladjustment or deviation from optimum population.
- \( A \) — Actual population
- \( O \) — Optimum population

If \( M \) is zero, population is optimum, when \( M \) is positive, it is over population, when \( M \) is negative, and it is under population. Therefore, optimum population is not fixed and a rigid one. It is rather variable and relative to resources and technology. Optimum population is not just an economic concept but qualitative in nature. Prof. Cannan has correctly remarked, “It is being perpetually altered by the progress of knowledge and other changes affecting the economic system. It is, thus, a dynamic concept. It may be higher or lower as different methods of production are used.” (Economic Discussion, 2014)

Benefits of the Theory

The theory is a landmark in the science of demography. Its merits are under noted:

1. **Comprehensive Approach:**

   It explains the problems of population in a comprehensive way from the production side. It also explains the relationship between productive efficiency and production.

2. **Qualitative Nature of the Theory:**

   Prof. Bye said, “Optimum population is difficult to find because size of population must lead to the fullest development of social and economic life.”

3. **Pragmatic Approach:**

   This theory is also pragmatic, i.e. it is concerned with practical results.
4. More Detailed Analysis:

The optimum theory of population provides more detailed analysis as it considers over and under- population and brings out the evils of both.

**Criticism of the Theory**

The optimum theory of population is not free from defects. The critics have criticized the theory on the basis of the following grounds.

1. Difficult to Determine Optimum Population:

It is extremely difficult to know the optimum population of a country at any time. Many factors like technical knowledge, stock of capital, per capita income and natural resources etc. have to be taken into account for this purpose.

2. A Static Theory:

The optimum theory is criticized as a static short period theory. It ignores changes in natural and human resources which affect per capita income. This theory is also silent about the important questions of the determinants of population growth.

3. Neglects Biological and Sociological Factors:

Some critics also argue that this theory has not taken into account the biological and sociological factors which govern the size and growth of population. Strictly speaking, this theory is not a theory of population. It simply explains the state of population with reference to per capita income.

4. Not a Realistic Theory:

It is pointed out that two assumptions, on which the theory has been based, are not realistic. So, the practical value of this theory is reduced. In fact, natural resources, technical knowledge and production methods are generally changeable.
5. Only Economic Factors Considered:

The critics point out that the theory takes into account purely economic factors which determine the optimum size of the population of a country. This is one side of the picture. It should also be considered the social, political and other non-economic factors.

6. Not Practicable:

The optimum theory is not practicable as it is not fixed. Thus, it is unable to guide to the formation of any policy. Prof. Robbins says that this theory is the most sterile idea of economics.

7. Distributional Aspect Neglected:

The theory neglects the distributional aspect of the problem. This theory considers simple population to income per head. This increase of population and national income cannot be useful to a country if the increased national income is not properly and equitably distributed among the various sections of the society. Therefore, realistic theory must account for income distribution as a factor in determining the optimum population.

In a brief-

- Growth Rate, Birth Rate and Death rate are not mentioned in the theory.
- It doesn't describe the income distribution of people.
- It doesn't describe the exact population figure.
- This theory is impractical and unscientific.

**Concept of Optimum Population in Details**

**Optimum population** refers to the size of a population that produces the best results according to chosen end targets. One text from 1926 presented a single end target as being "...the largest per capital income of consumers' goods possible under the given conditions". Other potential end targets in favour of lower levels of population are cited, including: long term sustainability, efficient operation of democracy, the preservation of personal freedom and the preservation of biodiversity while potential end targets in favour of higher levels of population are
cited, including the abilities: to preserve and foster cultural diversity, to stimulate intellectual, artistic, and technological creativity and to facilitate social infrastructure

**Overview:** Regarding the human population, end-targets for an optimum population include ecological sustainability, economic output and philosophical or ethical ends-in-themselves. Some commentators disagree with the concept of "optimum population", believing that the human population will always, in the long-term, be able to adapt to the requirements of a larger population. Any conception of an optimum population level must lie between a minimum viable population of the human species and the maximum level of population that can be sustained by the carrying capacity of the planet Earth.

**Estimation:** Various end-targets are often balanced together in estimating the optimum human population, and different emphasis on different end-targets cause variability among estimates.

The optimal World Population has been estimated by a team co-authored by Paul R. Ehrilch. End-targets in this estimation included:

- Decent wealth and resources to everyone
- Basic human rights to everyone
- Preservation of Cultural Diversity. Allowance of intellectual, artistic, and technological creativity
- Preservation of biodiversity.

Based on this, the estimation of optimum population was to be roughly around 1.5 billion to 2 billion people. (Wikipedia, 2015)

**Population Growth in Bangladesh**

Bangladesh had high rates of population growth in the 1960s and 1970s. Since then however it has seen a marked reduction in its total fertility rate. Over a period of three decades it dropped from almost 7 to 2.4 in 2005-2010. (Wikipedia, 2015)

A brief image of population growth in Bangladesh has given in the following page-
<table>
<thead>
<tr>
<th>Census Year</th>
<th>Population in million</th>
<th>Density of population per sq. km</th>
<th>Average Annual Growth of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901, March</td>
<td>28.9</td>
<td>196</td>
<td>-</td>
</tr>
<tr>
<td>1911, March</td>
<td>31.6</td>
<td>214</td>
<td>0.94</td>
</tr>
<tr>
<td>1921, March</td>
<td>33.3</td>
<td>225</td>
<td>0.60</td>
</tr>
<tr>
<td>1931, February</td>
<td>35.6</td>
<td>241</td>
<td>0.74</td>
</tr>
<tr>
<td>1941, March</td>
<td>41.9</td>
<td>285</td>
<td>1.70</td>
</tr>
<tr>
<td>1951, March</td>
<td>41.2</td>
<td>284</td>
<td>0.50</td>
</tr>
<tr>
<td>1961, February</td>
<td>55.2</td>
<td>345</td>
<td>2.26</td>
</tr>
<tr>
<td>1974, March</td>
<td>76.3</td>
<td>484</td>
<td>2.48</td>
</tr>
<tr>
<td>1981, March</td>
<td>89.9</td>
<td>590</td>
<td>2.35</td>
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<tr>
<td>1991, March</td>
<td>111.5</td>
<td>720</td>
<td>2.17</td>
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<tr>
<td>1998, September</td>
<td>128.5</td>
<td>850</td>
<td>1.7</td>
</tr>
<tr>
<td>2011, March</td>
<td>142.3</td>
<td>1015</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Figure: Population Growth in Bangladesh. (Source: UNDP, 2010)

**Conclusion**

Modern economists have rejected the Malthusian theory of maximum population, which if exceeded will spell misery in the country. Instead of the maximum population the modern economists have substituted the idea of optimum population.

Despite of so much criticism leveled against optimum theory, it is surely said that it is an improvement over Malthusian Theory. The optimum theory is an important landmark in the science of demography. It is valuable because it enables us to overcome the bogey of Malthusianism and give us a test of progress (in per capita income). But this theory is not useful in social life due to its static nature. Thus, it is not a guiding principle to any economic policy. It requires being re-casted in a dynamic setting for making it more successful.
References