CHAPTER : III

DISTRIBUTION AND DENSITY OF POPULATION

KEYWORDS:

What is it they are; determinents; Distribution and density of population: 1901 - 2001; and Types of density.
DISTRIBUTION AND DENSITY OF POPULATION

The term "DISTRIBUTION OF POPULATION" in geography refers to the placing of people in life. "Heavy population concentration come about from a combination of favourable historical and physical factors, but once established population centres have grown more and more through economic advantages".¹

The man - land ratio is the "CRUDE DENSITY OF POPULATION", the number of people per unit area. The numerator may be either the total population or a category such as rural, agricultural or working population, while the denominator may be the inhabited, rural, cultivable, cultivated or crop areas, or an area weighted according to its land use.²

The spatial variations in distribution and density of population have been the concern of geographers. The geographical analysis of the pattern of population distribution and density is fundamental to the understanding of population geography of any area.³ Perhaps the most fundamental aspect of the urban community involves human numbers. Community size is itself a key feature, in that it often seems to be associated variations in other characteristics.⁴ According to Hoosen geography itself is concerned with the problem of uneven distribution of population over the earth.⁵

Distribution and density of population are very striking and important aspects of population study. The distribution and density
of population are not identical rather they are so closely related that they may be discussed simultaneously. There is such a minute difference between the distribution and density of population that it is always ignored, but a close observation is required to distinguish them. "The term DISTRIBUTION of population in geography refers to the placing of people in life."\(^6\) It may be defined as "the way the people are spaced over the earth's surface."\(^7\) And the DENSITY of population is the number of persons per unit area. Their number of per unit area varies from place to place. "Land and people constitute the two vital elements of an area so that the ratio between the two is of fundamental consideration in all population studies."\(^3\) The numerator in such a calculation is population while the denominator is area.

Population distribution is a dynamic process, which is ever changing. Its cause and effect vary in the spatio-temporal frame.\(^9\) The distribution of population pattern is like a sensitive photographic plate which records changing conditions.\(^10\) The economic characteristics of an area directly influence the population pattern through the resource and economic interchange.\(^11\)

**DETERMINANTS**

(i) **Relief**: It has a dominating influence on the distributional pattern of population on the face of the earth. The areas of difficult terrain have conspicuously low population. Study area is almost a plain land of alluvium formation and is suitable for population concentration.
(ii) **Climatic Conditions**: The effect of climate upon population distribution is immensely important, not only directly upon the human organism but also indirectly through its effects upon soils, vegetation and agriculture.\textsuperscript{12} Huntington and others have stated that climate is the mainspring of civilization, the impulse for migrants, the determinant of the energy and character of nations. Man cannot go beyond the limits set by the climate. "The severity of climate whether due to the extremities of temperature or precipitation or both has been responsible for man's aversion of such areas in his pattern of occupance.\textsuperscript{13}

(iii) **Drainage and Waterbodies**: These have also been the influencing factor of the pattern of population distribution and areas of concentration. Areas of poor drainage or waterlogging usually forbid human settlement. This is why areas of poor drainage have less or population in the study region.

(iv) **Soil and Agricultural activities**: "Like any other factor of the physical environment, soils are difficult to isolate as an influence upon population distribution, but their influence is undeniable."\textsuperscript{14} Even at present, more than 80 percent population of the countryside and a good percentage of urban population on the outskirt of towns of the study area are still engaged in agricultural pursuits. Agriculture is their mainstay.

(v) **Industrialization**: The economic characteristics of an area directly influence the population pattern through the resource and
economic interchange. Human being is not just passive within his natural environment. He is active in proportion to his ingenuity, his numbers and his technical efficiency. The process of industrialization and diversification of economy have enhanced the significance, of 'economic activity' as a factor influencing the distribution of population. The type and scale of economic activities exercise considerable influence upon population distribution.

(vi)Economic Activities : Economic capability is the most important factor in the human occupancy of an area. "The availability of employment opportunities in an area, determines the carrying capacity of the area, which exerts a direct influence upon the size and spacing of people in their spread."

The carrying capacity is mainly determined by the type of economy of an area. The development of Christaller's Central - Place Theory is a successful attempt in the direction of charting the spatial lattice of economic development and the resultant population patterns. Ackerman has made a serious attempt in calculating the size of population taking into account of the area's economic characteristics, based on the following formula.

\[ P = \frac{RQ(TAST) + Es + Tr + F - W}{S} \]

Where,

P = number of people,
S = Standard of living
R = Amount of resources
Q = Factor for natural quality of resources
T = Physical technology factor
A = Administrative technique factor
ST = Resources Stability factor
W = Fragality element (wastage or intensity of use)
F = Institutional advantage and "friction", loss element consequent upon institutional characterise of society.
Es = Scale economic element (size of territory, etc.)
Tr = Resource added in trade.

Still, the complexity of Ackerman's formula is a great hindrance in its popularity.

(vii) Cultural factors: Clarke and Zelinsky lay emphasis on the role of cultural factors on the distribution and density of population.

"...........................rapid urbanization is an index of the diminishing influence of the physical environment upon the pattern of population distribution."20 The carrying capacity is mainly determined by the type of economy of an area.

Over and above, the varied physical, economic influences, the past population distribution has impact on the present and future distribution. Actually, there is a tendency for population distribution inertia.

Following table no. 4 shows the distribution and density of population in the districts of South Ganga Plain in Bihar.
### Table No.- 4

**DISTRIBUTION AND DENSITY OF POPULATION : 1991 - 2001**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>District</th>
<th>Total Population</th>
<th>Area (in km²)</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Panta</td>
<td>36,18,211</td>
<td>47,09,851</td>
<td>3,202</td>
</tr>
<tr>
<td>2.</td>
<td>Nalanda</td>
<td>19,97,995</td>
<td>23,68,327</td>
<td>2,354</td>
</tr>
<tr>
<td>3.</td>
<td>Bhojpur</td>
<td>28,80,467</td>
<td>22,33,415</td>
<td>2,474</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Rohtas (including Buxar)</td>
<td>29,00,685</td>
<td>24,48,762</td>
<td>3,850</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Buxar</td>
<td></td>
<td>14,03,462</td>
<td>1,624</td>
</tr>
<tr>
<td>6.</td>
<td>Kaimur</td>
<td></td>
<td>12,84,575</td>
<td>3,362</td>
</tr>
<tr>
<td>7.</td>
<td>Gaya</td>
<td>26,64,803</td>
<td>34,64,983</td>
<td>4,976</td>
</tr>
<tr>
<td>8.</td>
<td>Jehanabad</td>
<td>11,74,900</td>
<td>15,11,406</td>
<td>1,569</td>
</tr>
<tr>
<td>9.</td>
<td>Nawada</td>
<td>13,59,694</td>
<td>18,09,425</td>
<td>2,494</td>
</tr>
<tr>
<td>10.</td>
<td>Aurangabad</td>
<td>15,39,988</td>
<td>20,04,960</td>
<td>3,305</td>
</tr>
<tr>
<td>11.</td>
<td>Munger</td>
<td>32,02,471</td>
<td>11,35,499</td>
<td>1,419</td>
</tr>
<tr>
<td>12.</td>
<td>Lakhisarai</td>
<td></td>
<td>8,01,173</td>
<td>1,229</td>
</tr>
<tr>
<td>13.</td>
<td>Sheikhpura</td>
<td></td>
<td>5,25,137</td>
<td>689</td>
</tr>
<tr>
<td>14.</td>
<td>Jamui</td>
<td></td>
<td>13,97,474</td>
<td>3,098</td>
</tr>
<tr>
<td>15.</td>
<td>Bhagalpur</td>
<td>32,02,471</td>
<td>24,30,331</td>
<td>2,570</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Banka (Including Banka)</td>
<td>16,08,776</td>
<td>3,019</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>South Ganga Plain</td>
<td>2,45,41,685</td>
<td>3,11,37,550</td>
<td>33,670</td>
</tr>
</tbody>
</table>

**in Bihar**

**Sources**

(i) Census of India, 1991, Series - 5, Bihar; Part II - B (i), Primary Census Abstract : General Population.


(iii) Self Calculation.

**Note**

(i) Buxar, Kaimur, Lakhisarai, Sheikhpura and Jamui are new districts which are included in Census decade of 2001.

(ii) In 1991 Munger district includes the present districts of Lakhisarai, Sheikhpura, Jamui, Kageria and Begusarai. (Kageria and Begusarai are in North Bihar Plain).

The above table depicts the features of distribution and density of population in the districts of South Ganga Plain in Bihar, Highest number of persons are distributed in Patna district, (47,09,851:2001)
followed by Gaya district (34,64,983 persons; 2001), Sheekpura, the newly created district out of the portions of old Munger district, has the minimum number of people (5,25,137 persons; 2001).

Highest density is seen in the district of Patna (1,471). It is all due to favourable geographical conditions as well as dynamics of population of Patna urban centre. Nalanda district ranks 2nd in position as regards density of population per km². Lowest density of population is recorded in Kaimur district (382/km²) which is due mainly to its rough terrain, hence having sparse population.

Bhagalpur district in 1991 shows higher density figure than 2001 census decade which is due to larger of its area including Banka district. The areas of Banke district have denser population concentration.

In general nearly 2.45 crores of population were distributed within the study area having a density of 729 persons/km² which increased to 3.11 crores and 925 persons/km² respectively in 2001 census decade.

**DENSITY OF POPULATION**

Density of population is the most important index of habitability of an area. "Man and land are the ultimate elements in the life of human society so that number of people in proportion to the amount of land is fundamental consideration in population study." People and activities tend to clump or cluster at certain points, and to be spread thinly at other points. The pattern assumed by these
distributions are the key subject for "Ecological investigation."22 The concept of population density is generally expressed in terms of area expansion and the ratio of resources available in a region for human living. Compared with simple arithmetic density, physiologicalA or nutritional density is a more refined method of calculating man-land ratio.23 Over and above this, there are a few other types of density also, e.g. "Agricultural Density"B, "Critical Density (Allan)C.

A. = Physiological or nutritional density, It (Known in France by this name) is the ratio between total population and total cultivated area. It is expressed in terms of number of persons per square mile or Kilometre of cultivated land. In this type of calculation an attempt is made to reach at a better man-land relationship by excluding the uncultivated area.

B. = Agricultural Density (AD). In it only agricultural population is correlated with the total cultivated area. It is expressed in terms of agricultural population per square mile or km. of cultivated area.

C. = Critical Density (CD). Allan defines it in the following way that it is the human carrying capacity of an area in relation to a given land use system, expressed in terms of population per square unit of area. It is the maximum population density that a system is capable of supporting permanently in a given environment without danger of land. It is calculated as below.
Critical Density (CD) = 100\(\left(\frac{C}{1}\right)^{a/b}\)

Where,  
- C is the duration of Cultivated area,
- f is the duration of fallow land
- a is the per capita acreage planted
- b is the percentage of land cultivable by traditional method.

"Economic Density" (Simon)\(^D\). But in the general study of population density, "General or Crude density" also known as "Arithmetical Density" is taken into consideration. G.T. Trewartha remarked, "the most common type of population density is arithmetic density assessed in relation to total population and total area". In other words, total population of a region or urban centre is divided by the total area, and the resultant is known as "density". It is also known as "Man-land-ration". It may be deduced with the help of the following formula:

\[ Gd = \frac{T_p}{T_a} \]

Where,
- Gd is the general density
- \(T_p\) is the total population of an area
- \(T_a\) is the total area

or

\[ \frac{\text{Total Population of South Ganga Plain}}{\text{Total area in Kms}} \]

\[ D = \text{Economic Density, Simon (1934)} \]  

the French demographer, while improving upon the man-land-ratio, suggested a more comprehensive ration which he calls as a general economic density. He takes into account both, the index of size of population and the index of production.
Economic Density (ED) = $100 \times \frac{a}{b}$

Where,  
- $a$ is the index of population
- $b$ is the index of production.

REFERENCES


7. Ref. 3., op. cit., p. 17

9. Ref. 2, op. cit, p.14


12. Ref. 9., op. cit,


14. Ref. 2., op. cit, p.22

15. Ref. 11., op. cit.,


17. Ref. 2., op., cit., p. 25

18. Ref. 4., op. cit., P. 27


20. Ref. 2., op., cit., p. 35

22. Ref. 4 op. cit., p. 191