CUTTACK
STANDARD URBAN AREA

SPATIO-TEMPORAL ANALYSIS OF POPULATION

Chapter IV

NATURE AND COMPOSITION OF POPULATION
DENSITY AND DISTRIBUTION OF POPULATION
MIGRATION
GROWTH OF POPULATION
POPULATION PROJECTION
CONCLUSION
CHAPTER - IV

SPATIO-TEMPORAL ANALYSIS OF POPULATION

Introduction:

One of the most obvious manifestation of areal differentiation is afforded by the uneven distribution of the earth's inhabitants. This unevenness is because of the uneven character of the earth itself and also disparity in the distribution of conditions and requisites of man to maintain his livelihood. In other words the uneven distribution of the people on the surface of the earth is the direct result of the interaction between the pre-existing physical factors and the cultural factors developed by man himself. The progress and prosperity of any region in its regional standard is attributed to the suitability of all these geographical, social, economic and political factors which interact with each other. Their degree of interaction being directly linked up with the progress of man's civilization, determines the unevenness in the character of man's distribution on the surface of the earth.

In the modern age of developed science and technology man's socio-economic progress has become the sole criterion

to determine the intensity of the degree of concentration of man in a particular place. The suitability of the physical factors of a place along with the man's capability to change the existing factors decide the suitability of a place for the living and concentration of man. This concentration of population in certain places of a region results in urbanization. The degree of urbanization or urban prosperity is, therefore, the direct result of environmental suitability and the development of man's cultural outlook.

Whatever may be the cause of the origin of urban centres, it seems clear that the emergence and growth of city is necessarily a function of four factors such as the size of total population; the control of natural environment; technological development; and development in social organization. With the suitability of all these factors a place gradually undergoes population concentration and with the diversified economy which is reflected by the differential occupation of the numerous inhabitants, the place acquires urban character and differentiates itself from the rural area. In the practical sense a distinction always exists between urban and rural population under the assumption that the two offer much contrast in terms

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of occupation, socio-economic value systems, and economic interaction. It is a commonly observed phenomena that over since the emergence of an urban settlement, the urban population has been growing with more rapidity than its rural counterpart. The urban settlement once established tend to be centre of power and influences the whole socio-economic milieu of the area, and this helps in accelerating the process of urbanization. Again, though two types of settlements have been recognised, i.e., urban and rural, yet there is no settlement that is entirely urban or wholly rural. Urban rural concepts are only mental constructs which deviate very much from reality. In fact, there is no point in the continuum from large agglomerations to small clusters where urbanity disappears and rurality begins; the division between urban and rural population is, thus, necessarily arbitrary. Urban areas should not, thus, be differentiated on the basis of their urban-like appearance but on the basis of the economic structure, diversification of economy, specialization and dominance of secondary, tertiary and other higher forms of economic activity.

The concept of Standard Urban Area is different from that of the urban area in that, it not only comprises the core town or city but the surrounding rural areas which are

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urbanized or potentially urbanizable within a period of about 2 to 3 decades. The Cuttack Standard Urban Area includes Cuttack Urban Agglomeration and portions of surrounding four Police Stations which are rural in character. The purpose behind the inclusion of these rural areas is that they have close socio-economic links with the core town. The spatio-temporal analysis of their population in the past years reveals that they show a tendency to be urbanized in the near future because of the influence of Cuttack city and the latter may encroach upon these rural areas to be recognised as a contiguous urban area. So, the aim of this chapter is to critically analyse the population composition and structure, their economic background and future prospect both spatially and temporally so as to assess whether the rural areas encircling the urban components have the potentiality to be transformed into urban areas or not. The study also aims at analysing the process of urbanization and urbanism existing in the rural components of the Standard Urban Area. Urbanism normally refers to a process by way of which a section of population adopts urban way of life even while residing in the countryside. It implies that social institutions and attitudes which are associated with urban living tend to be found in rural population. Thus, urbanism represents a revolutionary change in the whole pattern


2 Chandana, R.C. & Sidhu, M.S., op. cit. 1980, p. 120.
of social life. It exercises its pervasive influence not only within the urban milieu but also in rural hinterland. To analyze the process of urbanism in the rural parts of the Cuttack Standard Urban Area it is necessary to analyze the change in socio-economic aspects of population on temporal basis to see whether these areas are undergoing socio-economic transformations or not. The study also aims at to assess the intensity and pattern of the change in social and economic life of the people in the rural areas of the Standard Urban Area to determine the potentiality in them to be urbanized.

Urbanization is more commonly used a term in Geography than urbanism. The term urbanization refers to a process. Lampard argues that there are three concepts relating to the process of urbanization which have currency in social sciences: the behavioural; the structural; and the demographic. The study aims at analyzing all the three aspects of the Standard Urban Area, both of rural and urban components. The behavioural concept of urbanization expresses that the size of aggregate population will affect relations between members, increasing the process of differentiation which ultimately leads to segregation. The structural concept is concerned with the

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3 Wirth, L., op. cit., p. 11.
activities of the whole population primarily related to change in economic structure. Thus, the structural interpretation of urbanization is economic and relates to the movement of people out of agricultural communities into generally non-agricultural communities. This concept gives primary recognition to the differential ordering of occupations within a given territorial space. Accordingly, urbanization is seen as a product of increasing specialization and advancing technology. The demographic concept envisages urbanization as a process of population concentration and a way of ordering a population to attain a certain level of subsistence and security in a given environment. Riessman visualizes urbanization as the whole process of change and its accompanying consequences: as a society moves from an agricultural to an industrial economy; from a small homogeneous society to a large metropolitan, heterogeneous community. Urbanization immediately involves firstly, the multiplication of points of concentration and secondly, the increase in the size of individual concentrations. This phenomena can happen by the following processes:

a) Rural population migrating to urban centres for various reasons and thus settling there.

1 Lampard, E.S., op. cit., p. 520.
4 Chandana, R.C. & Sidhu, M.S., op. cit., p. 121.
<table>
<thead>
<tr>
<th>Year/Urban Area</th>
<th>Cuttack Population</th>
<th>Growth</th>
<th>% of</th>
<th>Choudwar Population</th>
<th>Growth</th>
<th>% of</th>
<th>Cuttack Urban Agglomeration Population</th>
<th>Growth</th>
<th>% of</th>
<th>Cuttack Standard Urban Area Population</th>
<th>Growth</th>
<th>% of</th>
</tr>
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<tr>
<td>1981</td>
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</tr>
</tbody>
</table>

Source: Census of India (Orissa), Series 16, General Population Table

*It was 'Town Group' in 1961 which was replaced by Urban Agglomeration in 1971.
**The concept of Standard Urban Area was introduced in 1971.
b) Rural settlements, by virtue of their natural increase and consequent increase in their size as also the diversification of their economy, gain urban status and thus the entire rural population of such settlements become urban.

c) The urban settlements by the enactment of law extend their territorial jurisdiction as a result of which some rural settlements lying on the periphery of such urban places get merged into urban areas adding to the urban population.

The concept of Standard Urban Area takes into account all these aspects of the process of urbanization. It is a fact that the process of urbanization and the transformation of rural areas into urban character are truly manifested through the changes in population composition, structure, its socio-economic status, distribution and all the related aspects. So to recognise the process of urbanization and the spreading of urban processes in Cuttack Standard Urban Area, the spatio-temporal change of population of both urban and rural components have been considered minutely by the author in the following pages (Table 4.1 and Fig. 4.1(a)).

Spatio-temporal Growth:

The settlement of pre-historic stage of this region is undoubtedly concealed in obscurity and it is hard to trace the accurate details. However, from literatures, inscriptions and archaeological remains various informations have been gathered about the evolution of settlements in this region.
A sort of hieroglyphic inscription, similar to that of the Indus Valley, exists at Baraj at the apex of the Mahanadi Delta, north of the present Cuttack city. It shows that this part of Cuttack Standard Urban Area was under the influence of Dravidian civilization in the past.  

In the 11th century A.D. the Somavansi kings (the Kesari dynasty) built the township of Choudwar at the confluence of the Mahanadi and the Birupa. King Nrupa Keshari built his capital at Cuttack in 989 A.D and King Markhata Keshari had constructed the stone embankments on the bank of the river Kathjuri to protect Cuttack from regular floods.  
The famous Ganga monarch Anangebhime Deva III (A.D 1211-1233) had his capital at Choudwar and later on he shifted his capital to Cuttack. He built a nine-storeyed palace at Barabati and named the new capital as 'Varanasi Kataka' or 'Abhimeba Varanasi Kataka' which is today obviously known as Cuttack.  

After the Ganges, the Suryavamsi kings or Gajapati kings became powerful, having Puri as their capital. After the decline of the Suryavamsi kings the Bhoi dynasty ruled but it was short-lived. King Mukunda Deva of the Bhoi dynasty had established his capital at Cuttack, but he was killed by the Afghan king Soleman, the Muslim king of Bengal in 1568. Then the Mughals ruled Orissa till 1740. After them the Marathas ruled from 1751 to 1803 and the British ruled from 1803 to 1847. During all these periods,

2 Mahatab, H.K., History of Orissa, p.60.  
3 The World 'Kataka' implies the meaning of 'Army Cantonment' and 'Capital City'.
Cuttack remained as the capital of the Muslims, Mughals, Marathas and the British.

In 1936, Orissa became a separate province with Cuttack her capital. In 1951, this capital was shifted from Cuttack to Bhubaneswar. In 1961, taking Cuttack and Choudwar together the town-group* was formed and in 1971, this town-group was changed into 'urban agglomeration', and this urban agglomeration with some urbanizable rural components was considered as the Standard Urban Area.

Nature and Composition of Population in Cuttack Standard Urban Area:

The nature and composition of population of a region with all its peculiarities and dynamic characteristics is only one stage of a continually altering pattern, as the population composition of a region undergoes thorough and continual changes with the progress of human civilization. In the case of urban areas, the pattern of population composition is more dynamic as these areas are characterized by diversified higher forms of economic activities, division of labour and specialization.

The composition of population, or the population structure refers to those aspects of population which may be measured however inadequately. The study of population composition or structure is restricted to the aspects of age, sex, marital status, the size and composition of families and

households, economic activities, nationality, language and religion. All these quantitative aspects of population study strongly contrast to the qualitative aspects such as physical and psychological characteristics and socio-cultural grouping. The study of population composition is of immense significance in urban geography. It reveals the characteristics of a region, by the study of its inhabitants, that whether the region is urban or rural and if rural, whether it shows the tendency to be transformed into urban area in the future.

The study of the population composition of Guwahati Standard Urban Area will reveal to a considerable extent the potentiality in the rural component to be urbanized in the near future.

**Age Structure:**

Age, which is an index of a person's capability, is a significant measure of a region's vitality in relation to its socio-economic status. The man-power supply and the dependency ratio characterizing the region are guided by the age structure. The age composition of a country's population, among other things, is a sensitive index of its fertility, mortality and mobility patterns. 1 With respect to economic characteristics, it has been noted that the functional specialization of cities tends to be reflected in their age-sex composition. 2

1 Chandana, B.C., & Sichu, M.S., op. cit., p.86.
The age structure of a population is determined basically by three factors i.e., fertility, mortality and mobility. These three variables in themselves are not entirely independent and any change in one may eventually influence the other two, but social and economic conditions influence age structure through them only. The fertility rate of a population determines the proportion of population in different age categories. The influence of mortality upon the age structure largely depends upon mortality rates at different ages. Again, the influence of migration on age structure is well recognized since migration is often age and sex selective. The age structure of the two areas involved in the process of migration gets modified and as does the sex composition since areas of immigration are dominated by adult age group. So age structure of a population is one important device to determine the socio-economic status, the population potentiality and population concentration which are the determinants of the process of urbanization.

The age-pyramid reveals the population proportion in productive age group and thereby determines the economic structure of a region. The age pyramid of the Cuttack Standard Urban Area reveals that about 61.77 per cent of the total population are in the productive age group, out of which 33.74 per cent

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1Clarke, John 1., op. cit., p.66.
2Chandana, R.C., & Sidhu, M.S., op. cit., p.88.
CUTTACK STANDARD URBAN AREA

AGE STRUCTURE

1981

Fig. 4 (b)
are males and 28.03 per cent are females which shows the
clear urban character of the region. In the rural components
the productive age group is 59.78 per cent of the total
population (Table - 4.1), out of which 31.36 are males and
28.42 per cent are females. So, it is observed that the rural
components keep pace with the urban areas of the region to
reveal their potentiality for complete urbanization.

The Economic age pyramids represent economically
active population with a comparison to the economically
inactive population, which is a better indicator of the economic
structure and status of the population of a region. The economic
age pyramids highlight the combined effect of size and age
structure of a population upon the economy of the region. ¹

The age pyramid of the Cuttack Standard Urban Area (Fig. 4.1(b))
reveals that about 51 per cent of the total population of the
region are economically active and in the rural counterpart
60 per cent of the total population are economically active.
So it is revealing that the rural components of the Cuttack
Standard Urban Area are fast acquiring the characteristics
of the Urban Area.

The dependency ratio is a well known index which provides
a rough but serviceable measure of the number of people in the
so-called active age (15-64) as compared to those in the
"dependent" age group (0-14 and 65+). ²

¹Valentey, D.I., The Theory of Population, Progress

²Browning, L. Harley, "Methods for Describing Age-Sex
Structure of Cities" in Jack P. Gibb (Ed.), Urban Research
Methods, Affiliated East-West Press Pvt. Ltd., New Delhi,
The dependency ratio for the Cuttack Standard Urban Area is 62, being lowest in Cuttack city, i.e., 59 and highest in the rural components of Salipur Police Station, i.e., 93. As the ratio is low in the rural areas, by nowhere exceeding 100, it is adequately indicated that the population of the region in general and the rural components in particular are productive in nature, which is an important characteristic of urban centres.

The old age index is also another important indicator of the economically inactive population as compared to the population in active age group. This index is obtained by:

\[ \text{Ioa} = \frac{(15-64)}{(65+)} \times 100 \]

Ioa, Index of old age.

The old age index of the population of Cuttack Standard Area indicates that it is only 3 for the region being highest i.e., 23 in the rural component of Salipur Police Station. Thus it is well affirmed that the old age index being moderately low for the rural components of the Standard Urban Area, these regions are economically active which is the criterion of the
**Table: Age Structure (1981)**

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total Population</th>
<th>0-14</th>
<th>15-64</th>
<th>65+</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
<th>Density</th>
<th>Rate of Old Age</th>
<th>Index of Aging</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cuttack Standard Urban Area</td>
<td>392,017</td>
<td>73580</td>
<td>97360</td>
<td>111186</td>
<td>132277</td>
<td>199768</td>
<td>241215</td>
<td>12260</td>
<td>7416</td>
<td>19676</td>
<td>61.89</td>
<td>8.13</td>
<td>19.11</td>
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<td>2. Cuttack Urban Agglomeration</td>
<td>328,468</td>
<td>81086</td>
<td>46400</td>
<td>108366</td>
<td>117175</td>
<td>91254</td>
<td>202929</td>
<td>10727</td>
<td>6146</td>
<td>16915</td>
<td>59.86</td>
<td>45.33</td>
<td>15.07</td>
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<tr>
<td>a) Cuttack Municipality</td>
<td>269,054</td>
<td>48759</td>
<td>47765</td>
<td>96544</td>
<td>92404</td>
<td>78361</td>
<td>170765</td>
<td>7948</td>
<td>5007</td>
<td>11735</td>
<td>78.55</td>
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<td>b) Cuttack Industrial Estate</td>
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<td>1855</td>
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<td>5198</td>
<td>3333</td>
<td>8831</td>
<td>403</td>
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<td>869</td>
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<td>29.07</td>
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<td>1784</td>
<td>1588</td>
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<td>d) Jagatpur Industrial Estate</td>
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<td>796</td>
<td>1817</td>
<td>1777</td>
<td>1115</td>
<td>2892</td>
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<td>570</td>
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<td>11651</td>
<td>13352</td>
<td>1057</td>
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<td>1736</td>
<td>1336</td>
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<td>3. Rural Components</td>
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<td>11206</td>
<td>23660</td>
<td>20542</td>
<td>16824</td>
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<td>2763</td>
<td>67.27</td>
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<td>a) Tangi Police Station</td>
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<td>2271</td>
<td>1871</td>
<td>4149</td>
<td>212</td>
<td>295</td>
<td>507</td>
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<td>13.72</td>
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<tr>
<td>b) Chowdwar Police Station</td>
<td>24,139</td>
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<td>4015</td>
<td>8738</td>
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<td>6682</td>
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<td>c) Cuttack Sedan Police Station</td>
<td>20,392</td>
<td>5547</td>
<td>5624</td>
<td>10921</td>
<td>9305</td>
<td>7114</td>
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<td>646</td>
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<td>1152</td>
<td>65.00</td>
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<td>d) Salipur Police Station</td>
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<td>685</td>
<td>648</td>
<td>1333</td>
<td>1134</td>
<td>787</td>
<td>1900</td>
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<td>206</td>
<td>437</td>
<td>93.16</td>
<td>23.0</td>
<td>32.98</td>
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*Source: Census of India (Orissa) Series 16, General Population Table, 1981.*
process of urbanization. The index of aging which expresses the relationship of the young to the old in a given population has a much greater range than dependency ratio and it reveals the future socio-economic prospect of the region as a whole. This index is obtained by the following way:

\[
I_a = \frac{65+}{6-14} \times 100
\]

\(I_a\), Index of aging.

The index of aging is 15.11 for the Cuttack Standard Urban Area as a whole and within the region it varies from 10.65 to 34.22 (Table - 4.2). So this index indicates that there is potentiality in the components to be economically and socially prospered in the near future.

Thus, the analysis of the age structure of the population of Cuttack Standard Urban Area adequately proves that the rural components have a wider scope to be urbanized within the coming 2 or 3 decades and they along with the control city, i.e., Cuttack may form a continuous urban area.

**Sex Composition:**

Although the numbers of two sexes are not widely divergent, their disparity is of interest to geographers because of the contrasting and complementary roles of the two sexes in the economy and society. Sex ratio is an index of the socio-economic conditions prevailing in an area and is

a useful tool for regional analysis. In itself, the ratio is a function of three basic factors of sex ratio at birth, differential in mortality of the two sexes at different stages of life, and sex selectivity among the migrants. In its own turn, sex ratio has a profound effect on other demographic elements like growth of population, marriage rates, occupational structure, etc. The analysis of sex ratio helps in understanding the employment and consumption patterns, social needs and perhaps the psychological characteristic of a community. Equally significant is the relationship between change in sex ratio on the one hand and the trends in socio-economic life of a region, on the other. It reveals the changes in the birth and mortality pattern of the two sexes and their migrational behaviour. Thus, sex ratio is fundamental to the geographic analysis of an area, for they are not only important features of the landscape, but also influence the other demographic elements significantly and as such provide additional means and materials for analysing regional landscape.


<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total Population</th>
<th>Male</th>
<th>Female</th>
<th>Sex Ratio</th>
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<tr>
<td>Cuttack Standard Urban Area</td>
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<td>216,417</td>
<td>175,600</td>
<td>811</td>
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<td>1. Cuttack Urban Agglomeration</td>
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<td>182,268</td>
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<td>a) Cuttack Municipality</td>
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<td>149,111</td>
<td>119,953</td>
<td>804</td>
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<td>b) Cuttack Industrial Estate</td>
<td>14,089</td>
<td>8,435</td>
<td>5,654</td>
<td>670</td>
</tr>
<tr>
<td>c) C.R.R.I &amp; Other Government Colonies</td>
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<td>3,145</td>
<td>2,757</td>
<td>877</td>
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<td>32,134</td>
<td>18,658</td>
<td>13,476</td>
<td>722</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS</td>
<td>65,549</td>
<td>34,149</td>
<td>31,400</td>
<td>919</td>
</tr>
<tr>
<td>a) Tangi Police Station*</td>
<td>7,357</td>
<td>3,822</td>
<td>3,535</td>
<td>925</td>
</tr>
<tr>
<td>b) Chowdwar Police Station*</td>
<td>24,130</td>
<td>12,974</td>
<td>11,156</td>
<td>860</td>
</tr>
<tr>
<td>c) Cuttack Sadar Police Station*</td>
<td>30,392</td>
<td>15,494</td>
<td>14,898</td>
<td>962</td>
</tr>
<tr>
<td>d) Salipur Police Station*</td>
<td>3,670</td>
<td>1,859</td>
<td>1,811</td>
<td>974</td>
</tr>
</tbody>
</table>

* = Parts of the Police Station mentioned above are within the Cuttack Standard Urban Area

Source: Census of India (Orissa), Series 16 General Population Table, 1981
The most commonly used technique for expressing the sex distribution is sex ratio:

\[ \text{Sex Ratio} = \frac{\text{Females}}{\text{Males}} \times 1000 \]

Accordingly, the sex ratio for the Cuttack Standard Urban Area is 811, though in the spatial context it varies from 670 in the Cuttack Industrial Estate to 974 in one of the rural components of Salipur Police Station (Table 4.3). The analysis of the sex ratio in the urban and rural components shows that everywhere the proportion of females is below the males (Fig. 4.2). The lower proportion of the females in the population of the rural counterpart reveals the symbols of their transformation into urban areas and it is expected that in the coming 2 or 3 decades the proportion of females will fall still lower by the in-migration to these areas. The lower proportion of females (791 females for 1000 males) in the urban components indicates the pre-dominance of industrial, commercial and other higher forms of economic activity. It also reveals that the urban centre acts as the centre of gravity for the surrounding region. It is also clear that the urban centre is credited with adequate potentiality for the socio-economic interaction with the rural components of the Standard Urban Area.

There is another way of expressing sex differences which has certain advantages not possessed by the sex ratio. This is the percent male index:
\[
P_m = \frac{\text{Males}}{\text{Total population}} \times 100
\]

\[P_m = \text{Percent male}\]

It is thus computed by simply expressing the male population as a percent of the total population. The percent male index which is 55.83 for the Cuttack Urban Agglomeration and 52.10 for the rural components (Appendix - V) indicates that males predominate in the population of the region which is an important indicator of the urban economic structure. Again, the percent male active age index reveals that 34.10 and 31.06 are the index values for the urban and rural components respectively, which is above the percent female active age index of 23.07 and 23.72 respectively. In the total population, the percentage of active age people is 62.17 for urban and 59.83 for rural. This high proportion of the active age people in the total population is due to the migration and the economic structure of the Standard Urban Area. Because mobility and migration are mostly associated with the adult age groups.

It is a fact that the sex ratio in the Cuttack Standard Urban Area remains male dominated due to preponderance of males among the rural-urban migrants. This is due to: (1) Prejudice against female employment and mobility (ii) Scarcity of jobs suitable for females, and (iii) Problems of housing and high cost of living in cities which discourage many male migrants from taking their females along. The prevalence of joint family system in rural areas facilitate this type of migration.

### CUTTACK STANDARD URBAN AREA

#### LITERACY (1981)

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total population</th>
<th>Total literate</th>
<th>Male</th>
<th>Female</th>
<th>Percentage of literates to total population</th>
<th>Total Male to total population</th>
<th>Female to total population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>392,017</td>
<td>238,137</td>
<td>159,281</td>
<td>69,256</td>
<td>69.73</td>
<td>69.73</td>
<td>49.66</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>326,458</td>
<td>205,271</td>
<td>129,109</td>
<td>76,162</td>
<td>62.88</td>
<td>70.83</td>
<td>52.82</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) C.R. R. I and Other Govt. Colonies</td>
<td>5,902</td>
<td>3,391</td>
<td>2,510</td>
<td>1,230</td>
<td>57.46</td>
<td>68.93</td>
<td>44.36</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Chowkwar Municipality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Rural components</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Tangi P.S</td>
<td>7,357</td>
<td>3,859</td>
<td>2,495</td>
<td>1,364</td>
<td>52.44</td>
<td>65.31</td>
<td>38.53</td>
</tr>
<tr>
<td>b) Chowkwar P.S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Cuttack Sadar P.S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Salipur P.S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Census of India (Orissa), Series - 16 General Population Table, 1981
that is why the population of the Standard Urban Area is
decimated by the rural and the rural components also show
the same tendency which indicates that they are also gravi-
lly acquiring the characteristics of urban areas.

Literacy:

It is an established fact that there is a wide gap
between the literacy rates of rural and urban areas, that
is why literacy is being considered as an important determinant
to distinguish between rural and urban areas.

In the Cuttack Standard Urban Area the literates constitute 61.75 per cent of the total population. In the urban population, the literacy rate ranges from 57 per cent in
Jagatpur Industrial Estate to 71 per cent in Cuttack Industrial
estate and the average literacy rate in the urban population is
68.53 per cent. For the rural components, the average literacy
rate is 50.12 per cent but spatially it varies from 51.33 per
cent in Chandwai Police Station to 52.44 in Sambal Police Station.
The proportion of male literates is far above the females in
all the areas. In the core town the male and female literacy
rates are 75.26 and 53.54 respectively. The highest literacy
rate is associated with Cuttack Industrial Estate where the
male and female literacy rates are 75.37 and 53.18 per cent
respectively. For the rural components, the average male and
female literacy rates are 63.63 and 35.15 per cent respectively
(Table - 4.4, Fig. 4.3). So it is revealed that the literacy
rate of the Cuttack Standard Urban Area in core 1 and the
rural components in particular exceeds the literacy rate of the State which is 36.17 per cent in average and 46.74 per cent and 24.88 per cent for males and females respectively for the year 1981. This high literacy rate of the people inhabiting the Cuttack Standard Urban Area, particularly of the rural components which is more than that of the state's average indicates clearly that the regions are on the process of socio-economic transformation and they are on the way of urbanization.

Literacy is also an important measure of the degree of urbanization. The areas which are more urbanized are also characterized by higher rates of literacy. The urban areas present a contrast to the countryside in terms of the type of economy which is also one important determinant of the literacy rate. As the rural components are associated with relatively high literacy rate, it becomes evident that these areas are undergoing urbanization.

The standard of living, the status of women in the society, the availability of good educational facilities, the means of transportation and communication, technological development and public policies etc. are the determinants of literacy rate. All these go in favour of the Cuttack Standard Urban Area. Here the literacy rate is adequately above the state's average. The rural components are gradually acquiring relatively higher literacy rate.
Language is universal to mankind, is also one of the most significant differentials to distinguish one group of people from another. Languages are the chief determinants of nations, that they are a source of common traditions and sentiment, a source of cultural unity. Today, due to the diffusion of man in wide scale, it is quite impossible to find a particular language group in any one place. With the progress of human civilization, and with the progress of man's scientific and technological skill, man has become more migratory in nature and this migration has caused the language groups to be intermixed improportionally. The improportional composition of language groups of a place can be taken as one of the important indices of urbanization, for urban areas are inhabited by people of different languages. The population of Cuttack Standard Urban Area is composed of various language groups. Its rural components reveal the same tendency, thus indicating the fact that the economy of these areas is diversified because of the activities of people of different sects. The people speaking languages other than Oriya and Urdu, constitute about 13 per cent of the total population of the Standard Urban Area, whereas for the Cuttack Urban Agglomeration considered separately this figure accounts for about 16 per cent. For the rural components the people in language

1 Clark, John L., op. cit., p. 100.
2 Clark, John L., op. cit., p. 102.
### TABLE - 4.5
**CUTTACK STANDARD URBAN AREA**
**LANGUAGE (1981)**
**MOTHER TONGUE**

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total Population</th>
<th>Oriya</th>
<th>Urdu</th>
<th>Bengali</th>
<th>Marwari</th>
<th>Telugu</th>
<th>Punjabi</th>
<th>Nepali</th>
<th>Malaya-Lam</th>
<th>Gujarati</th>
<th>Hindi</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>392,017</td>
<td>313603</td>
<td>25860</td>
<td>8590</td>
<td>5467</td>
<td>17209</td>
<td>3141</td>
<td>1088</td>
<td>270</td>
<td>1885</td>
<td>2907</td>
<td>12197</td>
</tr>
<tr>
<td></td>
<td>(79.99)</td>
<td>(6.69)</td>
<td>(2.19)</td>
<td>(1.39)</td>
<td>(4.25)</td>
<td>(0.60)</td>
<td>(0.27)</td>
<td>(0.68)</td>
<td>(0.45)</td>
<td>(3.74)</td>
<td>(3.11)</td>
<td></td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td>326,468</td>
<td>254945</td>
<td>22528</td>
<td>7691</td>
<td>4839</td>
<td>16894</td>
<td>3029</td>
<td>1026</td>
<td>225</td>
<td>1785</td>
<td>2486</td>
<td>11222</td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>269,064</td>
<td>211892</td>
<td>18657</td>
<td>5723</td>
<td>3337</td>
<td>14765</td>
<td>1853</td>
<td>415</td>
<td>69</td>
<td>1314</td>
<td>1686</td>
<td>9543</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>14,089</td>
<td>10610</td>
<td>647</td>
<td>443</td>
<td>189</td>
<td>947</td>
<td>533</td>
<td>213</td>
<td>29</td>
<td>178</td>
<td>135</td>
<td>165</td>
</tr>
<tr>
<td>c) C.R.R.I &amp; Other Govt. Colonies</td>
<td>5,008</td>
<td>4063</td>
<td>591</td>
<td>245</td>
<td>151</td>
<td>218</td>
<td>189</td>
<td>102</td>
<td>40</td>
<td>121</td>
<td>117</td>
<td>157</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>5,279</td>
<td>3399</td>
<td>979</td>
<td>135</td>
<td>167</td>
<td>201</td>
<td>97</td>
<td>51</td>
<td>21</td>
<td>27</td>
<td>59</td>
<td>143</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>32,134</td>
<td>24976</td>
<td>1734</td>
<td>1155</td>
<td>995</td>
<td>763</td>
<td>357</td>
<td>245</td>
<td>63</td>
<td>143</td>
<td>459</td>
<td>1214</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS</td>
<td>68,519</td>
<td>58658</td>
<td>33338</td>
<td>899</td>
<td>628</td>
<td>315</td>
<td>112</td>
<td>62</td>
<td>45</td>
<td>102</td>
<td>421</td>
<td>975</td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>7,357</td>
<td>6742</td>
<td>542</td>
<td>182</td>
<td>72</td>
<td>94</td>
<td>34</td>
<td>12</td>
<td>12</td>
<td>19</td>
<td>53</td>
<td>195</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>24,130</td>
<td>21622</td>
<td>1379</td>
<td>385</td>
<td>289</td>
<td>91</td>
<td>24</td>
<td>15</td>
<td>7</td>
<td>25</td>
<td>31</td>
<td>282</td>
</tr>
<tr>
<td>c) Cuttack Sedar Police Station</td>
<td>30,392</td>
<td>26262</td>
<td>813</td>
<td>217</td>
<td>154</td>
<td>106</td>
<td>37</td>
<td>21</td>
<td>19</td>
<td>35</td>
<td>234</td>
<td>494</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>3,670</td>
<td>2632</td>
<td>598</td>
<td>115</td>
<td>113</td>
<td>24</td>
<td>17</td>
<td>14</td>
<td>7</td>
<td>23</td>
<td>103</td>
<td>24</td>
</tr>
</tbody>
</table>

(Percentage of total population is given within bracket)
Source: Census of India 1981 (Orissa), District Census Hand Book, Cuttack.
groups other than Oriya and Urdu constitute 6 percent of the total population (Table - 4.5). So, it is seen that Oriya followed by Urdu constitute the main languages of the region, but people of other language groups such as Bengali, Marwari, Telgu, Punjabi, Nepali, Malayalam, Gujarati and Hindi are widely diffused in all the components of the Standard Urban Area (Fig. 4.4). The region acts as the main attraction to the people from inside and outside of the state as well. As the diversified economy of the region along with its wide market facilities and employment opportunities offer prospect to the people of various language groups, they immigrate to this region and get intermixed with their respective mother tongues. So the people of various language groups are found in Cuttack Standard Urban Area. But their percentage and number to the total population that the region possesses vary from time to time and they keep pace with the degree of diversification of the economy of the region.

Religion:

Religion is one of the other aspects of population composition. The study of religion helps to a considerable extent to know the degree of diversification of the economy and social structure and it also helps to determine the process of urbanization which is in a large measure, due to the immigration of people of other religion groups.

So far as the religions of various people inhabiting the Cuttack Standard Urban Area is concerned, it is a fact that the composition of population in the region in terms of religion groups is the resultant effect of the urban-environ-
### TABLE 4.6
#### CUTTACK STANDARD URBAN AREA
**RELIgION - 1981**

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total Population</th>
<th>Hindu</th>
<th>Muslim</th>
<th>Christian</th>
<th>Sikh</th>
<th>Buddhist</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>329,017</td>
<td>354,283</td>
<td>12,450</td>
<td>5,319</td>
<td>3,749</td>
<td>2,677</td>
<td>10,554</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td>329,017</td>
<td>292,911</td>
<td>14,009</td>
<td>7,747</td>
<td>3,292</td>
<td>2,418</td>
<td>9,894</td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>329,017</td>
<td>292,911</td>
<td>14,009</td>
<td>7,747</td>
<td>3,292</td>
<td>2,418</td>
<td>9,894</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>14,089</td>
<td>15,166</td>
<td>391</td>
<td>278</td>
<td>146</td>
<td>98</td>
<td>10</td>
</tr>
<tr>
<td>c) Cuttack Municipal &amp; Other Government Colonies</td>
<td>14,089</td>
<td>15,166</td>
<td>391</td>
<td>278</td>
<td>146</td>
<td>98</td>
<td>10</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>5,879</td>
<td>4,846</td>
<td>285</td>
<td>163</td>
<td>16</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>c) Chowdwar Municipality</td>
<td>32,134</td>
<td>29,772</td>
<td>740</td>
<td>537</td>
<td>189</td>
<td>134</td>
<td>762</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS:</td>
<td>65,649</td>
<td>61,337</td>
<td>2,044</td>
<td>572</td>
<td>457</td>
<td>259</td>
<td>890</td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>7,557</td>
<td>6,891</td>
<td>252</td>
<td>37</td>
<td>41</td>
<td>33</td>
<td>102</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>24,120</td>
<td>22,438</td>
<td>771</td>
<td>236</td>
<td>181</td>
<td>93</td>
<td>413</td>
</tr>
<tr>
<td>c) Cuttack Sadar Police Station</td>
<td>30,392</td>
<td>23,627</td>
<td>816</td>
<td>272</td>
<td>211</td>
<td>110</td>
<td>329</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>3,670</td>
<td>3,333</td>
<td>203</td>
<td>27</td>
<td>26</td>
<td>17</td>
<td>15</td>
</tr>
</tbody>
</table>

**Source:** Census of India (Orissa), 1981, District Census Hand Book, Cuttack.

*(Percentage of the total population is given within the brackets).*
ment and the socio-economic potentiality of the region. The whole region is primarily Hindu dominated, but the spatial and temporal growth of the region along with the degree of diversification of its economy have given habitation to the people of other religions. Though the Hindus and Muslims are the major occupants of the Standard Urban Area by constituting combinedly 93.5 percent of the total population, still the number of people from other religions such as Christian, Sikh, Buddhist etc., is increasing from time to time, the cause of which is the immigration of the latter.

In Cuttack Urban Agglomeration the proportion of Hindu and Muslims taken together constitute for more than 93 percent of the total population, but Hindu always shows a far greater proportion than any other (89.7 percent). In the rural components Hindu and Muslims constitute 93.6 percent and 3.1 percent of the total population respectively (Table 4.6). In Cuttack city the religious groups are relatively more evenly placed, but in other components Hindus dominate over others (Fig. 4.5). In recent years it is observed that the region is receiving huge mass of population from other religions in the form of permanent immigrants. So it is expected that in the near future, the people other than Hindus and Muslims will account for a greater proportion in all the components of the region.
### Table 4.7
**Cuttack Standard Urban Area**

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total Population</th>
<th>Scheduled Caste</th>
<th>Male</th>
<th>Female</th>
<th>Percentage of Scheduled Caste to Tribe Total Population</th>
<th>Male</th>
<th>Female</th>
<th>Percentage of Scheduled Tribe to Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cuttack Standard Urban Area</strong></td>
<td>392,017</td>
<td>11,779</td>
<td>21,990</td>
<td>19,789</td>
<td>10.66</td>
<td>6,460</td>
<td>3,059</td>
<td>5,071</td>
</tr>
<tr>
<td><strong>Cuttack Urban Agglomeration</strong></td>
<td>326,468</td>
<td>31,424</td>
<td>16,603</td>
<td>14,821</td>
<td>9.62</td>
<td>3,543</td>
<td>1,811</td>
<td>1,734</td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>269,064</td>
<td>25,728</td>
<td>13,557</td>
<td>12,191</td>
<td>9.56</td>
<td>1,924</td>
<td>978</td>
<td>946</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>14,089</td>
<td>1,409</td>
<td>794</td>
<td>615</td>
<td>10.00</td>
<td>284</td>
<td>155</td>
<td>129</td>
</tr>
<tr>
<td>c) C.R.R.I. &amp; Other Govt. Colonies</td>
<td>5,902</td>
<td>1,182</td>
<td>602</td>
<td>580</td>
<td>20.02</td>
<td>298</td>
<td>161</td>
<td>137</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>5,279</td>
<td>462</td>
<td>220</td>
<td>212</td>
<td>8.75</td>
<td>375</td>
<td>194</td>
<td>181</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>32,134</td>
<td>2,643</td>
<td>1,450</td>
<td>1,193</td>
<td>8.22</td>
<td>664</td>
<td>323</td>
<td>341</td>
</tr>
<tr>
<td><strong>Rural Components</strong></td>
<td>65,549</td>
<td>10,325</td>
<td>5,387</td>
<td>4,968</td>
<td>15.80</td>
<td>2,653</td>
<td>1,298</td>
<td>1,337</td>
</tr>
<tr>
<td>a) Tangi P.S.</td>
<td>7,337</td>
<td>1,533</td>
<td>824</td>
<td>709</td>
<td>20.84</td>
<td>54</td>
<td>32</td>
<td>22</td>
</tr>
<tr>
<td>b) Chowdwar P.S.</td>
<td>24,103</td>
<td>2,971</td>
<td>1,592</td>
<td>1,379</td>
<td>12.31</td>
<td>544</td>
<td>413</td>
<td>431</td>
</tr>
<tr>
<td>c) Cuttack Sadar P.S.</td>
<td>30,392</td>
<td>3,017</td>
<td>2,574</td>
<td>2,473</td>
<td>16.61</td>
<td>1,681</td>
<td>818</td>
<td>863</td>
</tr>
<tr>
<td>d) Salipur P.S.</td>
<td>2,670</td>
<td>804</td>
<td>397</td>
<td>497</td>
<td>21.91</td>
<td>56</td>
<td>35</td>
<td>21</td>
</tr>
</tbody>
</table>

Source: Census of India (Orissa), Series 16: General Population Table, 1981.
Scheduled Caste and Scheduled Tribe Population:

The composition of population in a place in terms of social groups can be analyzed by the standard of economy and the social structure that the region possesses. In the present time when the government is giving stress to uplift the moral as well as the economic standard of the socially backward people, they are increasing in number in the population of urban areas of India. The fact is so, as these people are being given wide facilities in the sphere of employment, settlement etc., in the urban areas. So their number can be taken as an index to analyze the economic structure of a region and the process of urbanization undergoing in that region.

The Cuttack Standard Urban Area includes within its population a good percentage of the scheduled caste and scheduled tribe people because of its social pattern and diversification of the economic base. The population of both the social groups in the region constitutes 10.66 and 1.58 percent respectively (Table - 4.7). In Cuttack Urban Agglomeration it is below the average but their percentage varies from one urban component to the other. In Cuttack city it is about 10 percent which is relatively low because the city is an old settlement. But the other urban components have a good number of Scheduled Caste and Scheduled Tribe people because of their recent origin and better scopes for employment particularly in industrial spheres.
In all the components of the region the Scheduled Caste people predominate over the Scheduled Tribe people because the former mostly live in the settlements of the coastal Orissa whereas the latter have migrated from the western hilly tracts of Orissa. In the Cuttack Standard Urban Area, the Scheduled Caste people constitute 10.68 percent of the total, but there occurs a great irregularity in their distribution over the components (Fig. 4.6). Among the urban components, their proportion is highest in Central Rice Research Institute and other Government Colonies (outgrowth) being 20.02 percent. In other urban components their corresponding figures remain below 10 percent. But in rural components they constitute 15.8 percent of the total population and are relatively evenly distributed over these areas.

In comparison to Scheduled Castes, the Scheduled Tribe people account for a very small percentage of the region's total population, i.e., 1.58 percent. They are sparsely and unevenly distributed over the components with relatively higher concentration in Central Rice Research Institute and Cuttack Sadar Police Station (Fig. 4.7). They are migrants from western Orissa and constitute the working force of the region. Their higher percentage in sections of rural components may be due to their immigration to the respective areas.

At the same time it observed that in the Scheduled Tribe population of the region mostly in the rural components, females outnumber males. This is so because of the fact that
the females of this section are more laborious and they generally migrate from western Orissa to settle up here for any type of work or employment. Again their proportion in the rural parts is more than that in the urban areas, because, as they are not educationally well to do, the job's of the rural areas are suited to them.

**Economic Composition:**

The study of the economic composition is one of the most vital aspects to unravel the intensity and degree of urbanization, as urban areas do possess a different economic structure. People live in cities in order to secure advantages which would not be possible under non-urban conditions. Among these advantages are the satisfaction of many desires: social, religious recreational and economic, but most of them depend upon the individuals making a living. The economic base, therefore, constitutes the reason for the development and growth of most cities.¹ Cities are efficient instruments for utilizing resources productively, including labour, which must concentrate in and near cities in order to perform its increasingly specialized role. Urban land is extremely productive in the sense that it creates utility by the processing, transfer, and distribution of goods and services. Knowledge of the economic base of urban areas, therefore, is an indispensable pre-requisite to the understanding of the aspects of urbanization.

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total population</th>
<th>Total workers</th>
<th>Male</th>
<th>Female</th>
<th>Percentage of workers to total population</th>
<th>Total non-workers to total population</th>
<th>Percentage on Non-workers to total population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>392,017</td>
<td>119,623</td>
<td>109,303</td>
<td>10,330</td>
<td>30.32</td>
<td>272,384</td>
<td>69.48</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td>326,468</td>
<td>100,833</td>
<td>92,503</td>
<td>8,350</td>
<td>30.89</td>
<td>225,613</td>
<td>69.11</td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>269,064</td>
<td>81,364</td>
<td>74,616</td>
<td>6,948</td>
<td>30.31</td>
<td>187,500</td>
<td>69.69</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>14,089</td>
<td>4,885</td>
<td>4,482</td>
<td>403</td>
<td>34.67</td>
<td>9,204</td>
<td>65.33</td>
</tr>
<tr>
<td>c) C.R.R.I. &amp; Other Govt. Colonies</td>
<td>5,952</td>
<td>1,772</td>
<td>1,527</td>
<td>245</td>
<td>30.02</td>
<td>4,130</td>
<td>69.98</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>5,279</td>
<td>1,469</td>
<td>1,369</td>
<td>100</td>
<td>27.83</td>
<td>3,810</td>
<td>72.17</td>
</tr>
<tr>
<td>e) Choudwar Municipality</td>
<td>32,134</td>
<td>11,165</td>
<td>10,511</td>
<td>654</td>
<td>34.75</td>
<td>20,569</td>
<td>65.25</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS</td>
<td>63,549</td>
<td>18,778</td>
<td>16,790</td>
<td>1,980</td>
<td>28.65</td>
<td>46,771</td>
<td>71.35</td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>7,337</td>
<td>2,018</td>
<td>1,912</td>
<td>105</td>
<td>27.43</td>
<td>5,339</td>
<td>72.57</td>
</tr>
<tr>
<td>b) Choudwar Police Station</td>
<td>24,130</td>
<td>5,904</td>
<td>5,513</td>
<td>391</td>
<td>24.47</td>
<td>18,226</td>
<td>75.53</td>
</tr>
<tr>
<td>c) Cuttack Sador P.S</td>
<td>30,392</td>
<td>9,771</td>
<td>8,389</td>
<td>1,382</td>
<td>32.15</td>
<td>20,621</td>
<td>67.85</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>3,070</td>
<td>1,085</td>
<td>983</td>
<td>102</td>
<td>29.56</td>
<td>2,985</td>
<td>70.44</td>
</tr>
</tbody>
</table>

Source: Census of India (Orissa), Series 16, General Population Table, 1981.
The analysis of the economic characteristics of the population of a region needs a distinction to be made between total population that inhabit an area and the manpower that the area possesses. Manpower consists of only those people who could participate in economic activities to produce goods and services that the inhabitants of a region require or demand. Manpower is further classified into two categories: (i) Economically active population and (ii) Economically non-active population. In India, these two sections of manpower have been identified by the Census with workers and non-workers respectively. Economically active population consists of that part of manpower of both sexes which is actually engaged or attempts to engage itself in the production of economic goods and services, out of which those who are engaged are known as workers. Economically non-active population, on the other hand, includes all such persons of either sex who are engaged in such activities like the household duties in their own houses, students, income recipients, retired persons, inmates of institutions, those living from royalties, rents, pensions, dividends etc.

**Workers and Non-workers:**

Workers constitute about 30.52 percent of the total population in the Cuttack Standard Urban Area. In the rural components about 25.85 percent of the total population are workers (Table - 4.3). The comparison of the present working force with that of the year 1971 shows a decreasing trend in the working force-composition. The percentage of working force
in rural components has increased by 1.82 percent over the 1971 Census, whereas the same figure increase in the urban components is 17.98 percent. So it reveals that the urban areas have created considerable work opportunities. Female workers constitute about 6.63 percent of the total workers of Cuttack Standard Urban Area. In the urban population they constitute 8.23 percent whereas in the rural population they represent by 10.54 percent. So it reveals the relatively leading role of the females in the economy of the rural components (Fig. 4.8).

Activity Rates:

The magnitude of economically active population of an area should be considered to study the economic composition and the man power potentiality of that area, for which there are various measures. The crude activity rate $^1$ which is otherwise known as crude labour force participation rate helps to know the present potentiality of the working force of an area. It is obtained in the following way:

$$\text{CAR} = \frac{Fa}{Tp} \times 100,$$

Where, CAR, the crude activity rate

Fa, Economically active population

Tp, Total population

---

$^1$Chandana, R. C., & Sidhu, N.S., op. cit., p. 105.
**TABLE 4.9
CUTTACK STANDARD URBAN AREA
ECONOMIC COMPOSITION (1981)**

<table>
<thead>
<tr>
<th>of the Area</th>
<th>Economically active</th>
<th>Economically active people in adult age group</th>
<th>Workers of adult age group</th>
<th>No. of entrants per 100 retired persons</th>
<th>No. of Unemployment persons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>132,908</td>
<td>118,988</td>
<td>13,920</td>
<td>117,712</td>
<td>149</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td>113,073</td>
<td>101,301</td>
<td>11,777</td>
<td>99,535</td>
<td>173</td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>91,069</td>
<td>81,389</td>
<td>9,680</td>
<td>80,785</td>
<td>185</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>5,556</td>
<td>5,038</td>
<td>518</td>
<td>4,687</td>
<td>191</td>
</tr>
<tr>
<td>c) Cuttack Industrial Estate &amp; Other Govt. Estates</td>
<td>1,996</td>
<td>1,664</td>
<td>312</td>
<td>1,731</td>
<td>167</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>1,757</td>
<td>1,616</td>
<td>141</td>
<td>1,396</td>
<td>172</td>
</tr>
<tr>
<td>e) Chowdgar Municipality</td>
<td>12,700</td>
<td>11,574</td>
<td>1,126</td>
<td>10,936</td>
<td>148</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS</td>
<td>12,630</td>
<td>117,687</td>
<td>2,143</td>
<td>18,177</td>
<td>126</td>
</tr>
<tr>
<td>a) Tangi P.S</td>
<td>2,174</td>
<td>2,034</td>
<td>120</td>
<td>1,972</td>
<td>122</td>
</tr>
<tr>
<td>b) Chowdgar P.S</td>
<td>6,184</td>
<td>5,781</td>
<td>403</td>
<td>5,723</td>
<td>127</td>
</tr>
<tr>
<td>c) Cuttack Sadar P.S</td>
<td>10,252</td>
<td>8,768</td>
<td>1,484</td>
<td>9,484</td>
<td>139</td>
</tr>
<tr>
<td>d) Salipur P.S</td>
<td>1,220</td>
<td>1,024</td>
<td>126</td>
<td>298</td>
<td>116</td>
</tr>
</tbody>
</table>

Sources: Census of India (Orissa), 1981.
Accordingly, the crude activity rate for Cuttack Standard Urban Area is 33.90 and for the urban and rural components it is 34.64 and 30.25 percent respectively. It is evident that the urban components do have more potentiality than the rural counterpart in terms of economically active people, but the difference between them is not great. So it implies that the rural components of Cuttack Standard Urban Area are also potential to create working opportunity, which is one of the basic criteria of the process of urbanization being in operation (Table - 4.9).

The general activity rate is of better use to analyse the present proportion of population who are actually engaged in the production of goods and services. So it reveals the actual man-power potentiality for an area. It is expressed as follows:

\[ \text{GAR} = \frac{Wa}{Tp} \times 100 \], where

- GAR, General activity rate
- Wa, Workers of both the sexes in adult age group
- Tp, Total population of the area

The general activity rate of Cuttack Standard Urban Area which is 30.03 with 29.26 and 27.75 for the urban and rural components respectively shows that the working population of the respective areas mostly belong to the adult age group which is a plus-mark for the socio-economic upliftment of the area as a whole.
The age and sex specific activity rate of adult age group shows the potentiality of economically active population in the particular age group and in particular sex. It is obtained by:

\[
SAR = \frac{Eai}{TPi} \times 100, \text{ where}
\]

\[SAR, \text{ Specific activity rate}\]
\[Eai, \text{ Economically active people in a particular sex and age group}\]
\[TPi, \text{ Total population in that sex and age group}\]

From the results obtained, it is observed that the specific activity rate for the males in the adult age group is about 90 percent for the Cuttack Standard Urban Area, though for the rural components the average figure is little less than that of the urban counterpart. The females do not represent a good figure, but their proportion is relatively more here because of social advancement and female education in the region.

The unemployment rate which expresses the problem of unemployment that a region faces is of no less magnitude for Cuttack Standard Urban Area. It is the proportion of unemployed person to the economically active population and is expressed as:

\[
Ur = \frac{Up}{Eai} \times 100, \text{ where}
\]

\[Ur , \text{ Unemployment rate}\]
\[Up, \text{ Number of unemployed persons of both the sexes}\]
\[Eai, \text{ Number of economically active population in both the sexes}\]
The unemployment rate for Cuttack Standard Urban Area is 9.99 percent whereas for the rural and urban components it is 5.31 and 10.81 respectively. It happens as there are more people in urban areas who are ready for employment but lacking adequate opportunity. So in this respect the rural areas do not face this problem with great intensity, so that their socio-economic progress is less.

The replacement ratio which considers the number of entrants per 100 retired persons reveal that for the Cuttack Standard Urban Area the figure is 149 and for the rural and urban population of Cuttack Standard Urban Area, it is 126 and 173 respectively. It, thus, indicates that the number of job seekers are more than the required and also in the urban areas, the intensity is more (Appendix - VI).

Composicion of Working Force:

The composition of working force in a region varies by sex, residence and age. The earning of bread in most of the societies of the world, even today, is primarily the male responsibility. That is why, the proportion of male workers in the total working force in most of the countries is large in comparison to that of the females. The extent to which the females participate in work in any area depends primarily upon the status which they enjoy in the society; the extent to which they are allowed mobility; the economic exigencies necessit-

ting their participation in work; the availability of suitable jobs for females; and the desire on the part of the females to avail themselves of these opportunities. 1

In the case of Cuttack Standard Urban Area the male workers compose about 91.37 percent of the total workers. In the urban components the proportion of male workers to total workers is 91.72 percent whereas for the rural components the corresponding figure is 89.46 percent. So it is observed that female workers in rural components outnumber the same in the urban components. In the urban components the female workers account for 8.23 percent. The proportion of female workers in the rural components is relatively larger as most of the female migrants from Western Orissa settle in these parts of the region, though they come to the urban areas for work. The proportion of female workers is highest in Cuttack Sader Police Station accounting for 14.14 percent of the total working force. Among the urban components the Central Rice Research Institute and other Government Colonies (Outgrowth) takes the lead with its female workers of 13.83 percent. (Appendix - VII). But as a whole the percentage of female workers is very low because of the lack of social support and less female employment opportunities. Looking to the nature and trend of migration of workers to this region it can be well forecasted that the percentage of workers and particularly female workers will certainly rise in the near future.

Occupational Structure:

The occupational structure of the population of any region is one important index of the economic strength and characteristics of that region. Occupation refers to a person's trade or profession or the type of work one is engaged in. The study of occupational structure holds immense significance as it reveals: (i) whether a country's economy is agricultural, industrial or semi-industrial; (ii) its level of economic development and (iii) the direction which the entire process of planning a country could follow.

The study of occupational structure of Cuttack Standard Urban Area reveals that the structure has found its base on the tertiary forms of the economy. It is a fact that, in the economy of the whole region, the tertiary sector predominate by including about 72 percent of the total workers within its grip. In the urban components about 78.43 percent of the total population are engaged in the tertiary economic activity which has increased by 10 percent in relation to the year 1971. In the rural sectors, though the primary activity predominate over the tertiary, still the later with secondary activity far exceeds the primary figure both for 1971 and 1981 census. So this is a good and supporting tendency for the acceleration of the process of urbanization. In Cuttack city, the primary sector has very little importance, as this sector represents only 3.04 percent of the total workers.

1Chandana, R.C., and Sidhu, M.S., op. cit., p.110.
### Table 4.10
#### Cuttack Standard Urban Area
#### Occupational Structure (1981)

<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Total Workers</th>
<th>Cultivator</th>
<th>Agricultural Labourer</th>
<th>Household Industry</th>
<th>Other Workers (Manufacturing, processing, trade, Commerce &amp; Transport)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>119,683</td>
<td>4,979</td>
<td>6,185</td>
<td>4,495</td>
<td>104,170</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>100,855</td>
<td>741</td>
<td>2,300</td>
<td>4,023</td>
<td>93,831</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>4,888</td>
<td>57</td>
<td>193</td>
<td>334</td>
<td>4,331</td>
</tr>
<tr>
<td>c) C.R.R.I &amp; other Government colonies</td>
<td>1,772</td>
<td>28</td>
<td>555</td>
<td>224</td>
<td>967</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>1,469</td>
<td>87</td>
<td>193</td>
<td>37</td>
<td>1,152</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>11,195</td>
<td>207</td>
<td>661</td>
<td>150</td>
<td>10,047</td>
</tr>
<tr>
<td>2. Rural Components</td>
<td>18,770</td>
<td>4,213</td>
<td>3,795</td>
<td>472</td>
<td>10,275</td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>2,018</td>
<td>506</td>
<td>412</td>
<td>56</td>
<td>1,044</td>
</tr>
<tr>
<td>b) Chowdwar Municipality</td>
<td>5,304</td>
<td>1,879</td>
<td>937</td>
<td>160</td>
<td>2,978</td>
</tr>
<tr>
<td>c) Cuttack Sadar Police Station</td>
<td>9,771</td>
<td>1,411</td>
<td>2,179</td>
<td>241</td>
<td>5,928</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>1,085</td>
<td>422</td>
<td>217</td>
<td>15</td>
<td>431</td>
</tr>
</tbody>
</table>

Source: Census of India (Orissa) 1981.
The temporal analysis of the economic composition shows that the percentage of people engaged in the tertiary sector of the economy is increasing while those in the primary sector is decreasing. Thus, the tertiary sector is gradually gaining importance. There is one worker for every three persons in rural sectors of Cuttack Standard Urban Area. So it is evident from the above analysis that the rural areas have kept pace with the urban centres in terms of economic composition from time to time. In the rural components of the region, the occupational structure goes in favour of cultivator and agricultural labourer though occupations such as manufacturing, processing, trade, commerce, and transport still dominate in these parts. In the urban components, occupations such as trade and commerce, manufacturing, processing, transport, and household industry account for more than 95 per cent of the total occupation. (Table-4.10, Fig. 4.9). It is observed that with the progress of economy in the region, there is occurring occupational transformation and workers from agriculture and cultivation are coming into manufacturing, processing, and trade and commerce. So, it is obvious that with the same trend, the occupational structure of the region will gradually be dominated by the secondary and tertiary activities in the future times.

Density and Distribution of Population:

The studies pertaining to the spatial variations in distribution and density of population are fundamental to the understanding of population geography of any area because it is
<table>
<thead>
<tr>
<th>Name of the Area</th>
<th>Area in Sq.Km</th>
<th>1971 Total population</th>
<th>1981 Total population</th>
<th>Density of population/Sq.km 1971</th>
<th>Density of population/ Sq.km 1981</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>225.89</td>
<td>282,109</td>
<td>392,017</td>
<td>1,254</td>
<td>1,735</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>109.95</td>
<td>230,059</td>
<td>323,468</td>
<td>2,906</td>
<td>2,969</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>39.57</td>
<td>194,068</td>
<td>209,064</td>
<td>3,258</td>
<td>4,517</td>
</tr>
<tr>
<td>c) C.A.R.I. and Other Government Colonies</td>
<td>6.94</td>
<td>7,173</td>
<td>14,089</td>
<td>1,034</td>
<td>2,030</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>5.95</td>
<td>4,811</td>
<td>5,992</td>
<td>663</td>
<td>967</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>31.08</td>
<td>24,300</td>
<td>32,134</td>
<td>722</td>
<td>1,034</td>
</tr>
<tr>
<td>2. Rural Components</td>
<td>115.94</td>
<td>54,421</td>
<td>66,549</td>
<td>463</td>
<td>565</td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>13.09</td>
<td>5,891</td>
<td>7,357</td>
<td>434</td>
<td>407</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>45.33</td>
<td>20,936</td>
<td>24,130</td>
<td>462</td>
<td>532</td>
</tr>
<tr>
<td>c) Cuttack Sadar Police Station</td>
<td>39.45</td>
<td>24,199</td>
<td>30,392</td>
<td>613</td>
<td>770</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>13.07</td>
<td>3,595</td>
<td>3,670</td>
<td>275</td>
<td>281</td>
</tr>
</tbody>
</table>

Source: Data computed by the author on the basis of the data, Census of India 1971 and 1981.
CUTTACK STANDARD URBAN AREA
DENSITY OF POPULATION
1981

Fig - 4 10
the pattern of population distribution and density with which all other characteristics of population are intimately related. The distributional pattern of population does not merely reveal men’s preferences and aversions in his occupation but is an eloquent expression of the synthesis of geographic phenomena operating in that area. Thus, the regional disparities in the distribution and density of population are of immense importance to study the spatio-temporal characteristics of the population of a region.

The term distribution refers to the way the people are spaced over a region, and it, thus, shows the actual place location of a population. The people may be so spread as to yield a linear or dispersed or agglomerated pattern of population distribution. On the other hand, the term density of population refers to a ratio between population and land area. Thus, it is a measure of the degree of population concentration.

The degree of concentration or density of population in Cuttack Urban Agglomeration ranks highest in the state level. The density of population in the Cuttack Urban Agglomeration is 3732 persons/sq. km. according to 1981 census. With the temporal growth of population in the region it is expanding spatially, but the growth of people here is so intense that it results in an upward trend of density irrespective of the aerial expansion of the Cuttack Standard Urban Area. From time to time people are getting concentrated over the region making it a densely populated one. The cause of this growing density pattern
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Male</td>
</tr>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>289,109</td>
<td>161,947</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>194,066</td>
<td>109,200</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>7,173</td>
<td>4,335</td>
</tr>
<tr>
<td>c) C.K.R.I and other Government Colonies</td>
<td>4,513</td>
<td>2,437</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>24,300</td>
<td>14,765</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>10,263</td>
<td>6,408</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>20,036</td>
<td>11,282</td>
</tr>
<tr>
<td>c) Cuttack Sadar Police Station</td>
<td>24,199</td>
<td>12,640</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>3,596</td>
<td>1,850</td>
</tr>
</tbody>
</table>

Source: Census of India (Orissa), Series 15, General Population Table, 1971, 1981.
CUTTACK STANDARD URBAN AREA
POPULATION DISTRIBUTION
1981

SCALE

ONE DOT REPRESENTS 50 PERSONS

Fig-4 II (α)
of population can be attributed to the increasing degree of diversification of the economy of the region, particularly of its urban components.

The density of population in Cuttack Standard Urban Area is 1729 persons per sq.km. But the pattern of density varies greatly in spatial terms. In the urban components the average density is 3732 persons/sq.km whereas the same figure in rural components is only 565*. The density of population in Cuttack city is 4517, which reveals the highest intensity of population concentration in that part of the region. The average density of population has increased by 481 persons whereas the increase in the density of population in Cuttack city has doubled over the 1971 data**(Table - 4.11, Fig. 4.10).

So far as the distribution of population is concerned it is revealing that the people are distributed in a clustered fashion in the city region and also in other urban components, but the intensity of clustering is not so great in the rural sectors of the Standard Urban Area. About 83 percent of the total population which is urban by inhabitance live in an area which is about 45 percent of the total area of Cuttack Standard Urban Area. At the same time, the rural components which account for 55 percent of the total area give inhabitation to a population which is only 17 percent of the total population of the Cuttack Standard Urban Area (Table - 4.12). So this fact makes

---

*Computed by the author taking the 1981 Census figure.
**The density of population in Cuttack Standard Urban Area was 1254 persons/sq.km according to 1971 Census.
CUTTACK STANDARD URBAN AREA
MALE FEMALE POPULATION
1981

Fig - 4
it evident that the intensity of clustering of people is twice in the urban areas than in the rural areas (Fig. 4.11).

Centrographic Study:

The existence of varying sizes population clusters in the landscape is an inevitable feature in the spatial organization of human activity. The distribution of population within the boundary of a region follows a pattern over the space. This pattern is independent of its type, arrangement and form and is largely a function of physical and cultural factors, some tangible and well understood, some unidentified as to their nature and process of operation. The centrographic study which attempts to analyse the spatial aspects of central tendency of the distribution of urban centres and urban population helps to make evident the pattern of spatial organization of human activity of a region in a large measure. Through this study the distributional changes of population are measured in terms of the indices of central tendency.

Theoretically assumed, the Geographical Centre (G.C) and the population centre (P.C) should coincide in an optimum case of population distribution, indicating maximum concentration at the core of a region and thinning out of population gradually to the peripheral areas. But with the progress of time the uneven growth or mal-distribution of population, the

---

population centre becomes mobile and thus it tends to shift away from the Geographical Centre. In an ideal case, where the growth and distribution of population remains uniform with time, the location of the G.C. and P.C. do not change. But ideal cases are very rare or perhaps non-existent. Hence, is the need of centrographic study to determine the degree and direction of the shift of the P.C. from the G.C. or vice versa or even both.¹

Centrographic analysis of areal distributions is primarily concerned with the understanding of the spatial aspects of the central tendency. The centrographic method is analogous to the principle of movement, that is, the product of mass and distance and hence is also known as movement analysis.² The basic idea behind the movement analysis is that interactions or movements between places are proportional to the product of the masses of those places and inversely proportional to some exponent of the distance separating them. The concept of central tendency has three known types of applications: (i) in the studies of regional analysis, (ii) shifts in spatial distribution, and (iii) optimum location of the distributional phenomena.


The central tendency is defined as the degree to which units of a distribution tend to cluster around a given point and hence is helpful in providing a typical value in describing the entire mass of data. The most common indices of central tendency are mean, median, and mode.

The heterogeneity of a region in terms of population distribution causes the mean centre of the urban population (Cu) and mean settlement (Ct) to not coincide with the geographical centre of the region (Cg). In other words, if the distribution is not uniform then these centres would move away from the centre of the region (Cg) which is almost stable for an area of fixed shape and size. Hence the vectors Cg-Cu, Cg-Ct, and Ct-Cu indicate variations in the spatial aspects of central tendency for a given areal distribution.

Procedure for locating the centres of Cg, Ct, and Cu:

The geographical centre of the region (Cg) and subdivisions or components is static by nature, unless and until the shape, size, or the areal configuration of the region is changed. Therefore to locate the geographical centre of the Standard Urban Area under study the method of intersection devised by Cole and King has been followed.

The mean centre of population (Cu) which is also called as the centroid, centre of gravity or balancing point, is the most dynamic and unstable centre exhibiting mobility in its

---

location as the urban population distribution is changed from
time to time over space. To find out this mean centre of popu-
lation the grid co-ordinate method as suggested by J.F.Hart
has been adopted. In a population distribution each areal
unit, with a population of $P_i$ can be approximated as a point
with a horizontal co-ordinate of $X_i$ and a vertical co-ordinate
of $Y_i$. Then the "mean centre" of population (at $X, Y$) can
be computed with the help of the formula:

$$
\bar{X} = \frac{\sum_i X_i P_i}{\sum_i P_i}
$$

$$
\bar{Y} = \frac{\sum_i Y_i P_i}{\sum_i P_i}
$$

where $\bar{X}$ = Mean distance of the mean population
centre with respect to x axis.

$\bar{Y}$ = Mean distance of mean population centre
with respect to y axis.

And dispersion around the mean centre can be measured
by the "Standard distance".

$$
d = \sqrt{\frac{\sum_i P_i (X_i - \bar{X})^2 + \sum_i P_i (Y_i - \bar{Y})^2}{\sum_i P_i}}
$$

$X_i$ = the horizontal co-ordinate of the ith area.

$Y_i$ = the vertical co-ordinate of the ith area.

$P_i$ = Population of the ith area.

---


The "mean centre" of urban settlement (CT) is also dynamic and unstable. But the degree of its mobility is less than that of the population centre (CU), because the temporal change in population number usually exceeds the increase in the number of settlements from time to time. So, while CU presents an idea of the mean centre of urban population, CT gives an idea of the number of urban centres. Hence the "mean centre" of settlements is calculated quantitatively as above following the same formula removing the component of urban population i.e., the mean co-ordinates \( \bar{x} \) and \( \bar{y} \) are computed on the basis of the location of urban centres without referring to their population.

The location of such a centre remains unchanged when the urban centre grows in size, however, due to reclassification, or addition of areas there may be some change in the number of settlements in the region. Hence the changing vector \( \Delta G - \Delta C \) from time to time expresses the variation in the size of the region as well as the changing spacing of the mean settlement centre.

The geographical centre (CG) and the settlement centre (CT) will coincide if the settlements in the region are distributed uniformly, and the variation in their location indicates a changing pattern of the distribution of settlements in the region. The direction of \( \Delta G - \Delta C \) will indicate the direction in which the settlements of the region are more concentrated. The same procedure may be followed to show the distribution pattern.
CUTTACK STANDARD URBAN AREA
SPATIAL ASPECTS OF CENTRAL TENDENCY
1981

INDEX
○ GEOGRAPHIC CENTRE
△ MEDIAN CENTRE
● URBAN CENTRE
■ MODAL CLASS (PRIMARY)
□ SECONDARY MODE

Fig-4.12
and direction of shift of the population. Thus, an analysis of the locational changes (areal shift) of Cu and Ct over a time period will indicate the impact of urbanization on the spacing of the urban centres and their differential growth.¹

Like the "mean centre" the spatial median for the distribution of population or settlements in the region is located by moving the horizontal straight edge vertically across the map of the region until its value is half of summed value of the distribution. Similarly the vertical edge is also moved on the map and the intersecting point of these two lines gives the location of spatial median.² Since the median point is not influenced by the movements and happens to be the centre of distribution if distance is disregarded, it has a relevance in the centrographic analysis. The median centre of Cuttack Standard Urban Area is located near the Badambari area of Cuttack city. The modal class is very apparent and presently it is near the Buxibazar area of Cuttack city but there is a tendency in it to shift its position towards Badambari Area (Fig. 4.13).

Measurements of the degree of the shift of the Population Centre from the Geographical Centre or vice versa or even both over a period of time indicates the direction of movement of population and even growth of population. Theoretically it is being assumed that the region's physical extension should be in concentric circular belts and so also the growth

¹Reddy, M.B.K., op. cit., 1920, p.7
of population. The following formula have been used to measure the shift of population centre with reference to the Geographical Centre of the Cuttack Standard Urban Area.¹

\[
P.C = \frac{\Xi(Px_1 \land Px_2)}{N} \text{ for } X \text{ co-ordinate.}
\]

and \[
P.C = \frac{\Xi(Py_1 \land Py_2)}{N} \text{ for } Y \text{ co-ordinate.}
\]

Where, \( P.C \) = Population Centre

\( P \) = Population of the region

\( N \) = Total Population

\( X_1 \) = Perpendicular distance from the Geographical Centre of the component to X-axis falling to the west.

\( X_2 \) = Perpendicular distance from the Geographical Centre of the component to X-axis falling to the East.

\( Y_1 \) = Perpendicular distance from the Geographical Centre of the component to the Y-axis falling to north.

\( Y_2 \) = Perpendicular distance from the Geographical Centre of the component falling to the south.

The shift of the Population Centre from the Geographical Centre is given by

\[
r = \sqrt{X^2 + Y^2}
\]

Where, \( X \) = the distance along the X-axis from the Geographical Centre.

\( Y \) = the distance along the Y-axis from the Geographical Centre.

The above formula has been adopted with a slight modification in case of Cattack Standard Urban Area. First, N-S and E-W perpendiculars are being drawn through the Geographical Centre, which are being turned as 'X' and 'Y' ordinate respectively. The Geographical Centre of components falling to the east and west of 'X'-axis are being grouped together, and the perpendicular distances are being multiplied with the population of the respective divisions. The summation of the multiplied results to the east and west of the 'X' axis are being determined. The smaller of the two is being subtracted from the larger one. The subtracted result is being divided by the total urban population of the region which indicates the direction and location of Population Centre. Similarly the perpendicular distance of the Geographical Centres of the components lying to the north and south of the 'Y' ordinate are being determined and multiplied by the population figures of the respective components. The summation of the multiplied figures lying to the north and south of the 'Y' axis are being separately determined and the smaller is being subtracted from the larger. The subtracted figure is divided by the total urban population of the region which will indicate the direction and location of population centre. Then the combined action of 'X' axis and 'Y' axis on Population Centre will indicate the shift of Population Centre from Geographical Centre.

The value of shift of X, Y and r are revealed from Appendix - IX. These are expressed for total population, rural population and urban population.
CUTTACK STANDARD URBAN AREA
SPATIO-TEMPORAL VARIATIONS OF
CENTRAL TENDENCY (1971-1981)

INDEX

⊙ GEOGRAPHIC CENTRE (CUTTACK SDA)
⊙ GEOGRAPHIC CENTRES (OMENTSI)
△ POPULATION CENTRES (CUTTACK SDA)
□ SETTLEMENT CENTRES (CUTTACK SDA)
Locational changes of Cg, Ct and Cu

The Geographical Centre (Cg) of Cuttack Standard Urban Area lies near the South-east corner of Chowdwar Municipality. The mean population centre is on the northern part of ward No. 7 of Cuttack city but the tendency shows that it may shift to Badambari area in the near future because of the intensity of population concentration in the later in recent years. The mean settlement centre is on the Jagatpur Industrial Estate, but it is evident that the settlement centre may shift to the Cuttack Industrial Estate Area in the near future. The population of the Standard Urban Area does not show concentrating tendency around the geographical centre. The mean centre of settlement in the region is located 1 km. east to the geographic centre. The population centre is also 3 kms. South-west to the geographic centre indicating the unevenness in the distribution of population in Cuttack Standard Urban Area. The Cu and Ct. approximately coinciding with each other shows the intensity of population concentration in that part of the region (Fig. 4.13). Thus the centrographic study of the population of Cuttack Standard Urban Area reveals that the distribution of population in the region is not even, and the distribution of population here is greatly guided by the urban economic structure.

Concentration Index:

Concentration index is one of the devices to analyse the population distribution in an area which indicates the amount of population involved in the process of movement to achieve
an equitable distribution of population in different parts of a region. Hence this indicates the amount of concentration in a particular region at a given point of time. Where the analysis at spatial distribution is based on territorial divisions rather than points in space, measures of concentration describe the degree of correspondence between units and area. If the units are distributed evenly throughout the region, each territorial division will contain a proportion of all units equal to the proportion of the total area enclosed by its boundaries. The formula for computing a measure of the degree to which a population is concentrated is:

\[ C = \frac{(A \times P)}{2} \]

Where:

\[ C = \text{Concentration index.} \]

\[ A = \text{Area of the component in percentage of the region.} \]

\[ P = \text{Population of the component in percentage of the region's population.} \]

Thus to achieve uniformity in population distribution in all the components of Cuttack Standard Urban Area, 42.77 percent of the total population will be involved in the inter-regional movement (Appendix - X). Hence, the disparity in the population distribution in Cuttack Standard Urban Area


is considerable among the components, as a great size of population is to be involved in the process of movement to approach optimum distribution where land is proportional to the population concentration.

The degree to which residents are concentrated may be gauged by determining the percent of the total population who would have to move out of one component into another to bring about a uniform population distribution throughout the Cuttack Standard Urban Area. Thus 17.31 percent of the population from urban components would have to move to their rural counterparts. From the Cuttack Municipality about 21.13 per cent of the total population would have to move away to bring the optimum condition. In the outgrowth areas of Cuttack Municipality the concentration is found the optimum situation. The Chowdwar Municipality needs 2.28 per cent of the population of the region to reach in equilibrium condition.

The value of 'C', according to Gibbes, may vary from a fixed minimum of 0.0 to a maximum of near 100.00 (Specifically, 100.00 minus the percent of the total area contained in the smallest division) and they are mathematically independent of the number of divisions, the areal extent of the urban area, and the number of urban dwellers. A high value of 'C' is indicative of an uneven distribution of population, which is manifested in a considerable amount of variability among the territorial divisions as to population density. Since the observed 'C' value for Cuttack Standard Urban Area is 42.77,
it is evident that the population in this region is very uneven in nature, and in the urban components, and in case of Cuttack city the unevenness is more revealing.

The temporal variation of population concentration shows that in relation to the year 1971, the distribution of population is becoming more uneven, as it has been revealed by the year 1981, by an increase of 1.18 percent in the unevenness, and it is also revealed that people are getting more concentrated in the central city of the Cuttack Standard Urban Area, than in any other parts.

Measurement of Deconcentration

As the "concentrated distribution" of population refers to the clustering of people within the boundaries of a given area, the process of concentration takes place when the people change position in such a way that the average distance between them decreases. So the deconcentrated distribution describes an even spatial distribution of population or any other units and the process of deconcentration is applied to change in which the average distance between people or any other units increases. The difference between a concentrated and deconcentrated population is of course one of degree. Concentration and deconcentration as processes are also reckoned in quantitative terms, but they indicate distributional changes in opposite directions. 

---

Since deconcentration refers to a process in which the units of observation become more evenly distributed in space, then the amount of deconcentration in absolute terms is expressed as:

$$D_a = C_1 - C_2$$

Where, $D_a$ = Amount of deconcentration in absolute terms.

$C_1$ = The degree to which the population was concentrated in 1971.

$C_2$ = The degree to which the population was concentrated in 1981.

Again, the amount of deconcentration in relative terms is expressed as:

$$D_r = \frac{C_1}{C_2}$$

Where, $D_r$ = Amount of deconcentration in relative terms.

$C_1$ = The degree of population concentration in 1971.

$C_2$ = The degree of population concentration in 1981.

The absolute values for $D$ range between $-100.0$ and $+100.0$ with those above $0.0$ (Positive numbers) indicating deconcentration and those below $0.0$ (Negative numbers) indicating concentration. When $D$ is expressed as a ratio of $C_1$ to $C_2$ or in relative terms, values above $1.00$ reflect deconcentration.

The analysis of data, derived by the application of above formula in the population of Cuttack Standard Urban Area, shows that the region possesses concentrated population as the
deconcentration index shows that the figures are -1.18 and 0.87 for absolute and relative deconcentration respectively (Appendix - XI). The Cuttack Industrial Estate and Chowdwar Municipality, the two urban components of the region show deconcentration of population while among the rural components deconcentration of population is represented by Tangi and Chowdwar Police Stations. Maximum deconcentration of population occurs in Chowdwar Municipality where the deconcentration value is 0.25 and 1.11 for absolute and relative figures respectively. But, taken as a whole, there is concentration of population in Cuttack Standard Urban Area as the deconcentration of population in the places mentioned is not considerable and are only marginal.

Centralization Index:

The term centralization designates a process in which the distribution of units in an area changes in such a way as to reduce the average distance between each unit and the point taken to be the centre of the area. This process differs from concentration in that a highly concentrated population is not necessarily a highly centralized one, since the units may cluster on the periphery or at places other than the centre. The Centralization study brings out the impacts of urbanization and it is a tool to measure the degree of urbanization in a given region at a particular point of time.  

---


Since a centralized population is one in which the units are clustered around a particular point, measurement must be based on the distance which separates the individual units from the point. If the number of units in each division (P) is multiplied by the distance (D) separating the approximate geographical centre of the divisions from the central point or the geographical centre of the region, and the sum of the products is divided by the total number of units (N), the resulting quotient is the approximate average distance between the individual units and the point. This number indicates the degree to which the population is centralized (C_e) and is derived from the formula:

$$ C_e = \frac{\Sigma D \cdot P}{N} $$

Where, $C_e$ = Centralization index.

$D$ = Distance from the geographical centre of the region to the geographical centre of the components.

$P$ = Population of the components.

$N$ = Total population of the region.

By using the above formula, it has been found that an urban resident has to travel an average distance of 3.23 kms. to reach the geographical centre of Cuttack Standard Urban Area in 1981 (Appendix - XII). But in the case of a hypothetical situation of even distribution of population throughout the Cuttack Standard Urban Area, or in other words when the density of population remains same in all parts of the region at the same time (1981), the average resident of Cuttack
Standard Urban Area has to travel 4.81 kms. to reach the geographical centre of the Cuttack Standard Urban Area. This has been termed as 'Ch' while the hypothetical distribution of population is being termed as 'Ce'. The ratio of this hypothetical value 'Ch' to Ce gives a second measure (Cr) which indicates how much the average distance has been reduced as a consequence of the clustering of the population about the geographical centre. This measure for Cuttack Standard Urban Area is:

\[ Cr = \frac{Ce}{Ch} = \frac{3.23}{4.81} = 0.67 \]

Thus, the spatial distribution of the population in Cuttack Standard Urban Area is such that the average distance separating residents from the centre is much less than one-half of what would result from an even distribution throughout the region. Hence, centralization is intense in the Cuttack Standard Urban Area as more people are concentrated round the geographical centre of the region.

One of the major advantages of Cr measure is that it is not influenced by the areal size of an urban unit. If Cr is less than 1.00 the population is more centralized and if it is more than 1.00, the population is decentralized. In the Cuttack Standard Urban Area the Cr value comes to be 0.67 which is less than 1.00. This indicates the centralization tendency.

---

*In cases where the Geographical Centre of a division is taken to be the centre of the region, D is one-half of the approximate distance between the centre of the division and its periphery.*
of population in the region. Temporally considered, it is also observed that the Cr value is gradually decreasing as it has come down to 0.67 in 1981 in relation from 0.71 in 1971. This indicates that the tendency of centralization is getting more intense with the progress of time.

Measurement of Decentralization:

Shifts in the degree to which a population is centralized (that is, shift towards either centralization or decentralization) can be expressed mathematically as the difference between two Ce values such as:

\[ D_Z = C_{2} - C_{1} \]

Where, \( D_Z \) = degree of decentralization.

\( C_{1} \) = centralization index of 1971.

\( C_{2} \) = centralization index of 1981.

The \( D_Z \) value representing positive number shows decentralization while the negative number indicates centralization of population in the region during the period.

The \( D_Z \) value for Cuttack Standard Urban Area is

\[ D_Z = 3.23 - 3.45 = -0.22 \]

Thus, the \( D_Z \) value for Cuttack Standard Urban Area is being a negative number shows centralization tendency in the region.

An alternative formula is also used to show the amount of decentralization relative to the original Ce value, with values less than 1.00 indicating centralization and more than
1.00 indicating decentralization. This formula is expressed as:

$$D_z = \frac{C_{eg}}{C_{e1}}$$

The $D_z$ value for Cuttack Standard Urban Area is:

$$D_z = \frac{3.23}{3.45} = 0.94$$

Thus, the $D_z$ value being less than 1.00 indicates that there exists a centralization tendency in the population of Cuttack Standard Urban Area.

The difference between $C_{e1}$ and $C_{eg}$ in any given case may be a function of an expanding boundary and not an actual change in the pattern of distribution. For this reason $Cr$ values should be used to express shift in population distribution independently of an increase in the areal size of the region. This measure ($D_r$) may be computed in two ways:

$$D_r = Cr_2 - Cr_1 = 0.67 - 0.71 = 0.04$$

Or

$$D_r = \frac{Cr_2}{Cr_1} = \frac{0.67}{0.71} = 0.94$$

The first formula expresses the change in distribution in absolute terms with negative number indicating centralization while the second formula expresses change relative to the original level with values less than 1.00 indicating centralization.

Both in absolute and relative change the values reveal the centralization tendency in Cuttack Standard Urban Area. So it is revealed that the population distribution of the Cuttack Standard Urban Area is very uneven and the people are
centralized around the geographical centre of the region, thereby indicating the process of intense urbanisation in and around the geographical centre (which lies over Cuttack city) of the Cuttack Standard Urban Area. Thus all these analyses make it evident that the density and distribution of population in Cuttack Standard Urban Area varies considerably both spatially and temporally.

The Measurement of Association in Spatial Distribution

The association between the spatial distribution of urban and rural population is worthy of analysis as it indicates the degree of urbanization and population concentration. It is generally recognized that the inhabitants, both urban and rural, in a region do not locate in a purely random fashion. For a variety of reasons¹ separate nuclei (urban centres) and differentiated areas (rural areas) come into being and this reflects differences and similarities in the locational requirements of various activities which go on in a region. People in more and more number want to live in urban areas to avail the modern facilities and to fulfil their institutional requirements. Hence, most of the people from rural areas are seen to migrate to urban areas by which the number of urban population is increasing. On the other hand, due to the concentration of economic activities at certain rural centres, new urban centres are coming into being. So the

study of rural-urban relationship indicates the degree of urbanization in a region. This spatio-temporal analysis of a rural-urban association illustrates a good measurement of the locational association.

Here, the method of locational association is concerned with the distribution of rural population and urban population of the Tahsils of Cuttack District.

Taking the percent of the Urban population and rural population of the constituent Tahsils of Cuttack District, the degree of locational association between the urban population and rural population can be expressed mathematically as:

\[ L_a = 100 \times \left[ 1 - \frac{X - Y}{2} \right] \]

where, \( L_a \) = degree of locational association,

\( X = \) percent of urban population of the Tahsil to the total urban population of the district.

\( Y = \) percent of rural population of the Tahsil to the total rural population of the district.

The application of the above formula on the region surrounding Cuttack Standard Urban Area for the year 1931 results in the \( L_a \) value of 25.2 (Appendix - XIII). This lower value suggests that the degree of association between the rural and urban population of the region is not considerable. Therefore, it is self indicated that the degree of urbanization in the region is very high as the urban economy depends on the rural economy to a very little extent.
Migration:

The study of migration has become one of the most dynamic aspects of human knowledge as the mobility of man has increased fitfully with the progress of technical and economic aspects of man. The term migration generally refers to all movements of population in physical space with the assumption more or less implicit that a change of resident or domicile is involved. Migration is not merely the shift of people from one place of abode to another but also is not fundamental to the understanding of the ever changing 'space content' and 'space relations' of an area. It is an instrument of cultural diffusion, social integration and results in more meaningful redistribution of population. Whether migration takes place over long or short distance; whether it involves several millions or a few hundreds; it ends in all cases into transformation of both - the area of origin and the area of reception and also modification of not only the way of life of migrants but also their metabolism and their mentality. Thus the area from which the people out-migrate,


and the migrants themselves never remain the same, but they change in socio-economic and demographic characteristics.

So, the impact of migration can be said to be of three fold: (1) On the area of in-migration, (2) On the area of out-migration and (3) On the migrants themselves.

As the population of a place is the most important determinant influencing the socio-economic status of the region, their mobility is of immense significance to analyse the socio-economic structure of the regions involved in the process of migration. Migration has considerable impact on urbanization and the degree of urbanization is directly linked up with the degree of mobility of the people. When migration takes place within the territorial limits of a country, it can be classified into four types on the basis of the nature of the area involved; these are: (i) rural to urban, (ii) urban to urban, (iii) rural to rural, and (iv) urban to rural/sub-urban areas.

In Cuttack Standard Urban Area migration from rural to urban predominates. In Indian context, people generally want to live in or near urban areas in order to secure advantages which would not be possible under non-urban conditions. Among these advantages the most important is the scope provided by urban centres to fulfil the economic needs of man. In normal conditions the economic base of the urban centres constitute the primary reason for its attraction to the people of rural areas.
The Cuttack Standard Urban Area in general and its urban components in particular have strong economic base which cause the people of surrounding areas to influx onto the region in great number. The region provides wide opportunities for employment in different sectors, good market condition, well organised industrial enterprise, etc., which cause the number of immigrants to increase from day to day in this region.

The rural-urban migration, a potent factor in the progress of urbanization, is to a considerable extent, due to changing economic structure of the regions involved. The dependence of the urban place on its rural hinterland is demographic as well as economic in nature. Occupational opportunities in the urban place, because of industrialization, commercialization etc., attract both the ruralities and foreigners which increase the population size of the urban place.

In the case of Cuttack Standard Urban Area no concrete date is available on the migration phenomenon. Moreover, the migrants are so well-mingled in the region that it is impossible to identify and count them. So the author has to calculate the approximate number of the migrants by indirect method using the following formula:

\[
\text{Nmi} = \text{Pt}_2 - (\text{Pni} + \text{Pt}_1)
\]

Where, \(\text{Nmi}\) = Net migration in the period \(1971-81\)

\(\text{Pt}_2\) = Census Population in the year 1981

\(\text{Pt}_1\) = Census Population in the year 1971

\(\text{Pni}\) = Amount of natural increase in population in the period \(1971-81\)
### TABLE 4.13

**CUTTACK STANDARD URBAN AREA**

**GROWTH OF POPULATION (1971-81)**

**NATURAL INCREASE AND NET-MIGRATION**

<table>
<thead>
<tr>
<th>Cuttack Standard Urban Area/Urban/Rural Components</th>
<th>Census population 1971</th>
<th>Census population 1981</th>
<th>No. of Births in the period 1971-81</th>
<th>No. of deaths in the period 1971-81</th>
<th>Amount of natural increase of population during 1971-81 (Pn2 = Pni + Pn1 - Dm)</th>
<th>Expected population of the region by 1981 only because of natural increase (Pn2 = Pni + Pt1)</th>
<th>Net migration during the period 1971-81 because of net migration (+) or - (out-migration) (Nmi=Pt2-Pni)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>289,109</td>
<td>392,017</td>
<td>130,199</td>
<td>90,903</td>
<td>39,296</td>
<td>328,405</td>
<td>+ 58,333</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>230,059</td>
<td>326,468</td>
<td>100,505</td>
<td>72,346</td>
<td>28,159</td>
<td>258,218</td>
<td>+ 62,971</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>7,173</td>
<td>140,890</td>
<td>3,257</td>
<td>2,158</td>
<td>1,099</td>
<td>8,272</td>
<td>+ 5,817</td>
</tr>
<tr>
<td>c) C.R.R.I. &amp; Other Government Colonies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4,518</td>
<td>4,997</td>
<td>+ 905</td>
</tr>
<tr>
<td>2. Jagatpur Industrial Estate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>5,279</td>
<td>-</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>24,300</td>
<td>32,134</td>
<td>12,920</td>
<td>8,347</td>
<td>4,573</td>
<td>28,873</td>
<td>+ 3,261</td>
</tr>
<tr>
<td>2) RURAL COMPONENTS</td>
<td>58,998</td>
<td>65,549</td>
<td>29,694</td>
<td>18,558</td>
<td>10,137</td>
<td>70,134</td>
<td>- 4,585</td>
</tr>
<tr>
<td>a) Tanga Police Station</td>
<td>10,268</td>
<td>7,357</td>
<td>4,955</td>
<td>3,151</td>
<td>1,804</td>
<td>12,072</td>
<td>- 4,715</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>20,936</td>
<td>24,130</td>
<td>9,794</td>
<td>6,706</td>
<td>3,088</td>
<td>24,024</td>
<td>+ 107</td>
</tr>
<tr>
<td>c) Cuttack Sadar Police Station</td>
<td>24,199</td>
<td>30,392</td>
<td>13,099</td>
<td>7,494</td>
<td>5,605</td>
<td>29,804</td>
<td>+ 534</td>
</tr>
<tr>
<td>d) Sailpur Police Station</td>
<td>3,595</td>
<td>3,670</td>
<td>1,846</td>
<td>1,207</td>
<td>640</td>
<td>4,234</td>
<td>- 564</td>
</tr>
</tbody>
</table>

*Source: Census of India (Orissa).*
With the above formula, it is found that (Table - 4.13) in the period of 1971-81 about 60 thousand people have immigrated to the Cuttack Standard Urban Area and they constitute 15 percent of the total population of the region. Compared to the in-migration figure of 1961-71 which is 84315, the number of in-migrants has decreased by the period 1971-81, the cause of which can be attributed to the increasing degree of population concentration in the urban centres and non-availability of space for the migrants to settle down into the urban centres. Though, the region provides employment or working opportunities to a great number of people of the rural areas, it does not provide place for their inhabitation. So, workers or service holders daily come to the urban centres of Cuttack Standard Urban Area and travel back, as they find little space to settle down in the urban centres and as their native places are well connected with the urban centres by good transportation lines. These daily in-migrants contribute to a considerable extent to strengthen the economic base of the urban components and to the process of urbanization.

Growth of Population:

Population growth in an area is an index of its economic development, social awakening, cultural background, historical events and political ideology. The change in the number of inhabitants from time to time contribute significantly to the demographic dynamism of the region concerned.
In population geography, the term growth of population is used in its broadest connotation to cover change in population numbers inhabiting a territory during a specific period of time, irrespective of the fact whether the change is positive or negative. The number of inhabitants of a particular place changes through time because of additions through births, subtractions through deaths, additions through immigration and subtractions through outmigration. So, also increases in urban population are affected through three sources: natural increase; net-migration and reclassification. Hence, urban population grows or shrinks under the impact of following demographic and politico-economic factors.

1. Births  
2. Deaths  
3. In-migration  
4. Out-Migration  
5. Immigration  
6. Emigration  
7. Incorporation  
8. Reclassification

The change in population numbers between two points of time is the net-resultant effect of above factors which are

---

called the components of population growth. So far as the
Cuttack Standard Urban Area is concerned, all these components
play equally important role to add to the dynamism of the
population that the region possesses. Here, the birth rate
always exceeding death rate results in a continuous change of
population number vertically upward at every moment. The numeri-
cal change of population because of births minus deaths is termed
as 'natural increase' and it can be obtained by the formula.

\[ \text{Pri} = \text{Bri} - \text{Dri}, \text{ (when absolute figures are available)} \]

Where,

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pri</td>
<td>Number of population added because of natural increase in the year 1.</td>
</tr>
<tr>
<td>Bri</td>
<td>Number of Births in the year 1.</td>
</tr>
<tr>
<td>Dri</td>
<td>Number of deaths in the year 1.</td>
</tr>
</tbody>
</table>

But when the birth rate and death rate are available, the
amount of natural increase can be obtained in the following ways

\[ \text{Pri} = \text{Pt}_1 \left( \frac{\text{Bri} - \text{Dri}}{1000} \right) \]

Where,

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pri</td>
<td>Number of population added because of natural increase in the year 1.</td>
</tr>
<tr>
<td>Pt_1</td>
<td>Population of the base year (1971).</td>
</tr>
<tr>
<td>Bri</td>
<td>Birth rate of population during the period (1971-81) per 1000 population at the base year 1971.</td>
</tr>
<tr>
<td>Dri</td>
<td>Death rate of population during the period i (1971-81) per 1000 population at the base year 1971.</td>
</tr>
</tbody>
</table>

*Birth rate and death rate are calculated as per birth and deaths per 1000 population per year.
By applying the above formula, it has been obtained that 
(Table - 4.12) in the period of 1971-81, the number of population added because of only natural increase is

\[ 239109 \times 0.1352 = 32306 \]

If it is assumed that the population of a region at a particular year is because of only natural increase in comparison to the previous or base year, it can be calculated as:

\[ P_{n2} = P_{n1} + P_{ni} \]

Where, \( P_{n2} \), Population of the region because of natural increase at the later year (1981).

Accordingly the expected population of the Cuttekk Standard Urban Area by 1981 taking natural increase as the sole factor is

\[ P_{n2} = 239109 + 32306 = 323405 \]

By the above mentioned process, the expected population of all the urban and rural components of Cuttekk Standard Urban Area have been estimated, but in all the cases the estimated value of population hardly resemble to the actual population of the respective components provided by the census of India. In case of all the components except one, i.e., Tangi P.S., the estimated population because of only natural increase lies far below the actual population of the respective areas. So this discrepancy makes it clear that births and deaths or in other words the natural increase is not the sole factor determining the population growth of Cuttekk Standard Urban Area, but other factors also play their roles here.
For the above mentioned discrepancy, the population growth of a place cannot be said as the sole effect of natural increase, in the present time of developed science and technology the mobile nature of man has fitfully increased. The term mobility applies to net-migration which is the sum-total of all migratory movements — i.e., \((\text{in-migration} + \text{immigration}) - (\text{emigration} + \text{out-migration})\). Thus, mobility refers to the bulk of all movements, regardless of whether they displace population towards or away from the urban centre. By means of 'residual method' including 'survival technique' and by means of 'nativity and residence' method the net migration of an area can be calculated. The residual method takes into assumption that in the absence of population migrations, the growth of population of a given area over a given period of time will be equal to the difference between births and deaths in the area, which has been discussed in the earlier paragraphs in connection with Cuttack Standard Urban Area. Any discrepancy between the theoretical and the actual change obtained from census or the direct observations, is defined as net-migration during the period. The net-migration is mathematically obtained as follows:

\[ \text{Net migration during the period 1 (1971-1981)} = P_{t2} - P_{n2} \]

Where, \(\text{Net migration during the period 1 (1971-1981)}\) = \(P_{t2}\) — Census population at the later year (1981)

\(P_{n2}\) = Population at the later year (1981)

**only because of natural increase**.
The application of the above formula on the population of Cuttack Standard Urban Area reveals that the net-migration figure exceeds 58 thousand, and the in-migrants constitute 15 percent of the total population of the region by 1981. The net-migration also causes the population of the Standard Urban Area to grow by 20 percent during the period of 1971-81. It is also observed that more than 90 percent of the in-migrants migrate to the urban components of Cuttack Standard Urban Area (Table - 4.13). The rural components also attract the in-migrants, though it is in less intensity. All these facts make it clear that the influx of in-migrants to the Cuttack Standard Urban Area, particularly to the urban components of Cuttack Standard Urban Area adds increasingly numerically to the population stock and thereby accelerates the process of urbanization there.

The study of the population growth of Cuttack Standard Urban Area reveals that the growth of population of a place is the product of the sum of natural increase and net-migration. So, to analyse the population growth of a region both natural increase and net-migration should be taken into consideration. Here net-migration denotes migration both at national (in-migration and out-migration) and international (immigration and emigration) spheres. Taking all these components into account the population of a region at a given point of time can be mathematically calculated as follows:

\[ P_{t2} = P_{t1} + \left\{ (S_{t1} - D_{t1})R \right\} + \left\{ (I_{t1} + I_{t1}) - (E_{t1} + E_{t1}) \right\} \]

where, \( P_{t2} = \) Population at the later year (1981)
Fig. 4.14

CUTTACK STANDARD URBAN AREA

GROWTH OF POPULATION (1971-81)

NATURAL INCREASE AND NET MIGRATION

SCALE

0 1 2 3 4 5 6

CHOWDHURY'S

MAHAMADI RIVER

NATURAL INCREASE

NET MIGRATION

CUTTACK SURA

Fig 4.14
Thus, with the help of the above formula the population of the Cuttack Standard Urban Area in 1981 will be 386,738 because of natural increase and net-migration (Table = 4.13 & Fig. 4.14). It is very close to the actual population of 1981 i.e. 392,017. It is observed that migration is the most important factor accelerating the population growth in the region, particularly in the urban components. The increase in population due to migration in all of the urban components is more than three times that of the natural increase. In the rural components migration tendency exists though with very less intensity. Chowdwar and Cuttack Sadar Police Stations are characterized by immigration whereas Tangi and Salipur Police Stations are characterized by out-migration. It is also marked that the rate of migration account for a greater proportion in the rate of population growth in the region (Appendix -XIV). In Cuttack Standard Urban Area the population growth rate during the decade 1971-81 is 35.6 percent and out of this 20.18 percent is only due to

\[
\begin{align*}
Pt_1 &= \text{Population at the former year (1971)} \\
Bri &= \text{Birth rate in the period i (1971-1981)} \\
Dri &= \text{Death rate in the period i} \\
R &= \text{Unit of population, because of 1 percent difference between Bri and Dri} \\
Imi &= \text{Immigration to the region in the period i} \\
Ini &= \text{In-migration to the region in the period i} \\
Emi &= \text{Emigration from the region in the period i} \\
Eri &= \text{Out-migration from the region in the period i} \\
\end{align*}
\]
migration. This can amplify the importance of migration in the population growth of the region.

It is interesting to note that the population number of Cuttack Standard Urban Area which resulted by the formula enumerated in the earlier paragraphs, is 366793, and this still less than the actual population of Cuttack Standard Urban Area by 1981. So it is self indicative that there is another factor which contributes greatly to the dynamism of population of a region so far as their number is concerned. This factor is the politico-economic factor which refers to the reclassification of settlements and inclusion of rural population into urban.

So the population of an area changes because of the changes of its boundary and conversion of rural population into urban. Hence, it should be mentioned that the above described formula applies appropriately in the national level, when the area of the region remains unchanged. But in the local sphere, when the boundary of an area changes frequently because of political and economic factors the following formula can be more appropriate than any other:

\[ P_t = P_0 + \left\{ (B_{ri} - D_{ri})R_i \right\} + \left\{ (I_{mi} + I_{ni}) + (E_{mi} + E_{ni}) \right\} + \left\{ (I_{ri} + R_{ei}) \right\} \]

Where, \( I_{ri} \) = Population of the area included as new areas in the region in the period \( i \) (1971-81)

\( R_{ei} \) = Amount of population involved in the process of resettlement, in the period \( i \).
It can also be mentioned as the amount of population falling out of one division of the region because of resettlement and developing a new division within the boundary of the region. It is found that the Nimpur village of Tangi Police Station has been taken out and is added up with Jagatpur Industrial Estate which has grown up during 1971-81. So during the period resettlement has taken place in Cuttack Standard Urban Area which adds to the Urban population in this period. Thus, taking the resettlement factor into account, the population of Cuttack Standard Urban Area in 1981 is 392,017.

Thus, applying the above formula the population of Cuttack Standard Urban Area is calculated as 392017 which is the same as the actual population of the area according to the 1981 census. So it is now established that all these factors such as natural increase, net-migration and population addition or subtraction due to resettlement and incorporation play equally important role to analyse the growth of population of a place.

Another aspect which is of immense significance to be analysed for the study of population growth of a region is the growth rate. Growth rate of a population as the term connotes is the rate at which the population of a given area is growing over a given period of time irrespective of the fact whether the rate is associated with positive or negative sign. There are many facts for the study of population growth or growth rate of a region, such as: (i) absolute growth,
<table>
<thead>
<tr>
<th>Name of the Components, Urban/Rural</th>
<th>Total population</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>209,355</td>
<td>239,109</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>146,309</td>
<td>194,063</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>N.E 7,173</td>
<td>14,089</td>
</tr>
<tr>
<td>c) C.R.R.I. &amp; Other Cst. Colonies</td>
<td>N.E 4,518</td>
<td>5,902</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>N.E</td>
<td>N.E</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>17,021</td>
<td>24,300</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>10,517</td>
<td>10,288</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>14,397</td>
<td>20,936</td>
</tr>
<tr>
<td>c) Cutteck Sader Police Station</td>
<td>13,180</td>
<td>24,199</td>
</tr>
<tr>
<td>d) Salipur Police Station</td>
<td>2,912</td>
<td>3,595</td>
</tr>
</tbody>
</table>

N.E - Not existed.

Source: Census of India (Orissa), 1951, 1971 and 1981.
CUTTACK STANDARD URBAN AREA
GROWTH OF POPULATION 1961-1981

INDEX

- CUTTACK MUNICIPALITY
- CUTTACK INDUSTRIAL ESTATE
- C.R.R.I. & OTHER GOVT. COLONY
- CHOWDWAR MUNICIPALITY
- TANGI PS
- CHOWDWAR PS
- CUTTACK SADAR PS
- SALIPUR PS

Fig.-4.15
(ii) percentage growth, (iii) rate of growth. The absolute growth refers to the net increase of population in a given period and is obtained by subtracting the population of an earlier date from that of the later point in time as:

\[ Agi = Pt_2 - Pt_1 \]

where, \( Agi \) is the absolute growth of population in the period \( i \) (1971-81)

\( Pt_2 \) and \( Pt_1 \) = Population at later and former year respectively.

The absolute growth of population of Cuttack Standard Urban Area during 1971-81 is 102,305.

The percentage growth of population shows the percentage increase of population over a given period of time and is expressed as:

\[ Pgi = \frac{Pt_2 - Pt_1}{Pt_1} \times 100 \]

where, \( Pgi \) is the percentage growth of population in the period \( i \).

By utilizing the above formula, the growth rate of population of Cuttack Standard Urban Area its urban and rural components have been calculated (Table 4.14). It is observed that the population of Cuttack Standard Urban Area has increased during 1971-81 by 35.6 percent. The highest growth rate of population in this decade has been recorded against Cuttack Industrial Estate which is now expanding rapidly. The growth rate of population for Cuttack Urban Agglomeration is 41.91 percent which reflect the rapidity with which the urban components of
### TABLE - 4.15
**CUTTACK STANDARD URBAN AREA**
**MALE-FEMALE POPULATION GROWTH 1971-81**

<table>
<thead>
<tr>
<th>Cuttack Standard Urban Area</th>
<th>Male Population</th>
<th>Female Population</th>
<th>Average growth rate during 1971-81</th>
</tr>
</thead>
<tbody>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>Cuttack Standard Urban Area</td>
<td>161,947</td>
<td>215,517</td>
<td>+33.70</td>
</tr>
<tr>
<td>1. Cuttack Urban Agglomeration</td>
<td>150,737</td>
<td>182,266</td>
<td>+39.38</td>
</tr>
<tr>
<td>a) Cuttack Municipality</td>
<td>109,200</td>
<td>149,111</td>
<td>+35.65</td>
</tr>
<tr>
<td>b) Cuttack Industrial Estate</td>
<td>4,336</td>
<td>8,435</td>
<td>+94.53</td>
</tr>
<tr>
<td>c) C.R.R.I. &amp; Other Government Colonies</td>
<td>2,427</td>
<td>3,145</td>
<td>+29.07</td>
</tr>
<tr>
<td>d) Jagatpur Industrial Estate</td>
<td>-</td>
<td>2,919</td>
<td>-</td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
<td>14,765</td>
<td>18,653</td>
<td>+25.37</td>
</tr>
<tr>
<td>2. RURAL COMPONENTS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Tangi Police Station</td>
<td>5,408</td>
<td>3,922</td>
<td>-27.48</td>
</tr>
<tr>
<td>b) Chowdwar Police Station</td>
<td>11,282</td>
<td>12,974</td>
<td>+15.00</td>
</tr>
<tr>
<td>c) Cuttack Sader Police Station</td>
<td>12,840</td>
<td>15,494</td>
<td>+22.58</td>
</tr>
<tr>
<td>d) Selipur Police Station</td>
<td>1,650</td>
<td>1,859</td>
<td>+0.49</td>
</tr>
</tbody>
</table>

Source: Census of India (Crisis), 1971 and 1981.
CUTTACK STANDARD URBAN AREA
MALÉ- FEMALE POPULATION GROWTH 1971-1981

Fig.- 4.16
the region are expanding (Fig. 4.15). Among the rural components Tangi P.S. is characterized by negative growth rate amounting 33.35 percent during this decade. This negative trend is because of the exclusion of Hiranpur village from this Police Station and its inclusion in Jagatpur Industrial Area. So far as the male-female population growth in the region is concerned it is observed that the female sector is growing more rapidly than that of the male. During the last decade the growth rate for females is 33.01 percent whereas for the males the same is 33.7 percent. In case of Cuttack Industrial Estate the females have nearly doubled their number during the last decade (Table - 4.15 & Fig. 4.16). In all the components of the region which are associated with the increase in population number, the exceeding growth of females is more ravelling.

Of the various formulae which can be used to express the amount of change in population size, the least complex one is:

\[
\begin{align*}
    r &= \frac{(P_{t2} - P_{t1})}{t} \times 100 \\
    &= \frac{(P_{t2} + P_{t1})}{2} \\
\end{align*}
\]

Where, \( r \) = rate of change

This formula expresses change in numbers of population on an annual basis \( (P_{t2} - P_{t1})/t \), as a percent of the average population size \( (P_{t2} + P_{t1})/2 \) over a period of time \( t \), and is suited for comparing cities with respect to growth regardless

\[\text{Gibbs, J. F., op. cit., 1966, p. 103.}\]
of variation in their population size or the number of years in their growth periods. The formula yields results which are more realistic than those produced by the simple interest formula; although easy to compute, value of \( r \) usually is very close to growth rates derived from complex exponential and compound interest formulas.\(^1\)

The terms 'population' and 'dynamism' are an inseparable pair, as the former changes numerically at every point of time. So it cannot be assumed that a fixed number of persons is added to the existing stock of population at the end of every year, the rate which remains constant throughout the decade. Population, when the growth is positive, grows according to the principle of 'compound' interest rather than of 'simple' interest. The base is increased each year by the amount of increase during preceding year. It is very much important to be remembered the principle of compounding since it shortens the period within which a population doubles.

The analysis of population growth in Cuttack Standard Urban Area supposes to the fact that the growth of an urban unit can be registered in either or both of two directions - vertical or horizontal. In the former case, the boundary of the region remains constant, while the number of residents increases, which is accompanied by an increase in the level

---

of population density. Contrasting to it the horizontal growth causes the boundary of the region to change and thereby brings changes in the population number. In case of Cuttack Standard Urban Area both the changes are in existence and it is expected that in the near future the urban components of the Cuttack Standard Urban Area will still grow both in population and area to embrace the surrounding rural areas and thereby to add to the socio-economic and regional status of the region.

Population Projection:

The study of the characteristics of a population and of their evolution through time and space constitute the field of demography. Population projection connotes to the forecasting of population number of a region for future and it is of immense significance from the viewpoint of future political and socio-economic plan formulations. Plans and policies are by nature oriented towards the future and are always associated with the number of people inhabiting a region. Thus, estimates of the composition of a given population at a future date is quite necessary.

Various methods are developed for the projection of population of a region or an urban centre for future. The author has attempted to project the population of Cuttack Standard Urban Area upto 2031 A.D. by using the methods like

---

### TABLE - 4.16

**CUTTACK STANDARD URBAN AREA**

**POPULATION PROJECTION**

**BY ARITHMETIC PROGRESSION METHOD**

<table>
<thead>
<tr>
<th></th>
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<tbody>
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<td>103908</td>
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<td>11438</td>
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<td></td>
</tr>
<tr>
<td>e) Chowdwar Municipality</td>
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<tr>
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<td>10659</td>
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<td>13971</td>
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<td>b) Chowdwar Police Station</td>
<td>20936</td>
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<td>30518</td>
<td>33712</td>
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<td>c) Cuttack-Sadar Police Station</td>
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<td>30392</td>
<td>6263</td>
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<td>77</td>
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<td>3820</td>
<td>3995</td>
<td>3970</td>
<td>4045</td>
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</tr>
</tbody>
</table>

Source: Data computed by the author.
The following enumerations will present a comprehensive idea of the various estimates of population of the Cuttack Standard Urban Area and its components.

**Arithmetic Progression:**

The arithmetic progression method is mathematically expressed as follows:

\[ P_Q = P_t_2 + \left( \frac{P_t_2 - P_t_1}{t} \right) t \]

Where, 
- \( P_Q \) = Population of the projected year
- \( P_t_2 \) = Population of the current census year (1981)
- \( P_t_1 \) = Population of the base year (1971)
- \( t \) = Time interval between the current census year and the year for which projection is done.

By applying the above formula, the population of Cuttack Standard Urban Area has been projected upto 2031 A.D (Table-4.16).

**Exponential Growth Model:**

This method is otherwise known as geometric progression and is similar to the compound-interest formula of financial analysis. Mathematically it is expressed as:

\[ P_n = (1 + r)^n P_o \]

Where, 
- \( P_n \) = Population of the projected year
- \( P_o \) = Population of the current census year
- \( r \) = Rate of change of population as a percentage of the existing population level
- \( n \) = Number of years between the current year and the year for which population is projected.
<table>
<thead>
<tr>
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<th></th>
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<td>556139</td>
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<td>432201</td>
<td>742070</td>
<td>1118785</td>
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<td>859086</td>
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<tr>
<td>b) Cuttack Industrial Estate</td>
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<td>35371</td>
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<td>222940</td>
<td>559703</td>
<td>1405166</td>
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<td>c) C.R.R.I. &amp; other Government colonies</td>
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<td>6599</td>
<td>8249</td>
<td>10312</td>
<td>14607</td>
<td>16114</td>
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<td>a) Tangi Police Station</td>
<td>0.02310</td>
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<td>9788</td>
<td>13039</td>
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<td>64839</td>
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Source: Data computed by the author based on the data, Census of India 1971 and 1981.
### TABLE 4.18
CUTTACK STANDARD URBAN AREA
POPULATION PROJECTED - BY CWBBS' METHOD (1991-2031)

<table>
<thead>
<tr>
<th>Urban/Rural Components</th>
<th>(Pt2-Pt1)t</th>
<th>Pt2+Pt1)/2</th>
<th>r</th>
<th>PROJECTED POPULATION BY THE YEAR OF-</th>
</tr>
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<tr>
<td></td>
<td>1991</td>
<td>2001</td>
<td>2011</td>
<td>2021</td>
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<tr>
<td>Cuttack Standard Urban Area</td>
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<td>510406</td>
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<td>1. Cuttack Urban Agglomeration</td>
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<td>439426</td>
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<td>a) Cuttack Municipality</td>
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<td>6.51</td>
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<td>c) C.R.R.I. &amp; Other Government Colonies</td>
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<td>31940</td>
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<td>d) Salipur Police Station</td>
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Source: Data computed by the author based on the data, Census of India, 1971 and 1981.
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<tr>
<th>Name of the Area</th>
<th>Population in 1981</th>
<th>Projected Population in the Year of</th>
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</thead>
<tbody>
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<td>2001</td>
</tr>
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<td>Cuttack Standard Urban Area</td>
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<td>1. Cuttack Urban Agglomeration</td>
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<td>a) Cuttack Municipality</td>
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<td>463290</td>
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<td>373030</td>
</tr>
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<td>c) C.R.R. &amp; Other Government Colonies</td>
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<td>27674</td>
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</table>

Source: Data computed by the author based on the data, Census of India, 1971 and 1981
With the use of this formula, the population of Cuttack Standard Urban Area has been projected for the successive five census years (Table - 4.17).

**Gibbs’ Method:**

Gibbs has enumerated a method of his own to project the population of a region at future times. His method is mathematically expressed as:

\[ PQ = Pt_2 + Pt_2 \left( \frac{r \times t}{100} \right) \]

Where, \( r \) = rate of growth of population in the previous decade.

In Gibbs’ method the value of \( r \) is calculated by the following formula:

\[ r = \frac{(Pt_2 - Pt_1)/t}{Pt_2 + Pt_2/2} \times 100 \]

Using Gibbs’ method the population of Cuttack Standard Urban Area has been projected upto 2031 A.D (Table - 4.18).

**Registrar General Method:**

This method has been enumerated by the Registrar General of India and it is described as:

\[ PQ = Pt_2 + \frac{Pt_2(Pt_2 - Pt_1)}{Pt_1} \times t/10 \]

The population of Cuttack Standard Urban Area has been projected by the author with the help of the above method (Table - 4.19).

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</tr>
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<td>b) Choudwar Police Station</td>
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<tr>
<td>c) Cuttack Sadar Police Station</td>
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Source: Data computed by the author based on the data, Census of India, 1971 and 1981
CUTTACK STANDARD URBAN AREA
POPULATION PROJECTION
1991-2031

CUTTACK STANDARD URBAN AREA

CUTTACK SADAR P.S.

CHOWDWAR MUNICIPALITY

C.R.R.I. & OTHER GOVT. COLONY

INDEX

EXPONENTIAL GROWTH METHOD

DECENNIAL G.R. METHOD

REGISTER GENERAL METHOD

GIBBS METHOD

ARITHMETIC PROGRESSION METHOD

Fig.-4.17 (a)
CUTTACK STANDARD URBAN AREA
POPULATION PROJECTION
1991-2031

CUTTACK INDUSTRIAL ESTATE

CUTTACK MUNICIPALITY

CUTTACK URBAN AGGLOMERATION

SALIPUR PS

INDEX

EXPONENTIAL GROWTH METHOD
DECENNIAL GR METHOD
REGISTER GENERAL METHOD
GIBBS METHOD
ARITHMETIC PROGRESSION METHOD

Fig-417 (E)
CUTTACK STANDARD URBAN AREA
POPULATION PROJECTION
1991-2031

CHOWDWAR P.S.

JAGATPUR INDUSTRIAL ESTATE

TANGI RS.

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------------------- EXPONENTIAL GROWTH METHOD
------------------- DECENNIAL GR METHOD
------------------- REGISTER GENERAL METHOD
------------------- GIBBS METHOD
------------------- ARITHMETIC PROGRESSION METHOD

Fig.- 4.17(e)
Decennial Growth Rate:

Using the following formula the decennial growth rate has been calculated:

\[
DGR = \left(\frac{POP_F - POP_I}{200/(POP_F + POP_I)}\right)\times 100
\]

Where, DGR = Decennial Growth rate in percentage
POP_F = Population of the Final year
POP_I = Population of the Initial year
Nd = Number of decades.

With the use of the decennial growth rate the population of the region has been calculated in the following way:

\[
PQ = (POP_F - POP_I) + (POP_F + POP_I) \times (DGR/100)
\]

Using this formula, the population of Cuttack Standard Urban Area has been projected up to 2031 A.D. For the respective census years (Table = 4.20).

The population of 289,109 of Cuttack Standard Urban Area in 1971 came up to 392,017 by 1981 and thus an average growth rate of 35.60 percent was being maintained during the last decade. It is projected that the region may have a population of 1,467,720 by 2031 A.D. which will be 26.71 percent over the 1981 figure.

Considering the summary of projected population of Cuttack Standard Urban Area which is expected to be attained by 2031 A.D. (Fig. 4.17, a, b, c) it may be concluded that the projected population of the region may be 1,340,127 in 2031 A.D., which is the mean of the above five estimated figures. The pro-
Projected figures by different methods show that the population of Cuttack Standard Urban Area will double the number of its present figure by 20-21. Among all the components of Cuttack Standard Urban Area, Cuttack Industrial Estate is expected to double its population very soon and it may happen by the year 2001. The population of Cuttack city may double its present figure by 2011 and by 2031, its population may exceed 1 million. With 2021-31, the population of Cuttack Standard Urban Area is expected to exceed 1 million.

Conclusion:

In view of the tremendous increase in the size of cities and urban centres and world-wide urbanization during the past two decades the study of population growth, structure and composition has received a great deal of attention, as the study of demography is basic to understand the process of urbanization. As it has been revealed by the study of population in Cuttack Standard Urban Area, the demographic dynamism and intensity of the degree of urbanization are both intimately interlinked with each other. Looking to the past it can be mentioned that before 1950 Cuttack city was the only urban centre in the region and was surrounded by rural areas. But the increasing degree of population concentration in the city accompanied with development in socio-economic status has resulted in a spreading out process and the surrounding rural areas have been transformed into urban areas. This tendency has been intensified in recent times because of the increasing socio-economic importance of the
region and with the influence of the urban units the surrounding rural areas are undergoing transformation.

It has been adequately proved in the context of Cuttack Standard Urban Area that the vertical as well as horizontal growth of urban centres is because of the numerical change of its population and the change in socio-economic status of the region. Vertical growth has a certain limit and when it reaches to that, the intensity of horizontal growth of urban centres increases. Thus, the areal expansion of an urban unit adds to its population and the residents of the territories which were outside the boundary of the urban area at one point of time come to remain within it at a later point of time.

When the horizontal expansion of an urban unit takes place, it is generally understood that the territories adjacent to the city acquire urban character possessing a set of criteria, such as particular levels of population density or non-agricultural employment. This is observed in the case of the areas surrounding Cuttack city and now the rural components of the Cuttack Standard Urban Area are undergoing socio-economic transformation being influenced by the urban components. The functional interaction between the urban centre and the surrounding rural components of the region is very intense and it leads to conclude with the statement that the rural components are rightly on the highway of urbanization. So far as all the aspects of urbanization is concerned, they are now revealed by the rural
components. Their population composition, economic structure and social status are changing rapidly, along with the change of those factors in the urban components. The present structure of population such as sex composition, livelihood pattern and literacy condition also show a marked progress on temporal basis. So with all the changing aspects of demography, with the present trend of urbanization, it will be logical to foretell that the rural components of Cuttack Standard Urban Area will soon and surely merge with the urban components to form a contiguous urban centre which will be the rate of its kind in the national level.