Chapter IX

SUMMARY AND CONCLUSION
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The present research work is an attempt for the locational study of tribal settlements in the northern and southern tribal regions of Orissa state with emphasis on settlement planning adopting service centre as the important strategy for the purpose of regional development. The important aspects of the study are to identify the tribal regions of the state with core tribal areas in order to understand the spatial distribution of settlements and population and then to recognise the settlement pattern, based on measuring the concentration of tribal settlements in tribal areas aided by locational association of tribal population and settlement. Finally, an attempt has been made to identify the service centres of the core tribal areas in favour of balanced regional development.

The first chapter of the thesis outlines the main issues and organisation of the work with a detail survey of research works done in this field. The aims and objectives of this piece of research work are properly defined with a set of assertions, assumptions and hypotheses to examine the nature and pattern of distribution of tribal population and settlements.
The second chapter deals with the problems and procedures of identification of tribal regions of Orissa state. There are 5.915 million tribal people out of the 26.370 million population of the state, which means that the tribals constitute about 22.43% of the total population. The distribution and concentration of tribal population varies from locality to locality and district to district. The districts of Mayurbhanj, Koraput and Sundargarh have more than 50% of the total Population under scheduled tribes followed by Phulbani having 38.93% of tribal population. On the other hand, about 70% of the total tribal population of the state are distributed in the five districts of Mayurbhanj, Koraput, Sundargarh, Sambalpur and Keonjhar. Koraput tops the list with a share of 23.19% of tribal population followed by Mayurbhanj with 15.43%. Sundargarh, Sambalpur and Kendujhar are the next districts which contribute approximately 10 percent each to the total tribal population of the state. The picture of tribal population distribution at police station level is somewhat different and quite magnified as compared to the results obtained at district levels. Out of the 312 police stations of the state 87 police stations have more than 50 percent of tribal population to the total population of the respective police stations.
For the purpose of the delineation of tribal regions of the state an attempt has been made here at the level of police station. The police station having 50% or more tribal population are taken into consideration for inclusion into the tribal regions giving due emphasis on the contiguity of concentration of tribal population on one hand and homogeneity of non-human or natural elements on the other in which homogeneity of relief is the primary one. On the basis of the above said criteria there are two tribal regions in Orissa - the Northern and the Southern regions. These emerge from the attempted analysis based on spatial consideration of tribal concentrations. The Northern tribal region has 59 police stations composed of almost whole of the districts of Sundargarh and Mayurbhanj districts and a major part of the Kendujhar district and also few police stations of Sambalpur and Baleswar districts. The second major region is the Southern tribal region which has 54 police stations comprising the whole of Koraput district, part of Phulbani and minor pockets of Ganjam and Kalahandi districts.

From the distribution picture it is evident that the tribal people in the north are inhabiting the rugged terrains in the southern border of Chotnagpur plateau which forms the northern hilly terrain in Orissa. In the south they live in the Eastern Ghats portion of Koraput, Phulbani and Ganjam.
districts. The 300-metre contour line approximately marks the territorial limits for tribal regions of Orissa.

It has been further attempted to demarcate the core tribal areas within the identified tribal regions of the state. The core areas are constituted by the police stations having high percentage (about two-third or over 65 percent) of tribal population and these under general norms do detect the terms, nature and characteristics of organisation and socio-cultural impact on tribal occupation over space. These core areas exclusively have been taken in relation to contiguity of tribal population and settlements.

The third chapter presents the geographical setting and resource inventory of the two delineated tribal regions for a better understanding and illustration of tribal situation, including problems and prospects of tribal development in the state. The high hills, plateaus and rolling uplands constitute the geographic base of the two tribal regions mostly covered with light to dense deciduous forest covers with practice of shifting cultivation in the major parts of the regions. The problems are exhibited in terms of soil infertility with rampart soil erosion and deforestation with many associated problems. There is no doubt that these two regions are rich forest resource regions of the state but the quick loss of forest coverage creates alarming situation in the state. Apart from this, these regions are again the places for a varieties
of mineral resources available in abundance, partly exploited and a lot more with good prospects of yield in near future for a large number of industries. As the regions are covered with high hills and plateaus, these are most suitable places of important water resources with high potential of hydro-powers. The multipurpose river valley projects such as Machhkund, Kolab and Indravati are few of the present illustrations in the southern tribal region. The problems of transport and communication due to the phenomena of land-lockedness and non-conducive terrain are well understood.

The fourth chapter gives a detail account of the spatial distribution of the tribal population and settlements in the two study regions. When viewed in terms of their share of tribal population, it is evident that many of the settlements have cent percent tribal population and practically none of the settlements have at least less than 50% of its total population concentrated in a group of tribal households. When concentration of such tribal settlements considered at the level of police stations in both the tribal regions was noted, it is found that out of 59 police stations in the northern tribal region only 9 police stations may be taken as non-tribal whereas the rest 50 police stations are taken as tribal settlements having more than 50 percent of total settlements under tribal category.
In the southern tribal region, out of 54 police stations, 19 police stations have more than half of their settlements with 75 percent tribal people identified as tribal settlements. In general, high percentage of tribal settlements are distributed where there is relatively higher relief, narrow river valleys and forested tracts. The distribution and spatial location of tribal settlements in core tribal belts of the two regions are mainly controlled by factors of terrain, water courses and forest tracts, particularly in the interior areas, but in many cases the control is noticed to include transport link and big industrial and mining units where the tribals can get avenues to work.

It is revealed from the distribution of settlements by size class of population that in general the small settlements having population less than 500 are more in number and they contribute more than 50% of the total settlements. In case of southern core belt, the tribal settlements are very very small and the settlements with below 200 population account for 51.68% of the total settlements. This is the characteristic of primitive type of settlements which are isolated and are having wide scattered distribution.

Apart from this, the main purpose of this chapter is to identify the dominance and concentration of the types of tribal groups over space. In the present day of stronger call for the
planning and development of tribes, it is required to formulate certain development programmes for specific tribal groups suiting to their socio-cultural background and adoptability, for which it is utmost important to identify the geographical pockets of concentration. Out of 62 tribes presently seen in the state, 19 major tribes are taken into consideration for such kind of analysis. Finally, the areas under the dominance of single, double and multiple tribes are identified for both the tribal regions. In addition to this, the geographical pockets of Munda, Bhuyan, Santal, Oraon, Bhumij, Kolha, Kisan and Gond tribes in northern region and Kandha, Paroja, Saura, Bhottada, Gond, Koya, Bhuyan and Gadaba tribes in southern region are mapped out for their economic planning and development purposes. These identifications have most practical value for administrators, planners and development agencies.

In fifth chapter an attempt has been made to study the settlement pattern based on Chi-square distribution and also on centrographic analysis based on mean centre techniques to identify central settlements for the consideration of service centres for settlement planning purposes. For the purpose of the study mentioned above, the northern and southern tribal regions are further divided into 5 and 6 tribal belts respectively. The Chi-square test is applied for the study of
settlement pattern. From the study it is observed that the settlement pattern in 5 tribal belts of the northern tribal region is, in general, clustered and tending to highly and extremely clustered in almost all the belts except in one. Similar results are equally repeated in 6 belts of the southern region. It is very common to note from the field investigation at micro-level that there is a strong tendency among the tribes to cluster together at one place which is again guided by socio-cultural, topographical and environmental situation. The two tribal regions are very much superimposed over the high hills and plateaus with thin to thick forest coverage characterised by inaccessibility and this fact supports in favour of clustered development of tribal settlements. In addition to this, as the size of the settlements in terms of population and household are very small and the number of settlements are quite large there is a tendency to cluster for safety and security purposes.

The mean settlement centres are identified for both the regions in all the tribal belts to operate as points of diffusion of innovations of tribal welfare. The locations of the theoretically obtained mean centres for each belt were checked in the field and alternative nearby locations were suggested considering existing advantages of infrastructural facilities with the hope to make the mean centres practically operational.
In attempt has been made in chapter six to make a study of the spatial measure of tribal settlement concentrations in the two core areas of the tribal regions of Orissa. This is done using a quantitative technique of Gibbs' rule of measuring concentration index based on integration of the lowest level of areal units taking their geographical area, and the tribal and total population as the variables. The computed values for the northern core area show that all the 12 police stations tend to have lower concentration indices for the tribal settlements i.e. less than 25.00, thereby indicating a trend of comparatively even distribution of tribal settlements within limited territorial areas. The low values of concentration indices are mainly because of the fact that the core area is very near to the highly industrialised area of the Rourkela Steel Plant and the Rajgangpur industrial area, where there are significant urban influences. Therefore in this core area, the tribal concentration follows approximately an even pattern. It is further significant to point out here that in this northern tribal regions the police stations are more under the common influence of mixed tribe types than under any single or double tribes, and this reflects the assimilated characteristics to justify the lower concentration index. The picture in the southern core areas, where the concentration indices tend towards higher values for tribal settlements, is in sharp contrast to the pattern in the northern core area indicating comparatively an uneven distribution pattern of them. This is
because of the least effect of industrialisation and urbanisation and more control of the parameters like relief, ecological setting and also due to isolation caused by inaccessibility. The study of this kind is very much useful in providing guidelines for decision-making processes in preparation of infrastructural and essential services appropriate to tribal settlements.

In chapter seven due attention has been paid for the study on the mutuality and level of tribal and non-tribal association for the state as a whole at the lower-most administrative level. It is not desirable to ignore areas outside tribal regions of the state where there has been intermingling of tribals and non-tribals in the natural process for socio-cultural integration. For this reason it is essential to understand the level of locational association of the tribals and non-tribals both in terms of population as well as settlements for all areas of the state.

For the study of the locational association of settlements and population of tribals and non-tribals groups, the Gibb's approach of measurement of association has been applied for two census periods (1971 and 1981) in order to show the temporal change in spatial association. As per the rule, the two limiting values of locational association would be 0.00 and 100.00 suggesting no possible association in the former value and a
sure and strong association in the latter value. Values in between would indicate the amount of spatial deviation in either way. Tables of locational association of the two population groups as well as for settlements have been prepared for the tribal core areas and maps have been drawn to portray the pattern of assimilation of both population groups and settlements. It is suggested that the indices and the pattern maps prepared for locational association at various levels would act as impressive indicators for understanding the present pattern of tribal and non-tribal assimilation in the said two tribal core regions of Orissa which is considered to be necessary while taking up effective measures for improving the lot of the neglected tribal concentrations.

The eighth chapter is specifically designed to identify the network of service centres at different hierarchical level for the core areas of the northern and southern tribal regions of Orissa state giving due emphasis for tribal development in the concerned areas. The concept of mean threshold population is adopted here for establishing functional hierarchy and hierarchy of settlements on the basis of the aggregation of the available facilities and services. The service centres are selected at four levels,
designated as: (a) regional centres, (b) local centres, (c) agro-service centres, and (d) central villages in both the core areas. A set of functions and services have been suggested for a four-tier 'service centre system' to take care of the existing gap causing disparity in provision of facilities and to help in nearing towards balanced regional development. These suggested service centres would act as centres of mutuality for assimilation and ward off the evils of dissatisfaction through an active role of spatial shock-absorber against fissiparous tendencies.

The final chapter is, as seen here, a brief portray of the main points of the whole work in addition to a broad conclusion of principal findings and suggested development strategies towards planning and development of the tribal regions of the state of Orissa.

**Principal findings:**

The important results obtained from the previous discussions are given below:

1. The tribal regions with core areas so delineated are characterised by the phenomena of higher relief, light to dense forest coverage with the practice of shifting cultivation which stands as one of the major hindrances to developmental issues, isolation from the main stream of socio-cultural and
developmental streams with high inaccessibility and hence projected as areas of high economic backwardness.

2. In contrast to this the tribal regions are the most promising and resource potential areas in terms of water and hydro-power, forest and varieties of minerals in vast reserves which have great importance in national and global context.

3. The distribution of many individual tribes have specific geographic spreads in specific locations in general. The dominance of single tribes at different areal locations are common in southern region whereas the tribal mix is the dominant picture prevailing in the northern region as a consequential effect of rapid industrialisation and urbanisation, except the Santal concentration in Mayurbhanj district.

4. The settlement pattern in general in the two tribal regions of the state is highly clustered which is in support of the view that the majority of the tribes have a strong tendency to cluster at suitable locations for safety, security and economic reasons.

5. From the study of the concentration index of settlements of different police stations belonging to the two tribal core areas it is quite interesting to note that the northern core area has lower concentration indices indicating tendency towards an even distribution as against higher concentration indices.
indicative of clustering in the southern core area. This is again a phenomenon of high industrial and urban influence in case of northern core area as against the prevailing indigenous conditions in southern core area.

6. In the analysis of measuring the strength of tribal and non-tribal locational association for settlements in Orissa, it is noticed that the coastal districts, though with very high concentration of non-tribal population, show very low association index suggesting exclusive location of tribal pockets in these non-tribal areas of the state. It is indicative of the fact that tribal settlements remain isolatedly concentrated in those districts for the fear of exploitation and harassment by the dominant cultural group, i.e. the non-tribals. But, inspite of this, there has been movements for assimilation between the two communities leading to re-grouping of settlements and therefore a change in the association index in the desired direction, most particularly in Baleswar, Bhadrak and Cuttack Sadar sub-divisions. The study here for Orissa as a whole gives an important finding that the pulling effect of greater availability of food and employment has served the strong valency bonds of cultural isolation of the tribals leading to dispersion over some areas in the coastal tract. Interestingly in this area the non-tribals, because of their complete
dependence on themselves for manual labour, have gradually become less hostile to tribals, thus leading to a happy fasion of the cultures.

7. The locational association analysis for population and settlements in the tribal core areas of Orissa clearly suggest that the validity of the hypothesis 'urban proximity is a repulsive factor to tribal concentrations' is questionable. This is obvious from the finding that in the two tribal core areas settlements even in the lowest level have a tendency for assimilation of the two communities inhabiting there. The hypothesis is however valid for other areas of the tribal regions having interior locations.

_Development strategies:

Developing rural areas and more specifically tribal areas is the main concern of everybody in India today. A brief review of tribal development during the Fifth Plan shows that considerable ground has been created with finalisation of the subplans and integrated tribal development projects. The idea of generating employment, alluviation of poverty, emphasis on rural industrialisation, transfer of technology, ensuring people's participation and involving voluntary organisations for rural development and searching for the structural change have never given optimum assertive answer to rural development in general and more so for tribal areas in particular.
The process of development in India is very much complex and more so in the tribal pockets of the country. The tribal regions of Orissa state present a varieties of problems and peculiarities which require a specialised treatment. The geographical environment, the language bar, inaccessibility due to rugged terrain and dense forests, practice of shifting cultivation, growing tension and conflict due to change of religion activated by missionary groups, alcoholism among the tribes and negative developmental behaviour and finally lack of infrastructure facilities are some of the important issues being much connected to tribal development processes.

With this background in mind a set of development strategies have been formulated for the wholesome development of tribal regions of the state.

1. There is a greater need for the preparation of regional development plans for these two tribal regions of the state giving due emphasis on forest, mineral and water resources and simultaneously linking with tribal economy and tribal development, with proper attention on the locational pattern of tribal settlements.

2. Top priority should be given for agricultural development with proper land use planning and introduction of new cropping pattern suiting to frequent drought condition in the two tribal regions. As there are a number of streams and river channels
which originate from these regions, at least the available surface water should be properly managed through a number of small and minor irrigation projects to raise the irrigation potential in order to diversify and to adopt new cropping pattern as per the geographical and agronomic conditions. The pattern of tribal belts in the two tribal regions would provide indications as per their respective occupational behaviour.

3. Shifting cultivation still draws attention inspite of having laws and regulations to prevent them from doing so. The economic conditions and age-old habits for such practices by the tribals are to be thoroughly investigated and accordingly developmental programmes have to be taken up without hurting the tribal feelings. As a matter of fact there are a number of afforestation programmes which have been taken up both by the soil conservation and forest departments during last plan periods which however do not compensate the rate of deforestation caused by shifting cultivation and many other unauthorised tree-cutting activities. The rules and regulations vis-à-vis government programmes alone can not restore the ecological balance unless and until a strong awareness is created for the conservation of forest resources. Here it is recommended that a considerable portion of forest land should be transferred to the hands of local bodies like Gram Panchayat and Panchayat Samitis and
to private milling entrepreneurs to take up forestry as a profession. The appropriate steps for forestry education and related infrastructure measures should be taken up for the purpose.

4. In addition to traditional agricultural practices due emphasis must be given for plantation of coffee and tea and of extensive horticultural, industrial and medicinal plants in these regions. For this purpose important task is to identify the types of land with specific locations belonging to settlement areas with higher tendency for assimilation. It is quite obvious that the infrastructural support should be provided to those areas which show ideal tendencies of locational associations between the tribal and non-tribal communities.

5. As these regions have different industrial resource potential it is quite obvious that at present a number of mineral-based and some small-scale industries are functioning and a large many are on the way to come. But, this does not help much in raising the standard of tribal economy. However, for the development of tribal economy and tribal people, industrial programmes are specifically to be drawn up either to strengthen the existing indigenous ones by involvement of tribal groups directly or to utilise the talent and skill they have in those units which are located under better conditions of communal assimilation. In this respect the rural and
forest-based industries are to be considered on priority basis over others for bringing the tribal destiny and economy to a level closer to those of the non-tribal groups in the locality.

6. Education is a crucial item during the present transitional stage of the tribal groups. Universalisation of elementary education has to be ensured through providing a package of services and innovation in organisation, institutions and content. Whatever educational facilities and services are there, they are not presently utilised due to lack of interests and motivation among the tribes on one hand and on the other non-involvement of teachers and others who are expected at least to look after education as a routine programme. Creating social awareness is only possible by inducing the tribals to go for proper education. The role of administrators and politicians as committed workers for area development may bring some change in the existing system of operation which is essential for all kinds of development in the area. For this purpose the spatial pattern of tribal concentrations as well as spatial distribution of tribe types in the tribal regions should be consulted for priority decisions.

7. In addition to the above aspects, the general infrastructural developments linked with items like roads, irrigation canals, and electricity should support specific economic activity like all-weather links to market centres, provision of telecommunication
facilities at important points, and rural electrification to
develop lift irrigation potential, household and village industries. For this goal, it is desirable to select areas
where the tribal settlements have shown a greater degree of
mutuality through inter-communal association and consequent assimilation. The maps presented in this study showing the
different grades of assimilation are expected to provide necessary hints for operation. The degree of assimilation
has to be complemented by centrographic findings to give indication of control points while the findings on service centres would provide clues for inter-regional links at micro-level in order to disseminate the development innovations, facilities and ideas and ideals of motivation in a gradual process.