Chapter I

INTRODUCTION
CHAPTER - I

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Geography and Settlements of Tribal Regions - Preliminary consideration:

With the growing demand on various academic disciplines to project each of them so as to be of some relevance to the society it is but natural that now social scientists including geographers have been more and more tempted to analyse the human relationship in any inhabited area with the aim to get more minute and meaningful explanation of the nature and pattern of spatial organisations, thereby helping planners and executives of development agencies (both government and non-government) in appraisal of regional characteristics and peculiarities at various levels. It is in this context, and more so because man's distribution over the earth's surface is one of the fundamental problem of human geography, that human geographers have found the study of location of settlements with their spatial behaviour of distributional pattern as an important and useful branch of research so that the findings would provide precise indications in formulating plans of regional development and also in decision-making process for identifying priority areas and centres of desirable emphasis in order to help progress towards a balanced regional coherence.
Settlement is man's first step towards adapting himself to his environment. Its problems are at the cross-roads of several sciences, and the ethnographer, who describes the forms of houses and the materials used in their construction, and who examines the various aspects of social structure and level of a people's culture, is always faced with geographical problems of settlement. Geography as a discipline of spatial consideration of phenomena, including settlements on earth's surface at different regional level, provides clues to the various problems of not only the ethnographers as mentioned above, but also of the sociologists and economists who in their concern of social and economic aspects of development find the system of settlements and their locational pattern of distribution as the basic field of operation. It is in this regard that geographers make a resourceful band of workers in a team of regional planners.

In the context of geography, geographers and settlements, most of us are of no two opinions that no two geographers would deal with any aspect of geography in the same way. For, as Hudson has pointed out there are as many ways of looking at it as there are of bowling a cricket ball. Geography in which settlement is the principal focus of space organisation is seen by some as a description of phenomena with 'areal differentiation' approach while others see the discipline as an
examination and analysis of inter-relationships of two or more environmental factors at the level of any order of region. A third group may look at it as human ecology. Another group may, on the contrary, demand a more complete synthesis and find the most worthy aim lying in the description and interpretation of complete natural and cultural landscapes. To a good extent, the general world-wide view-point as adopted by the systematic geographer is to regard his field as the 'science of distributions' but the interpretation of a small area with its own individuality is looked upon as the core of the subject by the regional geographer. Whatever may be the point of the view, the study of settlements is accepted as an integral part of the subject by all except the narrowest of geographical specialists (5).

Consider any region in any part of the world. Its characteristics, both social and economic, are to a good extent a reflection of its spatial interaction arising out of its locational and distributional pattern of settlements. Therefore, in both 'areal differentiation' and 'regional synthesis' approaches settlement geography has tended to focus on distribution pattern and on analysis of spatial relationship (6). Professor Peter Haggett, an eminent British geographer of the present time, has clearly stated that geographers have long been fascinated by the galactic patterns of human settlement which raise a number of questions such as (7):
"What forms do the human settlements take?"

"Is the form random and chaotic - or can pattern and process be discerned?"

"If there are regularities, what causes lie behind them?"

In providing the answer he rightly observes that 'we look at some of the answers to those questions and consider the models geographers have built and how we can use them to predict future changes and to plan more efficient ways and attractive settlement patterns'.

Whenever we take up the issue of portraying a geographical background of an area, settlement is one of the primary aspects which draws our attention to a great extent since it is logically related to the habitat and inhabitants as well as to the economy and socio-cultural traits of that area.

There are innumerable research articles and books written in different countries on settlement geography but in most of the published work invariably one finds more attention having been paid to urban settlements with case-studies, hierarchical ordering, morphology, classification, interaction and housing problems. Work on rural settlements is limited and often it is taken up with distribution of population, house types, place-names, historical evolution or individual village studies. The most neglected aspect in settlement geography is the study of the tribal settlement pattern although everybody in political and social organisations in
our country speaks emphatically on the need of socio-economic development of the various tribal communities in prominent tribal regions and belts. Often the research papers are on tribal population or on individual tribal communities, more oriented towards socio-anthropological interpretations. Even geographers who have taken interest in tribal development projects find themselves safe in the familiar and comfortable straight jackets of tribal culture and individual case-studies in the same way as a social anthropologist would do. The in-depth analysis of the mosaic of distribution pattern of tribal settlements, their spatial behaviour and the resulting regional structures which should be of primary concern of human geographers, hardly finds a place in the mind of the large number of human geographers dealing with settlements. It is needless to emphasize that depiction of the locational and distributional aspect of tribal settlements in major tribal regions of any country is uniquely relevant to the current concern both with environment and ecology and with regional contrasts and imbalance in welfare(9).

Geographers, as also sociologists and social anthropologists, have observed that migration of people from early times from one area to another has added a unique dimension to area research resulting in exchange of views
and culture of adverse ethnic groups and cultural associations. There are some unique areas on the surface of the earth where different ethnic groups have been living, each contributing towards the growth and development of a unique human ecological system. Such areas are where tribal population has been sticking to its age-old customs and activities in spite of the nearness and exposure to the magnetic impact of dynamic culture and living of people in large urban concentrations[10]. But one does notice that in such areas due to migrational factors and impact of modernisation there has been some amount of slow but positive transformation in cultural landscape and socio-economic structure, the degree of transformation varying from one micro-regional unit to another.

Attracted towards the need of understanding the characteristics of the tribal areas and communities, a number of social scientists have contributed to tribal geographic research at different levels and with varying intensities. A review of the existing literature in anthropological and sociological writings suggested rather difficulties than any clue to pursuing the study of the tribal population and settlements in spatial context[11]. The present author finds, among the many references she consulted, the work of Miss Deepti Das to be of some relevance towards spatial or locational study of tribal settlements. Her work has
been done at a micro-level considering only the plain tribes of the Kamrup district of Assam. This author did draw much inspiration from her work but desired a more integrated approach concentrating attention on the tribal regions of Orissa in general and the tribal core areas in particular.

Review of literature:

Before going to spell out the problem, aim, objectives and methodology adopted in the work on settlement pattern of tribal regions of Orissa it is felt necessary to review some earlier works on or about the tribes with special emphasis on the tribal groups of Orissa. Brief accounts of most of the tribes of eastern India are extent in all the nineteenth and early twentieth century works done by foreign scholars who were mostly administrators or army personnel in British India. The works of Dalton (1972)\(^{(12)}\), Bainbridge (1907)\(^{(13)}\), Stapleton (1910)\(^{(14)}\), Archer (1940)\(^{(15)}\), Bradley-Birt (1903)\(^{(16)}\), Hutton (1941)\(^{(17)}\), Risley (1872)\(^{(18)}\) and Temple (1922)\(^{(19)}\) are based on observation of tribal communities under different ecological set up and also on history and ethnography. On tribes of Orissa, there is an interesting discussion in the work of Hunter\(^{(20)}\) who has dealt with the distribution of tribal population pointing out the areas exclusively settled by important tribal communities in Orissa. The district Gazetteers and District Census Hand books are also good sources
of information on tribal population and their regional concentrations, though the reports in these are mostly descriptive without any significant analysis.

Among the publications which have some amount of analysis based on field-work in tribal areas with an intention of providing indication for development, mention may be made of the work of Kulkarni (1974) (21) who has made an in-depth study with a difference about one of the scheduled tribes, the Koknas, of Maharashtra. This work, no doubt, has tried to combine the particulars of the tribal area and of the tribals in one perspective as inseparable and complementary factors in their development. The weakness of the work lies with lack of a locational study to indicate the spatial distribution patterns and associated implications for regional planning and development. The same author, M.C. Kulkarni (22), earlier in 1970 did present an interesting paper but it highlighted the social aspects only. One of the recent geographical contribution is of Azad (1977) (23) whose study presents an account of the growth and distribution of tribal population in Bihar and it examines the habitat conditions of the chief tribes. The study, however, is not an indepth analysis nor has it taken up any sophisticated methods for putting forth the distributional patterns. Mention must be made of the
contributions of Prof. Nirmal Kumar Bose (1956, 1967 and 1972) who has discussed on the tribes of India in the background of their occupational pattern. The present author after making a continued search of literature on tribes found that contribution by geographers is rather small in number. Most of the tribal studies are the contribution of social anthropologists or of sociologists among whom Das (1965), Sen (1967), Aiyappan (1965), Ghose (1965), Vidyarthi (1969 and 1971), Prasad, S. (1974), Sachidananda (1968) and Batra (1971) do attract the attention of geographers with some amount of relevance of geographical perspective in dealing with planning and development of tribal areas and population. Deepti Das (1975) in this context has remarked that the interest of social scientists in studying about the tribal people and their settlements in India has gained some momentum since only two decades and that too with greater emphasis on the anthropo-sociological analysis rather than with an anthropo-geographical approach. The present author endorses this view.

It will not do justice in a review if we do not make mention of the few but prominent studies made by geographers on tribal population, settlement and regional development, both in India and abroad. In this context at the outset we may make mention of the two articles written by Buschmann (1954)
where he has shown the distribution types of rural settlements in India in a map based on cultural peculiarities and therefore he has taken his regions to include the areas of tribe types such as the Mala Aryan tribes living in Malaber region and the Munda tribe living in a contiguous tract of Orissa and Bihar. He has then discussed the nature and characteristics of the rural settlements of tribes living in those regions. Though the map gives an over-generalised view of the pattern of some important pockets of tribal settlements in India, it hardly goes into the locational study of tribal settlements based on spatial analysis.

Few years before the work of Buschmann, the work which did provoke some geographical interest is that of A.L. Sundaram (1943) on the Todas of Nilgiri and of Srivastava (1946) on the Bhils of Mewar. While Sundaram's work is on the impact of the environment on the growth of the Toda settlement pocket, the work of Srivastava deals with geographical location of the Bhil settlements in a contiguous situation to form agglomerase type in the plains and dispersed type in the hills of Mewar region. In a case-study approach Sinha (1950) has studied a tribal village in Singhbhum of Chota Nagpur Plateau inhabited by the Ho tribe. The settlement pattern
of Eastern Kolhan, also in Chota Nagpur Plateau, has been described by Bandyopadhyay (1957)\(^{38}\) in an idiographic approach. Almost in a similar fashion the settlements of the Bihar tribes have been discussed by Guha (1966)\(^{39}\). An indepth spatial analysis of tribal population and settlements in the context of regional development based on agriculture has been attempted by Joshi (1982)\(^{40}\). Mention must be made of the combined work of Sundaram, Misra and Prakasarao (1972)\(^{41}\) which has drawn the attention of social geographers towards a spatial study of the tribal settlements with a view to regulate the relationships between human interaction and available natural resources in tribal regions. An interesting work is that of Chauhan (1970)\(^{42}\) who however deals only with urban settlements in tribal setting. A valuable work on tribal concentrations has been done by Roy (1974)\(^{43}\) to show an all-India general pattern of tribal area. Perhaps one of the most appropriate geographical work on tribal areas and regional development is that of Singh and Singh (1984)\(^{44}\) which provides inspirations to undertake tribal studies in the background of regional planning and social concern. Considering Eastern Gujarat as a region, Mazumdar (1973)\(^{45}\) has discussed in a generalised way the distributional pattern of tribal population. A diagnostic survey in spatial pattern of the
Northeast India has been made by Taher (1977) which is a good attempt in understanding the locational aspects of different tribal groups in areas specifically settled in by major tribal communities. Deepti Das (1969) in her work on a tribal village gives an analytic frame at micro-level in tribal settlement and population analysis to geographers so far impact of urbanisation leading to transformation in cultural landscape is concerned. A later work (1978) of her is an interesting analysis on establishing the merit of the hypothesis that urban proximity is a repulsive factor in location of tribal settlements which may be observed in various areas. But as already stated, her unpublished doctoral thesis (1975) is a wide geographical study which analyses both population distribution and settlement pattern of tribal region in Kamrup of Assam using a few but useful quantitative techniques. In a recent article Singh (1981) has made an useful contribution on distributional characteristics of tribal population in India in an overall generalised approach. Das and Singh (1971-72) have contributed towards a socio-geographical analysis of the tribal population in and around Guhati of Assam.

Coming to the case of tribal studies in Orissa, it is seen that there are only a very few articles which may be of
of some use to researchers interested in the tribal development programmes based on in-depth study of distribution pattern of population and settlements. One such paper is written by Sinha and Mishra (1976) which provides a geographical analysis of tribes of Orissa in general. It tries to correlate concentration of tribal settlements to the relief and gives a locational study, only in an idiographic manner, of the major tribes of the state. The paper, however, does not attempt to pin-point the major tribal regions nor does it deal with tribal settlement pattern. The work lacks in merit due to absence of field observations. But it is commendable as it provides a geographical base to approaches on locational aspects of the tribal areas. Another work, though not a work of geographers, is a report produced by the planning and coordination (evaluation) Department of the Orissa Government in 1963. It is of immense help to geographers as it deals with the living condition and environment of the scheduled tribes of the state. Another report is of the planning commission produced by a study team in 1967 on tribal development programmes of Orissa which has interesting geographical observations particularly from the point of view of tribal development studies. The final report in 1964 on the major settlement operations in the tribal district of Koraput in Orissa presented by Behuria gives some information on the
tribal settlements of the southern tribal belt of Orissa. One finds interesting accounts on tribes of Orissa in *Man in India*, Vol.61, No.2, 1981(56) particularly on transformation processes at work in the tribal pockets. Panda (1965)(57) has attempted to show the changing pattern in Saura culture in Orissa which, though not geographical in approach, has much information on changing cultural landscape and distributional pattern of the Saura tribe. G.N. Das (1965-66)(58) has dealt with aspects of tribal development in his work on tribal welfare in various tribal blocks of Orissa. A.K. Dalua (1958)(59) gives an interesting geographical account of the Khonds of Orissa with special reference to their distributional pattern and culture.

Raicharan Das (1982)(60) in a recent article, though not of geographical approach, has interesting notes on the culture of Orissan tribes which would help research scholars in social sciences to understand the cultural pattern and therefore the associated locational aspects of tribes in Orissa. An account on the North Orissa tribal region is available in I.I.T., Kharagpur in the form of an unpublished M.R.P. thesis written by Satpathy (1978)(61). The work is basically aimed at planning for human resource development in the tribal region lying in northern Orissa. It has a number of maps and tables to help in further work though it cannot be taken as a reference for settlement pattern. The district educational profiles (62) prepared by the Department of Education of the Orissa Government for tribal
districts of Orissa contain valuable information on the geographical background of such districts as Koraput, Kendujhar, Mayurbhanj and Sundargarh. A valuable work on the tribes of Orissa has been done by J.K. Das (1972) based on tribal population data of 1961 census and it has been acclaimed as the first and only encyclopaedia of scheduled tribes of Orissa, as many as 22 selected tribes have been dealt with to help research scholars and others in getting an overall view of their locations and also tribal characteristics. The work of Patnaik and Bose (1976) on the integrated tribal development plans of Kendujhar is noteworthy particularly due to the suggestions for regional development of tribal area. With a marked difference from all the above works, Routray and Singh (1987) have presented the systems of settlements of the tribal district of Boudh-Khandmals in Orissa to help in projection of planning prospects of rural service centres through an integrated approach of weightage techniques and calculation of composite indices of development and this work is very useful to extend its application to larger areas so that the regional disparity might be lessened in the process of equitable distribution of facilities and innovations of development. Similar work on Orissa, particularly for backward tribal districts has been suggested by Routray (1984) and
Singh and Routray (1980) in the context of micro-regional planning necessary for eliminating the regional disparities at different spatial levels. One of the recent works is that of Misra (1988) which has a useful analysis relating to the tribal areas of Orissa. It shows tribal concentrations in Orissa and attempts to establish a correlation between tribal population resulting against urbanisation index on one hand and development ranks at district level on the other. The paper however does not focus exclusively the tribal regions nor it deals with the core.

**Statement of the problem:**

All the above works have exerted much influence on the present author to ponder over the ways and means for planning and development of tribal regions of Orissa mainly because her early interest in geography has been towards human organisation of space and the associated aspects of regional development in backward areas of our country. During her assignment in the project 'Adibasi Atlas of Orissa' as a research assistant and later in the 'Population Research Centre' as an investigator she developed further interest in tribal geography and particularly towards the locational aspect of tribal communities in Orissa. As a teacher at college level she has been impressed to note the contributions of human geography towards regional
planning and development where population clusters and settlements provide viable field for valuable research work of social relevance. This made her convinced on the usefulness of geographers to the nation and the society. At the juncture her attention was drawn towards a publication Geographic Dimensions of Rural Settlements edited by Singh, Singh and Singh (1976) which provided much inspiration towards locational study approach in geography. Particularly the article of Singh, Routrey and Jena in this volume dealing with spatial analysis of rural settlement pattern in Orissa using centrographic technique impressed her to dive deep into study of settlement pattern of backward areas for giving indication to planning and development mechanism. Haggett's work on locational analysis, Isard's regional analysis and Brush and Bracey's work on rural service centres have their profound impact on the author to direct her research towards locational study of population and settlements. There has been so much talk on the intention of various planning agencies and the government for improving the conditions of living in tribal areas of Orissa that it was but natural on the part of a social geographer to go into some detail of the nature and characteristics of the tribal regions.
in this backward state of Orissa. The settlements of tribal regions and especially of the tribal core areas of Orissa immediately attract the attention since the tribal population and their settlements are directly related to any attempt on improving the lot of the tribal communities of the State of Orissa where the tribal population accounts for more than one-fifth of the total population.

**Aim and objectives:**

With the above observation on statement of the problem and realising that not much work has been done delineating the tribal regions of Orissa, the main aim has been to go deeper into the study of the pattern of tribal settlements particularly based on measurement and assessment of the nature and characteristics of the locational aspects of tribal population and settlements in the identified tribal regions of the State of Orissa. Further it has been the intention of the author to investigate the locational study of tribal settlements of the core tribal areas at micro-level so that this may help in decision-making process of planning and development of the tribal regions of Orissa in general and of the tribal core areas in particular.

The important objectives of the present piece of research work are as outlined below:

1. To assess qualitatively the extent of the tribal concentrations in Orissa with the aim of identifying the boundaries of the outstanding tribal regions in the state based on locational contiguity of tribal settlements.

2. To locate the hard tribal core areas which are supposed to consist the most vulnerable tribal settlement sectors of Orissa inside the tribal regions with the aim of exposing these areas to the planners, administrators and executives of development programmes so that tribal development measures are taken in the right direction without ignoring the groups living in the core areas even though they do not fight for their rights.

3. To highlight the geographical setting of the tribal regions of Orissa in order to have a perception on the resource base besides the ecological and demographic peculiarities of these tracts.

4. To project the spatial extent of the distributional pattern of settlements by their sizes and also the locational pattern of the tribes by types in the tribal regions of Orissa and thus identify the tribal sub-regions occupied by specific tribe or tribes.

5. To present the pattern of location of tribal settlements in each tribal region and tribal sub-regions in order to assess their spatial arrangement on random or clustered basis.
6. To find out the mean centres of settlements for all the tribal regions and sub-regions and locate them on maps in order to assess their vulnerability for acting as control points of distribution of subsidies, introduction of innovations of development items, and administration of activities connected with different levels of regional development measures. Further, to suggest alternative operational mean centres of settlements where the theoretical mean centre is unsuitable for operational purpose.

7. To apply suitable measures for concentration indices of settlements of the vulnerable tribal core areas at grass-root level with the aim of identifying the various grades of concentration so that priority in allocation of infrastructural facilities could be logically and usefully spelt out.

8. To find out the various grades in locational association between the tribal and non-tribal population and settlements in Orissa at operational administrative level in order to recognise the bunch of settlements of extreme non-assimilation as against areas of high assimilation and mutuality of communal harmony so that while giving much attention on tribal regions, the tribal pockets of non-tribal districts are not ignored in allocation of developmental inputs.
9. To obtain the spatial pattern of locational association of population in the tribal core areas considering each tribal village so that the lowest possible level of the degree of mutuality for communal harmony could be assessed.

10. To suggest a system of settlements under ideal control of a hierarchy of service centres in the tribal core areas with the hope of eliminating the existing gap of lack of service facilities for tribal settlements in these vulnerable tribal tracts of Orissa so that planning and decision-making processes for regional development might be properly directed.

With the above aim and objectives and considering the implications of the problem of research at hand, we may logically and obviously come out with some assertions, assumptions and hypotheses which would form the base in dealing with the problem stated above. The following are the assertions, assumptions and hypotheses:

Assertions, Assumptions and Hypotheses:

1. Orissa is one of the few states in India where the scheduled tribe population is in an overwhelming number in some concentrated areas and belts. With as high as 22.4% of the total population of the state can the tribal communities be ignored in any planning policies made to raise the standard of the people of the state in an over-all estimation?
2. The scheduled tribe population has been always shy of coming closer to the so-called modern civilisation under the garb of industrialisation, urbanisation and of modernisation through new technological innovations. Can the tribals be blamed for not opting towards the imposed changing ways and therefore be excluded in the process of regional development for the state as a whole? After all, they have their age-old cultural habits and traits.

3. Looking at the nature of distribution of the scheduled tribes it is evident that tribal concentrations lie in some specified ecological suitable tracts for their habitation which are in the north and in the south comprising areas considered as backward simply because of heavy concentrations of tribal settlements where education and modern technology did not find place till recently. But, these areas paradoxically are the most rich tracts so far as mineral and water power resources are concerned as is evident from the recent developmental activities of the authorities for commercial exploitation of the resources, in these areas. It is through the bounties of these areas that efforts are being made to push Orissa ahead in the industrial map of the country and therefore gain an overall economic strength for the whole state. True; but have the administrative authorities and agencies of development taken any step to understand the peculiarities of the distributional pattern of tribal population and
settlements which is necessary for proper planning and development of the tribal regions?

4. It is necessary to identify the tribal core areas within the tribal regions of the state which are likely to be the hard grounds of dissatisfaction and social depression where the seeds of fissiparous tendencies can be expected to germinate for inter-regional feuds at micro-level and also for regional descention leading to communal disharmony and creation of unhealthy spatial pattern of degraded social environment.

5. The intra-regional feuds and regional disparities arise out of the unequal and uneven distribution of resource endowment between different communities. Geographical assessment of the degree of association between different communities, tribal and non-tribal, is a pointer to check the growth of regional disparities.

6. All tribal areas do not exhibit repulsive tendencies to urban proximities though in a general sense the hypothesis 'urbanisation in a repulsive factor to tribal concentrations' is true.

7. The higher degree of assimilation between tribals and non-tribals is a healthy indication towards better and balanced regional development.
8. Regional and sub-regional mean centres of settlement in backward tribal areas are the focal points through which development mechanism can be diffused since least distance for receiving messages of regional development is the first and foremost consideration for tribal settlements where communication network is rather meagre.

9. A well-planned adoption of service centres as the strategy for the purpose of regional development is of primary importance for tribal region.

10. Level of regional development is concomitant with the variation of industrial development and nature of assimilation between tribals and non-tribals in tribal regions of Orissa.

Methodology and Data Base:

J. Beaujeu-Garnier (1976) has rightly observed that "A multilingual bibliography is of little help in the search for a coherent methodology. Without elaborating on the traditions of particular schools of geography, or on the personality of individual scholars (which must inevitably influence a discipline where the presentation of research findings is in a literary form), the logical sequence of reasoning is often difficult to identify. Beneath the apparent diversity, however,
there are two fundamental methods of investigation: empirical-inductive and theoretical-deductive. The deductive method is more appropriate in the pure sciences while the inductive method at its simplest seems the more likely to fit geographical reality. In the context of the present statement of the problem and the connected aims, objectives, assertions, assumptions and hypotheses, it is inevitable that the inductive approach provides the base to spell out the methodology to be adopted for analysis. At this point we may note the observation of Berry (1968)\(^{(75)}\) according to whom 'the geographic point of view is spatial and that the integrating concepts and processes of the geographers relate to the spatial arrangements and distributions, to spatial integration to spatial interactions and organisation, and to spatial processes'. The present research work finds enough support from the above notions and adopts in its organisational frame the spirit and purpose of spatial implications for the theme in hand which is locational study of tribal settlements.

Having the above philosophical background with a bias towards pattern of spatial distribution, the fundamental techniques of operation have been chosen to form the component parts of methodology adopted. These are:
1. Identification of tribal regions and tribal core areas on the basis of percentage share, locational contiguity and ecological setting;

2. Traditional pattern depiction of the distribution by sizes of settlements and tribal types on the basis of choropleth maps;

3. Location analysis and measures following Isard's localization coefficient for geographical association, modified in the spirit of Gibb's locational association and adopted by the author with her supervisor in an earlier research article;

4. Logical depiction of the distributional pattern of tribal settlements using \( \chi^2 \)-distribution technique;

5. Identification of locations of the theoretical and operational mean centres through centrographic study;

6. Adoption of Gibb's method of concentration index in study of the magnitude of tribal concentrations in the tribal regions; and

7. Finding out a 'system of service centres' based on 'mean threshold population' technique of L.K. Sen and S.Wanamali (1971) to suggest equitable distribution of facilities and services in the tribal core area.
The method of analysis as outlined above is based on data collected mostly from secondary sources and on intensive field-work for locational and qualitative checks. From the subsequent chapters it would be clear that much verification in the field was necessary before arriving at logical suggestions. Most of the data are from published documents of different government and non-government agencies and institutions. The most important source of published data is the Directorate of Census Operations of Orissa (Census of India) and it is in this organisation that the author got all cooperation for collection of data in tabulated form for different census periods (1961, 1971 and 1981). Another important source is the Department of Tribal and Harijan Welfare of the Government of Orissa. The other important sources of data are the Survey of India Office in Bhubaneswar, Office of the Chief Engineer (Roads and Buildings, Orissa), Directorate of Public Instructions (Govt. of Orissa, Bhubaneswar), Orissa State Electricity Board, Office of the P.M.G., Orissa, Directorate of Health Service (Orissa), Office of the Registrar of Co-operative Societies (Orissa), Directorate of Animal Husbandry (Orissa), headquarters of different nationalised banks in Orissa, Planning and Co-ordination Department of Orissa and the Forest Department of the Government of Orissa.
The base map for the two tribal regions has been prepared by making a mosaic of photographically reduced million sheets which contain the boundaries of the State of Orissa. The base maps for the two tribal core areas are obtained in a similar way but making mosaic of the thana maps from respective District Census Handbooks.

The study in its final stage has been possible after preparation of tables of data and analysis of the same to provide meaningful explanations to the locational aspects of the tribal settlements in the tribal regions of Orissa. Drawing of maps and drawings have been made to provide visual impressions of the patterns in one glance for each theme of research investigation. It is hoped that the present work would provide a locational perspective of the tribal settlements in the tribal regions and also in detail in the core areas which in their turn would act as indicators towards decision-making processes of planning and regional development of the neglected tracts of the State of Orissa.

Organisation of the study:

Based on the aim, objectives and methodology of the research work stated above, the dissertation has been outlined in the following order:-
Chapter I is an introduction to the entire work with a logical statement on the importance of settlements in human geography and the study of tribal settlements in the context of planning and regional development. It makes review of the works done in tribal geography particularly in the background of tribal population and settlements of India and Orissa. The review also includes those valuable works which provide some inspiration to human geographic research irrespective of the discipline to which the authors of those works belong. Here the problem has been logically stated with aim, objectives, assertions, assumptions, hypotheses and methodology adopted in the analysis.

Chapter II deals with identification of the tribal regions and the tribal core areas of Orissa in the background of ecological setting.

Chapter III provides in detail the geographical setting with resource inventory for the two tribal regions lying in the north and in the south of the state of Orissa. It also gives a picture of general and tribal growth, density and other demographic characteristics.

Chapter IV is a detailed study of the spatial distribution of the tribal population and settlements in the tribal regions. The locational patterns of tribal settlements by size and also
by tribal types with their dominance and concentrations have been depicted through maps, tables of data and description.

Chapter V is organised with technical analysis of the spatial pattern of tribal settlements using chi-square technique which is followed by centrographic study for locational identification of the operational mean centres of development for the tribal regions at macro-level and tribal subregions at micro-level.

Chapter VI deals with concentrations of tribal settlements in the core tribal areas of the tribal regions of Orissa. It depicts the pattern of tribal settlements at micro-level based on computation of concentration indices.

Chapter VII has specifically analysed the pattern of assimilation of tribals and non-tribals at various spatial levels for both population and settlements based on the technique of locational coefficient of geographical association in order to identify various degrees of vulnerable tracts of communal mutuality for planning and development measures.

Chapter VIII is an integrated analysis of available functions and facilities in the tribal core areas of Orissa for obtaining a system of settlements under control of a hierarchy of service centres. The purpose is to achieve better
distributional pattern of service facilities for the tribal settlements in the hard core areas which, it is hoped, would lead to desirable regional development. The technique of mean threshold population and weightage has been applied here for a logical system of selected settlement to act as service centres under four different orders.

Finally, Chapter IX deals with summary and conclusion where the broad findings have been outlined followed by a logical suggestion for development strategy for the tribal regions of the state of Orissa.
Reference


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