CHAPTER II

CONCEPTS AND APPROACHES TO LAND USE AND SETTLEMENT GEOGRAPHY

A) Evolution of the Settlements

B) Concepts and Approaches to Land use and Settlement Geography

   Rural-Urban Typology
   Rural-Urban Dichotomy
   Rural-Urban Continuum

   Objectives of the Study
CHAPTER II
CONCEPTS AND APPROACHES TO LAND-USE AND SETTLEMENT
GEOGRAPHY

(A) EVOLUTION OF THE SETTLEMENTS

Origin of the Name:

The region comprises of talukas of the two districts of the coastal Karnataka namely Uttar Kannada and Dakshina Kannada. The word Kannada means as "Kannada Language". Until 1860, the two districts of the Karnataka coast were under a single administration. In that year however, a division of this area which had a natural and cultural unity was brought about. As a result Coastal Karnataka was partitioned into North Kanara and South Kanara. In 1862, the former was tagged on to the Bombay presidency, while the latter portion was retained in the Madras presidency. In an anglicised form the coastal area was called and recorded by British rulers as "Canara" or "Kanara". After reorganisation of the Karnataka State in the year 1976, the two districts of the Karnataka Coast were called as Uttar (North) Kannada and Dakshina (South) Kannada.
It appears that the Portuguese, on arrival in this part of India, found the common linguistic medium of the people to be Kannada and accordingly called the area as Canara, 'd' being not much in use in Portuguese. This name applied to the whole coastal belt of Karnataka and was continued to be used as such by the British. When this "Canara" coast was divided into two parts in 1660, this Southern area was called 'South Kanara' and the part lying to the North of it was termed "North Kanara". In Dakina Kannada coast "Tulu" is a local language, spoken in the house, though Kannada is a regional language as well as administrative language. In Uttar Kannada coast Konkani is another local language. Both "Tulu" and "Konkani" do not have their scripts. People usually write these languages in Kannada script. The evolutionary aspects of settlements of the study have been traced out from the prehistoric age. So far very little is known about the Prehistory of the region. It may be said that the early man must have found it very difficult to settle in this area which was full of mountains, dense forest and trackless and infested by snakes and wild animals.
Alupa Period: The Alupas ruled the area from an early period of Christian era to the end of the fourteenth century A.D. In this period settlements like Coondapur, Baindoor, Mangalore, Udipi, Mavalli, Vaddarse, Kota, Udyavara, Mudukori, Barakuru, Kadri, Ulepadi, Uppura, Kotekeri, Koteshwara were existed.

Vijayanagar Period: Vijayanagar Kings ruled the region from 1346 to 1554 A.D. In this period also some of the settlements were introduced. This can be found out with the help of their trade. Their trade was carried on through the ports of Mangalore Barakuru, Bhatkal and Honavar etc. Other than these, some other settlements like Sadashivagad, Majali, Shirali, Surathkal, Malpe, Vittal, Krimanjeshwara, Basavarajdurga etc. were important places of trade activities of Vijayanagar Kings.

Portuguese Period: It was during the region of Saluva Narasimha-II (1491-1505) that the Portuguese arrived in India. Vasco-da-Gama reached one of the Islands near Udipi in 1498 and set up a cross and called the Island "El Fadronde Saneta Maria", (Now St. Mary island).
Period of Keladi Nayakas: After the rule of (1500–1548) Vijayanagar Kings, Keladi Nayakas ruled coast round about 16th century. In this period new settlements were noted like Barakura, Kallianpur, Kumta, Kapu, Tonse-West, Tonse-East, Kollur, Simantur, Mulki, Hosangadi etc., in the Coastal Karnataka.

Since the beginning of British rule in India we are able to trace out more than 800 settlements. Earlier to British rule in the region, there were no adequate sources to mention exact names or number of settlements of the study area. At present the region has about 846 settlements which also include some deserted villages.*

-------------------------------------------
* Deserted Villages (Uninhabited)

Kumta taluk: Kelaginastal, Keppekurve, Masurkurve, Middlegazani, Nagarbail, Marnapur, Savalkurve, Yeshwantimule.

Bhatkal taluk: Mudbhhatkal.

Ankola taluk: Kanchinmale, Lakkeguli, Shikli-turli.

Honavar taluk: Kakurve.

Coondapur taluk: Paduvari port.
The history reads: 'The Fort of Sadashivgad was built in 1715 by the Raja Basavalinga of Sonda Dynasty, naming it after his father, Raja Sadeh. The existence of Goddess Durgamma in the Fort is traced to long ago much earlier days. The Portuguese visited this place twice in 1665 and again in 1673 with an army and captured all the coastal places of Goa including Sadashivgad. He was a devotee of Goddess Durgamma. After the Treaty of 1660, the Portuguese obtained possession of the Fort, thereafter, the East India Co. then at Kedva got control over the Fort in 1779. The stone statue of the Hindu God is found on the top of the main entrance gate of the Fort, displayed here speaks of the British supremacy for number of years. The ancient monument of Durgamma was built in 1665 by the Hindu community settled on the coast.'
The landuse survey deals with inventoring, classifying and mapping of lands according to their present utilisation and such study is needed for their proper assessment. Generally the landuse survey's are carried out by traversing the area as well as collecting the data from the administrative records. It is time consuming and many a time erroneous. But in recent times the data can be collected from multi-date as well as sequential areal photographs and land-sat immageries. In our present study it was not possible to obtain the land-sat immageries of the Karnataka Coast.

Collection of landuse data is one aspect. The more important aspect is the analysis and assessment in respect of landuse trends and changes, effect on land quality, environment and socio-economic structure. Such studies are the fore-runner for introducing in a radical changes in the landuse pattern. Eventually, the ultimate objective ought to be to meet the increasing needs of the local population.
and yet maintain ecological balance and satisfy the conservation needs. Landuse survey should provide data on the present landuse and also the land available for future. It should help in predicting the suitability of the lands for various uses, the management practices, necessary and the possible likely changes in landuse consistent with the environmental features and changing socio-economic conditions.

In this thesis a chapter on landuse, resources and their economic inter-relationship provides general landuse study of the coastal region in general and landuse profile of the Karwar-taluk and Halge village as a case studies.

Settlements form an essential element of the cultural landscape and are viewed as "a concrete expression of human occupation of the earth's surface". Though their studies are as old as the subject of geography itself, no serious attempt on scientific lines could be made till the mid of 19th century when


Khol pioneered their studies. Later on Ratzel, Schulter, Blashe, Brunhes, Demangeon, Blanchard, Bowman, Kohn and others made contributions to these settlement studies. But the real credit of developing this branch into an independent discipline goes to Meitzen who is popularly known as the father of settlement geography. Settlement geography, whose central theme is to examine the locational and spatial distribution of settlements has always been a point of debate amongst academicians and has been constantly modified with the changing concepts of the subject of geography. Whereas in its traditional studies emphasis was laid on man-land-relationships concentrating initially on genetic and morphological approaches and then on the functional ones, the recent concept revolves around the complex set of man-man-relationships emphasizing the role of economic and social factors and thus clearing the way for locational studies with the help of models and quantitative techniques.

We find that a significant progress in rural geography has not been made as far as its theoretical side is concerned. Especially, the rural settlement location, unlike its counterpart has attracted...
the least attention of the geographers. This is mainly due to the paucity of reliable and adequate data on the global scale and the lack of incentive by governmental and non-governmental organisations finalising such research projects. Further it is wonderful to note that majority of the location theories have been borrowed from urban geography and have been extended or modified to cover up this aspect of the problem.

Only a few of them have originated exclusively from rural environs. All these theories can be grouped under two categories; 1) Those developed elsewhere in the fields other than rural geography and 2) those put forth mainly for rural geography. The purpose of this chapter is to evaluate these existing theories of rural settlement location and thereby focus the attention of the scholars for formulation of their basic principles and laws.

The first theoretical statement on agricultural location was Thumen's "Der isolierte staat" Wherein he assumed a flat uniform plain with a single transport media and showed that under ideal conditions a city would develop in the centre of the land area.
and concentric circles of landuse ranging from intensive farming to waste land would be formed around it. This theory which explains the evolution of landuse pattern around a city can be applied to rural settlements as well. It may serve a better purpose of explaining settlement location in a rural geography. But it is a rather curious paradox that the theory led to some of the valuable researches in urban geography but could not become popular so far for rural geography is concern.

The most developed area of settlement geography which has the profound impact on geographical research in various parts of the world is central place theory of Christaller. The theory, devised to explain size, number of distribution of towns is based on the assumption of an isotropic surface on which there will be regular spacing of settlement arranged in hierarchical order, each bounded by hexagonal shaped trade area and each nesting a host of six nearest immediately lower order places around it. The higher order central places

which are more widely spaced than lower ones have larger population and trade area and so perform all the functions of lower order places plus a number of higher order functions of their own category. Also based on his three locating principles (marketing, traffic and socio-political), Christaller suggested seven tier hierarchy in his model ranging from the market hamlet to the regional capital city. Although Christaller's theory commanded a great applause by urban geographers who tested many of his findings and suggested necessary improvements there in, its application to rural geography remained neglected for long. The theory may prove to be equally important in case of rural geography where it may serve a useful purpose of explaining the distributions, spacing, hierarchy and hexagonal patterns of rural settlements.

Christaller's model of hexagonal shape has been greatly improved by Losch so as to make it more suited to the patterns in the real world. The salient feature

7. Losch A: (1954), "The economics of location."
of the Loschian hierarchy is that it is less rigid and allows the $k$-value to very freely. It consists of a nearly continuous sequence of centres rather than discrete tiers, so that 1) settlements of the same size need not have the same function and 2) larger places need not necessarily have all the functions of the same smaller central places. Also unlike Christaller Losch discussed rural settlement location in his version of the theory. The hexagonal models of Christaller and Losch were subjected to a number of empirical tests and subsequent modifications. Whereas Haggett finds striking approximation to hexagonal number in his study of Brazilian counties, Isard expresses doubts in the occurrence of the regular pattern of hexagons in practice. Another objection is raised over the application of these models to rural settlements where the number of settlements may not necessarily increase proportionately with the lowering of the hierarchical order (e.g. isolated farmsteads may not be more numerous than hamlets).

The main criticism levelled against Christaller and Losch models is that they are static and therefore

---

less meaningful to the patterns of the real world where the central place hierarchy is very much complicated through time. Hagerstrand's model is a major improvement towards this direction. In his pioneer attempt he suggested a four stage model for the passage of innovation waves to account for the diffusion process: (I) Primary stage marks the beginning of the diffusion process with a strong contrast between the innovating centres and the remote areas, (II) The diffusion stage marks the diffusion process proper in which there is a strong centrifugal effect with the creations of new rapidly growing centres in the distant areas and reduction in the strong regional contrasts of stage-1, (III) The condensing stage in which the relative increase is equal in all three locations and (IV) The saturation stage in which there is a general but slow asymptotical increase towards the maximum under existing conditions. Hagerstrands models paved the way for locational studies in settlement geography.


Another approach on these lines, though controversial and less meaningful to settlement location, has been suggested by Neyman and Scott. Their stochastic model of diffusion envisaged that the spatial distribution of a population on a basic habitat plane is dependent on the interplay of four forces: (I) Chance distribution of 'cluster centres' where litters of generation are born (II) Chance variation in litter-size, (III) Chance mechanism of dispersal and (IV) Chance mechanism several up to a pre-assigned movement in time.

One of the significant contributions to the field of diffusion studies has come from Bylund. He considered the ways in which waves of settlement moved in the central Lapland area of Sweden and suggested four hypothetical models of settlement diffusion. His deterministic models are based on the assumption that 1) the physical conditions of the land are equal in all areas and 2) further areas will not be settled until those close to the another settlements are occupied. Each of these models have four stages of growth and differs from one another in number and the location of the mother settlements, the first and the last spreading from a coastal location and the second and third from an inland one. Bylund's idea is being applied to a


number of studies on settlement location. The need is to test this hypothesis and suggest suitable modifications in view of the contrasting conditions prevailing in Western or Eastern world. R.L. Singh and R.B. Singh throw some light on this aspect of the problem in which they challenge some of the findings of Bylund. Also serious objections have been raised by Meinig and Morrill regarding the suitability of deterministic models, because these are basic uncertainties in the pattern of human behaviour and man is not always able to distinguish between equally good choices nor can be always able to distinguish between equally good choices nor can he always recognise optimum locations should there exist.

Since 1952 Hagerstrad has stepped on to explore diffusion waves through the use of the dynamic simulation techniques. A probabilistic model on these line within the frame work


of stochastic has been developed by Morrill to account for
the evolution of settlement patterns by using Monte Carlo
simulation. He starts with an initial settlement and suggests the
development of settlement hierarchy around it as governed by a
sequence of random numbers. The three basis rules governing
his model include 1) for each time period or generation
(T0, T1, T2, ..., Tn) every place generates at least one
migrant in the order of its origin with the total number of
migrants from each place proportional to its size. 2) any
place may be settled more than once and enlarged in size
provided it does not clash with distance compatibility rule
and 3) distance and direction of each migrant's move is
governed by the number in the probability matrix, prepared
on the basis of empirical studies by Hagerstrand. Using this
model, Morrill simulated the growth of the population between
1860-1980 in Varname area of Southern Sweden. In another
paper he examined the migration spread and growth of urban
settlements. The need is to popularise the use of this recent
technique to rural settlement studies and if possible to
suggest some clue to the probable location of nuclei of
initial settlements by reverting the technique.

Drawing upon the ideas of the Zipf and Webber, Chisholm has
provided a systematic account of the general problem of the

17. Chisholm M. (1962); "Rural settlement and landuse", London Hutchinson University library.
According to him a new agricultural settlement has two sets of space relationship: (1) to its lands or resources and 2) to its links with the outside world. Whereas the initial location of such settlement would be determined by the principle of 'least cost' depending upon the availability of arable and greening lands, water, fuel, resources, building materials, protected sites and external contents; its diffusion may be linked to four major changes: 1) Socio-economic changes in the land holding system 2) removal of the need for defence agglomeration, 3) elimination of such factors as disease and 4) technical improvements in water supply. He further contended that 'the best primary' units for rural environs are squares and oblongs rather than hexagones.

Recently game theory methods have been applied to various locational problems by a number of writers. One such problem of mixing crops in the appropriate combination at Jantilia village of Western Ghana has been approached by Gould with successful results. Curry has gone still further in applying wholly random processes to the building of settlement patterns with varying degrees of industrial specialisation.


A location theory exclusively for rural settlements has been proposed by Hudson to explain morphological changes in settlement distribution over time. Borrowing ideas from the field of plant ecology, he suggested three distinct phases of settlements growth: (1) Colonization, by which the occupied territory of a population expands (2) Spread, through which settlement density increases with a tendency to short distance dispersal; and (3) Competition which is marked by decline in density and produces regularity in settlement pattern. He then formulated three hypotheses and subjected them to empirical tests on the basis of settlement data collected from six countries of eastern Iowa by applying Poisson distributions. His results indicated that the distribution is definitely tending toward greater and greater regularity between 1870-1960.

Hudson's theory has invited a number of criticisms from various scholars. While Birch commented that "such a model is of course unreal"; Grossman raised his serious objection to the steady decline of density in the third phase. He also expressed doubt over the suitability of this theory to African

environ where each Clan & cultural unit has its own method of special organisation and a community has control over matters relating to land tenure and land allocation. Singh²⁴ has also noticed the dominance of similar factors in the growth of settlements in northern India. Another doubt of this type may be expressed regarding Hudson's claim of observing regularity in settlement-pattern in the third phase.

In the case of Indian rural settlements, we hardly find traces of such regularity, instead there is haphazard clustering of buildings without any proper pattern of lanes, roads, drains, etc. Regularity, on the other hand is the typical feature of urban areas and its beginning is an indication of gradual transformation of the settlements from rural to urban. Therefore, it is erroneous to look for such an orderly development in rural areas. Infact urbanisation begins its foot-hold with the later part of the second phase itself in which we observe density increase and its conitant effect of competition forcing individuals either to migrate to new areas, change over to non-rural activities or devote their lands to more productive urban purposes. Hudson's failure to keep notice of these facts in his theory is mainly due to paucity of world wise settlement data and the fundamental difference between the characteristics of rural settlements in western and eastern worlds.

²⁴ Singh R.K.(1972); "Rural settlements in Monsoon Asia", P.114 & 152-170.
In the light of the above discussions, three distinct phases of Hudson's theory may be redescribed as (1) Colonization (2) Spread and (3) Saturation. The first phase is marked by the beginning of new settlements with large inter-spatial distances. The second phase includes the gradual narrowing of these distances by the spreading of the settlement areas. This could be possible only due to population increase either because of immigration from outside or natural increase. Saturation in which settlement pattern stabilizes and some sort of equilibrium is reached between population and existing soil resources (for rural activities) may provide ideal conditions for the beginning of urbanization. Hudson marks this stage by lower limit of the size of the farm that can be operated economically. Further addition in population whether by immigration or by natural increase will force inhabitants either to migrate to new areas or to switch over to non-agricultural occupation which have greater capability of supporting denser population. No time limit can be fixed for the settlements passing from one phase to another and the process may be rejuvenated following technological improvements which may open new prospects for rural settlements. The above arguments are based on the assumption that there is an upper limit to which farms can be exploited for rural purposes, that urban activities can support denser population by virtue of their more intensive use of the land and that as population increases any human society tends to
shift its geonomic dependence from one set of environmental elements to a more productive set of elements. On the strength of the Hudson's theory it can be observed that in the coastal Karnataka the 'spread effect' is taking place. The coast has already experienced the stage of 'Colonisation' but the 'density' effect is not seen uniformly and intensively throughout the coastal Karnataka, instead the density is extensively emerging in and around the Mangalore Urban agglomeration and to certain extent nearby Udupi and Karwar towns. On the strength of the resources and the geo-economic development, in and around the coastal Karnataka, it can be assumed that the urban centres along the coast will act in near future as the nodal centres of spread effect of the settlement development.

Rural-Urban Typology:

Human settlements very often are arbitrarily and vaguely distinguished as rural and urban, and it is still an open and highly controversial question as to what attributes qualify a settlement is being designated rural or urban. The United nations Demographic year book of 1952 states that "there is no point in the continuum from large agglomerations to small clusters of scattered dwellings where urbanite disappears and ruralite begins". The division between rural and urban populations appears arbitrary and varies considerably both in the spatial and temporal contexts. However, it is an accidental thesis that high population density and urbanisation are
necessarily co-related. Though in the Indian context it is not always necessarily true. The process of urbanisation involves both the multiplication of points of concentration and increase in the size of the individual clusters. In a pre-industrial society, the town existed as a central place to the surrounding countryside. The countryside could send its produce to the towns, from which its needs be obtained. It was in the town that production and consumption interlocked, and led to its distinctive function as a commercial and service centre with its shops, banks and offices or in short, its tertiary function.

Rural-Urban Dichotomy:

Lampared argues that present day sociological theories of urbanisation are centered around three concepts: behavioural, structural (economic) and demographic. The consequences of rural urban contrasts have given rise to the recognition of a rural urban dichotomy. Wirth in characterising sociologically the urban population is of the opinion that increase in size and density of population leads to increased anonymity, which

26 Lampared B.E. (1965); "Historical aspects of urbanisation", in P.M. Hauser and L.F. Schмore (Ed. the study of urbanisation, N.Y.).
27 Wirth L. (1938); "Urbanisation as a way of life", American Jr. of Sociology, P.2,44.
together with more widespread division of labour than in rural setting would in turn produce social heterogeneity. Redfield suggests that these two opposite rural and urban are the effects of polarisation of successive patterns of change through which folk society becomes urbanised. He, therefore introduced the notion of folk urban continuum of contends that urbanisation is transformation of the social situation of the individual. Lonard Frankan Burg thinks of morphological continuum and develops a theory of spatial change a progressive, historical development from rural to urban, mediated by industrialisation, division of labour and role of differentiation.

In its economic aspects urbanisation mainly relates to movement of people out of agricultural community into other non-agricultural communities. This approach to urbanisation directly co-relates economic development with urbanisation. Urbanisation is seen as the product of increasing economic specialisation and advancing technology. Brian Barry supports the contention that urban growth is simply a concentration of differentiated by functionally integrated specialisation in rational locales. In a demographic ecological sense,

urbanisation involves the urbanizational component of the populations achieved capacity for adoption. A main criticism that social scientists make is that purely sociological concepts like the rural-urban dichotomy and rural-urban continuum are too weak, and that the urban environment is stressed at the expense of the society that gave rise to it. The geographers' approach is more direct. It emphasizes the part played by the physical environment. A significant contribution of the geographers, lies in studying the urban centres with reference to their regional setting. R.B. Dickinson's city and Region highlights the relevance of this geographical concept, and explains how in an economic sense the city reflects its region; the city depends on the region for its needs stemming from agricultural production, and in complimentary way the region is dependent on the city for all those specialised functions which hinge on exchange, manufacture and service. The relationship between the city and the region is somewhat symbolic: the traders, administrators, craftsmen and service seekers live on the surplus which the countryside in the region produces and in exchange, they serve a large farming

community through their urban amenities and services. There is a mutual dependence between the town and the country-wise in economic as well as social and political considerations.

**Rural-Urban Continuum:**

The notion of rural-urban continuum arose in reaction against the polar type dichotomy. The concept of a continuum also sociological approach, postulates distinctive pairs of antithetical social, cultural and economic systems (in truly ideal rural-urban situation) that are derived from demographic and ecological variables & intermediary phases or stages in the continuum with varying degrees of rurality and urbanism. It implies, typologically an open ended scale of measurement of rurality/urbanism.

One general theory that provides a particularly useful background to this notion is that based on Gideon Sjoberg's thesis which views cities as products of their societies which he categorises as per literate, feudal, pre-industrial and post industrial. This typology similar to that of Heissman, characterises urban development as temporal continuum, along with pre-industrial and industrial cities are convenient categories.

---

The concept of continuum is useful in distinguishing phases and changes in urban evolution through time and also to identify contemporary change in Space. The concept of rural urban continuum has also a strong physical bias in which if there is continuum, there must be social processes that must lead to progressive differentiation.

Although about 20% of population lives in urban areas and the tempo of urban growth has increased during last three decades India is still predominantly a rural country. As the tempo of economic growth accelerates, the stimulus for a shift towards the urban centre in search of better living conditions might gain further momentum. We may also notice that there is more on the political plane, an urge to improve rural India. Urbanization in India is a complex phenomena as a result of economic, social, cultural demographic and technological processes net-work. The processes and modernization are creating a gulf between the city and country.

The city draws into itself a large number of rural people and develops into a rapidly growing industrial, commercial and educational complex offering a variety of opportunities for employment and education for trade and industry and for recreation. The influx of population into cities is continuing unabated.
The social and economic processes at work in the Indian countryside and the urban setting have helped by and large in producing a sharp polarisation between the town and the country. In fact, it is the rural-urban dichotomy that appears to be prevalent in the Indian context rather than a rural-urban continuum, although in the neighbourhood of large metro-politan cities like Bombay this discontinuity is tending to get blurred. Mujumdar, finds in the Indian town and village two distinct sets of values. Yet, city hinterland relationships are ecologically closely fused with extended families owning property in both the country and town and members living at different times in both or alternatively commuting between them. On the one hand, through their daily contact with the town they introduced the urban values into the village and on the other hand through their desire to become farmers and to acquire prestige in the village, they support the traditional system. The strong pull of farming makes it difficult for them to adjust themselves to urban environment. It leads them to act as villagers in town and also tones down their introduction of urban values to the villages.

The aspects of the regional setting and population and settlement structure bring to focus the following problems in drawing up a spatial frame work of the development plan at and

32. Mujumdar D.N. (1956); "Caste and communication in an Indian Village", Asia, Bombay.
below the coastal regional level. (a) The future pattern of functional organization of settlements will be dictated by the nodal centres located in the coastal region. (b) Along the coast all the urban centres would get further strengthened by the radial roads spreading towards the east and north-south convergence and in turn the future pattern of growth of central places form among the large number of rural settlements would also follow the same principle of emergence and growth along the axis converging on bigger settlements. (c) The increasing productivity from the primary activity would bring about stabilisation of rural population in small settlements and also increase the mobility of people for transaction of commodities and availing of services and amenities not available in the place of residence. The social and political considerations would exert pressure for down-ward thrust of development benefits to smaller settlements. This means the requirement of a large number of nodal centres particularly at the lowest level of urbanisation of the rural economy. (d) The plans for linking all the villages with the metalled roads has set in a tendency for further growth of large urban centres like Mangalore, Karwar, Udipi, etc. In such a situation the problems of upgrading the small towns which has assumed priority both at the regional and national levels have to be considered along with the plans for evolving a pattern of growth of selected rural settlements as nodal centres. From these considerations, therefore the formulation of strategy and drawing up of spatial frame-work of