

## CHAPTER - I

### INTRODUCTION

The present work undertaken is on "Dynamics of General and Crop land use - A selected study of two talukas of Baroda District" i.e. taluka Padra and Karjan. It studies the changes that have taken place in General and crop land use of the two talukas situated in south and south west of Baroda taluka

#### **Land use**

##### **Meaning and Definition**

"The allocation of land for various human activities competing for it is one of the most basic geographical problems" (Conkling & yeats 1976, P 8) The land use is the behavioral function of human being changing according to the changing situations with an anticipation of the advantages. Land use, therefore, indicates a kind of economic concept that denotes two types of functions performed by man, one is in space, and the other is in quality. Space gives the location of activity and quality gives the type of use. Thus land is any kind of permanent or cyclic human interference to satisfy human needs, either material or spiritual or both from the complex of natural and artificial resources which together are called "land" (Vink 1975 P.1) He further states "land carries ecosystem; land use is the application of human controls, in relatively, systematic manner, to the key elements within any eco-system, in order to derive benefit from it"

The term land use and land utilisation, as suggested by the Oxford Dictionary are synonyms. The longman Dictionary of Geography and in many other texts these two terms have been used inter-changeably (Rizvi, 1991 - unpublished thesis)

However, "some scientists have attempted to make a subtle difference between the two, as they were of the opinion that institutional factors should not be included in land use, but land utilization" (Vink P2). But Vink (1975) is of the opinion that "land as a tract" i.e. as a geographically defined specific area, does not include the permanent or cyclic institutional attributes. He further says that A rural land use in its widest sense is including agriculture, forestry and game cropping as well as wild life conservation and the development and management of recreation grounds. In this sense, therefore, both terms are used interchangeably by him. The present study also uses the terms in the same meanings.

### **Location And Extent**

Padra taluka is bounded between  $22^{\circ}00'$  -  $22^{\circ}15'$  north latitudes and  $73^{\circ}00'$  -  $73^{\circ}11'$  east longitudes. River Mahi marks its northern side and talukas of Karjan, Baroda and Bharuch delimit it in its southern and western directions. It encompasses 534.6 Sq.Kms. (Fig. 1.1).

The Karjan taluka lies in the south-west of Baroda taluka. It is bounded between  $21^{\circ}49'$  -  $22^{\circ}7'$  North latitudes and  $73^{\circ}00'$  -  $73^{\circ}14'$  East longitudes. The total area of the taluka is about 602 00 Sq. Km.. In its south and south-east across the river Narmada is Bharuch taluka Padra, Baroda and Dhaboi talukas lie on its north-west, north and north-east. (Fig. 1 2)

### **Physiography :**

Padra falls in the central mainland Gujarat. Physiographically it is a plain gently rolling towards south west. The average elevation is around 100 meters above mean sea level. The eastern part of the taluka is slightly inclined towards south and the western part is found tilted towards west. Other characteristic features of the relief are undulating

## LOCATION OF VILLAGES



Fig. 1.1

# KARJAN TALUKA

## LOCATION OF VILLAGES



Fig. 1-2

ravines of Mahi river in the north and a few of the ravines of Dhadhar in the south where steep terraces, valleys and narrow gullies formed by heavy rains and floods are prominent features

As such the slope is very gradual, barring a few wind deposited accumulation of loam and sand the entire taluka appears to be a monotonous flat land. Further there are as many as 318 small and big depressions causing inundation during the rains and suspending the agriculture work. They were, however, given an artificial drainage by digging canals and joining them to river gullies. There are undulating land strips caused by the imbalanced erosion and deposition of two rivers Mahi and Dhadhar flowing from the northern and southern boundaries of the taluka. The ravine areas have distinct irregular relief, and otherwise the taluka has no such conspicuous upraised feature to be mentioned.

This physiography of the taluka is, by and large, very much suitable for the agricultural land use in all the seasons, except the ravines and undulating land strips along the two rivers in diametrically opposite directions and the depressions scattered in different parts of the taluka, usually inundated during the monsoon rains.

#### KARJAN

It is also a part of mainland Gujarat. Physiographically it is almost flat gently rolling alluvial plains. It is built up of the alluvial deposits of Dhadhar in the north west, Narmada in the south east and their tributaries in their respective regions. It is found tilted towards the river Dhadhar and Narmada at the north west and south east. The mid plain area is characterised by very gentle slope making it ill drained.

It is about 90 meters high from the mean sea level. Near the bank of river Dhadhar huge mound like land forms exist which may be attributed to erosional and depositional work of the same river. It is the only conspicuous feature in the entire monotonous flat plain, the rest is offering very suitable conditions for the agricultural land use.

The hydrology of the taluka is governed by the texture of the soil, the climate and general relief of the plain, and these conditions together govern the making of the physiography of the area. It is aforesaid that the slopes of the region are towards its big rivers treading from the northern boundary (river Dhadhar) and south eastern boundary (river Narmada). Narmada is making a big bank of concave meander steeply sloping in the villages of Kotiya, Ranapur, Somaj and on convex side of the meandering bank are the villages Moti Koral and Nani Koral. The erosional work of Narmada and its small tributaries are very much conspicuous in the villages Delwada, Somaj, Arjanpura etc. It is found that these tributaries have caused great damage by laying waste much of the area in these villages.

River Dhadhar has also played havoc in the northern part of the Karjan taluka. Since it flows from the areas of sandy soil, it has deposited enormous sand in its near by areas making them uncultivable. Great sufferers are those villages lying near the bank of river Dhadhar where in a large area the upper mantle of the soil is washed away by its erosive action. Its tributaries, even though, small, enlarge every year, erode more areas and have formed more or less a dendritic pattern of drainage.

The Bhukhi and Ranger rivers are rather rivulets. Bhukhi flows through the centre of the taluka through the natural depressions during the monsoon it comes into spate and causes damage to the standing crops and also erodes away the soils.

Bhukhi meets Narmada in the Bharuch District while Ranger joins Dhadhar

There are a few depressions, though, small in size innundate during the monsoon, cause some damage to soils These depressions are considered very suitable areas for rice cultivation, but when they innundate and overflow they damage the crops and also the soils

Besides, these water features, the general nature of land is a flat plain built up mostly of black cotton soil and largely suitable for cotton cultivation

These physiographic features are both helping and retarding features in the crop land use of the area particularly during the monsoon season but in the other seasons larger tract of the area excepting near the two rivers in the north and south are most suitable for a variety of crops including cereals, pulses, oilseeds, vegetables but most favourable for cotton if other things remaining the same

### SOIL

“Soil is the most valuable natural resource and is the basis of all agricultural production” (Rajan & Rao 1978 P 1). Though modern technology is developing the scientific measures to grow crops without soil, it seems an illusion in the wider spectrum of the significance of soils, for large crop raising This technology may be successful in the highly technically advanced countries or some such like Israel where cultivable land is short, and their spending capacities are high In the countries as ours where this economy is characterised with the primary and rural based, this technology may be nothing more than a dream. Our rural folk, at least, in the near future, cannot afford to have such a closed door agricultural concept The fields that are available for this economy can give enough with the application of modern

scientific methods which have already made their way in The soils of the study area were formed in the Pleistocene and the recent post tertiary rocks (Wadia D N 1949) The soils are the part of the broadly classified soils of the 'Kanam' region - the region characterised for its black soils for cotton crop The soils of the area are not in uniform composition, varying shades are formed on the basis of texture and composition However, the sub regional classification of soils (at district level) show that there are mainly three types of soils (Gazetteer, Vadodara District 1971 P.273-275) The two main divisions are Black (Kali) and high concurrent Alluvial (Goradu Gorat) soils. The mixture of the two soils forms a third type known as Besar (locally known as Bhatha). Gorat and Besar soils contain more proportion of silt and sand than the black soil In the Gorat soil the percentage of sand varies from 55-65% The Besar (Bhatha) soils have a higher percentage of silt in them

The soils of Padra and Karjan have mainly three divisions. The two main types are Black (Kali) and light coloured Alluvial (Goradu) soils The third one is overlapping in the regions of the former two and which is a mixture of both of them, known as Besar (locally known as Bhatha) (Table 1 1).

Table No 1 1

Shows the region wise percentage share by each type of soils in the talukas

Regions	Percentage share of soils					
	Padra			Karjan		
	Black	Alluvial	Besar	Black	Alluvial	Besar
I	-	48.43	-	44.40	-	-
II	-	-	15.70	-	-	19.17
III	35.87	-	-	-	36.43	-



In Padra region I comprises of Alluviul soils, region - II is the overlapping region which is mixture of Alluviul (Goradu) soils and Black soils, known as Besar in both the talukas and the third region is of Black soil in Padra, where as in Karjan region I has Black soils and Region - III is of Alluviul soils (Goradu) (Fig 1 3 a&b).

### CLIMATE

More than any other factor, the climate plays dominant role in the development of the pattern and character of land use. The type of bio-mass, the human settlements, the types and patterns of general and crop landuse etc is in one or the other way reflect "a major exploitation of the climatic resources". (Peacock and Shelly 1974, P 87)

'The study regions are micro-climatic zone in the vast monsoon realm of Indian sub-continent. The climate in these areas represents the salient characteristics of the south west monsoon, partly modified by marine influences. there are seasonal rhythms but rarely reaching the extremes as experienced in the interior parts of the country" (Rizvi S M.H. 1991, Unpublished Thesis)

On account of the seasonal rhythms, the year has broadly been divided into three seasons - the winter, the summer, and the rainy season. A period of transition intervenes between each out going and incoming seasons

#### The Winter Season.

The winter season in the sub-continent starts from the end of the rainy season. But at different places, due to the spatial influences the onset period is varying. In the study areas winter do not start just after the end of the rainy season, but

# SOIL REGIONS - PADRA AND KARJAN TALUKA

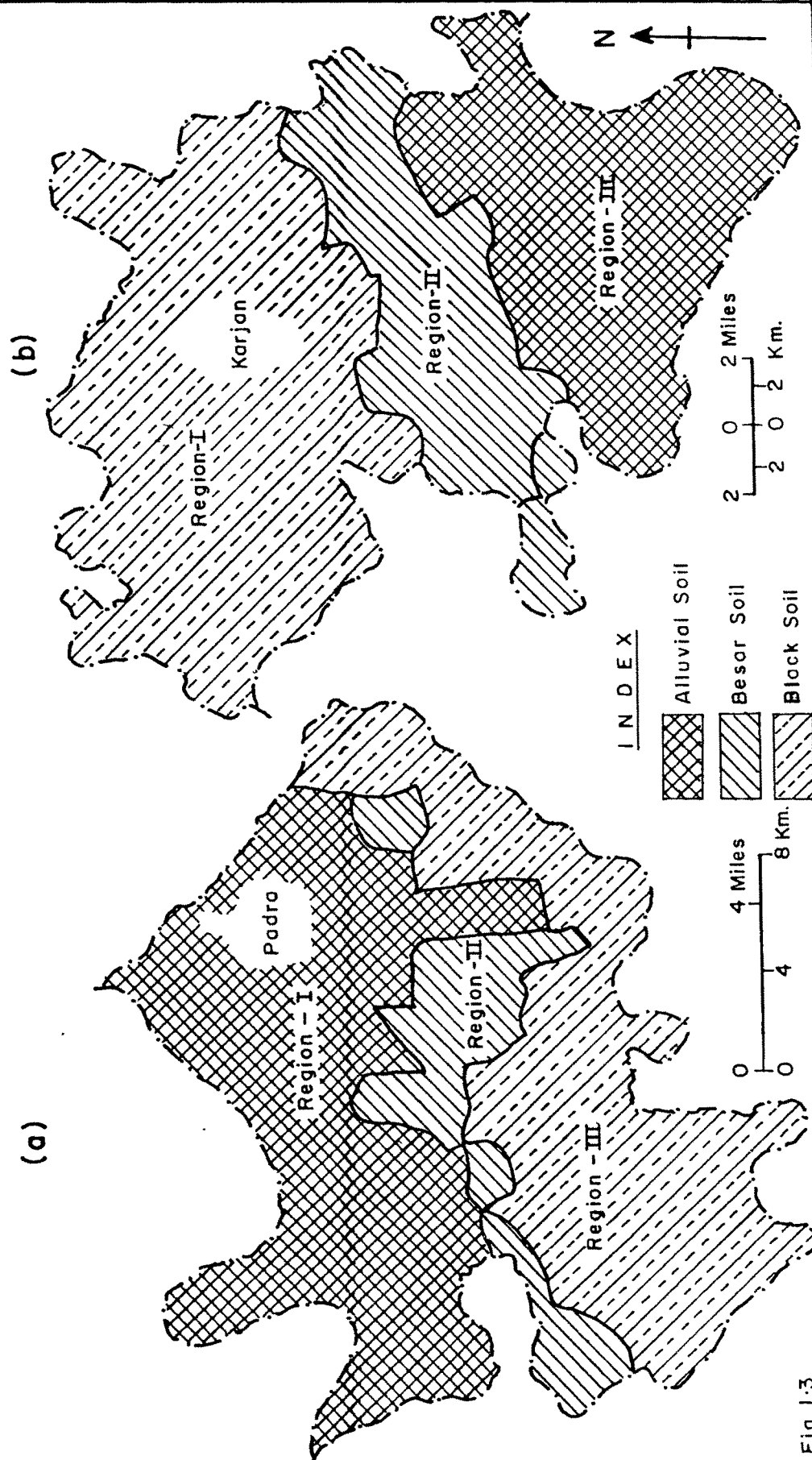


Fig. 1.3

sometimes after mid October when the evening and nights give a feeling of somewhat winter like conditions This period is the transitional period between the rainy and the winter seasons and characterised by the hot and moist days and moderately cool moist nights This season lasts till mid-November There after the winter starts, the mercury dips from 28°C down to 24°C or below Usually the winters are mild, but sometimes due to the cold waves brought by the northerly winds, become quite severe with mercury dipping down to 15 or 16°C during the day time and 8 to 10°C or below during the night However, during the two points of time this condition has not been observed The winters normally last up to mid-February The actual months are mid-December to mid-February Table 1 2 gives the maxima and minima of the temperatures of the Winter months of the study areas

Table 1 2

Maxima and Minima of the Temperatures of the Winter Months of the Study Areas

Temperature in °C												
Padra							Karjan					
	1960-61			1990-91			1970-71			1990-91		
Months	Max	Min	Range	Max	Min	Range	Max	Min	Range	Max	Min	Range
Nov	36	28	8	35	29	6	36	26	10	35	27	8
Dec	34	25	9	32	24	8	32	23	9	31	21	10
Jan	33	16	17	28	15	13	28	15	13	26	14	12
Feb	36	18	18	31	13	16	29	15	13	28	18	10

There have been significant differences between the monthly maximum and minimum temperatures of Padra Taluka. However, between the two points of time when compared, the November 1960-61 had 2°C more than that of the same month

in 1990-91. December had less by 1°C, January had 4°C more and February also had more by 2°C over the two periods of time

Karjan Taluka too have significant changes between the maxima and minima temperatures over the two periods of time. However, between the points of time, the November 1970-71 had 2°C more than that of the same month of 1990-91. December had less by 1°C and January-February had more by 1°C and 3°C respectively over the two periods of time

The inference is, that over the decades there had been no significant fluctuations in the range of maximum and minimum temperatures for the above mentioned months, which means that temperature had no notable influence in the dynamics of the crop land use

### **SUMMER SEASON**

The summer season is fairly long starting from mid-February and staying till the setting in of the monsoon by mid-June. The season is characterised by the words hot and scorching during April, May and part of June. The early part of the summer is the harvesting period of "Rabi" crops and final plucking of cotton (cotton plucking starts from late December), the sky is cloudless. The bright sunshine and warm winds assist in the ripening of the crops

In summer the mercury rises upto 45°C. The maximum temperature ranges between 41°C in early summers and 44°C in its later days, and the minimum temperatures range between 35°C and 37°C. During the early summers the maximum and minimum temperatures vary between 35°C and 28°C in both the talukas where as during the later part it soars to around 44°C and 39°C making the nights warm, sultry and uncomfortable. Table 1.3 gives the summer temperatures for Padra and Karjan taluka over two periods of time.

Table 1 3

Summer Temperatures for Padra and Karjan Taluka Over Two Periods of Time

Temperature in °C												
Padra							Karjan					
	1960-61			1990-91			1970-71			1990-91		
Mon- ths	Max	Min	Ra- nge	Max	Min	Ra- nge	Max	Min	Ra- nge	Max	Min	Ran- ge
March	39	30	9	41	34	7	38	30	8	42	34	8
April	44	36	8	43	37	6	42	35	7	43	38	5
May	45	39	6	44	38	6	44	38	6	44	39	5
June	39	32	7	40	35	5	40	33	7	44	38	6

The temperatures of these areas at both points of time have almost remained uniform. June is the hottest and most sultry month in the events of delayed rains.

### **The Rainy Season**

15th June is the tentative date of "break" of monsoon rains but rarely comes on this date. It comes earlier or later than the anticipated date. Similarly, the departure date is 15th October, but it hardly stays upto that date. The words that can explain the nature of the season's rain are-precarious, unreliable, irregular, scanty, excessive etc. The late arrival and early departure proves disastrous. (Rizvi SMH, 1992, P 32 unpublished thesis)

It is not the average that matters much, it is the coming of rains at regular intervals that bears great significance. If the rains come in light to moderately heavy showers at regular intervals of 15 to 20 days, they are more beneficial even if it is 550 to 600mm in the entire season. This may bring prosperity in agriculture.

The wet spell increases the humidity and decreases the temperatures, but this statement would be true only when a prolonged wet spell is experienced Table 1 4 gives the temperature and rainfall of the rainy season to substantiate the fact

P.T.O.

Table 1.4

Temperature and Rainfall of the Rainy Season.

PADRA										KARJAN									
1960-61										1970-71									
Month	Max in °C	Min in °C	R.F in mm	No of Rainy Days	Max in °C	Min in °C	R F in mm	No of Rainy Days		Max in °C	Min in °C	R F in mm	No of Rainy Days	Max in °C	Min in °C	R F in mm	No of Rainy Days		
June	39	32	50	7	41	34	-	-		38	30	68	9	42	34	145	5		
July	36	26	376	15	35	27	277	10		37	26	164	8	38	26	618	14		
Aug	35	27	195	10	33	25	641	21		34	25	323	15	35	27	237	9		
Sep.	35	24	368	15	34	26	379	10		34	22	363	15	34	25	22	2		
Oct	30	25	50	4	36	22	-	-		38	24	13	7	35	22	-	-		
Nov	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-		
Total	187	107	1039	51	190	115	1397	41		183	106	931	54	207	105	1022	30		
Avg	37.4	21.4	207.8	-	38	23	279.4	-		36.6	21.2	186.2	-	41.4	21.0	255.5	-		

## **GEOLOGY**

Geologically the study areas (Padra & Karjan) falling in lower western part of Baroda District are mostly underlain by the inter-trappean deposits of the recent period. The underlying rocks are generally composed of the nodular concretionary lime, commonly known as 'kankar' (Gazetteer, Vadodara District 1979). Often it is met at the surface mixed with the soil. The alluvium underneath the upper crust dates back to tertiary age. Further down are the petroliferous tertiary sediments. This could be revealed only after the drilling for oil extraction.

The upper crust is almost a monotonous flat deposited plain in both the talukas where the shades of alluvium both trappean and general (Black and Brown) are found. These shades of alluvium have been of great advantage in the selection of areas for the suitable crops. The bluish sedimentary deposits have been mostly used, in both the talukas for cotton cultivation and the others for other varieties of crops.

## **OBJECTIVE AND CHOICE OF THE AREA :**

The topic of the present research 'Dynamics of General and crop Land use - a selected study of two talukas of Baroda District' 1960-61 and 1990-91 has been chosen for the purpose of investigating the dynamics of land use and the concerning factors contributing change in the traditional crop growing areas of Baroda district. One significant purpose is to see as to how the traditionalism in crop growing and crop rotation has been subjected to change owing to the day by day sprawling urban center more particularly Baroda city. With this purpose one taluka Padra falling in the close neighborhood of Baroda at a distance of around 16 kilometers on its southern



periphery and another taluka Karjan around 35 kilometers away in its south-east has been chosen to assess the variable or similar factor in the dynamics of their land uses

One of the important factors for the dynamics of land use is the socio-economic change the ever increasing population pressure on the already limited cultivable land has been drastically reducing the area under cultivation In such a situation it becomes a major challenge to increase the agricultural yield to feed the ever increasing population. Such a challenge suggests the optimum utilization of the agricultural land by scientifically administering the inputs The proximity to an urban area invariably has a strong bearing on the use of the land, since there is an ever increasing demand to provide huge agricultural surplus for the urban households Gujarat is largely dominated by a vegetarian class of people, to provide the essential nutritional supplements to the body there will be a greater demand for pulses, which is a chief source of nutrition i.e. providing protein to the body.

Urban areas not only fuel economic growth by generating the demand for agricultural produce, but also by disseminating the fruits of industrialization, mainly in making adequate availability of infrastructure facilities like transportation, banking ware-houses and Mechanized agricultural implements, pesticides, insecticides, HYV seeds, fertilizers and bio-fertilizers, without which self-reliance is well nigh impossible Thus, rural and urban economies are complementary in their endeavor for economic growth. Much has been done in the direction of developing agriculture in India and abroad. Several organisations like F.A.O (Food and Agriculture Organisation, UN), Indian Council of Agriculture Research, the planning commission, National Council of Applied Economic Research and many other world and national

organisations have done substantial researches and investigations in these directions

It is, therefore, aimed to do an intensive study of the land use in the chosen areas (Karjan and Padra) at two points of time (1960-61 - 1990-91) for Padra and 1970-71 for Karjan and find out the changes that have taken place in the land use, and give suggestions to correct the prevailing systems so that better advantages may be reaped from the inputs applied. It is also aimed to prove how a student of Geography using the geographic techniques can help to bring out certain useful characteristics of the chosen areas of study

### **Choice of the Time Frame**

It is necessary to explain the reasons behind the choice of the time frame of the study. The work is designed to study land use patterns over two points of time one 1960-61 is closer to the time of the bifurcation of Gujarat in May 1960 when it appeared on the map of India. It is presumed that this period would be giving more of tradition bound systems of land use than the time substantially away from it. Thus, another point of time 1990-91 is chosen with the intention to assess the wider ranging changes over an adequate gap of three decades time

However, constraints of data compelled to make an alteration in the choice, as in many case of Karjan the data for 1960-61 was not available at all. Thus the study in this case is based on the data of 1970-71 instead of 1960-61.

Thus the study of Padra involves three decades i.e 1960-61 and 1990-91 and that of Karjan extends for two decades i.e 1970-71 and 1990-91 the beginning point of time is different

owing to the non-availability of data but the ending period is the same for both taluka.

## REVIEW OF LITERATURE

Research on general and crop land use is not new. Many academicians, writers and research workers have worked on the various aspect of land use in the past.

The land-man relationship developed the veryday man landed on the earth. Much is not known about that period, but it may be presumed that an organized ancient system of land use might have started when man learnt the art of gathering food, fishing, hunting and ultimately domesticating animals, raising crops from the soil and then making shelters for habitation. (Rizvi S M H. 1992, Unpublished Thesis)

The old text books deal with the spatial distribution of settlements, agricultural crops, mono or multiple cropping patterns, the cattle and live stock raising etc. These aspects have been undergoing changes with the passage of time and with the man's increasing awareness of his environment.

Between the general and crop land use, the latter has attracted more attention than the former. The changeable character of crop land use has been looked into by different workers from different angles. Chisholm (1889) saw it from economic and commercial view point. Other geographers of the nineteenth century attempted to understand the correlation between agriculture and physical as well as biotic factors, which proved a guideline for further researches in this field. Later geographers attempted to improve the old techniques and methods of researches in agricultural geography. The geographers of the early twentieth century introduced the

regional and areal approaches in such studies. The west European geographers took the lead in this direction, and later it diffused to the U S A and elsewhere. Physical and socio-economic studies in agriculture and live stock raising were introduced by them. Ratzel (1891) and Holms (1892) pioneered the studies in land use and crop land use from geographical view point. This required field survey and data collection for general and crop land use, soils and the related factors and their depiction on large scale maps (Dolge 1911, Sauer 1915).

Though comprehensive work of land use started during the early days of the modern period of Geography, more progressive and systematic work started only after 1920s. Baker (1924) prepared the American Agricultural Atlas and divided North America into Agricultural regions. Whittlesey (1936) produced the map of the world Agricultural Regions.

Between thirties and early forties no noteworthy work was done, however, the task undertaken by Sir Dudley Stamp to survey every inch of the land of England and Scotland within two years from 1931-1933, was a landmark in land use surveys and research. He is believed to have systematised the methodology and studies on land use. His monumental publication - "Land of Britain, Its Use and Misuse", stimulated land use studies not only in Britain but in various parts of the world, under the aegis of which a number of researches were carried out in the world and several papers and monographs were published. Coppock (1964) explained the importance of physical and historical factors to reach to some results in the absence of data on socio-economic aspects in agricultural dynamism. Kostrowicki (1968) prepared a model for land use of Poland and saw the changes in land use combinations between the points of time Coppock (1962, 1968, 1977),

— Clausen (1972), Champion (1974), Fraser Hart (1976), and Best (1981) laid greater emphasis on structural organisational, institutional and practical changes that have been taking place in their respective areas of study. Conkling and Yeates (1976) have seen the rural land use changes in the light of population growth, innovations and improvement in transportation, advances in production techniques, and increase in real income. They take recourse to agricultural location theories to find logical answers to the problems of location of agriculture. Champion (1981) looked at the dynamics of the land use through the loss of rural land to buildings, roads and related urban uses and also transfer of land to mining, afforestation and other activities. Kohl Hepp (1986) discussed the agricultural problems of Latin America and suggested the strategies of change in the traditional methods, so as to meet the growing demand of food and nutrition. He suggested the measures for improving the production of cash crops for increase in exports. Many more works in land use and crop land use covering various aspects have been done by foreign scholars.

The trend of studies in agricultural regionalization present varied facets. The study on crop combination regions was initiated by Weaver (1954) with a cumbersome calculation he divided the Middle west of the U S A. into different crop combination regions and prepared maps.

7 In India the work on land use synchronizes with the period of L Dudley Stamp in England. Prof. S.C Chatterjee of Calcutta worked on the land use of 24 pargana. Ali S\_M (1939) did his Ph.D. on the land use in Alaknanda river basin. However, since the early fifties a tempo of this type of studies got accelerated when the Aligarh school took the lead in this direction. Piles of books and research articles were

produced since then by the Indian Geographers belonging to different universities and institutes of higher and advanced learning

✓  
Shafi (1960) studied the land utilisation in Eastern Uttar Pradesh and developed the soil crop relationship and identified changes in cropping pattern. Sinha (1963) identified the influence of climatic cycle on the agricultural rhythms in a canal irrigated area of Patna District and also noted the perception of the local people in this regard as expressed through local proverbs. In another paper (1965) he looked into the existing land use patterns in the same area with the introduction of canal irrigation

More work in India has been done on various aspects of agricultural land use than on general land use. Ahmed (1966) studied the agricultural changes in the light of the crop yields while Singh (1966) analysed the changes in crop associations through the replacement of rice, maize, potato etc by indigo, millets and barley. Amani (1968) made a comprehensive study of Narainpur over a period of 40 years and noted the changes in the pattern of land use of that village as a consequence of the long processes of interaction between the physical and socio-economics factors. Husain (1969) noted the variability of succession of Kharif and Rabi crops in Meerut District, and studied the general use of land in both seasons. Dubey (1969) observed the changing pattern of cropland use in Madhya Pradesh owing to the increasing pressure of population. Ahmed (1969) studies the changing cropping pattern of Rohilkhand and established a high correlation between rainfall and crop land use. His hypothesis is applicable to all those areas where even today a high degree of environmental determinism is a haunting element, Saxena (1970) correlated the changing cropping pattern of a village in Badaun with

climatic, edaphic and demographic factors, and Malhotra (1970) identified the changes in land use and cropping pattern brought about in Ganganagar by Rajasthan canal (Now Indira Gandhi Canal) Sharma (1970) noted the replacement of the traditional crops by marketable crops in Assam Singh (1972) studied the dynamics of land use and cropping pattern of Uttar Pradesh and identified the influence of economic factors Das Gupta (1972) for Orissa and Shingarey (1972) for Maharashtra also worked on the same theme Nand (1972) using the Doi's method divided Rajasthan into simple crop combination regions and noted the changes over time Sharma (1983) applying Kostrowicki's method, identified the agriculture types and noted the changes in land use patterns in Rajasthan, through the influence of population pressures, industrial development, and also government policies Ahmed and Khan (1984) studied the changes in crop combination and cropping pattern in Punjab plains between 1966-1967 and 1976-1977 They used Rafiullah's Positive Deviation Method for the crop combination, and Gine's coefficient method for crop specialization Rizvi and Bhatt (1984) identified the changes in the cropping pattern of village Rustampura in Gujarat on the basis of the return flow of the Mahi canal waters which enhanced the prospects of well irrigation in the village

## METHODOLOGY

A simple methodology has been used for this work. Field survey and data collection from both primary and secondary sources is made.

The general and crop land use data for the chosen points of time, 1960-61 and 1990-91 have been collected from the offices of Mamlatdar, Taluka Development Officer (T D O) and Talatis (Patwaris) of the Padra and Karjan talukas.

The percentage difference of the data (which ever available) of both general and crop land uses for the two points of time are computed, analysed and mapped. These differences have been taken as the main object to analyse the levels of change in each set of the land uses of the study areas. The crop land use has been studied in depth and encouraging results supporting the given theme have been obtained. Unfortunately the general land use data obtained is too meagre to suffice the purpose. In case of population 1961 and 1991 census data have been used. However, attempt are made to derive positive and useful results about the present trends of land uses.

The areas are divided into soil based micro regions for the purpose of regional study and analysis.

- ⇒ Data analysis by percentage computation of the two points of time and the differences both positive and negative are done.
- ⇒ Combinational analysis have also been attempted to develop combination regions-weaver's method has been used for the purpose.
- ⇒ An endeavour to get the trends of diversification is made to have a look at the diversifying trends of crop land use. Gibbs Martin method is chosen for this objective. The



- computation of crops occupying as small percentage of areas as 0.10 are included, lower than that are ignored
- ⇒ Comparison of the two taluka's data are made and similarities and difference have been noted
  - ⇒ Attempt to ascertain the impact of the sprawling urban centers, and rural industrialization has been made both at the primary and secondary levels of data based work
  - ⇒ Regional approach is adopted to understand the variations within and between the regions at the chosen points of time
  - ⇒ Time frame is set to understand the spatial and temporal phenomena affecting changes in the tradition/land use systems

### **Organisation of the Thesis**

The thesis consists of six chapters

- 1) First chapter deals with geographical location, extent and site situations of the talukas under study
- 2) Second chapter deals with population distribution and its various attributes
- 3) Third chapter explains the general land use system of the area. Owing to the lack of its data of previous point of time a realistic study of change remained thirsty
- 4) The fourth chapter – the greatest of all, and most dynamic is the crop land use.
- 5) Fifth chapter deals with combination, diversification and ranking of crops

- 6) In the sixth chapter attempts have been made to assess the factors that have played the role of catalysts in bringing the change

Last comes the summary, conclusion and finding