CHAPTER

1

APPRAISAL OF THE PROBLEM

1.1 INTRODUCTION:

India is the agrarian country. Agriculture is the main occupation. In ancient time when the study of the geography started; man was totally unknown about his surroundings. Study of Geography is connected with the arrangement of all things on surface of the earth. Geographer found many things and geographical phenomenon and their characteristics of different places on the earth. The geographer made analysis of thoughts and observations of the geographical elements. Geography is considered as a description of the earth surface and exploration of it, gradually emerged also discipline of the earth surface dealing with non active relationship. Land is resource capital of the country. Agriculture is the backbone of Indian economy seventy percent people of the population engaged in the agricultural activity and allied work to it. This is the most significant of human being. Agriculture is the main occupation of the rural area. The economic and industrial development depends on agriculture.

Physical, social, institutional and technological factors are changeable in nature. It is true that there should be a change in agriculture with change in time for its progress and development. In this regard Agro Service Centres are playing very vital role in the agricultural development. The agricultural production depends on the agricultural implements, machinery and other essential inputs like hybrid varieties of seeds, chemicals like insecticides, fungicides, pesticides and weedicide etc. chemicals fertilizers, manures and technical know-how. Agro Service Centres are providing different agricultural inputs to achieve agricultural development.

Agro Service Centres are an innovative idea and interesting experiment which holds the great promises to increase agricultural production through more use of fertilizer and wise use of other agricultural inputs.

The Agro Service Centres located in the region performing a function to make remarkable change in agriculture. It provides not only various inputs but also better services to farmers. Farmers can achieve success in agriculture which would help to improve the national economy of the country. Now- a -days Agro Service Centres have become an important infrastructure in the development of agriculture and rural welfare. Agro Service Centres also help to solve the problem of migration of educated people from rural areas to urban areas. Agro Service Centres are providing different facilities to the farmers. It can play very dominant role in accelerating the pace of agricultural yield. The expansion of activities of Agro Service Centres would also provide greater employment to the rural people. The Agro Service Centres can help to educate and to make awareness among the farmers about now techniques, new arrivals, new hybrid varieties with typical characteristics, new different advanced techniques. Agro chemical companies and their attitude towards agricultural progress through introduction of their chemicals in field demos and trial plots and. It can promote agricultural production as they come in close contact with the farmers.

It realized that by introducing such facilities by the Agro Service Centres in rural areas the educated persons can also be retained in rural areas. Besides this to generate the employment opportunities made available to the unemployed from the countryside.Therefore it is very essential that to consider role of Agro Service Centres in the process of development of agriculture.

1.2 SELECTION OF THE PROBLEM :

The researcher undertakes the study of the Agro Service Centres in Satara District. This selection is based on following consideration

i) Area selected for present research is more dominant in agriculture mostly Krishna, Koyana river basin of the Satara district.

ii) Karad, Satara, Wai, Koregaon and Phaltan taluka of the district have significant area under cash crops like sugarcane, ginger soyabeen, wheat and rice. This is influenced by adoption of modern technology in the same region.

iii) Farmers are diverted from their traditional methods of agriculture to modern advanced techniques for increasing agricultural production in it.

iv) The selected region has taluka wise sugar factories except Mahabaleshwar, Man and Khatav talukas .

v) The Western part of Satara District i.e. Mahabaleshwar, Jawali and Patan talulka receive more rainfall where as eastern part of study region i.e. Phaltan, Man and Khatav talukas receive comparatively less rainfall throughout year.

vi) The major port of the Satara District with black cotton soil and alluvial soil which promotes the agricultural production

vii) As this study area has more number of green houses requires more technical know-how for modernization of agriculture.

viii) Development of agro based industries specially sugar factories and food processing industries grows and provide financial assistance and source of employment to the farmers of the study area.

ix) Significant increase in this area under cash crops has increased due to in facilities of irrigation and modern implements.

This creates the adoption of the modern agro technology in the Satara District.

1.3 OBJECTIVES :

The selected objectives for the research are as fallows.

i) To study the land use, irrigation and cropping pattern of the study area.

ii) To study the present nature of Agro Service Centres in the study area.

iii) To know the functional classification of the Agro Service Centres.

iv) To understand the correlation between Agro Service Centres and physical and economical factors.

v) To know the level of Agricultural Development in the study region.

vi) T mo know about government orders related with fertilizers, hybrid seeds, insecticides and essential commodities.

vii) To investigate the difficulties of Agro Service Centres and to suggest solutions for it.

1.4 REVIEW OF LITERATURE :

The present research work investigated by referring different kind of literature. There is very little published material particularly regarding to the Agro Service Centres. The geographical studies on rural service centres and market service centres are mainly in India and abroad. The geography of service activities has been an important area of interest in geographical research and teaching.

The studies in this field have been made by the Indian geographer recently. A brief account of some important work is given here.

The most remarkable pioneering work in this field has been done by Singh (1955, 1956) and Prakash Rao (1958). In

Mathematical model they have tried to demark the sum of influence of the Mysore.

Jaiswal,(1962) has examined Morphological and functional aspect of rural services centres. Guja (1967), identifies the rural service centres of Hugali district of Karnataka state by means of three criteria.

Mahadeo and Jaishankar (1969) have used mathematical model for delimiting the potential upland of Mysore city . In their model they have modified gravity potential model and calculated the amount of interaction between two major cities of Karnataka.

The study regarding to the spatial organization of service centres have been done by Tiwari(1980) Wanmali (1983) In their study of service centres of rural India has been analyzed the impact of Government policies on the service provision. He has demonstrated how the development of rural areas can be based entirely on rural processes involving agriculture.

Service provision and agro based industries, Geographical studies of the location and use of service facilities mainly related to central place theory have been emphasized by Deshmukh (1985), Didde (1884) and Mulik (1989).

Agro Service Centres in respect of Spatial organization, Centrality and hierarchy and spheres of influence have been studied by Pawar and Gharpure (1985, 1987, 1988)

All details regarding to market facilities have been studied by Dixit (1988) the importance of Agro Service Centres in the study region has also been emphasized by Pawar (1989)

The some studies have been made with special emphasis on Agro Service Centres in the western Maharashtra by Agricultural economist, Agronomist, Agricultural engineers, pertaining to their relevant aspects.

The basic requirements, objectives and working of Agro Service Centres have been studied by Krishna and Chouhan (1975).The role of agro service centre in rural development has been studied by Wagh (1975).Agro service centre and agricultural modernization have been studied by Throat (1977) whereas the study regarding to agro service centre and communication of agricultural technology was carried out by Jadhav (1977).

The innovative and interesting experiments of Agro Service Centres have been studied by Narkhede (1977). The evaluative study of Agro Service Centre in Punjab carried out by the government of Punjab (1980)

Development of Agro Service Centre, which provides the essential technical services, supply of inputs and serve as guide to the farmer has been studied by Zachariah (1971)

An attempt to study the extent and distribution of soviet agricultural services including regional and local services for plant crop protection and fertilizers, distribution of machinery, Spare parts and other forms of inputs, repair stations transport services was made by Doroffeva (1979). The change in structure of agricultural production service in Poland have been studied by Misiua(1979), services in (Zecholobvak agriculture include those connected with use of chemicals, special services such as agro chemical enterprises, commercial production service for purchasing agriculturall products and supplying agricultural requisites have been studied by Bartunek and Pytel(1979).

Spatial analysis of Agro Service Centres in development of agriculture In Bhusawal taluka one of the geographical analysis studied by Ingale (1995). A spatial perspectives on Agro Service Centres in Karad taluka, geographical analysis (2009)studied by Shinde S.A. In her studies, functional classification, spatial distribution, land use pattern, cropping and irrigation patterns and other aspects are studied.

The geographical studies on impact of irrigation are several in India and abroad. It is an interdisciplinary subject being studied by Geographer, Economist irrigation Engineers and Agronomist Contor, (1967) in his book A world of Geography of irrigation (1967) has highlighted the history and present condition of irrigated agriculture in the world.

Michel, in his book Irrigation theory and Practices (1983) has covered all the areas of irrigation related to agriculture. An attempt has been made by Fakuda (1962) to study the Irrigation and drainage of the world.

The method of irrigation and water management are studied by M. Shafi (1987) and Atkinan (1979). India's water wealth, its Problems facts and basic principles are highlighted by Rao (1975). Impact of irrigation, studies of Canal, well and tank irrigation in Karnataka was attempted by economist such as Karni M.V. Mishra G.P. and Vivekananda.

Kamble, N. D. Abdul Ali, C.Charles Nalson, Nageshwar Rao and V. M. Gadgil (1948) studied the economic effects of irrigation. The regional account of irrigation is studied by Jasbir Singh (1977) and Pawar (1981) and Gurjark. K (1987) some aspect of irrigation have been highlighted by David friman (1952)

The negative effect of irrigation have also been studied by many scholars such as Chowdhary and Reddy (1987) Patil P.B.(1988) Bowonder B. and Ravi 1984, Aggarwal R. R. (1957) and Dhawan L. L. (1964). The regional account of irrigation is studied by Jasbir Singh, Pawar C.T. (1977).

Agricultural geography (1984) is studied by M. G. Jadhav. The Inter district variation in agriculture efficiency studied by Sapre S. G. and Deshpande V.

Irrigation and its impact on cultivated area of Satara district (2009) is studied by Wagh A.S. in his study irrigation pattern, cropping pattern, production of major crops and productivity of crops measures are investigated.

Gomatee Singh, Syed Was Ashraf (2012) studied the Spatial Variation in Level of Agricultural Development in Bulandshahr District of Western U.P'. (India) with help of Z-score and its composite index for level of agricultural development

1.5 STUDY AREA :

Satara District is one of the economically, culturally and historically prosperous districts in the state of Maharashtra. It lies on the southern part of the state on Deccan plateau. Major portion of Satara district is in Krishna river basin and remaining the Bhima river basin. The longitudinal and latitudinal extent of Satara district is 770^0 33' to 74^0 54' east and 17^0 5' to 18^0 11' north respectively. Area wise Satara district is 15 th ranking district in the state. It is comprised by 11 talkuas like Satara, Koregaon,Wai,Khandala,Medha (Jawali) , Phaltan, Man (Dahiwadi) ,Khatav (Vaduj), Mahabaleshwar, Karad and Patan. Satara city is located in Satara taluka of Satara district on Mumbai Bangalore National high way (NH-4) passing through Satara district. Satara, Wai, Karad and Phaltan are the main revenue divisions.

Sahyadri mountain range, undulating range and flat leveled plain are the three general physical divisions of Satara district. The western side of Satara district is boardered by Sahyadri ranges. Near about 93 kms from south to North it known as Bamnoli range. Mahadeo is another range of Sahyadri lies to north of Mahabaleshwar, is the highest place from the sea level, having height 1436 mt. Western side of Satara district is hilly and mountainous where as central part Is of river basin and eastern part is rigid and off rugged land of Satara district.

According 2011 census the population of the Satara district is 30.04 lakh, compare to 2001 census there is 6.94 percent increase in population. The sex ratio is 986 per thousand males which is decreased by 09 females per thousands male. As per 2011 census the area of Satara district is 3.4 percent to the total area of Maharashtra and population ratio is 2.6 percent. Density of population is 268 people per sq.km. The highest density of population is observed in Karad Taluka i.e. 561 and lowest density of population is recorded in Man Taluka i.e. 138.86 percent population residing in villages and remaining population concentrated in Satara, Karad and Phaltan cities. Mahableshwar, Panchagani are world famous hill stations and tourist centres in Satara district.

Satara District has 3086 Agro Service Centres based on different permissions to the Fertilizers , Insecticides , Hybrid Seeds , Cattle Feeds , Farm implements and Nurseries providing agriculture inputs and rending others services to the farmers of study area. Talukawise distribution of Agro Services Centres is uneven. Less than 100 Agro Service Centres is observed in Mahabaleshwar Taluka. The Khandala , Wai and Jawali Talukas have under the category of 100 to 200 Agro Service Centres.

The talukas of Man and Patan are under the category of 200 to300 Agro Service Centres. More the 300 Agro Service Centres are observed in Karad taluka (562), Phaltan (487) , Satara (375), Khatav (309), Koregaon (310), Agro Service Centres are running on cooperative and private basis. Agro Service Centres are classified on the basis of permission of different facilities given by agriculture Department of Satara Zilla Parishad.

The region under study area is a part of the basalt plateau of Maharashtra with an average height 800mt above sea level. Topographically it is hilly and plain .The rugged hilly topography is observed in western and central part of study area. The hilly part is also found in eastern part of study area. Many flat topped off shoots terminates at the central part The River Krishna is main source of water flowing in direction from north to south which is originated at Mahabaleshwar.

Climate is principal aspect of physical environment affecting almost all sides of life.The river Venna, Tarali, Urmodi, Vasana and Vangana are the other rivers flowing through the district. The river Koyana is main tributary of the river Krishna. It is right bank tributary which enters from west into Karad taluka .The river Krishna flows from north by entering in the talukas of Wai, Satara, Koregaon and Karad.The Dhom Dam is constructed on the river Krishna near Wai, due to it large area brought under irrigation from various taluka.The Kannher Dam is constructed on the river Venna which is the one of the tributary of river Krishna. This site is very near to Satara city just 10km. away from it. There is one more world famous dam on the river Koyana near to Helwak in Patan Taluka.The River Koyana is considered as life line of Maharashtra. It is boon to study area due to availability of unbroken and continuous supply of water and electricity for the irrigation. The Urmodi dam is also significant because it is beneficial to the talukas from drought prone area of Man and Khatav for irrigation and drinking water supply specially in summer season .The other rivers Tarali, Vang, Utter Mand , Dakshin Mand and Manganga contributing less extent to the study area

The climate of study area is generally cool at High Mountain, hot and dry in plains. There is no sudden change in climatic conditions. According to geographical situation some changes are seeing in climate. In summer season climate of western part of study region is cool and pleasant. At the plains of the Wai taluka temperate type of climate is there. In the Central part of the district warm climate in summer and in winter is warm during day time and cool during night time. As compare to western part, the central part and eastern part of Satara district is with hot climate.

The maximum and minimum average temperatures recorded as 37.6^0 c and 19.5^0c respectively. The annual temperature range is 18.1^0 c the rainfall is significant climatic element that influences the agricultural economy of the study region. The average annual rainfall is 1475 mm but in 2006 average rainfall was 1728 mm. The rainfall received mainly during June to September in the study region. It is decreases from west to east part of study area.

1.6 SOURCES OF DATA :

The investigation of the Agro Service Centres and agricultural development is based on collection, tabulation analysis and interpretation of data for the spatial analysis, existing conditions and various perspectives of Agro Service Centres of Satara district. The data has been collected from; both primary and secondary sources.

1.7.1 Primary sources :

Direct contacts and discussion with class I and class II officers of taluka offices, Zilla Parishad Office and agriculture offices of Satara district, the information about Agro Service Centres of the study area has been collected through interviews, schedule, questionnaire, discussions, telephones, websites and emails.

1.7.2 Secondary sources :

Secondary data required for the present work has been collected from different print and electronic media (published and unpublished material) like reports and abstract, census handbook, gazetteers, research journals and books related with agro cultures, Agriculture bulletins, and socio-economic abstract.

The data collected through different sources has been processed and presented with various cartographic techniques likes' maps, graphs and diagrams etc.

1.8 METHODOLOGY :

The data collected through various methods like field work and personal interviews. The analysis and interpretation of the data incorporate both empirical and testicular approaches. The appropriate cartographic techniques have been implemented to support the analysis. The Karl Pearson's rank correlation coefficient method is used for analysis of data.

Karl Pearson's rank Correlation coefficient (rs)

$$r_s = 1 - \frac{\sigma\sum (R1-R2)^2}{n^3 - n}$$

Whereas,

Rs -Coefficient of correlation

R1 -Ranks given to values of first variable

R2- Ranks given to values of variables

n -The number pair 'or' number of observation

The agricultural productivity of various crops is assessed by using Bhatia's Yield Index Method. He suggested that the contribution of each crop, agricultural efficiency is in relation to its appropriate share to the crop land.

- Bhatia's formula for agriculture efficiency is as follows

$$\text{Yield Index (Iya)} = \frac{Yc}{Yr} \times 100$$

Whereas,

Iya-Yield Index of crop 'a'

Yc - the hector yield of crop 'a' in the component area unit

Yr- the hector yield of crop 'a' in the entire region.

$$\text{Agricultural Efficiency (AE)} = \frac{Iya \times Ca + Iyb \times Cb \text{------------} Iyn \times Cn}{Ca + Cb + \text{---------} Cn}$$

Along with Karl Pearson's Rank Coefficient Correlation method, Bhatia's Yield Index method, Z-score method is used to measure the agricultural development For calculation overall levels of agricultural development and it's even distribution the data of all variables have been transformed into Z-score techniques. The formula is as fallows

$$\text{Z-Score (Zi)} = \frac{\overline{X}i - X}{S.D}$$

Where,

Zi -Z-Score For i' th observation

Xi - Original Value of i' th observation

$\overline{X}$ - Mean value of X' variables

S.D.-Standard Deviation of X' variable

In order to classify taluka according to their levels of development, the composite Z-score have been grouped into high, medium and low categories

The result of the standard score obtained for different indicators were aggregated by composite standard score (CSS). So that regional disparities in the level of development of the study regions may be obtained on a common sale. The composite Z-score may be algebraically expressed as

$$CSS = \frac{\sum Zij}{N}$$

Whereas,

CSS - Composite Standard Score

Zij - Scored of an Indicator J in the Districts.

N - Number of indicators.

1.9 DESIGN OF THE WORK :

The design of the work of the proposed research is as per following plan.

- **First chapter** includes Introduction, selection of the problem, objectives, review of literature, study region, sources of data, methodology and design of work.
- **Second chapter** deals with physical setup, Relief feature, climate, soil types and water resources of the study area.
- **Third chapter** considers Agricultural facilities, land use, irrigation and cropping pattern.
- **Fourth chapter** explains Crop Productivity of various crops.
- **Chapter fifth** includes functional classification of Agro Services Centres
- **Six chapters** contains the case Study of Karad taluka
- **Seventh chapter** deals with spatial distribution of agro service centres and level of agricultural development in the study region

- The **chapter eight** associated with Government Orders related to Fertilizers, Seeds, and Insecticides with Problems of Agro Service Centres.
- The last chapter means **chapter ninth** winds up with summery, the findings and suggestions.
- **Eventually** enclose of **Appendix I, II, III** Bibliography,

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CHAPTER

2

PHYSICAL SETTING

2.1 INTRODUTION :

In the South part of the Satara there is a village named State. The village near to the state is called 'Sat-dare' was borne normally from the fort Ajinkyatara was known as Saptarshi the word 'Satara' comes into existence. The capital of the king Bhojraj was Panhalgarh it seems that in northeast side is Pannalgarh, there must be a village named' Satar' and thus the word' Satara' came into existence. Inscription as an old 200 BC revel that probable the oldest known place in Satara district is Karad. It is also believed that Wai, in the Satara District is the Virat nagari where the Pandvas were lived in 13 years of their exile. In 1948 the District Satara comprised of four sub division namely Jail, Karad, Khanapur, Walwa and Wai. The sub division of Bijapur transferred to Belgium district.Tasgaon taluka was transferred to Sangli district and Pandharpur was transfer to Solapur district in 1864. A new Phaltan taluka was formed in 1949. In the same year the district was bifurcated into north and south Satara. At the time of 1961 Satara district comprised by 9 talukas and 2 Mahals which is included 1960 inhabited villages and 10 towns. According to 2011 census the district has 1739 villages 15 towns, and 11 talukas.

The district has been subdivided into 11 talukas for administrative purpose. The district is divided into four subdivisions Koregaon, Satara, Phaltan and Wai. It is situated in the river basins of the river Bhima and Krishna. Satara district lies at the western limit of Deccan table of Southern Maharashtra. But the point of view of the peninsular drainage the entire land of the district belongs to larger drainage system of Krishna River, Recently Satara district is one of the developed districts in the state of Maharashtra. Mahabaleshwar, Karad, Satara, Wai and Phaltan are the important urban centres in the district. Satara district is an important industrial, educational, and commercial centre in the state of Maharashtra.

2.2 LOCATION AND BOUNDARIES :

Satara district is one of the identical and Historical place in the Maharashtra State. Satara district lies at western limit of Deccan table of Southern Maharashtra. The district extends between 13.5^0 to 18^0 north latitudes and 73^0 33’ to 74^0 east longitude (Fig. No. 2.1).

The district has component shape with a west street of about 144 km and north-south 120 km. It covers an area about 10,480 sq.km. This is 3.4 percent of the area of Maharashtra State. Among 35 district of the state it ranks 15^{th} in the terms of area. The district consists of eleven talukas.

The district bordered by the Pune district to the north, Sangli districts to the south, Solapur district to the east and Ratnagiri district to the west. It has very short boundary of Raigad district to the northwest. Although the boundaries are main administrative line along with several lines this considered with physical features (Fig. No. 2.2)

Fig No. 2.1

2.3 PHYSIOGRAPHY :

The origin of Satara is said to form of seven hills or wall tower and forts. The Satara was supposed to possess residual hill range, intermediate valleys, all developed land surface from main element of landscape in the district.

There are two major ranges, the Sahyadri and the Mahadeo ranges. All among the western boundaries of the district The Sahyadri range has major peaks usually flat topped and intervening saddles. The Mahadeo range begins with an offshoot of the Sahyadri range into northwest part of the district. It runs eastward as a main range and sends of several minor ranges to the southeastwards and southwards. The Sahyadrian ranges having height in between 900 to 1200mt. from mean sea level.

The Sahyadri system includes the main range of Sahyadri which is of 96 km. from north to south to the western boundary of the district. The Sahyadri crown by several peaks of which two are major forts namely Pratapgarh (1074 mt) and Makarandgarh (1229 mt).

The main line of Sahyadri within Satara limits develops the several cols and saddles of which more accessible, one has become ghat route. The Ambenali pass, Par pass, Hatlot pass, Amboli pass, North kinara pass, Mala pass and Kumbharli pass are the important passes. In these passes Ambenali and Kumbharli allow the major routes from Plateau to Konkan.

Several leading spurs pass east to south. The Sahyadri begins from north. The spurs may be named the Kamalgad, Viratgad, Hategad and Arle-Bamnoli, Gheradategad and Bhairavgad-Kondur are the last two ranges.

The Bamnoli Gheradategad range consists of Kamalgad, Viratgad and Hategad, Arlespur and Bhairavgad. Kondur consist Satara, Kaveli Sonapur and Jalvasantgad spurs.

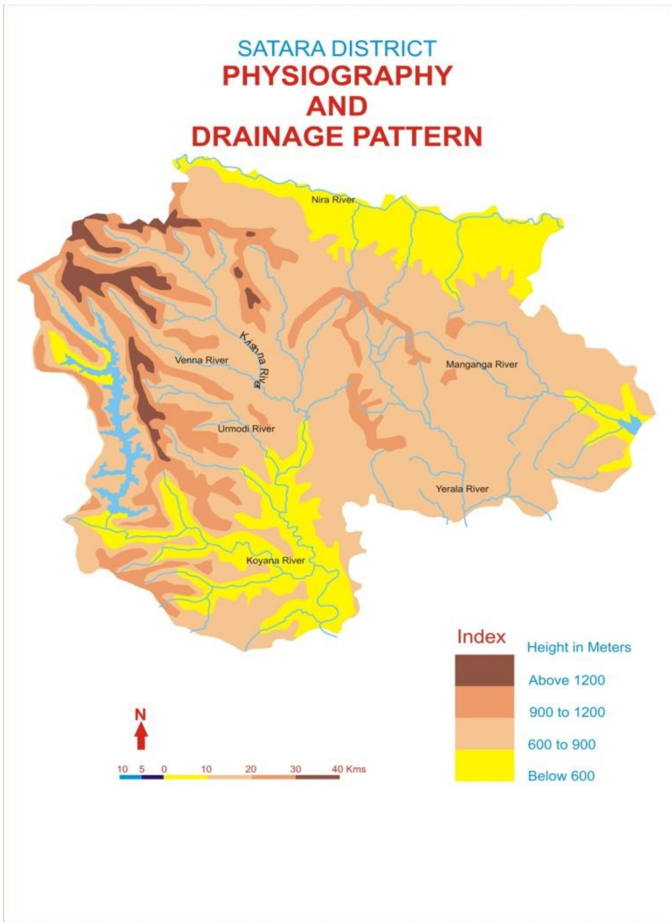

Fig. No. 2.2

The second range is Mahadeo range. In the north of the district the range emanates from Sahyadrian complex 16 km north of Mahabaleshwar and stretches to east and south east across the whole breadth of the district. The Mahadeo range has only three forts namely kelnaja, Thathvada of Santoshgad and Varugad. Besides this many small saddles, Khambataki, Adarki (Salpe) and Thathvada are the important passes from the Mahadeo range. Three main spurs stretches from south and chandan vandan spurs in the west, which runs about a crossing half of the district. Vardhangad and Mahimangad spurs further east which stretches right across the district.

The top of main Sahyadri and Mahadeo hills especially in the north western track of the Wai, Jawali and Patan looks like succession of forest raised on series of plateau pilled one over another. It surrounded by wall of the rock. The north faces of Mahadeo range flats sharply merge into Nira Valley. The distance from the crest of the range is not more than 16 to 20 kms. South hills fall much more gently to valleys of Krishna.

There are several notable hills and hilltops in the study region. The major hills in Khandala Wai track are Balegarh, Dhamna, Harlim, Kamalgad, Kenjalgad, Mahadeo, Panchgani, Pandavgarh, Pipli Sonjal, Vairatga Erali And the main hill features in Jawali-Mahabaleshwar track are Mahabaleshwar (1428mt) Makarandgad(1229mt) Pratapgad (1074mt) and within Satara track the fort Ajinkyatara (1005mt) Yewteshwar (1340mt) Parali fort or Sajjangad (910mt), Pateshwar and Janai-Malai are the important hill ranges.

The five Koregaon hills Harneshwar, Chavaneshwar, Jarandeshwar, Nandgiri and Chandan varies from 1100 mt to 1200 mt height from mean sea level. The slopes are bare and steep are climbed by very difficult footpaths. The five Patan hills Chandoli, Dategad, Gunvantgad and Jangli Jaygad all the five are fortified. The major Man hills are Varugad Kolkada, Shikhar_shinganapur, Thathwada, June-Pathar, Kalakjai and Mahimangad. The varugad, Thathwada and Mahimanagad are fortified. The Khatav hill consists of Solaknath, Bhapshah Vardhangad and Bhushangad, The Vardhangad and Bhushangad are fortified.

Satara district is broadly divided into four physiographical divisions. They are as follows-

i) Sahyadri hilly region :

Sahyadri ranges runs in west side of the district mainly in Wai, Patan, Jawali and Mahabaleshwar taluka.

ii) Eastern hilly region :

Khatav and Man taluka are included in this division.

iii) The region of Krishna river basin :

Krishna River flowing through the central part of the district. Krishna and tributaries expanded in Karad, Wai, Satara and Koregaon tahsil.

iv) Region of Nira river basin :

The Nira river flows to the northern boundary of Satara dilstrict Khandala and Phaltan tahsils are included in this division.

2.4 DRAINAGE PATTERN :

In the study area there are four river basins.

i) The Krishna drains the major portion to the south
ii) The Yerala drains Mideast and south region
iii) The Manganga drains eastern part to join Bhima River out of the district.
iv) The Nira drains the northern portion of study area.

From the point of view of the peninsular drainage the entire district belongs to the largest drainage system of the river Krishna, The Krishna is the major river in South India. The Krishna rises on eastern part of Mahabaleshwar plateau. It is four miles from '*Jor*' village in the extreme east of Jawali taluka. From its source runs to east about 3.2km to South of Pachwad. As the confluence of the river Krishna and river Venna at Mahuli near to Satara city is the sacred Spot.

In the Koregaon taluka Krishna river receives Vasana from the left about 1.6 km east to Mangalapur and Krishna receives Vangana from right .Krisna river receives two tributaries from the right, the Tarali near Umbraj and the river Koyana near the Karad city.

The Koyana is the largest Feeder River of Krishna River. It rises on Western side of Mahabaleshwar Plateau. The Koyana River is very import river in the state. (Fig No.2.2) The hydroelectric project is on Koyana River near Helwak. The Yerala is the largest of the left bank feeder of the Krishna River. It rises from Solknath hills in the eastern north of Khatav taluka. It flows along with the valley flanked by Vardhangad to the right and Mahimangad to its left. It flows generally to the south and falls into Krishna River outside the limits of district in Sangli district. The river Nira tributary of the river Bhima rises in Sahyadri in Bhor talukla of Pune district. Nira flows along with northern boundary of Satara district. The river Manganga is also tributary of river Bhima. It rises in Tital hills of Man Taluka. It runs southeast direction. In the district Shivsagar reservoir made by Koyana dam, Dhom dam on Krishna river Veer-Bhatnagar dam on Nira river Urmodi dam on Urmodi river,Kanher dam on Venna river are very supportive extensive dams having huge network of canal irrigation in the study region.

2.5 CLIMATE :

The climate of Satara district is very favorable for agriculture. The year is divided in to four seasons. These are as follows-

i) The cold season (December to February)
ii) The Hot and dry season (March to May)
iii) The Rainy season (June to September
iv) The season of retreating monsoon (October to November)

The hot season is the period of continuous increase in temperature. The rise in temperature is more marked in plains than the hills the maximum temperature is between 34^0 to 38^0c and minimum temperature is between 10^0 to 15^0c. The month of May is hottest month of the year and the December is coldest month of year.

The rainfall varies widely in the different part of the district depending on their closeness to Sahyadri. The maximum rainfall received in the month of June, July, August and September from southwest wing of monsoon winds. The average rainfall of the study region is 1000 mm. As per geographical condition distribution of rainfall is uneven. The western part receives heavy rainfall which is more the 5000 mm, mostly in Patan, Jawali and Mahabaleshwar taluka. More the 8000 mm rainfall is recorded in Mahabaleshwar.

The eastern part of study region i.e. Phaltan receives 459 mm rainfall

TABLE NO. II-I

SATARA DISTRICT

DISTRIBUTION OF ANNUAL RAINFALL

(2010-2011)

Sr. No.	Name of the taluka	Rainfall (mm)
1	Satara	1821.5
2	Koregaon	1395.6
3	Wai	1537.1
4	Karad	1184.5
5	Khatav	605.8
6	Man	542.8
7	Mahabaleshwar	8639.5
8	Khandala	778.5
9	Phaltan	459.5
10	Jawali	2720.0
11	Patan	3289.4

Source-Socio Economic Abstract 2011

The air is generally dry particularly in the afternoon except during the monsoon season. The dryness is more marked in the plains than the hills. During the southwest monsoon the skies are heavily clouded to over cast. With the withdrawal of monsoon cloudiness rapidly decreases and skies are clear the lightly cloud in winter and summer. Winds are generally light to moderate except during south west monsoon season. When these are stronger, particularly in the hills, Thunderstorms occurs in the pre and post monsoon months fogs occur occasionally in the valleys in the cold season.(Fig No.2.3)

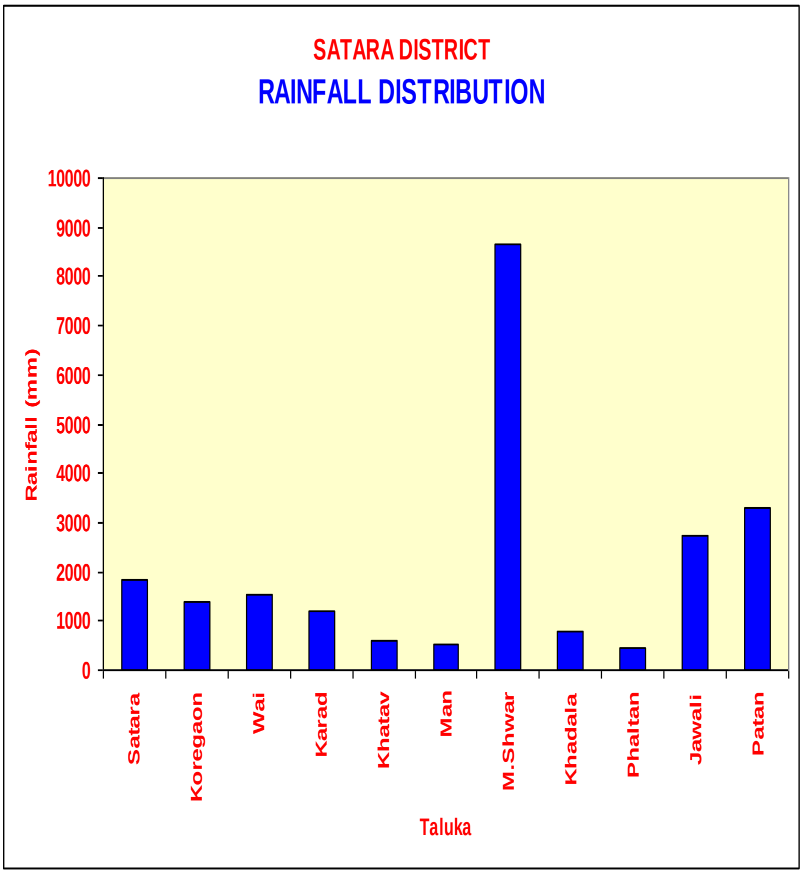

Fig. No. 2.3

2.6 SOILS :

The soils of the study region are generally fall under three main categories..

i) Medium black to deep Black, soil in the plains

ii) Lighter soils on the slopes of the district

iii) Late rite soils in hilly region of western part and small hillocks in the east.

Medium Black soils found mainly along with Krishna, Koyana and Nira rivers this. Soil usually characterized by a rich and fertile black soil contains high proportion of nitrogen and organic matter.

Light soils locally called '*Malran*'. These soils are hard, rocky, and brown in colour. They are rich in lime and potash content but shallow in depth. These soils has deficiency of nitrogen, organic compound and phosphorous. It can be productive after providing heavy fertilizer and irrigation facilities.

Late rite soils are red in colour and are locally known as '*Tambadi mati*' It is mainly found in Mahabaleshwar hills and mountain range along with entire Koyana valley. On the top of hills water cannot be confined. This soil used for '*Kumri'* cultivation or would ash tillage on account of heavy rainfall. Laterite soils are subjected to heavy leaching and high degree of erosion. The reason for red colour is high proportion of iron oxide in the soil.

2.7 LAND USE PATTERN :

In the any geographical region the land under different use has got importance in the economy of the region. In the study region the land under cultivation is about 65.74 percent out of total geographical area. The agricultural activity in the study region is very important because the economy of the region depends upon the land under agriculture or cultivation. In the western part of study region the land under forest is more near about 24.2 percent is the eastern part it is very low. Over all land under forest are 13.00


SATARA DISTRICT
SOIL TYPES
INDEX
Deep Black Soil
Medium Black Soil
Shallow Black Soil
Deep Laterite Soil
Medium Laterite Soil
Shallow Laterite Soil
N
0 5 10 20 30 40 Km

Fig. No. 2.4

percent. The eastern part mostly covered by barren and follow land while western part is covered by non agricultural land and grazing land. The study region is a part of Sahyadri ranges covered by Mahadeo ranges. So that land under cultivation is less in western part of study area.

2.8 AGRICULTURE AND IRRIGATION :

Agriculture is one of the important occupations of the study region. Near about 71.3 percent of working population is directly engaged in agricultural activities. The economy of study region is depending on agricultures. The modern agricultural implements, improved or hybrid varieties of seeds, use of different chemicals like Fertilizers, Pesticides Insecticides Weedicides, and Germicides etc. through Agro Service Centres and irrigation facilities have increased agricultural production. Agricultures is more prosperous in the areas of Krishna river Koyana and Nira river basins etc.

The cropping pattern and agrarian economy of the district has changed because of the land under the cash crops increased while the land under food crops decreased. The agricultural production increased due to introduction of canal and lift irrigation. Jawar, Wheat, Rice, Bajara and various Pulses are main food crops. In the central part Wheat and Jawar, Bajara and pulses are the main food in eastern part of study area.

In the study region nearly 56.62 percent area under cereal crops, 9.98 percent area under pulses. Oil seeds cover 12.50 percent. Sugarcane covers 6.2 percent area. Now- a -days sugarcane production increased due to irrigation facilities. Irrigation plays very vital role in development of any region. In the study area canal and well has got importance. In the year 2010-11 the land under irrigation was 216830 hectors. Out of which 63.46 percent land was irrigated by well irrigation and 36.53 percent land under canal irrigation. The canal and lift irrigation facilities have changed the cropping pattern in recent year. (Table No.II.III)

TABLE NO.II-II

SATARA DISTRICT

AREA UNDER DIFFERENT IRRIGATION SOURCE

(2010-2011)

Sr.No.	Irrigation Sources	Area in hectors	Percentage to Total
1	Canals and Tanks	113364	63.46
2	Well	65248	36.53

Source-Socio Economic Abstract 2011

IRRIGATION PROJECTS.

i) The Dhom dam
ii) The Koyna dam
iii) The Kanher dam
iv) The Arphal canal
v) The Veer Dam
vi) The Nira Devdhar project
vii) The Urmaodi project
viii) The Tarali project
ix) The Dhom balakawadi
x) The Tembhu lift irrigation project

The Vasana and Vangana lift irrigation, The Kavthe-Kenjal lift irrigation Jihe-Katpur lift irrigation, Ner tank, Ranand Tank, Yeralvadi dam, Yevati Mhasoli irrigation project, Moma project, Andhali, Uttarmand, Hateghar, Mahu- Nagewadi and Wang irrigation projects.

2.9 TRANSPORT AND COMMUNICATION :

The transport and communication plays very vital role in economic and social development of the region. In the Satara District the road network is well developed, Railway is also contributing in economic development of Satara district. The National highway (NH-4)(Pune-Bangalore stretches from to North to South along with the course of the Krishna river about 137 kms.

Total length of the roads is 9707.24 kms out of which 5398.05km are tar roads and remaining are fare whether roads. The Satara-Pandharpur,Satara-Mahad-Pune_Mahabaleshwar_Mahad, Chiplun_Karad_Pandharpur, and Miraj Phaltan roads are the state highways occupied 939 km, in length. The District roads connect the taluka and important places of study areas. From the central part of study region, the Pune-Bangalore broad gauge railway route stretches from north to south about 124 km. on this railway line, Lonand,Wathar, Satara,Koregaon,Rahimatpur, Masur and Karad are the important railways stations. The Mahabaleshwar-Pandharpur ,Phaltan Miraj and Bijapur-Chiplun are the state highway accounts 939 km in length.

The table No,.II.III gives clear idea about the distance covered by different types of ways.

TABLE NO. II-III

SATARA DISTRICT

TRANSPORT ROUTES

(2010-2011)

Sr. No.	Name of Transport Route	Length(Km.)
1	Broad-gauge Railway	120
2	National highway No.4	129.95
3	State Highway	965.85
4	District Roads	2215.49
5	Other District Road	1725.85
6	Village Roads	4670.10
7	Metelled Road	5463.49
8	Nonmetelled Road	2701.40

Source-Superintendent Engineer, P.W.D. Satara.

The communication system is also developed in the study area and link with important places of Maharashtra and Goa State. Different postal, telegram, telephone, mobile, net services are providing all facility of communication to the people of study region. Total No. of post offices 643, No. of village having post facilities 628, Indivival telephone connection holder in rural area 47327 and urban 89470in study region.

2.10 AGRO BASED INDUSTRIES :

The agriculture is one of the main occupations in the study region. The uses of fertile lands, fertilizer and manures, hybrid seeds have increased agricultural productivity. In the western part of the study region, due heavy monsoon rainfall the rice cultivation is more dominant but in the river basins canal irrigation and private lift irrigation schemes brought large area under irrigation and cultivation increased. The sugarcane is major crop along the riverside, so sugar factories are located in the river basins. There are 11+1 sugar factories in study area. They are situated in Karad (4), Phaltan (2) wai (1) and 1 proposed sugar factory will be run by females located at Khatav taluka.

The groundnut and other oilseeds like Soya been Sunflower, Safflower produced in the district. Oil mills are located at taluka places like Karad, Koregaon, Satara and Phaltan. There are 35 agro-processing centres in the study region.

The diary industry is major subsidiary occupation of the people. There are 1358 co-operation milk collecting centres and 61fishing co-operative societies in the study region. Now- a -days poultry industries are also growing because of different government policies and facilities. May other types of industries are located through SEZ, District industrial investment ,Direct foreign investment, MIDC and CIDC, at different places of the study region like, Satara, Karad, Koregaon, Khandala-Shirval,Phaltan and some other places.

2.11 POPULATION CHARACTERISTICS :

It is very important to study the population characteristics of the study area for knowing and understanding social and economic status of the people. The income and production efficiency of the people from the different sources is based on different factories. The development of natural resources and the level of economic development mainly depend on economic use of environment.

The total population of Satara district according 2011 census is 30.04 lakh which is increased by 207094 during 2001 to 2011 (6.94 percent). The density of population in the year 2001 to was 267 persons per sq.km which is increased up to 287 persons per sq.km in the year 2011.Sex ratio was 995 female per thousand males but unfortunately decreased up to 986 females per thousand males in 2011. During the 2001 to 2011 sex ratio decreased by only 1 percent.

2.12 RURAL URBAN POPULATION RATIO :

According to 2011 census there are 15 urban centres in the study area out of total population 81.02 percent population is rural and 18.98 percent population is urban population. When we compare rural urban population to last decade i.e. 2001, it is noticed that very little change in rural urban population density of Satara district is 287 persons per sq.km area. High density of population is observed in the Karad taluka i.e. 561 persons per sq.km. Lowest density observed in Man taluka.i.e.138 persons per sq.km.Out total of urban population 70.45 percent population concentrated in the Satara, Karad, Phaltan a Shirval and the Khandala cities and remaining population are in other cities.

The sex ratio of study area is 986 females per thousand males. There is high sex ratio than the Maharashtra's and India's sex ratio. Male population working outside especially in Pune, Mumbai and different defense and police forces, so sex ratio of rural area is 1006 and urban sex ratio is 928 females per thousand males.

2.13 OCCUPATIONAL STRUCTURE :

The occupational structure of any region is more important in economic life of the people. The working class population plays an important role in development of the region.

In the study region it is observed that out of total population 48.34 people engaged in farming activities and 21.55 percent population working as agricultural labourer, means totally 69.89 percent population engaged in agricultural activities. Remaining 30.12 percent population engaged in mining, manufacturing, maintenances, construction, trade and commerce, transport and other activities.

Female labours are more because most of male population migrated to the Mumbai and Pune and other part of the nations in search of Jobs and opportunities.

The ratio of the literacy is 84.20 percent, the male literacy is 92.09 percent and female literacy rates 76.29 percent as well as Rural and Urban literacy rates are 76.84 and 86.44 percent. As compare to states literacy rate, the literacy rate is more in the study region. In case of the literacy rate Satara district ranking 11th in Maharashtra.

2.14 MAJOR FINANCIAL INSTITUTIONS :

The finance is most important infrastructural facilities for development of agriculture. It is required for purchasing of new land extension and leveling of land for different agricultural inputs such as Hybrid Seeds, Chemicals in the Form of Fertilizers Insecticides, Weedicides, Fungicides and Germicides etc. Manures such as Compost, Cow Dung, Sericulture, Green manure, Fish Manures Poultry Manures, Piggery Manures etc. for different irrigation methods like drip, micro micro sprinkler irrigation, pipeline, daily wages of farm labors. Farmers are making available finanancial assistance from sources of financial institutions.

a) Institutional sources of finance

b) Non institutional sources of finance.

The first type is includes of District central co-operative banks, Primary agricultural credit societies, Land development Banks, Urban banks, Urban credit societies, Workers credit, societies, Non agriculture credit societies through which farmer can get financial assistance for different agricultural work

A non institutional source of finance includes Friends, Relatives and Money Lenders (Authorized/unauthorized)

Among these all sources of finance, SDCC bank and LDB Satara playing very vital role by providing finanancial assistance to the farmers through various schemes and project. Today land development bank in economic crises due to many move reasons many branches of it closed in the district.

2.14.1 SATARA DISTRICT CENTRAL CO-OPERATIVE BANK :

Satara Disrict Central Cooperative Bank is the leading Bank in the district. It is awarded at National level for “Best Performance’ Award by ‘NABARD’ (National Bank for Agriculture and Rural development) continuously six times, ‘Best’ District central co-operative Bank by the Maharashtra co-operative Bank association, Mumbai For its remarkable works in the field Banking Specially for farmers and their development

The SDCC Bank launched many more schemes projects to motivate the farmers for the development of agriculture. Some schemes are conducted by DCC through which DCCB providing agricultural loans and other financial assistance to the farmers of the study area.

SCHEMES OF SATARA DISTRICT CENTRAL COOPERATIVE BANK :

i) The Long/Medium/Short term loans Through the PACS
ii) The Shetkari Niwas
iii) The Green House Project
iv) The Gramin Souchalaya
v) The Waste Land Development Scheme
vi) The Rain Gun
vii) The Onion Storage Shade
viii) The Bhaghya laxmi Gas
ix) The Rabbit Farming Scheme
x) The Poultry Promote Project
xi) The Horticulture
xii) The Cold Storage Pre Cooling Unit
xiii) The Agro Clinics
xiv) The Marketing Credit
xv) The Housing Loans
xvi) The Self Help Group
xvii) The Computer Loans
xviii) The Educational Loans
xix) The Crop Insurance
xx) The Kisan Credit Card
xxi) The Krushi Paryatan /Agro Tourism
xxii) The Loan to Purchase JCB/Sugarcane /Harvester/Bulldozer/ /Road Roller/Mixer/Crusher etc.

TABLE NO. II-IV

SATARA DISTRICT

SATARA DISTRICT CENTRAL CO-OPERATIVE BANK SATARA

TALUKAWISE BRANCHES

(2010-2011)

Sr. No.	Name of the Taluka	1980-81	1990-91	2000-01	2010-11
1	Mahabaleshwar	-	02	04	06
2	Wai	-	12	14	16
3	Khandala	-	09	17	20
4	Phaltan	-	20	29	30
5	Man	-	12	17	19
6	Khatav	-	14	20	24
7	Koregaon	-	13	21	28
8	Satara	-	19	37	41
9	Jawali	-	09	11	11
10	Patan	-	11	22	22
11	Karad	-	28	46	50
Total		**73**	**149**	**238**	**287**

Source- Annual Report 1982,1992,2002,2012, Satara District Cental Co-Operative Bank Satara.

❖ **Social Awareness Programmes Conducted by SDCCB :**

i) The Formation of self help group

ii) The Establishment of farmers group

iii) The Innovative farmers District forum.

iv) The Satara district Sericulture Federation, Ajinkyatara Fruits, and Flowers and Vegetables growers' society.

v) The Scheme for purchase water for Drought affected grape Orchard plantation.

vi) The Financial support to eradication of white wooly aphids on sugarcane.

vii) The Cattles camps in drought affected area

viii) The Blood donation camps

ix) The Financial assistance for people affected by natural calamities, Kargil war, Mumbai Bomb Blast etc.

x) The Fodder Depot/Satara Mahostav/Granth ahastov/Agriculture and animal exhibition every year

2.14.2 LAND DEVELOPMENT BANK :

The LDB was very dominant before last 20years back it was providing every financial requirements of the farmers of the Satara District

TABLE NO. II-V

SATARA DISTRICT

LAND DEVELOPMENT BANK SATARATALUKAWISE BRANCHES

Sr.No.	Taluka	1980-81	1990-91	2000-01	2010-11
1	Mahabaleshwar	01	01	-	-
2	Wai	01	01	01	01
3	Khandala	01	01	-	-
4	Phaltan	02	02	02	02
5	Man	02	02	01	02
6	Khatav	02	02	01	01
7	Koregaon	02	02	01	01
8	Satara	02	02	02	02
9	Jawali	01	01	-	-
10	Patan	02	02	01	01
11	Karad	02	02	03	03
Total		**18**	**18**	**12**	**14**

Source-Annual Report, Land Development Bank Main office Satara.2012

Land development Bank providing loans and other financial assistance to the farmers belonging form the study area. Its branches during 1980-81 were 18, 1990-91were 18, 2000-01-12 and 2010-11 were 11 branches and 3 extension service centres. The loans provided by LDB Satara in 1980-81-Rs-165.19 lakh 1990-91-Rs 619.93, 2000-01-Rs29.61 and 2010-11 through various branches nothing was distributed crises because LDB was in economic crises and still today.

2.14.3. NON INSTITUTIONAL SOURCE OF FINANCE - MONEY LENDERS :

The Money lenders are the one of the source of finance to poor farmers if any source is not available to farmers, automatically they diverted to money lenders for the financial support.

TABLE NO. II-VI

SATARA DISTRICT

GOVERNMENT AUTHORIZED MONEY LENDER AND DISTRIBUTION OF LOANS (Rs. 000) (2009-2010)

Sr.No.	Taluka	Money Lenders	Loan to Traders	Loan to others	Total Loans
1	Mahabaleshwar	02	-	98	98
2	Wai	35	221	265	486
3	Khandala	-	-	-	-
4	Phaltan	32	09	-	09
5	Man	05	-	09	09
6	Khatav	11	07	09	16
7	Koregaon	9	18	-	18
8	Satara	35	125	32	158
9	Jawali	01	08	-	08
10	Patan	01	-	-	-
11	Karad	122	383	671	1054
Total		**253**	**771**	**1084**	**1855**

Source- District Dy. Registrar, Cooperative Institution Satara 2009-10

In the district the total No. of Money Lender are 253 in different talukas. They are more in number in Karad, Satara, Wai and Phaltan talukas provided total Rs 1855000 loans to the farmers..

2.15. AGRO-SERVICES CENTRES :

Agro Service Centres are playing very significant role in agricultural development .Due to ASC's it become possible to use all the essentials inputs for agricultural development. The license for ASC's provided by the Govt. Through Zilla Parishad . Agriculture department for Seeds, Fertilizers and Insecticides and now newly launched for Nurseries of various crops and vegetables.

TABLE NO. II-VII
SATARA DISTRICT
TALUKAWISE DISTRIBUTION OF AGRO SERVICE CENTRES
2010-2011

Sr. No.	Taluka	License of Fertilizer	License of Seeds	License of Insecticides	Total
1	Mahabaleshwar	28	34	20	82
2	Wai	77	41	40	158
3	Khandala	77	70	45	192
4	Phaltan	204	163	120	487
5	Man	104	103	77	284
6	Khatav	124	109	76	309
7	Koregaon	123	115	72	310
8	Satara	148	132	95	375
9	Jawali	47	39	23	109
10	Patan	92	85	41	218
11	Karad	230	185	147	562
Total		**1254**	**1076**	**756**	**3086**

Source-Agriculture Dept .Satara Z.P.Satara 2010

In the Satara districts distribution of Agro Service Centres is uneven. Only one taluka has less than 100 Agro Service Centres under to categaory of 100 to 200 Agro Service Centres Wai, Khandala and Jawali talukas are there Man and Patan taluka are the under category of 200-300 ASC's are found in Koregaon, Satara Karad and Phaltan taluka.As compare to total number of ASC's in 2009-10 there 311 Number of Agro Service Centres increased in 2010-11.There are 3086 Agro Service Centres in Satara district.

2.16 MAJOR CROPS :

The crops cultivated in the study region can be classified into

i) Cereal crops-Jawar,Wheat, Rice

ii) Pulses-Gram

iii) Oil seeds-Groundnut, Soya been

iv) Cash crops-Sugarcane, Ginger.

Along with this some fruits, flowers and vegetables are also grown on large scale in the Satara district.

2.17 OTHER FACILITIES :

Different town exhibits different social, economic features. Every town has its own identification. There so many facilities are affecting on the growth of the district. Education Facilities concentrated in the district in the forms of 3109 primary schools, 640 secondary schools and 163 higher secondary schools. Medical colleges, Polytechnic, Pharmacy, Agriculture, D.Ed., B.Ed., M.Ed., B.P.Ed., M.P.Ed., Information Technology, ITI colleges are spread in the district. Several numbers of English mediums schools and colleges are increasing in recent years. Different places have Residential schools run by Government for the backward class and economically weaker strata of the society. In the district there is concentration of well organized, esteemed, reputed government and private hospitals. Industrial units' like MIDC at Karad, Satara, Phaltan, Khandala, Shirwal, Koregaon and Satara road.

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CHAPTER

3

LANDUSE, IRRIGATION AND CROPPING PATTERN

3.1 INTRODUCTION :

This chapter deals with an analysis of general land use, irrigation, and cropping pattern of the study area with the changes there in. For study convenience, it is divided into parts like General land use pattern irrigation pattern and cropping pattern.

3.2 GENERAL LAND USE PATTERN :

The land is the basic source of human society and land use is the surface utilization of it .For development of vacant land, man used series of recognized category. Land use is an important economic activity of man. It is the function of four variables like land, water, air, and Man. The certain proportion of its available for cultivation, which the best base for the agricultural production, land use changes occur to meet the variable demands of the society in its new way of life .The primary use of land for Crops, Forest, Pasture, Mining, Transportation, Gardening, Residential, Recreational, Industrial, Commercial, Cultivable Waste, Barren And Fallow Land. The land use study in its spatial context is essential to understand the regionalization of the areas of optimum land use degraded area etc. The change in the land use pattern of Satara district depicts the interaction among all these elements. To study these changes the total area has been studied under two categories i.e.

TABLE NO. III-I

SATARA DISTRICT

LAND USE PATTERN (Area in hector)

Sr. No.	Land use Category	Area in 1980-81	%	Area in 1990-91	%	Area in 2000-01	%	change
I	**Non Cultivable land**							
	1) Forest	137572	13.00	140500	13.27	145800	13.77	-0.79
	2) Area not available for Cultivation	121212	11.45	123800	11.69	105100	10.87	0.58
	a) Area under non Agriculture	28151	2.66	23700	2.23	22800	2.15	-0.57
	b) Barren and Uncultivated land	93061	8.79	100100	9.45	86300	8.15	-0.55
II	**Cultivable Land**							
	3) Net sown area	151911	52.15	638000	60.28	589700	55.72	-3.57
	4) Fallow land	124559	11.77	63800	6.02	71400	6.74	5.02
	a) Current Fallow	53881	5.09	18400	1.73	16300	1.54	3.55
	b) Other Fallow	70678	6.67	45400	4.28	55100	5.20	1.47
	Other uncultivated land	122989	11.63	92200	8.78	136300	12.90	-1.25
Total		**1058243**	**100**		**100**	**1058300**	**100**	

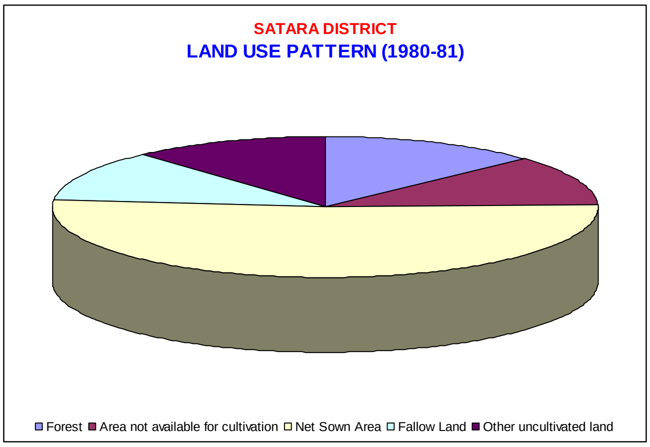
Source-Socio Economic Abstract 1982, 1992, 2002

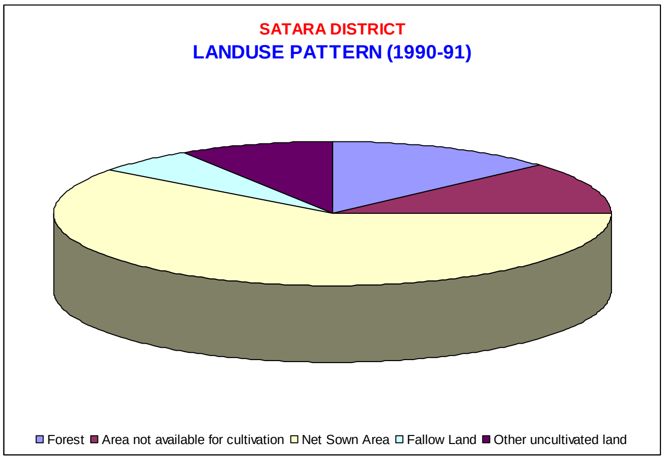
i) Non cultivable land

ii) Cultivable land

3.2.1 NON CULTIVABLE LAND :

The non cultivable land comprises forest land and area not available for cultivation. Forest occupies 13.00 percent of the total geographical area in 2000-2001 which was about 13.77 percent in 1980-81. The forest area is in the western part of the study area which coincides with the rainfall distribution and topography. Area not available for cultivation is about 11.45percent (121212 hector) of the total study area. It includes land which cannot be brought under cultivation unless at very heavy cost and rugged and barren topography. The land put to non agricultural use is 2.66 percent (28151 hector) and barren and uncultivated land is 8.7 percent (93061 hector) of the total area of Satara district shows the regional distribution of area not available for cultivation. Its proportion is high in eastern, western, North western part of study area. (Fig. No. 3.1 A, B, C and D)





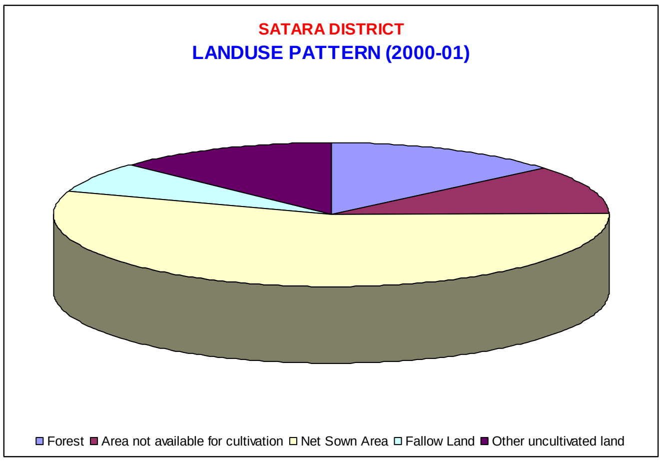


Fig. No. 3.1 A, B and C

3.2.2 CULTIVABLE LAND :

The cultivable land which includes the net area sown and follow land shares about 55.72 percent(587700 hector) of the geographical area in the present study during 1980-81 There was increase of 5percent (638000 hector) in the year decrease in 1990-91 but unfortunately there was decrease in area under net sown area by 8percent(589700 hector) in the year 2000-2001. The same meaning is taken for analyzing the impact of irrigation generally in central, northern, southern part of such area has high percentage (over 75 percent). Generally high proportion of net sown is due to leveled land. The northern eastern and south central have moderate (70 to 75 percent) area under this category the low (60 to 70 percent) intensity of net area sown lies in eastern and western part study area due to mountains and hilly area, rugged topography with undulating surface. The land which remains vacant for 6 to 10 seasons comes under fallow land class. The total fallow land during 1980-81 was 6.74 percent (71400 hector), in1990-91 it was 6.02 percent and in 2000-01 it was 11.77 percent (124559hector) to the total geographical area means showing positive change in fallow land

3.3 PATTERN OF IRRIGATION :

In this part of chapter aim to highlight the sources wise progress of the irrigation facilities for the period of 1980-81 to 2000-2001. The overall irrigation and changes therein also attempted in this part. Irrigation is essential for crop cultivation and better yield. The success of agriculture depends upon wise use of irrigation water, irrigation plays very significant role particularly in the areas where rainfall is low and uncertain. Therefore it is one of the significant inputs in the transformation of subsistence to commercial agriculture.

Irrigation being artery and pulsing heart is an absolute constant as well as a sufficient command over the location of commercial crops important in agricultural production per hector area shown in the cropping pattern.

3.4 EVOLUTION OF IRRIGATION :

Irrigation is an artificial supply of water to the crops for their proper development. It is as old as civilization. Irrigation in India is an old cultural technique and it has been existing from three to four thousand years. In India early development of irrigation took place in valley of Ganga and Indus.The British people systematically developed the irrigation to diminish the effects of drought and famines. After independence political stability has stimulated irrigation development which brought green revolution and many attempts were made to tap water for irrigation through major, medium and minor irrigation projects or schemes.

In the region under study, irrigation was started in early period of British rule with opening of Krishna canal but actual construction of were started in 1864 which was complicated in 1867. The weir is 60.66 mt. long and 7.01 mt. high which is situated across the Krishna river near Khodashi in Karad taluka.The canal discharges 160.06 cubic mt. water per second in Krishna canal and irrigates 3,079.02 hector land of cultivable land. Prior to this project the main source of irrigation was most by wells and *mots* and water wheel were used for lifting water. Now a day's many more irrigation projects launch by State and Central Government to bring maximum area under irrigation by supplying water through canals and other sources of irrigation.

TABLE NO. III-II

SATARA DISTRICT

MAJOR IRRIGATION PROJECTS

Sr. No.	Irrigation Project	Taluka	Irrigated Area		Total
			Perennial	Seasonal	
1	Dhom	Wai	1435	30937	32372
2	Kanher	Satara	1891	16732	18623
3	Arphal	Koregaon	2734	7814	10548
4	Veer	Khandala	2340	24447	26787
Total			**8400**	**79930**	**88330**

Source-Socio Economic Abstract 2006

Other Irrigation Projects :

1. Mhaswad tank (1901, Man)
2. Krishna canal (1985, Karad)
3. Yerelwadi dam (1998,Khatav)
4. Morna project (2009, Patan)
5. Andhali project(2005, Man)
6. Urmodi project (under Construction, Satara,2012)
7. Uttarmand project (under contruction, Satara, 2009)
8. Tarali project (2009, Patan)

9. Hateghar (2006, Man)
10. Nagewadi (2009, Wai)
11. Wang project (2009, Patan)
12. Dhom Balakwadi (2006, Wai)
13. Tembhu Lift Irrigation Project(Karad2006)
14. Jihekatapur Scheam (Satara-2014-15)

Now- a- days farmers of study area have started using extensively water from wells and rivers. Recently drip, sprinkler and micro sprinkler method of irrigation are practiced, almost all the area of the study region to avoid misuse of water and to get optimum benefits of available water by adopting this methods many farmers promoting economic use of water especially in eastern and central region of study area.In Satara district Government policies have encouraged to utilize the surface and ground water resources by providing financial assistance and subsidies, many co-operative societies emerged and formed dense network of lift, drip as well as sprinkler irrigation. Lift irrigation is dominant in Karad taluka in Krishna and Koyana river basins. The topographical obstacle has been surmounted by lift irrigation to some extent further, the sugar factories which has been establish in every taluka during last two decades have developed irrigation facilities by making special effort in command area, apart from this the rapid rural electrification, awareness of the farmers and increasing trend of education have stimulated irrigation development. The total area under irrigated has increased tremendously. In 1980-1981 the area under irrigation by all sources of irrigation was 1128603 hector its rises to 231777 hector. The absolute increase in area irrigation was 103174 hector of cultivated land.

3.5 METHODS OF IRRIGATION :

Methods of irrigation are practiced in the study region according to the nature of terrain, soil type and total climatic condition, mostly surface water irrigation are generally practiced everywhere beside that flood irrigation , border furrow and corrugation irrigation , however flood and border irrigation are observed in central part of the region like Wai, Satara, south Koregaon and Karad Taluka.

The furrow irrigation in which water is run in furrow is used in eastern and western part of the region when slopes are moderate and low. By this method water is applied to crops like sugarcane, maize and vegetables. Furrow irrigation is very common because it adoptable to great variety of land slope. The corrugation irrigation, where water is applied to the ground in rills or small shallow furrows is practiced along the Krishna valley. The subsurface and overhead irrigation methods are practiced in study area because they are expensive though they are economic to the water. But in future these economic methods of irrigation may be used. Now a day there is remarkable changes in farmer's outlook or approaches. They started to use advanced means of irrigation like drip, sprinkler and micro sprinkler methods of irrigation to avoid the misuse of irrigation and adopt proper utilization of available water. In the regions of drought i.e. Man, Khatav, eastern, north Koregaon, and Phaltan etc. Even though these methods of irrigation are costly and expensive, they are enjoining many more government policies which are in the favour of farmers like direct 50 percent subsidies in drip, sprinkler and micro sprinkler schemes.

3.6 SOURCES OF IRRIGATION :

The sources of irrigation in the study region largely affected by the physical features such as topography, water, geology means structure of rocks, soils and presence of ground water etc. presently the region has-

1) Well Irrigation

2) Surface Water Irrigation

3) Other sources of irrigation

The topography of Krishna valley is quite suitable for lift irrigation and very less suitable for tank irrigation. The physical features of Mahabaleshwar Jawali and Patan taluka are not suitable for lift irrigation. In such taluka well irrigation is flourished and eastern part of study area like Man, Khatav, Phaltan, taluka have canal, tank and well irrigation the geological structure is suitable to construct the dam and store the water for long time and utilize it whenever necessary. The lift irrigation widely spread in the Krishna river basin mostly in the Karad taluka. Maximum area is under irrigation. The lift irrigation is on cooperative basis, the 52 percent land under lift irrigation. The well and tank irrigation found in eastern and western part of study area. There are maximum land under well water irrigation in taluka of Man,Khatav, Phaltan taluka tanks are observed in all three parts of study area mostly movein eastern part canal irrigation observed in only along the lower reaches of river in Karad taluka. Tank irrigation is nil in the same taluka due to an unsuitability of topography. A brief description of major source of irrigation is attempted below.The term lift irrigation refers to lifting of water from the surface of *nala,* river, canal, tank, lakes etc. with mechanical power and supplying nearby area through cement or plastic pipes. The source of lift irrigation schemes depends upon perennial rivers. The obstacle of the slope is eliminated hence as the water is supplied to the fields for a distance ranging from 5 to 25 kms from river banks. The present lift irrigation is operated in Krishna basin and other area by constructing Kolhapur type weirs, and percolation tanks. Karad taluka is very well known for lift irrigation in the study area. The industrious natures of the farmer with the spirit of development and progress have formed the co-operative lift irrigation societies. These schemes promote to bring more area under irrigation.

3.7 WELL IRRIGATION :

Well irrigation is dominant in eastern region of study area. Near about (31.80percent) area is irrigated by well irrigation, Man and Khatav taluka having 10425 hector and 9852 hector. Land under well irrigation. There is reduction in area under well irrigation in Phaltan taluka because of other sources of irrigation like canal in 2000-01. Western part of study area receiving more rain then also area under well irrigation recorded in Patan taluka

32.72percent.30.78 and 28.19percent.In this region Jawali (30.78percent) and Wai (28.19) only. Mahabalehwar has less area under well irrigation due to rigid and rugged topography, mountainous soil with dense forest. In the central part of study are Karad recorded more area under well irrigation i.e. 12453 hector (31.0 percent) Satara 10846 hector (27.06 percent) and Koregaon has 10296 hector (25.69 percent) area under well irrigation. Khandala has comparative les of land under well irrigation in 2000-01. According to 1980-81 statistics it was more in every region of study region. In some areas it was less but now a day it is increasing. (Table No. III-III and Fig. No.3.2 A, B, C and D).

TABLE NO. III-III

SATARA DISTRICT AREA UNDER WELL IRRIGATION (Area in hectors)

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
Eastern Part								
1	Man	11177	28	22625	37.45	10425	31.80	3.8
2	Khatav	5595	14	24772	40.10	9852	31.10	16.1
3	Phaltan	23130	58	13005	22.45	12477	38.09	-19.9
	Total	39902	100	60402	100	32754	100	
Western Part								
4	Patan	594	11.83	2049	19.36	13265	32.72	20.89
5	Jawali	815	16.23	3621	34.21	12478	30.78	14.55
6	M.Shwar	41	8.81	1342	12.68	3325	8.20	-0.61
7	Wai	3571	63.13	3571	33.75	11469	28.30	-42.93
	Total	5021	100	10583	100	40537	100	
Central Part								
8	Karad	6394	33.61	2529	20.49	12453	31.03	-2.54
9	Satara	1225	6.43	1225	9.92	10846	27.06	20.63
10	Koregaon	6683	35.12	3240	26.25	10296	25.69	-9.43
11	Khandala	4721	24.88	5346	43.35	6478	16.22	-8.65
Total		**19023**	**100**	**12340**	**100**	**40073**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

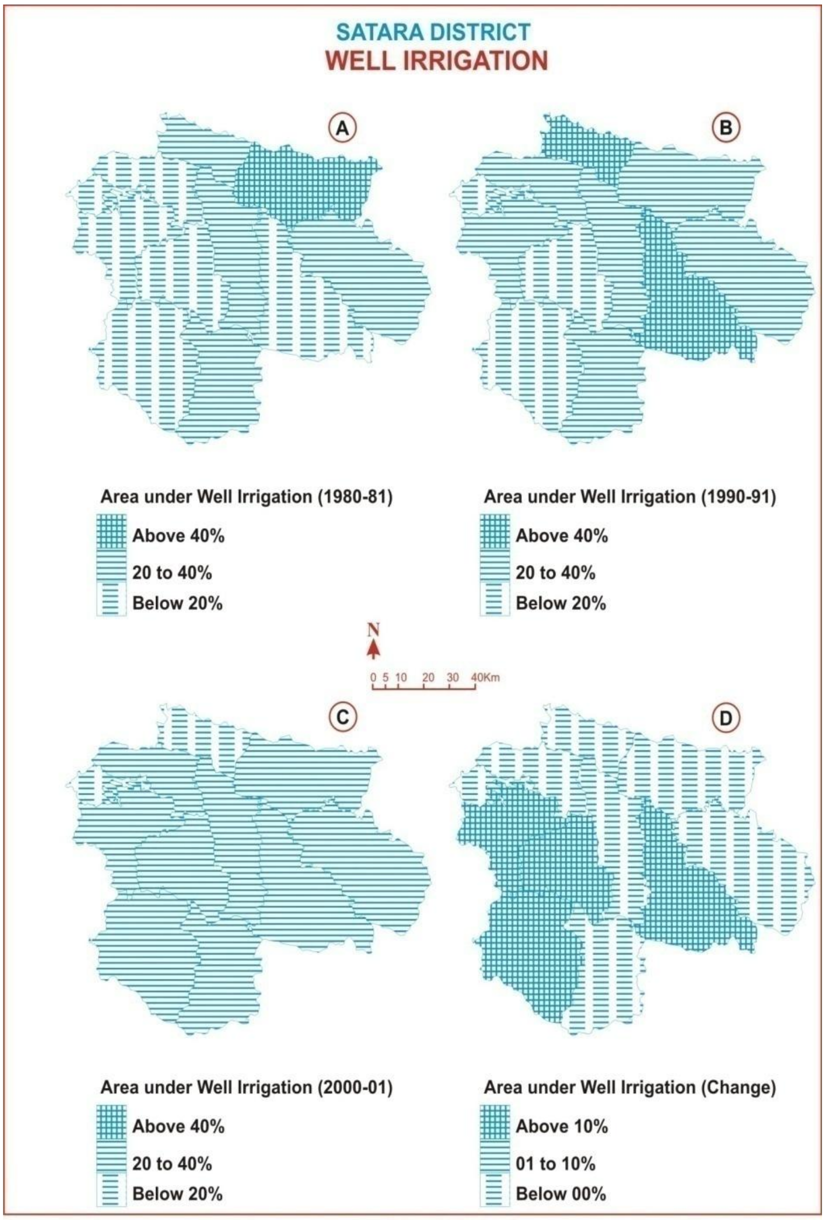


Fig. No. 3.2

3.8 CHANGES IN WELL IRRIGATION :

In the eastern region Man, Khatav and Phaltan these 3 talukas are included, the area under well irrigation in Man Taluka was 11777 hector (28.00 percent) during 1980-81 but now it is 16425 hector (31.80 percent) actually it is shows positive change but area under well irrigation in the entire region is changed so it shows positive change. Area under well irrigation in Khatav taluka is increased from 5595 to 9852. i.e. (14.02 percent to 16.05 percent) only Phaltan taluka shows negative change in well irrigation. i.e. –19.87. Actually it was 23130 hector lands under well irrigation but it decreases up to 12477 hector in 2000-2001. In the western part of Satara district positive change is observed in Patan, Jawoli M.Shwar taluka. There is tremendous change in land under well irrigation form 11.83 percent to 32.72 percent 16.23 percent 30.78 percent and 0.81 to 8.20 percent in western part. Only Wai taluka has negative change i.e.-0.61.Central part of the study area showing negative changes in Karad (-2.54 percent), Koregaon (-9.43) and Khandala (-8.65 percent) because in Karad taluka lift irrigation is dominant. Due to presence of Krishna river, ample water for agriculture is available and it is lifted by huge pump set so it shows negative change. Koregaon and Khandala showing negative changes due water is made available by other sources of irrigation during different season. Only in Satara taluka, the land under well irrigation increased form just 1225 (6.43 percent) hector to 10846 (7.66 percent) hector s of land. (Fig. No. 3.2 D)

3.9 SURFACE WATER IRRIGATION :

There was very less hector of land under surface water irrigation during 1980-81. But there was drastic change in this irrigation pattern in 2000-2001. In the eastern region Phaltan taluka shows more land 13625 hector during 1980-81 hector. (45.38 percent) under surface water irrigation Man and Khatav taluka show increase in land under surface water irrigation. Man, 1010 hector to 5047 hector and Khatav 1899 to 5810 hector. Western part of study area Patan, Jawali taluka and Wai taluka showing increase in land under surface water irrigation. In Patan taluka it increase from 3946 hector to 8325 hector during 1980-81 it increases up to 3277 hector in 2000-2001. The Wai and Mahabaleshwar taluka showing decrease in area under surface water irrigation. In Mhabaleshwar and Wai shows decrease. i.e. from 940 to 931 hector and 4526 hector to 3546 hector during 1980-81 to 2000-2001.

Central part of Satara district consisting Karad, Koregaon, Satara and Khandala taluka. Satara, Koregaon and Khandala shows increase in area under surface water irrigation i.e. – Satara 21.75 percent to 26.04 percent, Koregaon 10.19 percent to 27.51 percent and Khandala 4.22 percent to 10.92 percent to total irrigated area, only in Karad taluka area under surface water irrigation shows little increase but negative change due to improper use of water, illiteracy of the farmer, degradation of land. (Table no. III-IV and fig. no. 3.3 A, B, C and D

TABLE NO. III-IV

SATARA DISTRICT

AREA UNDER SURFACE WATER IRRIGATION

Sr.No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
Eastern Part								
1	Man	1010	6.10	325	1.24	5097	25.61	19.51
2	Khatav	1899	11.48	2656	10.13	5810	42.76	30.9
3	Phaltan	13625	82.42	23226	88.63	9034	45.38	-37.02
	Total	16534	100	26207	100	19901		
Western Part								
4	Patan	3964	31.17	2049	18.24	8325	51.62	20.45
5	Jawali	1495	13.70	3621	32.23	3277	29.01	6.62
6	M.Shwar	940	8.61	1342	11.94	931	5.76	2.84
7	Wai	4526	41.52	4220	37.59	3596	22.30	-19.19
	Total	10907	100	11232	100	16125	100	
Central Part								
8	Karad	9535	63.82	2529	30.15	10352	35.47	-28.35
9	Satara	3250	21.75	2505	29.87	7608	26.04	4.29
10	Koregaon	1524	10.19	2354	28.07	8029	27.51	17.32
11	Khandala	631	4.24	998	11.91	3189	10.96	6.7
Total		**14942**	**100**	**8386**	**100**	**29178**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

3.10 CHANGES IN SURFACE WATER IRRIGATION :

Positive change was observed in Man and Khatav taluka it is from 1010 hector to 5097 (6.10 percent to 25.6 percent) and 1899 hector to 5810 hector in percentage (11.48 percent to 42.76 percent) and negative change in Phltan taluka from 82.40percent to 45.38 i.e. – 3702percent due to undulating surface, rugged topography, seasonal rivers and less amount of rain in eastern part during 2000-2001.

Negative changes were found in Mahablaeshwar and Wai taluka of the district. In Wai remarkable decrease in land under surface water irrigation it was 4526 in 1980-81 it decreases up to 3596 in 2000-2001 so it shown negative change (i.e.-19.19 percent) due to baron land, less availability of water, less storage of water in reservoirs.

Positive changes were observed in Patan and Jawali taluka. It is from (Patan 31.17 percent) to 51.62 percent) Jawali 13.76 percent to 20.32 percent .In the span of 20 year i.e. 1980-81 to 2000-01. In central part of study region Karad taluka shows negative change in land under surface water irrigation even though there is actual increase in s under surface water irrigation i.e. 9537 in 1980-81 it increase 10352 s in 2000-01 .land turned to saline soil due to water logging & saturation of water and over irrigation.

Negative change (-28.35 percent) It was 63.82 percent during 1980.81 and 35.47 percent during 2000-01.Satara Koregaon and Khandala shows positive changes in surface water irrigation. (Fig. no. 3.3 D)

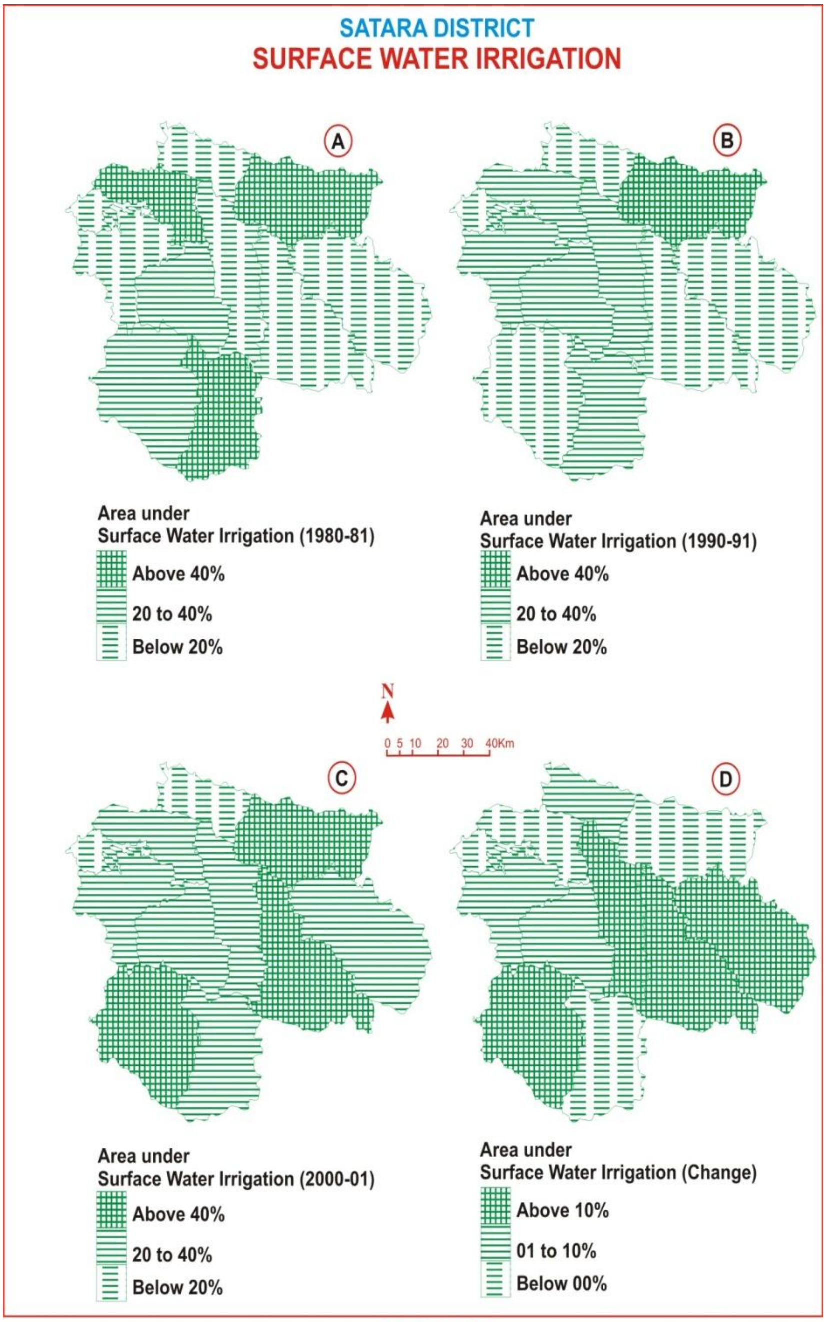

SATARA DISTRICT
SURFACE WATER IRRIGATION
A
B
Area under
Surface Water Irrigation (1980-81)
Above 40%
20 to 40%
Below 20%
Area under
Surface Water Irrigation (1990-91)
Above 40%
20 to 40%
Below 20%
N
0 5 10 20 30 40Km
C
D
Area under
Surface Water Irrigation (2000-01)
Above 40%
20 to 40%
Below 20%
Area under
Surface Water Irrigation (Change)
Above 10%
01 to 10%
Below 00%

Fig. No. 3.3

3.11 OTHER SOURCES OF IRRIGATION :

Other sources of irrigation consist rainfall and moisture in the air where there is no chance to get water from canal or lift irrigation, even though well is not possible in such area rain is one and only one source of irrigation in the study area. This area can be bringing under lift irrigation. Eastern part of the study area Khatav and Phaltan shows of irrigation in Khatav 6076 hector land was under other sources of irrigation during 1980-81 it is changed into 6658 hector in 2000-2001 and Phaltan had 5468 hector during 1980-81 changed into 9136 hector i.e. 27.10 percent to 42.18 percent during span of 20 years.

In Man taluka land under surface water irrigation decreases from 42.86 percent to 27.06 percent Western region of Satara district well known for rain but in recent year there is also less percent of rain but land under other sources of irrigation increased from 1135 hector (1980-81) to 3166 (2000-01). In Jawali taluka 440 hector increased upto 2846 hector (1980-81) in percentage 13.83percent to 24.11percent during this span. Mahabaleshwar show very little increase in land under other sources irrigation. Wai also shows increase in land under other sources of irrigation.

Central part of study area included Karad, Satara, Koregaon and Khandala taluka. There is maximum use of other sources of irrigation in Khandala and Karad.4742 hector land under other sources of irrigation during 1980-81 it changed into 6333 hector in 2000-01. Satara and Koregaon shows decrease in land under other sources of irrigation in Satara it was 6287 hector. in 1980-81 and it decrease upto 3683 hector in 2004-2005.

In Koregaon taluka land under sources of irrigation was 2689 hector. it decreases up to 3140 hector Khandala taluka has 2157 hector it changed in 6654 hector land under other sources of irrigation. (Table No. III-V and Fig. No. 3.4 A, B, C and D)

TABLE NO. III-V

SATARA DISTRICT

AREA UNDER OTHER SOURCES OF IRRIGATION

(Area in hectors)

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
Eastern Part								
1	Man	8626	42.86	9833	23.57	5862	27.06	-15.80
2	Khatav	6076	30.12	13921	33.38	6658	30.74	0.62
3	Phaltan	5468	27.02	17960	43.05	9136	42.20	15.08
Total		20170	100	41714	100	21656	100	
Western Part								
4	Patan	1135	36.93	53204	93.74	3166	28.83	-8.1
5	Jawali	440	13.83	467	1.35	2846	24.11	10.28
6	M.Shwar	124	3.89	-	-	455	3.85	-0.04
7	Wai	1482	40.35	2785	4.91	5233	43.21	2.86
Total		3181	100	56756	100	11800	100	
Central Part								
8	Karad	4742	29.87	59584	35025	6333	31.96	2.09
9	Satara	6287	39.60	14489	8.57	3683	18.71	-20.89
10	Koregaon	2689	16.93	63439	37.53	3140	15.85	-1.08
11	Khandala	2157	13.60	31506	18.65	6654	33.57	20
Total		**15875**	**100**	**169018**	**100**	**19810**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

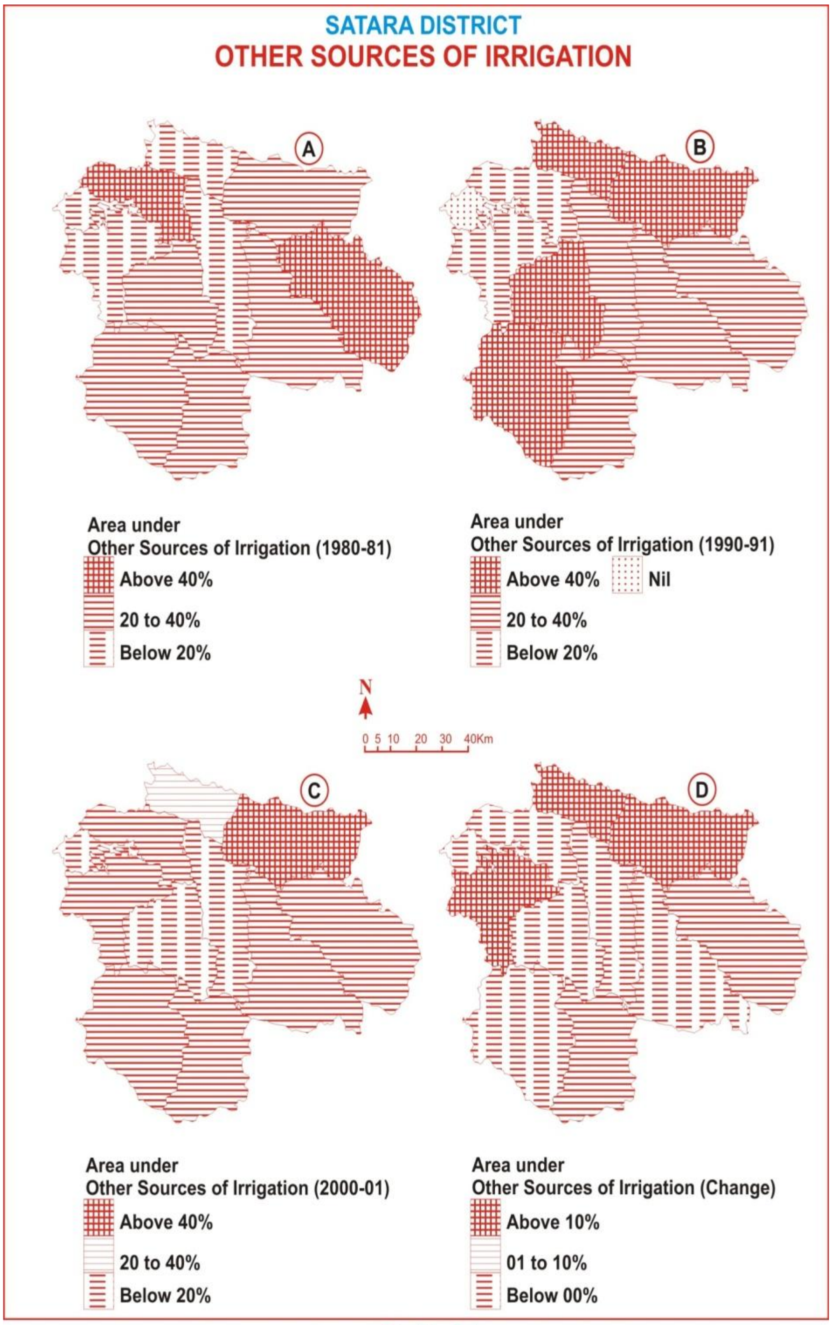

SATARA DISTRICT
OTHER SOURCES OF IRRIGATION
A
B
Area under
Other Sources of Irrigation (1980-81)
Above 40%
20 to 40%
Below 20%
Area under
Other Sources of Irrigation (1990-91)
Above 40%
Nil
20 to 40%
Below 20%
N
0 5 10 20 30 40Km
C
D
Area under
Other Sources of Irrigation (2000-01)
Above 40%
20 to 40%
Below 20%
Area under
Other Sources of Irrigation (Change)
Above 10%
01 to 10%
Below 00%

Fig. No. 3.4

3.12 CHANGES IN OTHER SOURCES OF IRRIGATION :

There were negative changes in of parts of study area In the eastern part Man taluka shown negative change i.e. (-15.8 percent) actually it was 42.86 percent land under other sources of irrigation but is decreased up to 27.06 percent. In western part Patan, Mahabaleshwar and Wai taluka shows negative changed because amount of rainfall is less so the people diverted to other sources of irrigation Patan (-8.1 percent) Mahabaleshwar (-0.04percent) Wai (-18.84 percent)

Central part of study area showing positive and negative changes in other sources of irrigation. Khandala and Karad taluka Jawali positive changes i.e. 20 and 2.04 percent respectively and Satara & Koregaon shows negative changes i.e. -20.89 percent -0.08 percent people find out new other sources irrigation to irrigate the crop. (Fig. No. 3.4 D)

3.13 TALUKA WISE IRRIGATION PATTERN :

MAHABALESHWAR –

In Mahabaleshwar taluka of the district irrigation facilities are not much developed during 1980-81. The area under well irrigation was just 41 hector. And area under surface water irrigation was 790 hector. Net irrigated area was 1105 hector and total area under irrigation out of 22700 hector to the total geographical area. But during 2000-2001 the area under irrigation changed tremendously. 790 hector by surface water irrigation and 2156 under well irrigation and total irrigated changes into 3303 hector. Out of 22190 hector because of awareness of the people in this span of 20 year there is drastic change in irrigation. Government forcing people to bring maximum land under irrigation for that Government made available so many facilities like finance, capital, and loans etc.

WAI –

The situation of irrigation in Wai, surface water irrigations sources irrigated 4526 hector area while 3571 hector area irrigated by well total area under irrigation was 9579 out of 61,600 sq.km area during 1980-1981, But in last 20 years there is tremendous change in irrigation pattern and irrigation sources. Form beginning the maximum area was under irrigation but there was not proper order of utilization of water but due to some minor and major projects of irrigation. The area under irrigation is changed during 2000-01 into area under surface water irrigation 3222 hector and by well 8283 hector and total irrigated area was 16894 hectors. There was remarkable change in irrigation i.e. from 9579 hector to 16894 hectors. Due to availability of lift irrigation Krishna river, canals connected to Dhom project and financial support by Government to digging well in the own farms of the farmers.

TABLE NO.III.VI

SATARA DISTRICT

TALUKAWISE CHANGES IN IRRIGATION PATTERN

1980-81 TO 2000-01(Area in hectors)

Sr.No.	**Taluka**	**Total area under irrigation**				**Change**
		2000-01	%	1980-81	%	
1	Mahabaleshwar	3303	1.52	1105	0.75	0.77
2	Wai	1689	7.81	9579	6.58	1.23
3	Khandala	19875	9.19	7509	5.15	4.04
4	Phaltan	54027	24.99	2223	29.00	-4.01
5	Man	20402	9.4	20813	14.29	-4.89
6	Khatav	21020	9.7	13570	9.32	-0.38
7	Koregaon	18011	8.3	10892	7.48	6.4
8	Satara	24900	11.51	10762	7.39	4.12
9	Jawali	9509	4.3	2750	1.40	2.9
10	Patan	12715	5.8	7675	3.89	1.91
11	Karad	15493	7.48	20673	14.75	-7.04
Total		**200944**	**100**	**107151**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

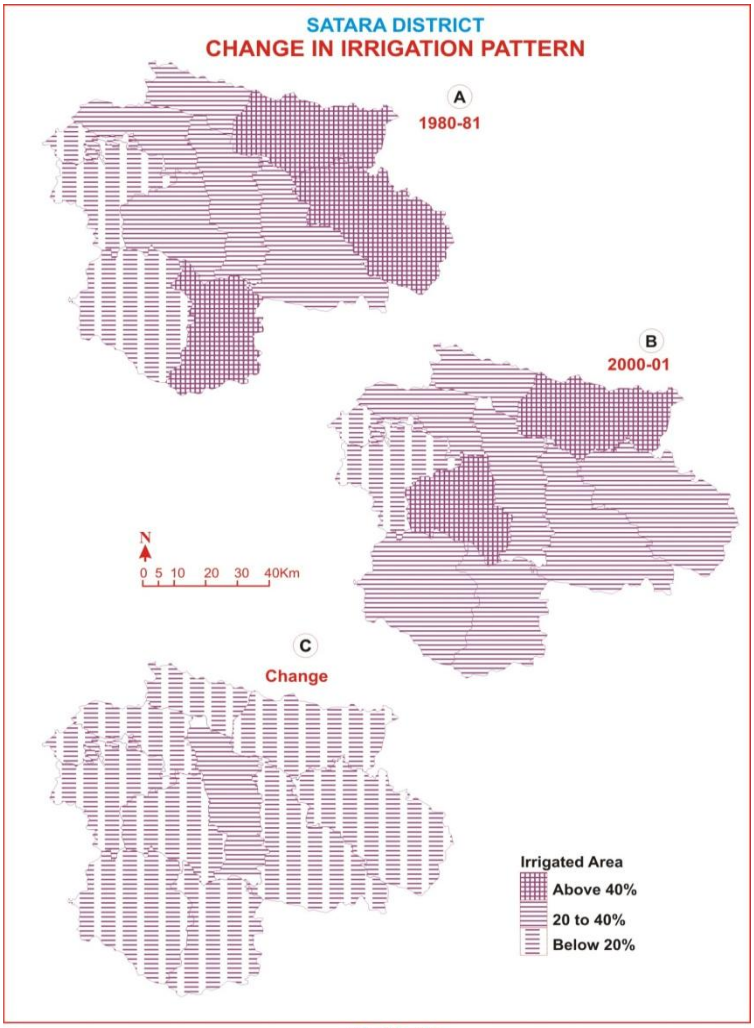


Fig. No. 3.5

KHANDALA :

The situation of irrigation was very poor in Khandala taluka of Satara district during 1980-1981.The area under irrigation by surface water irrigation and well irrigation was 631 hector and 4721 hectors respectively and total area under irrigation was 7509 hector. Out of 54300 hectors total geographical area. There was change in irrigation during 2000-01.The surface water irrigation, irrigated 3984 hectors and well irrigation irrigated 8266 hector and total area under irrigation 19875 hectors out of 53608 hectors.12366 hectors area under irrigation is the change in irrigation and this is identical one, due to diversion of people towards agriculture, change in peoples attitude and financial support by various institution of finance and non institutional sources of finance. Like many lender, friends' relatives and co-operative societies, Banks, sugar factories.

PHALTAN :

Phaltan is the 4th largest taluka in Satara district according to area that is 1, 19,029 hectors. Near about 50percent area was under irrigation from beginning i.e. 42,223 hector in brief 13625 hectors by surface water irrigation and 23130 hectors area by well irrigation and remaining by other minor sources like rain. The condition of irrigation changed in the last 20 years. The area under surface water irrigation was 11534 hector and 33248 hectors by well irrigation and the total area irrigated by all sources of irrigates was 54027 hector. There is change in irrigation pattern in the span of 20 years. It is remarkable change due to change in farmer's attitude and Govt. facilities some minor & major irrigation projects.

MAN :

This taluka of the district is always in drought conditions it receives very less rainfall throughout act the year but irrigation condition during 1980-81. 1010 hector area irrigated by surface water irrigation and 11177 hector area irrigated by well irrigation and area irrigated by all sources of irrigation was 20813 hector. And condition during 2000-2001 was area irrigated by surface water irrigation 4375 hector and by well 10025 hector with 20402 hector total of irrigated area there was no any identical/remarkable change in area under irrigation, even the Govt. is providing all the necessities to the farmer, due to unfavorable condition of climate and physiographic condition.

KHATAV :

In Khatav taluka we can observe somewhat improved condition in case of irrigation means within the period of 20 years just 7450 land brought under irrigation. During 1980-81 the area under irrigation by surface water and well irrigation 1899 hector, 5595 hector respectively and total area under irrigation was 13750 hector. During 2000-2001 the situation was 4715 hector and 9521 hectors under surface water irrigation and well irrigation respectively and total area and under irrigation was 21020 hectors. In this taluka some minor and medium project are there like near dam, Dingh tank canal irrigation but they are getting dry up due severe summers and frequents drought condition.

KOREGAON :

In the Koregaon taluka the area along with Krisha river and Vasana & Vangana river the develops well some part receive water left and right canal of Dhom and Kanher dam, so total area irrigated 14798 s and by well 10296 hector and by surface water irrigation 4502 hector. In 1980-01 the situation was weak means the area under surface water irrigation 1524 hector and area under well irrigate 6683 hector and total area irrigated was 10892 hector.

SATARA :

Western part of Satara taluka was no development in irrigation but eastern part somewhat developed due to the river Krishna Venna, and their tributaries, the level of well water is always medium level due to availability of water in dams and canal so the farmer can bring was maximum land irrigation. During 1980-81 the area under surface water irrigation was 3250 hector and by well irrigation 1225 hector is irrigated. And the total area irrigated 91.000 hector. In the span of 20 years means during 2000-2001 the area under irrigation by surface water changed into 6807 hector. And area under well irrigation changed into 14348 hector. There was tremendous change in area under irrigation in Satara taluka.

JAWALI :

This taluka of Satara on district is in the western part of the district the topography is not conducive There is heavy in but rain water is not arrested at many places so there is very less use of rainfall water During 1980-81 the area under surface irrigation was 1495 hector and under well irrigation just 815 hector and total area under irrigation 2750 hector. During 2000-01 the 1938 hector and

4615 hector area irrigated by surface water irrigation and well irrigation and total irrigated area was 9509 hectors. There is improvement in irrigation during those days total 6754 hector land brought under irrigation.

PATAN :

Pantan taluka is in extreme western side and Due to rugged topography and forest area very less land under irrigation even the this taluka has a boon of dam and Koyana river. The irrigation situation of Patan taluka during 1980-81 was area under surface water irrigation 3946 hector and just 594 hector by well irrigation the total area under irrigation was 5675 hectors. In last 20 years the area under surface water irrigation changing up to 3664 hectors. By well irrigation changed into 8073 hector. The total brought under irrigation 7050 hector by using various schemes of Government.

KARAD :

Only this talaka of Satara District is showing negative change in irrigation, because, farmers illiteracy in irrigation, over dosage of water, extensive use of fertilizer, urbanization, formation of saline and alkaline soil. Soil selling for brick making. Instead increase in area under irrigation there was decrease in area under irrigation that is from 2067 hector to 15493 i.e. – 5180 hector. (Table No.III.VI, Fig.No.3.5)

3.14 SCOPE FOR IRRIGATION DEVELOPMENT :

Irrigation is one of the significant input for development of the agriculture .The success of agriculture depends to large extent on how successfully water requirements of can we met (Arora 1976) Availability of water in the region present the scope for development of irrigation.

Presently many schemes on Krishna and Koyana and Urmodi are under construction which would create large potential and may head lead to an extension of commercial crop in future .The more and more lift irrigation schemes will be developed by improving rural electrification and financial assistance. The rain water can also be tapped in the east by constructing a chain of water percolating tanks .There is however, need to harness streams and other possible sites. In general lift irrigation in the west and central parts and well and tank irrigation in the east have better future in the entire region.

3.15 CROPPING PATTERN :

The climate and physiographical condition are quite suitable for cultivation of different crops In the Satara district cultivated crops can be classified into different categories like cereals, pulses oilseeds, cash crops and vegetables etc. An attempt has been made to investigate the production of major crops in the study area. In the recent years more than 60 percent area under various crops including fallow land .It indicates there is more scope for cultivation.

3.16 AREA UNDER DIFFERENT CROPS :

3.16.1 JOWAR :

Jowar is the major crop produced in both Kharip and Rabi season. In eastern zone of Satara district it is more i.e. in Phaltan taluka during 1980-81 total cultivation was 58856 hector. It is decreased up to 26691 hector in 2000-01. It is followed (28.50 percent) by Man and Khatav taluka, Patan and Wai taluka are leading in area under Jowar production i.e. 11434 hector. (33.36 percent) and 13619 hector (39.74 percent) in 1984-1985. There is somewhat increase in area under Jowar in Patan, Jawali i.e. 18333 hector (36.21 percent) 170501 hector (33.75percent) and in Mahabaleshwar 4591 hector (9.13 percent) it was just 285 hector during 1984.85. Central part of the district was dominant in Area under Jowar production like Karad, Koregaon, Satara and Khandala. The area under Jowar cultivation was 27331 hector (27.46 percent) 21216 hector (21.44 percent) respectively. There is decrease in area under Jowar crop.During 2000-01 Karad 17519 heact (26.46 percent) Satara 17062 hector (25.77 percent) Koregaon 16830 (28.14percent) and Khandala 12985 hector (19.61percent) during 2000-01 because most of the farmers started to cultivate wheat and other irrigated crops due to availability of irrigation facilities.

The positive change shows by Man and Khatav taluka i.e. 11.87 percent and 11.48 percent. Phaltan shows negative change i.e. -23.35percent due to source of irrigation facilities area under Jowar crops increased. Even amount of rain is less in eastern part of the district. Negative change found in Wai taluka i.e. -27.71percent, Jawali - 7.7 percent and Mahableshawr -8.3percent in western part of the district. Karad, Koregaon and Khandala taluka of central part shows negative changes because land under other crops increased only Satara taluka shows positive change in case of Jowar crop. (Table No. III-VII and Fig. No.3.6 A, B, C and D)

TABLE NO. III-VII
SATARA DISTRICT
AREA UNDER JOWAR
(Area in hector)

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
				Eastern Part				
1	Man	21049	18.54	26642	21.96	28478	30.41	11.87
2	Khatav	33588	29.59	47163	38.88	38454	41.07	11.48
3	Phaltan	58856	51.87	47478	39.16	26691	28.52	-23.08
	Total	**113496**	**100**	**121283**	**100**	**93623**	**100**	
				Western Part				
4	Patan	11434	33.36	11521	33.87	18333	36.21	2.85
5	Jawali	8929	26.05	8251	24.25	17050	33.75	7.7
6	M.Shwar	285	0.83	154	0.45	4591	9.01	8.3
7	Wai	13619	39.76	14088	41.43	10648	21.03	-18.71
	Total	**34267**	**100**	**34014**	**100**	**50622**	**100**	
				Central Part				
8	Karad	27331	27.46	24802	26.00	17519	26.46	-1
9	Satara	21263	21.36	24553	25.74	17062	25.77	4.41
10	Koregaon	29585	29.72	31691	33.23	18630	28.14	-1.58
11	Khandala	21345	21.48	14315	15.03	12985	19.62	-1.83
Total		**99524**	**100**	**95631**	**100**	**66196**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

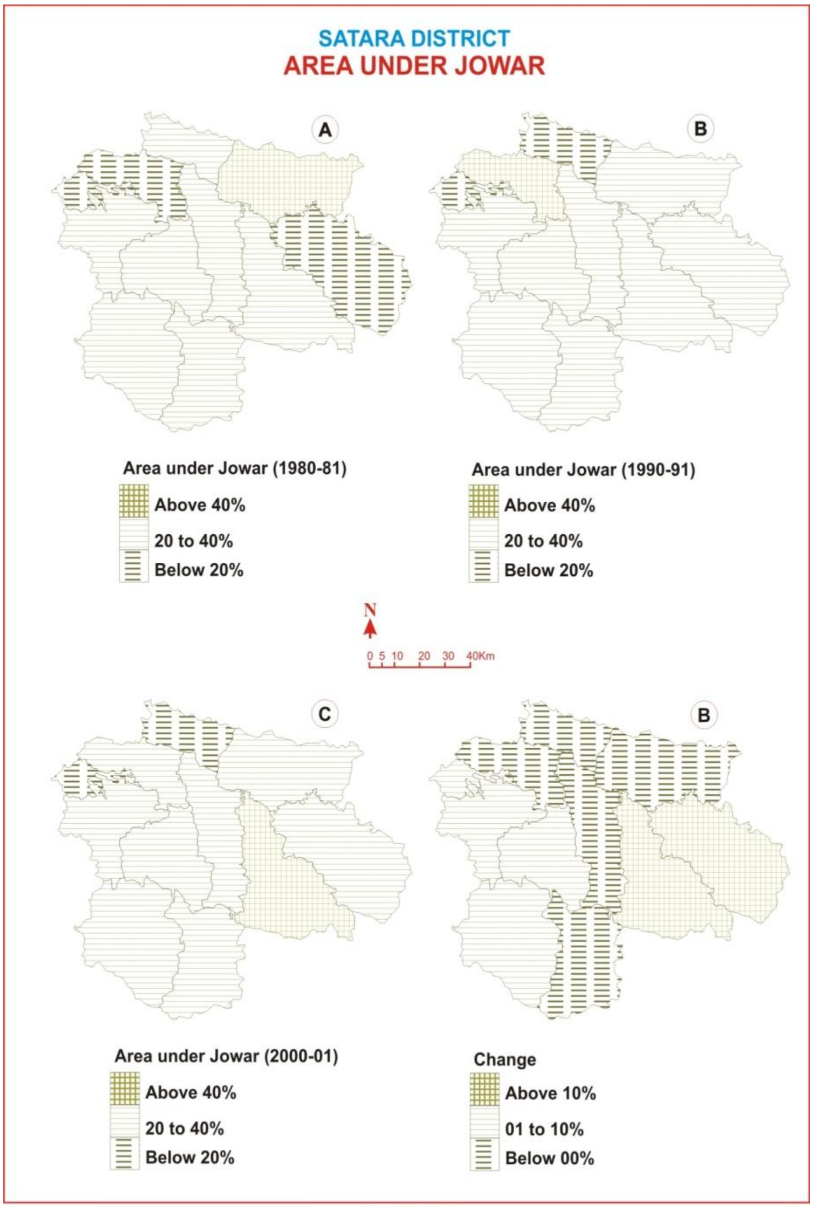


Fig. No. 3.6

3.16.2 WHEAT :

Wheat is the most significant crop grown during the winter season. It requires a cool climate with moderate rainfall less than

50cm and irrigation. As such in the study region the post monsoon rainfall is not sufficient for optimum production. Therefore it is the irrigation which determines it's a real extent wheat occupies maximum are in eastern part of the district i.e 9413 hector.

Other two part i.e. central and western occupies 7255 hector and 3944 hector respectively during 1980- 81.The area under wheat crop in eastern, western and central part of the district increased during 2000-01 from 9413 hector to 12026 hector,3944hector to 7988 hector and7255 hector to 10984 hector. Talukawise there was more land under wheat crop in Khatav, Phaltan, Patan and Karad and it is followed by Man, Satara, Koregaon. In the central part, Karad was leading taluka having more area under wheat crop i.e. 4748 hector (43.54percent), eastern part Khatav 5114 hector (34.37percent) and Paltan 4060 hector (27.28percent).

The little increase in area under wheat is recorded in Wai, Jawali and Mahabaleshwar taluka. The positive change in area under wheat is recorded in Man (10.57 percent) Khatav (15.94 percent) Patan (34.94 percent) Karad (9.35percent) Satara (2.79 percent) Koregaon (6.9 percent) Khandala (-0.31 percent).Negative change is observed in Phaltan (-26.87 percent) Wai (13.46 percent) taluka of the district. Compare to other cereal crops there is remarkable change in area under wheat crop.(Table No. III-VIII and Fig. No.3.7 A, B, C and D)

TABLE NO. III-VIII

SATARA DISTRICT

AREA UNDER WHEAT

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
Eastern Part								
1	Man	1205	12.8	1141	15.72	2852	23.71	10.97
2	Khatav	2502	26.58	2418	33.29	5114	42.52	15.94
3	Phaltan	5706	60.62	3703	50.99	4060	33.75	-26.87
	Total	**9413**	**100**	**7262**	**100**	**12026**	**100**	
Western Part								
4	Patan	939	23.27	859	21.84	4650	58.21	34.94
5	Jawali	1452	38.22	1214	31.55	467	5.84	-32.38
6	M.Shwar	194	4.8	117	2.97	205	2.56	-2.44
7	Wai	1359	33.71	1773	43.64	2666	33.39	-0.31
	Total	3944	100	3933	100	7988	100	
Central Part								
8	Karad	2481	34.19	884	22.92	4748	43.54	9.35
9	Satara	1776	24.47	1471	38.14	2364	21.68	-2.79
10	Koregaon	1427	19.66	769	19.96	2897	26.56	6.9
11	Khandala	1571	21.68	732	18.98	895	8.22	-13.46
	Total	**7255**	**100**	**3856**	**100**	**10904**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

3.16.3 RICE :

Among the cereals rice crop is more important requiring high temperature and rainfall. Western and central part of the district occupies more land under rice cultivation. There is variation in rice cultivation in different taluka Patan 12453 hector.Jawali 5645hector, Karad 6850 hector and Satara 5124 hector area under rice crop during 1980-81. The area under rice cultivation has increased in all talukas of the district region wise it is increasfrom1073 hector 11265 hector in eastern region. Little decrease from22044 to 19497 hector in western region there is little decrease in central part i.e. from 13571 to 13121 hector during 2000- 2001.

The significant increase in area under rice crop has been found in eastern part i.e. form 1073 hector to 12265 hector. There is decrease in central part i.e. from 13571 hector to 13121 hector and decrease also found in western part i.e. from 22044 hector to 19497 hector during the span of 20 years. Positive change observed in Man (5.76 percent), Wai (5.2 percent) and Phaltan (4.11percent), Karad (3.67 percent), Koregaon (7.33 percent), Khandala (1.75 percent), Jawali (1.77 percent).and the negative changes are found in Khatav 13.58), Patan (-7.02) and Satara (-12.19).Introduction of high yielding varieties irrigation facilities and attentive provides seem to have encouraged rice cultivation.

Attraction to the farmers and it has made rapid strides particularly in the irrigated tracts of the Krishna valley in recent year. Its uneven Spatial distribution in Karad taluka is concerned with spatial distribution the soil fertility and irrigation facilities sugarcane cultivation is largely confined to the central and western part of study area. (Table No. III-IX and Fig. No.3.7 A, B, C and D)

TABLE NO. III-IX

SATARA DISTRICT AREA UNDER RICE

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
				Eastern Part				
1	Man	238	22.18	64	12.52	3148	27.94	5.76
2	Khatav	592	55.17	386	75.53	5102	45.29	-9.88
3	Phaltan	243	22.65	61	11.95	3015	26.76	4.11
	Total	**1073**	**100**	**511**	**100**	**11265**	**100**	
				Western Part				
4	Patan	12452	56.48	10805	56.50	9644	49.46	-7.02
5	Jawali	5645	25.6	4277	22.36	5337	27.37	1.77
6	M.Shwar	707	3.2	783	4.09	795	4.07	0.87
7	Wai	3240	14.8	3256	17.02	3721	19.08	5.2
	Total	**22044**	**100**	**19121**		**19497**		
				Central Part				
8	Karad	6850	50.47	4962	46.73	7111	54.14	3.67
9	Satara	5124	37.75	4596	43.28	3354	25.56	-12.19
10	Koregaon	967	7.12	433	4.07	1854	14.45	7.33
11	Khandala	630	4.66	626	5.92	760	5.85	1.19
	Total	**13571**	**100**	**10617**	**100**	**13121**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

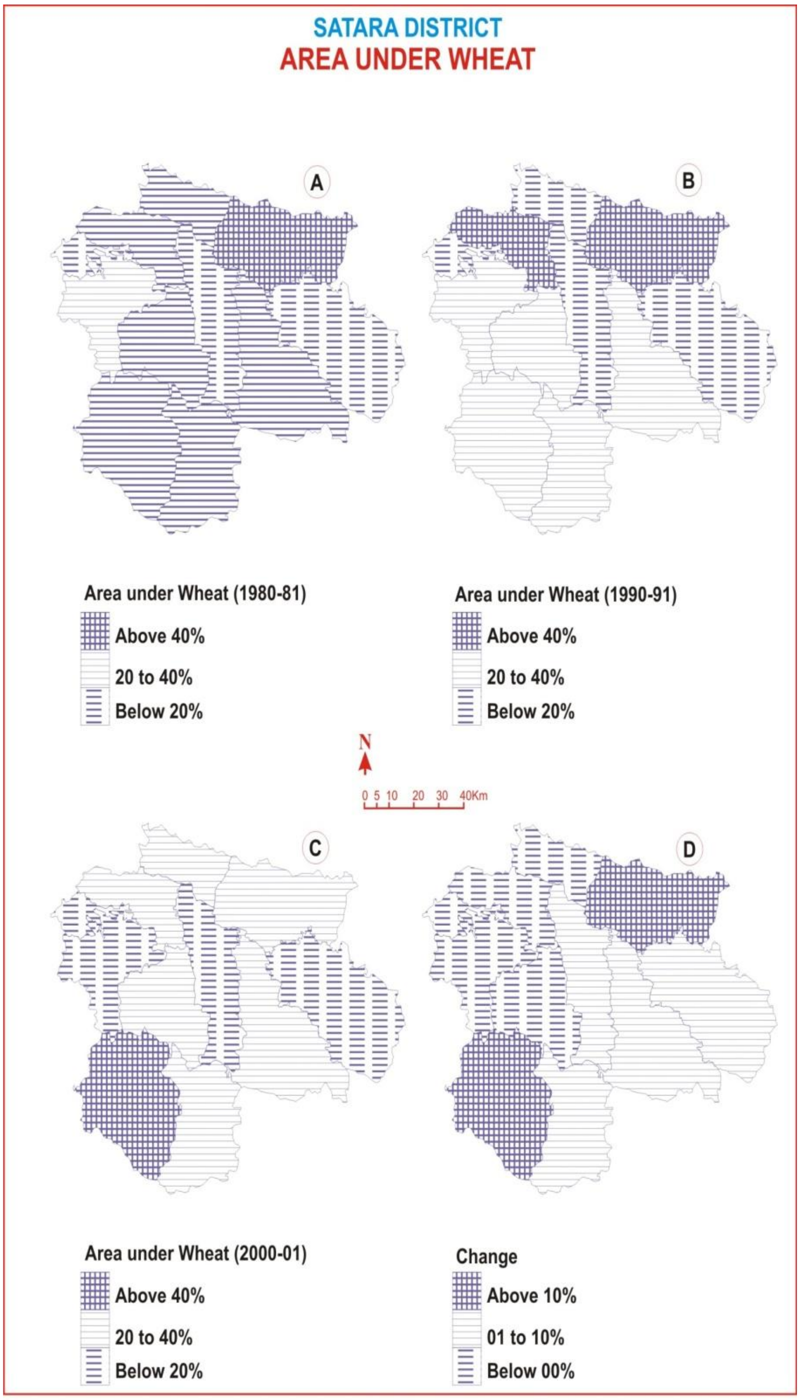

SATARA DISTRICT
AREA UNDER WHEAT
A
B
Area under Wheat (1980-81)
Above 40%
20 to 40%
Below 20%
Area under Wheat (1990-91)
Above 40%
20 to 40%
Below 20%
N
0 5 10 20 30 40Km
C
D
Area under Wheat (2000-01)
Above 40%
20 to 40%
Below 20%
Change
Above 10%
01 to 10%
Below 00%

Fig. No. 3.7

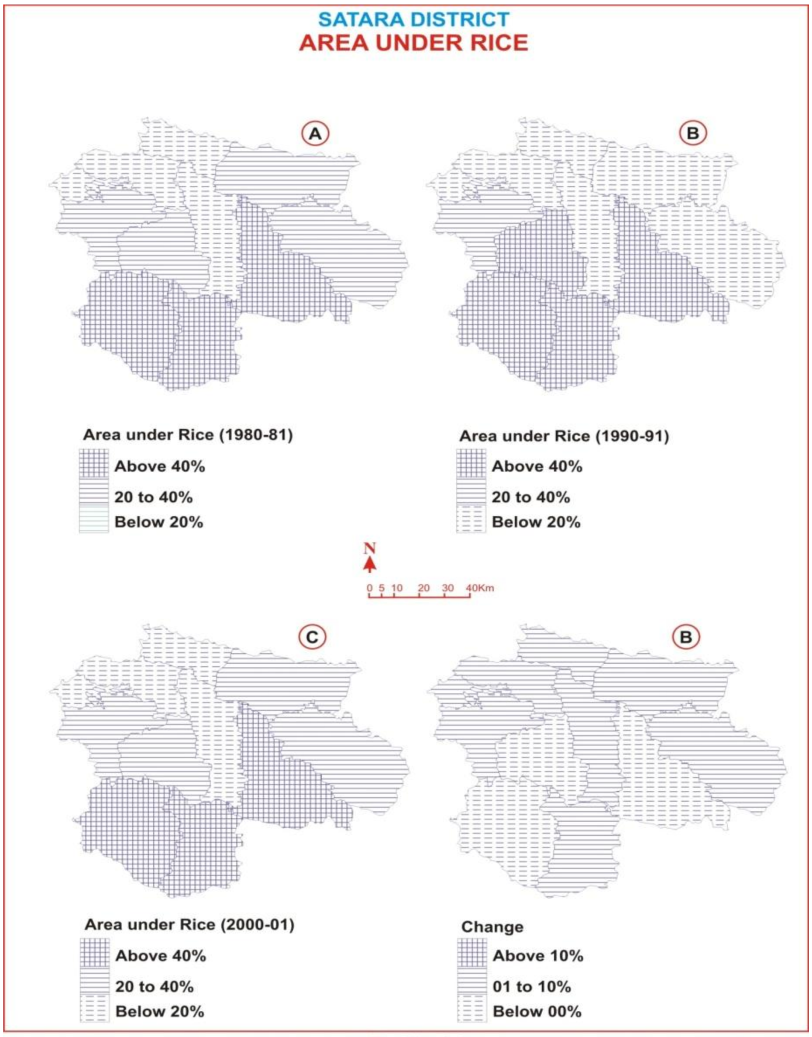


Fig. No. 3.8

3.16.4 SUGARCANE

The part of Krishna basin is very famous for the production of sugarcane. Sugarcane comprises about 8717 hector in eastern part, 3612 hector in western zone and 16264 hector in the central part of Satara district during 1980-81. It is increased by7086 hector, 14479 hector and25450 hector in eastern, western and central part of the study area. Negative change observed in Khandala (-0.71), Phaltan (-24.39), Karad (-23.15), Patan (-0.95) and Wai taluka (-3.57).Positive change found above 4percent found in Khatav (3.82 percent), Satara (5.52 percent) and Koregaon (18.33percent) taluka due to availability of irrigation facilities and special efforts of Government to bring more land under irrigation through various irrigation schemes. The significant positive change observed in Man, Khatav, Jawali, Satara and Koregaon taluka.

The confluence of Krishna and Venna at Sangam Mahuli (near Satara city), Krishan and Koyana at Karad made it possible to increase in land under irrigation with irrigation facilities and special efforts made by co-operative sugar factories. Increase in sugarcane production is proportionate to increase in irrigated area.

The negative change below 0 percent area under cane is noted in Karad, Wai, and Phaltan taluka. It may be due to change in farmers' attitude. They are performing other cash crops like fruit garden, other crops and somewhere land become saline and alkaline due to over irrigation and some people selling upper layer of soil for brick making, the land under sugarcane decreases due to social encroachment. Karad (14127) hector. Koregan (6610 hector) Patan (8081 hector) Wai (5443 hector) Phaltan (4025 hector) area under this crop during 2000-01. This is the area where irrigation facilities are comparatively more developed.

The moderate area under this crop observed in Man, Khatav, Satara taluka and low area under sugarcane crop observed in Jawali and Khandala taluka due to rugged topography and mountainous region with low rainfall and less irrigation facilities. There is no any single piece of land under sugarcane cultivation in Mahabaleshwar taluka because unfavorable condition. The fertile soil, better irrigation facilities and other agro climatic conditions are responsible for concentration of cane cultivation in Krishna river basin in Karad, Koregaon,Satara and Wai taluka.The period under investigation has witnessed phenomenal growth in area under cane. This rose from 28293 hector to 47015 hector in the span of 20 years. (Table No. III-X and Fig. No.3.8 A, B, C and D)

TABLE NO.III.X

SATARA DISTRICT

AREA UNDER SUGARCANE

(Area in Hectors)

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
				Eastern Part				
1	Man	714	8.19	505	5.75	1259	17076	9.57
2	Khatav	925	10.61	1008	11.49	1802	25.43	13.82
3	Phaltan	7078	81.20	7255	82.75	4025	56.81	-24.39
	Total	**8717**	**100**	**8768**	**100**	**7086**	**100**	
				Western Part				
4	Patan	2050	56.75	2898	52.87	8081	55.81	-0.95
5	Jawali	75	2.07	880	16.05	955	6.59	4.52
6	M.Shwar	-	-	-	-	-	-	-
7	Wai	1487	41.18	1703	31.08	5443	37.60	-3.57
	Total	**3612**	**100**	**5481**	**100**	**14479**	**100**	
				Central Part				
8	Karad	12792	78.65	15885	65.89	14127	55.5	-23.17
9	Satara	1635	10.05	3480	14.53	3965	15.57	5.52
10	Koregaon	1244	7.64	3939	16.25	6610	25.97	18.33
11	Khandala	593	3.66	823	3.33	748	2.96	-0.71
	Total	**16264**	**100**	**24107**	**100**	**25450**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

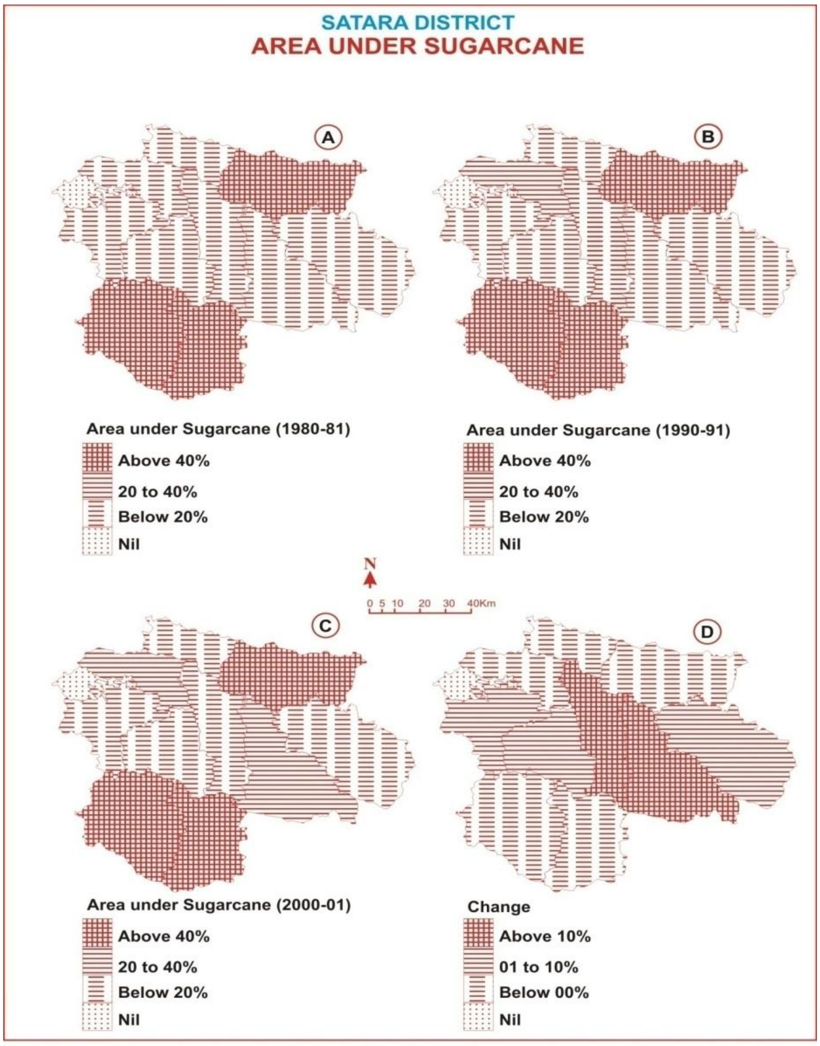


Fig. No. 3.9

3.16.5 GROUNDNUT :

Groundnut is a leguminous crop and can synthesize atmospheric nitrogen and thereby increase fertility, sandy loams, loams and well drained black soil which allow enough of root turning are suitable for groundnut cultivation. It cannot stand for severe drought and water stagnation groundnut is cultivated in Kharip and Rabi season it can grow both as an irrigated and rain fed corp.

The area under groundnut cultivation observed more above 40percent observed in Khatav, Patan, Karad taluka of the Satara district during 1980-81, and in 2000-2001 the maximum land that is above 40 percent found under groundnut cultivation in Khatav (94.64 percent) Satara (40.65 percent) moderate land under groundnut cultivation observed in Wai (22.07 percent) Karad (34.50 percent) and low area observed in Khandala (2.36 percent) Jawali (16.54 percent) Phaltan (2.56 percent) Man (2.78 percent) taluka to the total percentage of t their respective division or part. (Table No. III-XI and Fig. No.3.8 A, B, C and D)

TABLE NO. III-XI

SATARA DISTRICT

AREA UNDER GROUNDNUT

(Area in hectors)

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
				Eastern Part				
1	Man	350	18.29	464	23.54	399	2.78	-16.51
2	Khatav	958	50.07	1015	51.49	13536	94.64	44.57
3	Phaltan	605	31.64	492	24.97	367	2.58	-29.06
Total		**1913**	**100**	**1971**	**100**	**14302**	**100**	
				Western Part				
4	Patan	11031	62.89	11060	60.06	7965	44.27	-18.62
5	Jawali	2537	14.46	2846	15.46	4294	23.87	9.41
6	M.Shwar	3	0.09	-	-	-	-	-
7	Wai	3969	22.06	1508	24.47	5730	31.86	9.23
Total		**17540**	**100**	**18414**	**100**	**17989**	**100**	
				Central Part				
8	Karad	13469	40.45	16378	45.24	10682	34.5	-5.95
9	Satara	13302	39.95	13361	36.91	14146	46.65	6.7
10	Koregaon	5534	16.62	5508	15.21	5402	16.94	0.82
11	Khandala	990	2.98	949	2.64	731	2.36	-0.61
Total		**33295**	**100**	**36196**	**100**	**30961**	**100**	

Source-Socio Economic Abstracts 1982, 1992, 2002

3.16.6 GRAM :

Gram is one of the important pulses grown in Rabi season along with wheat or some time separately. In the eastern part of study area Khatav taluka recorded 311 hector (76.36 percent) land under gram production. In Wai taluka 1136 hector (60.04 percent) land under gram production. Mahabaleshwar recorded just 5 hector land under gram production in 1980-81.

Khatav, Phaltan and Man taluka recorded 4906 hector. (45.02 percent), 2900 hector. (28.45 percent) and 2687 hector. (26.36 percent) land under gram production respectively. There was tremendous increase in land under gram in the western part of study area. Patan 4850 hector. (45 percent), Jawali 2784 hector. (25.83 percent) and Wai 3120 hector. (28.95 percent) land under gram. Mahabaleshwar recorded 22 hector (0.2percent) lands under gram in 2000-01.

Positive changes noted in the taluka like Man, Khatav, Phaltan, Patan and Khandala taluka of study area. Negative changes found in Mahabaleshwar (-0.08 percent), Wai (-31.05 percent), Karad (-7.02 percent) and Koregaon (-7.31 percent) because the attention of the farmer diverted to cultivate other cash crops due to availability of irrigation sources.(Table No. III-XII and Fig. No.3.9 A, B, C and D).

TABLE NO. III-XII

SATARA DISTRICT

AREA UNDER GRAM

(Area in hectors)

Sr. No.	Taluka	1980-81	%	1990-91	%	2000-01	%	Change
Eastern Part								
1	Man	491	12.05	658	12.30	2687	26.36	14.31
2	Khatav	3111	76.36	2072	71.20	4906	45.2	-28.23
3	Phaltan	472	11.59	480	16.50	2900	28.45	16.87
Total		**4074**	**100**	**2910**	**100**	**10493**	**100**	
Western Part								
4	Patan	268	14.16	309	14.71	4850	45	30.84
5	Jawali	483	25.52	439	20.90	2784	25.83	0.31
6	M.Shwar	5	0.26	1	0.05	22	0.2	-0.08
7	Wai	1136	60.06	1351	64.34	3120	28.97	-31.05
Total		**1892**	**100**	**2100**	**100**	**10776**	**100**	
Central Part								
8	Karad	1135	34.97	599	14.26	4590	27.95	-7.02
9	Satara	493	15.19	1205	28.69	4750	28.92	13.73
10	Koregaon	1526	47.02	1934	46.05	6521	39.41	-7.31
11	Khandala	91	2.82	562	11.00	560	3.72	0.9
Total		**3245**	**100**	**4200**	**100**	**16421**	**100**	

Source-Socio Economic Abstract 1982, 1992, 2002

Due to change in farmer's outlook, government policies, irrigation facilities introduction of agro service centres there is drastic change in the production of all types of crops. In the duration of 20 years it is observed that farmers started to cultivate cash crops.

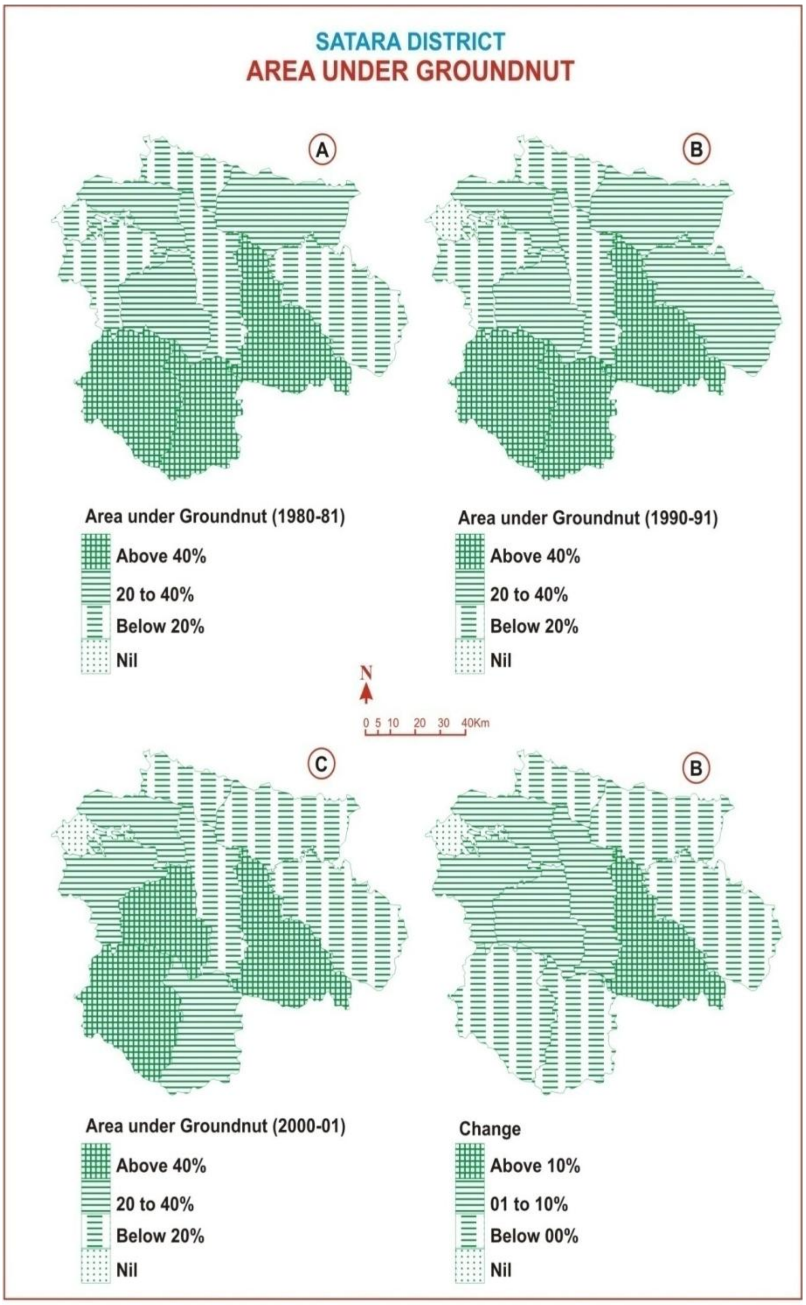

SATARA DISTRICT
AREA UNDER GROUNDNUT
A
B
Area under Groundnut (1980-81)
Above 40%
20 to 40%
Below 20%
Nil
Area under Groundnut (1990-91)
Above 40%
20 to 40%
Below 20%
Nil
N
0 5 10 20 30 40Km
C
B
Area under Groundnut (2000-01)
Above 40%
20 to 40%
Below 20%
Nil
Change
Above 10%
01 to 10%
Below 00%
Nil

Fig. No. 3.10

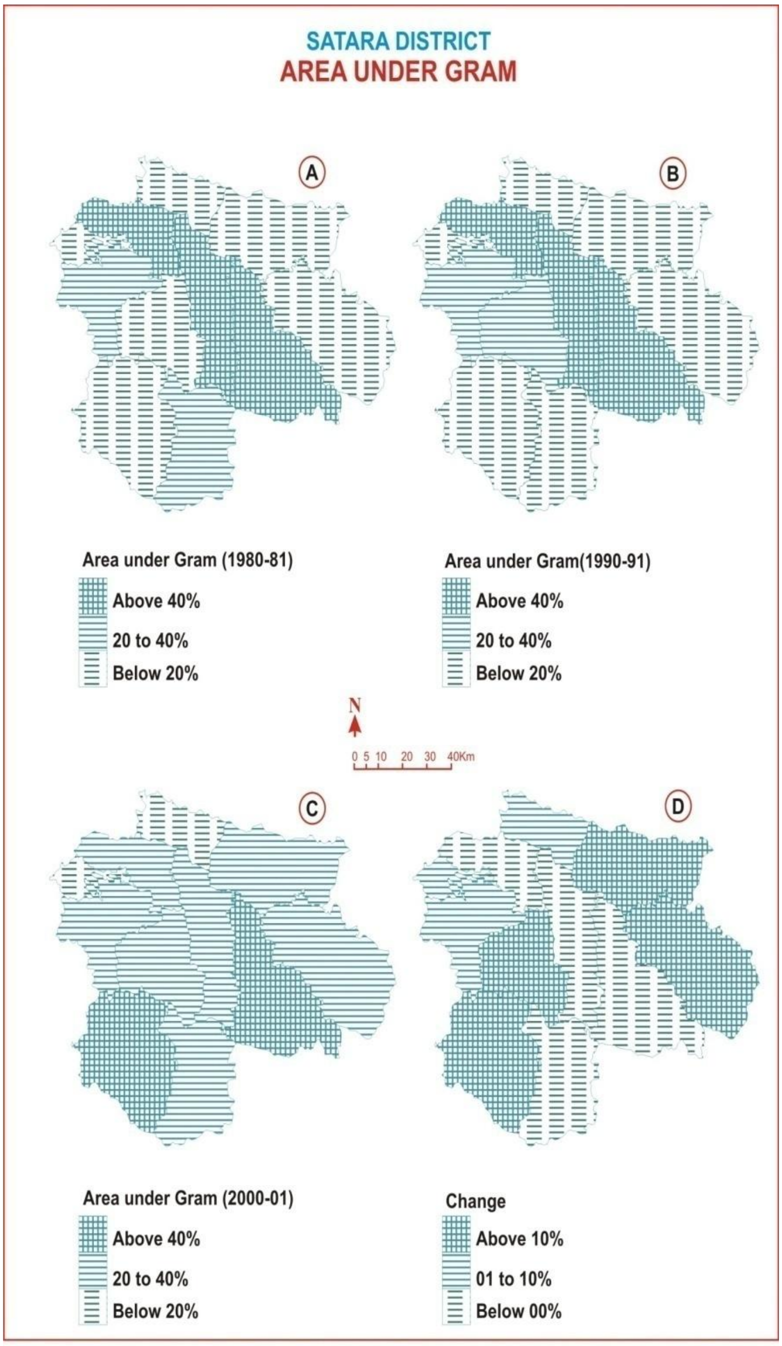

SATARA DISTRICT
AREA UNDER GRAM
A
B
Area under Gram (1980-81)
Above 40%
20 to 40%
Below 20%
Area under Gram(1990-91)
Above 40%
20 to 40%
Below 20%
N
0 5 10 20 30 40Km
C
D
Area under Gram (2000-01)
Above 40%
20 to 40%
Below 20%
Change
Above 10%
01 to 10%
Below 00%

Fig. No. 3.11

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CHAPTER

4

AGRICULTURAL PRODUCTIVITY

4.1 INTRODUCTION :

The previous chapter is devoted to the study of land use, irrigation and cropping pattern cropping pattern and changes there in. The present chapter aims to analyze, how far irrigation has changed the agricultural productivity. The term agricultural productivity is both a dynamic relative concept it is used to express the efficiency of agriculture .Agricultural productivity is the level of existing performance of a unit of land which differentiates from one area to another agricultural productive of an area is influenced number of physical social, institutional and organizational factors, beside these their productivity also depends on availability of labour supply of capital and encouragement by the government. Thus it is the result of combined interplay of physical and human factor.

4.2 INPUTS USED :

Generally the inputs means the factors on which the development of agriculture is depend. Mechanical biological and chemical inputs are playing important role in transformation of agricultural crop yield in the study region. It is noted in field observation that the adoption of form technology is increasing found in the irrigated areas. The improved iron plough, tractors, electric pumps, seedlings spray pumps, duster, sugarcane crusher are the modern machinery. Wooden plough is traditional implement largely used in un irrigated hilly parts of the Satara District. Iron plough is used for deep ploughing as compare to wooden plough. The formers are showing progressive trend in the use mechanical inputs. The mechanization is not possible in western and eastern hills areas. However the farmers in the level land of irrigated areas responding positively for the modernization of agriculture. The level of land is always suitable for mechanized farming provided other conditions are favorable sign. The adoption of chemical inputs such as HYV seeds has increases as they, respond more rapidly of the fertilizers and water input. There are significant centers in Karad taluka and many more centers in Satara district. Moreover, Satara Zilla Parishad, every Panchayat Samitees of 11 taluka Kharedi-Vikri society of every taluka and private traders related to agricultural inputs provides.

a) High yielding verities of seeds.

b) Fertilizers

c) Crop protection materials

1. Fungicide 2. Weedicide

3. Insecticide 4. Pesticide

5. Germicide

d) Organic manures etc.

Primary agriculture credit society, District central cooperative bank, Land development bank, Money lenders ,Credit Societies etc. all these are institutional Non institutional sources of finance provide loan and financial assistance to the farmer to purchase bio-chemical inputs. The green manure is also used to maintain the fertility of the soil. Moreover for the protection of sensitive crop all the types of chemicals in both forms i.e. powder and liquid are used (pesticide) to increase the productivity of land.

TABLE NO. IV-I

SATARA DISTRICT
AGRICULTURAL INPUTS

Sr. No.	Agricultural Inputs	1980-1981	1990-1991	2000-2001
1	Total number of Plough	77483	88292	55502
	a) Wooden	41666	46302	27077
	b) Steel	35817	41990	28425
2	Total number of bullock carts	39265	33012	28056
3	Sugar crusher	457	615	641
	a) Power driven	123	560	471
	b) Bullock driven	34	55	170
4	Number of Pumps for irrigation	26793	34694	39246
	a) Oil operated	9204	21498	30292
	b) Electric	17589	13196	8954
5	Number of tractors	960	2445	6542

Source - Socio Economic Abstracts 1982, 1992, 2002

4.3 METHODOLOGY :

Experts in Agricultural Geography have developed many techniques suitable for the measurement of agricultural productivity. The assessment of agricultural productivity in terms of grain equivalent per head of population was first employed by Back (1937) in his study of land utilization.

The need to determine the spatial variations in agricultural productivity statistically was realized by Kendall (1939) who devised for it a method called ranking coefficient.

L.D. Stamp (1943) determined agricultural productivity by Kendall's method by selecting number of countries and some major crops. However the method was found to be inaccurate as it did not take note of the real strength of the individual crops.

Sapre and Deshpande (1964) tried to eliminate this defect by weighting the ranks of the individual crop by their proportion in the total cropped area in the region. The areal units were graded in ranking order according to their output per unit area and ranking coefficients were derived.

Sigh, Jasbir (1972) has attempted to measure the agricultural efficiency of Haryana in terms of nutrition per unit area. Singh Jasbir et. al. (1982) recently applied a technique known as the crop yield and concentration indices ranking coefficient.

Bhatia (1967) used the index suggested by Sapre and Deshpande with slight modification. He used Yield Index of crops, instead of yield ranking of individual crops.

P. Sen Gupta (1968) also used the same index as prepared by Bhatia for stubbing agricultural efficiency in India.

Sinha (1972) has developed the standard deviation and standard core method to determine the agricultural productivity in India at the district level.

Shinde, Jadhav and Pawar (1978) measured agricultural productivity of Maharashtra plateau by money value co-efficient method .In the present study first individual crop productivity is assessed to show the variations in agricultural productivity by location quotient. Talukas are chosen as the basic areal unit and the span study period covers 20 years from 1980-81 to 2000-01.

4.4 BHATIA'S METHOD :

The crop productivity is determined by Bhatia's Yield Index method, he suggest that contribution of each for crop agricultural efficiency is in relation to its proportionate share to crop land. Bhatia's formula of agricultural efficiency is as fallows

$$Iya = \frac{Yc}{Yr} \times 100$$

Where,

Iya = yield Index of crop 'a'

Yc = is the hectare yield of crop 'a'in the component areal unit

Yr = is the hectare yield of crop 'a'in the entire region.

$$\text{Agricultural Efficiency Index (Ei)} = \frac{Iya \times ca + Iyb \times cb + ... + Iyn + cn}{Ca + Cb + Cc + ... + Cn.}$$

Where,

Ei is the agricultural efficiency index Ca, Cb ….. Cn are the percentage of crop land under different crops. With this technique the value are computed and depicted.

4.5 CROP PRODUCTIVITY AND CHANGES :

In the study of agricultural productivity it is of interest to know the general areas where different crops dominate and their contribution in agricultural productivity for this purpose viz. Jowar, Wheat, Rice, Groundnut, Sugarcane, Gram, have been considered. These crops are grown in various part of the district different combination and they contribute significantly total agricultural productivity.

4.5.1 JOWAR :

The distribution of the Jowar productivity is plotted in fig.No.4.1 A, B, C. The high productivity (above 200 percent index) was three in the talukas of (Karad 323.13 percent index), Jowali (255.64 percent index), Wai (223.58 percent index) and Patan (293.07 percent index) and moderate (100-200 percent index) Jowar productivity is recorded in Koregaon (188.52 percent index) Khatav (192.52 percent index) and Satara (145.71 percent index) and low (below 100 percent index) concentration of Jowar productivity and observed in Khandala, Phaltan, Man taluka during 1980-81 because this talukas of study area even today are under drought prone condition(Fig.No.4.1A).

In 1990-91 the productivity of the Jowar was declined but there was remarkable change in Jowar productivity in Mahabaleshwar taluka i.e. (101.03 percent index) which was just 4 percent during 1980-81.High productivity observed only in Khandala i.e. 295.50 percent index and in remaining talukas moderate productivity of Jowar was there e.g. Wai, Satara, Karad Patan and

Jawali. No productivity of Jowar in Phaltan taluka and lowest productivity recorded in Man taluka i.e. 22.04 percent index (fig. No.4.1B)

There was tremendous progress in the Jowar productivity of the Satara district during 2000-01. Six talukas of the district recorded more than i.e. high productivity index. Such as Karad (499.59), Koregaon (390.33 percent index), Khatav (335.30 percent index), Satara (326.84 percent index), Jawali 370.81percent index. talukas broken all the previous record of productivity of Jowar i.e. 520percent index. Only Man taluka was shown lowest (89.79 percent index) Jawar productivity due to some natural unfavorable condition during 2000-01. (Fig No. 4.1C)

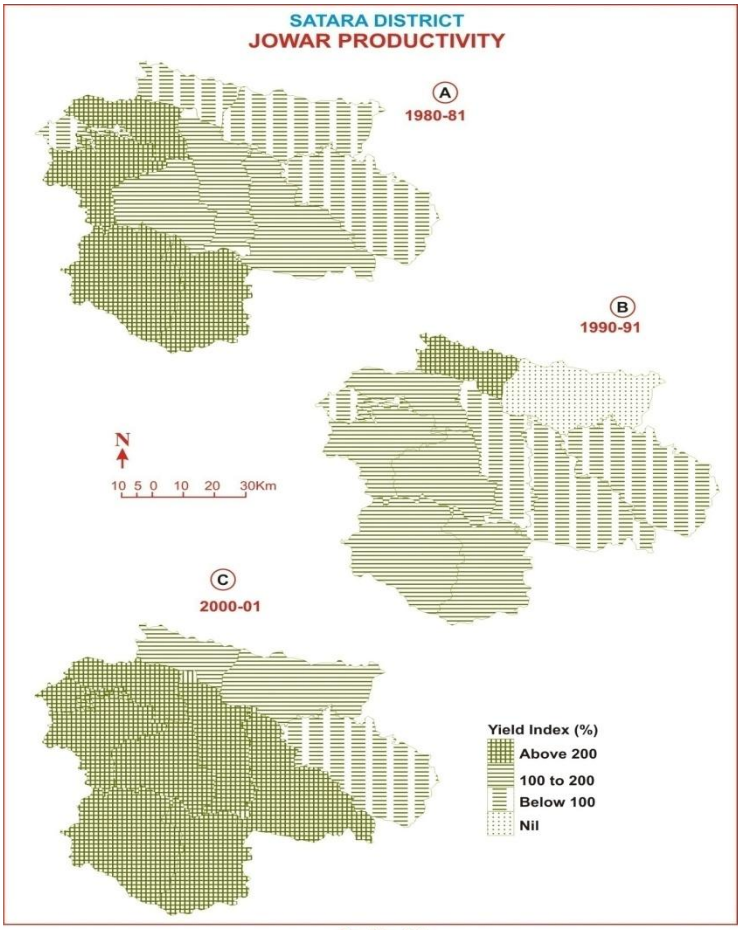


Fig. No. 4.1

4.5.2 WHEAT :

Fig.No.4.2 A, B and C reveals the spatial pattern of productivity of wheat. The high productivity of wheat was not confined in any single taluka of the district during 1980-81. Moderate wheat productivity recorded in the taluka Koregaon (163.57 percent index) Satara (108.39 percent index) Phaltan (155.42), Patan (108.23 percent index) and Karad (101.50 percent index) 50 percent area of study region covered by Wheat productivity lowest productivity recorded in Mahabaleshwar (8.07 percent index)

In 1990-91 also Wheat productivity under above 200 percent index not confined anywhere in the study area. Moderated productivity of Wheat recorded in the taluka like (Phaltan (109.07 percent index) and Karad (123.85percent index) in the rest part of the district under the category of lowest (below 100 percent index) productivity was found in Wai, Man, Khatav,Koregaon, Satara Jawali and Patan taluka of the district lowest productivity of wheat is recorded in Jawali taluka (58.42 percent index)

There was no high production wheat in the decade of 2000-01 also. Only Karad and Phaltan talukas were in the moderated category. All other taluka were under the lowest category of the Wheat productivity such as Mahabaleshwar (67.90 percent index), Wai (99.43percent index),Khandala (77.89), Man (94.72 percent index) Khatav (85.18 percent index), Koregaon (91.41percent index), Jawali (68.68 percent index) due to lack of irrigation facilities productivity of Wheat was low in the study area

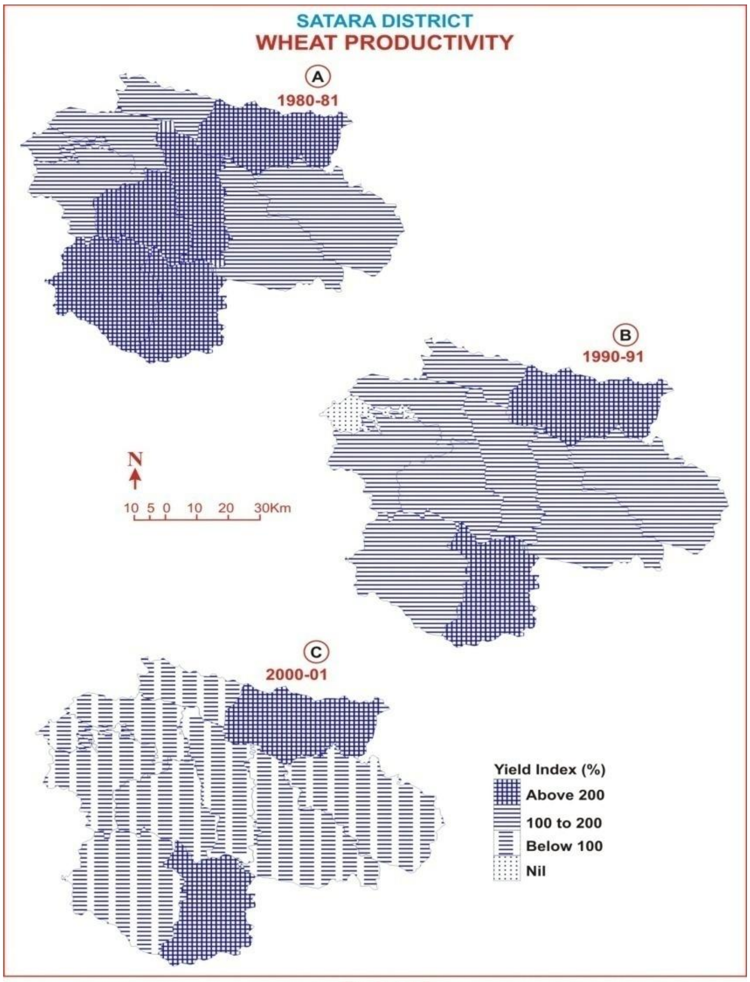


Fig. No. 4.2

4.5.3 RICE :

The spatial pattern of rice production is depicted in the fig No. 4.3 A, B, C. The productivity rice was not found the taluka like Khandala, Phaltan, Man Khatav and Koregaon taluka as these talukas were under the always drought situation and unfavorable condition only by Satara taluka moderated productivity (100-200 percent index) shown i.e. 156.50 percent index. Low productivity below 100 recorded in the taluka like Mahabaleshwar, Wai Jawalil, Patan and Karad. (Fig No. 3.3 A)

Rice productivity was not found in the taluka like Mahabaleshwar, Khandala Phaltan, Man,Khatav these area were under drought condition and moderated productivity (100 to 200 percent index) shown by Patan and Karad (107.60) as these taluka were there in western part of the district during 1990-91. Fig No. 3.3B

In the year 2000-01 the situation was changed and number of non rice productivity of taluka decreased up to 3percent index. Koregaon taluka recorded moderate productivity i.e. 119.19 percent index and remaining taluka shown lowest productivity (below 100 percent index) i.e. Mahabaleshwar (17.48 percent index), Wai (84.99 percent index) Khandala (54.82 percent index, Patan (75.34 percent index), Karad (97.29 percent index) because of lack of irrigation facilities.(Fig. No. 3.3 C)

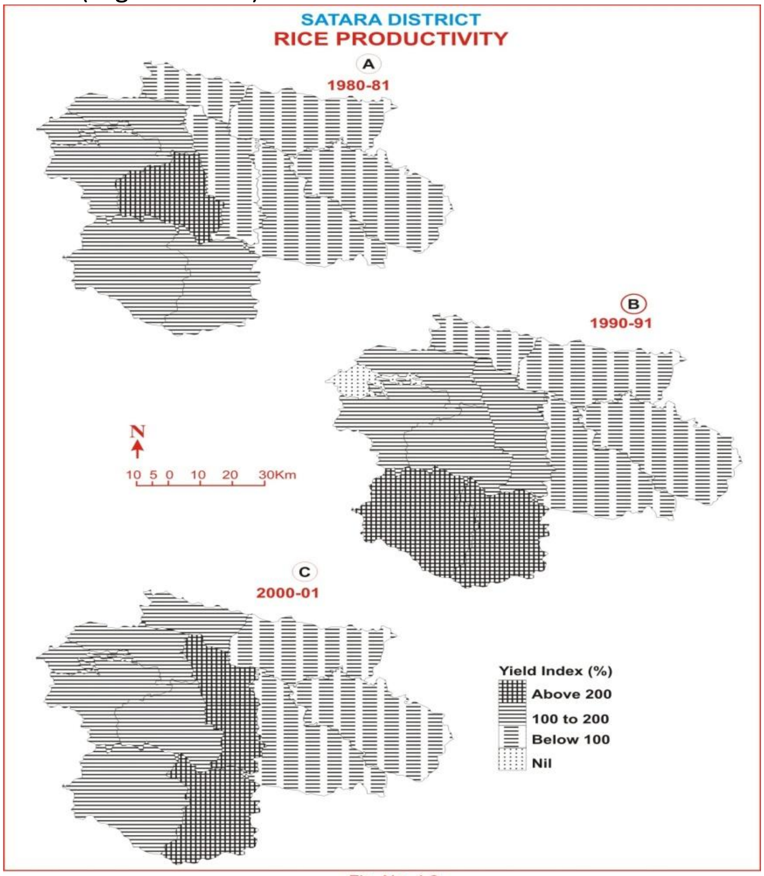


Fig. No. 4.3

4.5.4 SUGARCANE :

The soil, climate and irrigation facilities are the important factory which determines sugarcane productivity. The productivity of sugarcane is manifestation of integrated impact of factors like physical, social and institutional (Jadhav 1984) the distribution pattern of productivity of sugarcane plotted in Fig.No.4.4 A, B, C.

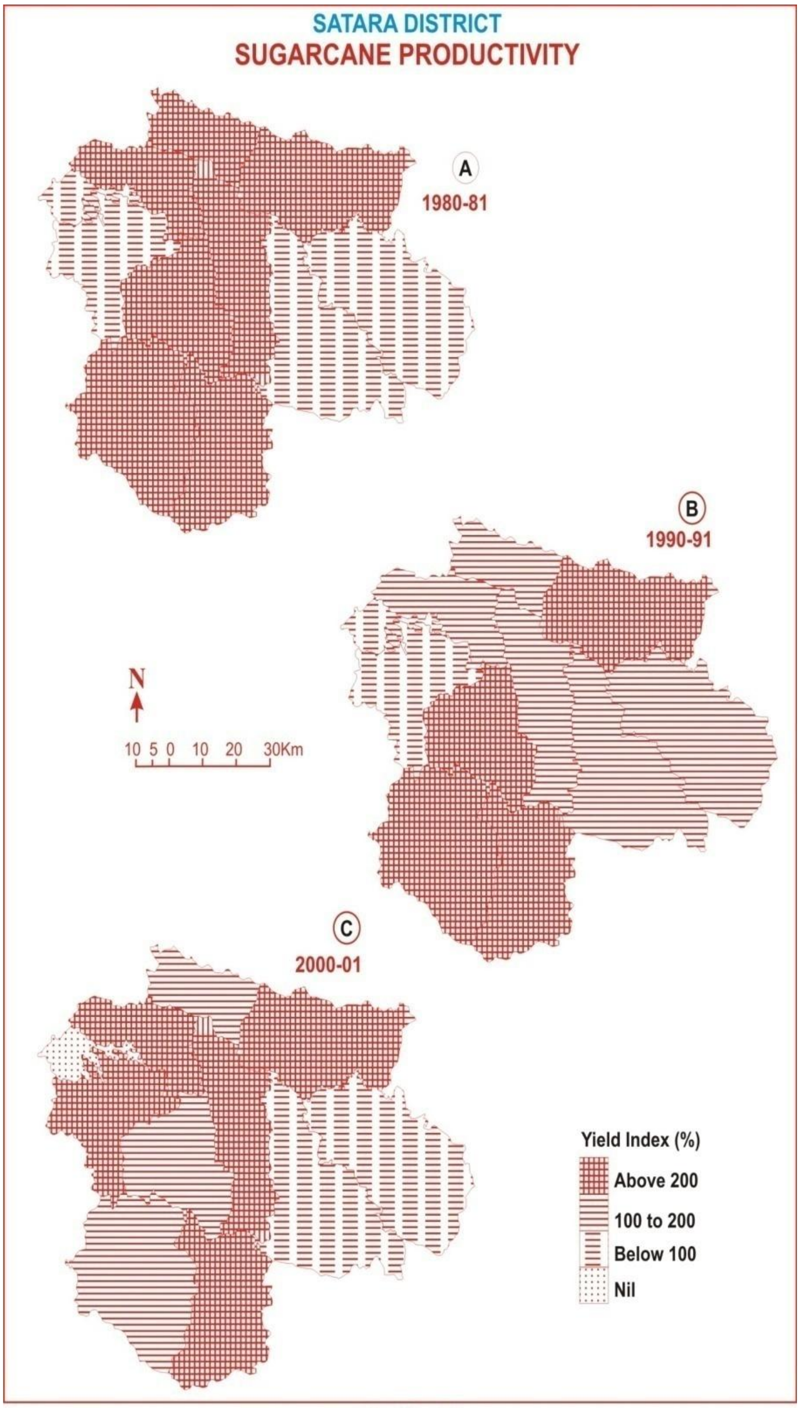
The high (above 200 percent index) productivity was not noted in any taluka of the district in 1980-81. Moderated productivity (below 100 percent index) recorded in the wai (86.20 percent index), Khandala (66.66 percent index) Phaltabn (79.31percent index), Koregaon (73.56 percent index) and Karad (74.71percent index)

Mahabaleshwar is in Hilly area and Man and Khatav are under drought condition, no chance of irrigation so any sugarcane productivity shown by them.

In the year 1990-91 also no any taluka under the category of high productivity index (above 200percent index) moderate productivity sugarcane is observed in Phaltan (125.28 percent index), Satara (121.8 percent index) and in Karad (101.14).In Mahabaleshwar and Jawali taluka there was no production of sugarcane due to unfavorable geographical condition. Low productivity recorded in Wai, Khandala, Man Khatav,Koregaon and Patan taluka due to absence of irrigation facilities as the sugarcane is irrigated crop requires more water. (Fig 4.4 B)

During the year 2000-01 five talukas of satara district gone under the moderate category of sugarcane productivity. But unfortunately there was no any taluka under the category of high productivity. There is 60 percent increase in the area under moderated productivity. There is no modification in high and low productivity of sugarcane.

There was no land under sugarcane during 2000-01 in Mahabaleshwar Man and Khatav due to rigid topography and absence of irrigation facilities. Fig 4.4.c)


SATARA DISTRICT
SUGARCANE PRODUCTIVITY
A
1980-81
B
1990-91
C
2000-01
N
10 5 0 10 20 30Km
Yield Index (%)
Above 200
100 to 200
Below 100
Nil
Fig. No. 4.4

4.5.5 GROUNDNUT :

The spatial pattern of Groundnut productivity is shown in the Fig 4.5 the nil productivity of groundnut noted in Mahabaleshwar, Phaltan, Man and Khatav. High productivity found in satara (307.6) Phaltan, (257 percent index) Wai (256 percent index) Koregaon (224 percent index) Jawali and Phaltan (234.6 percent index) Special feature of groundnut productivity shown by Karad taluka i.e. 600percent index of productivity in the year 1980-81.

During 1990-91 groundnut productivity was declined with special features means no any talukla were under the category of high productivity of ground nut, but by Khatav taluka included in groundnut production with 58.29 percent index of productivity. Only Koregaon taluka was under the low productivity i.e. 64.15 percent index remaining all taluka recorded moderate productivity of groundnut Wai (144.48 percent index) Khandala (156.50percent index), Satara (111.51percent index) Jawali (133.86) Patan (115.69 percent index) and Karad (124.32 percent index)

The groundnut production increased tremendously in the year 2000-01. As usual nil productivity recorded in Mahabaleshwar, Jawali and Patan taluka of the study region. There was no any taluka under moderated category. In Phaltan taluka recorded highest productivity i.e. 689.3 percent index. All remaining talukas included in the high productivity group (above 200 percent index) like Khatav (363.25 percent index, Khandala, (325.54 percent index), Koregaon (306.14 percent index), Karad (303.73 percent index), Satara (288.19 percent index), Wai (253 percent index).Due to high yielding varieties of seeds, irrigation facilities and change in attitude of the farmers.(Fig.No.5.4 A B and c)

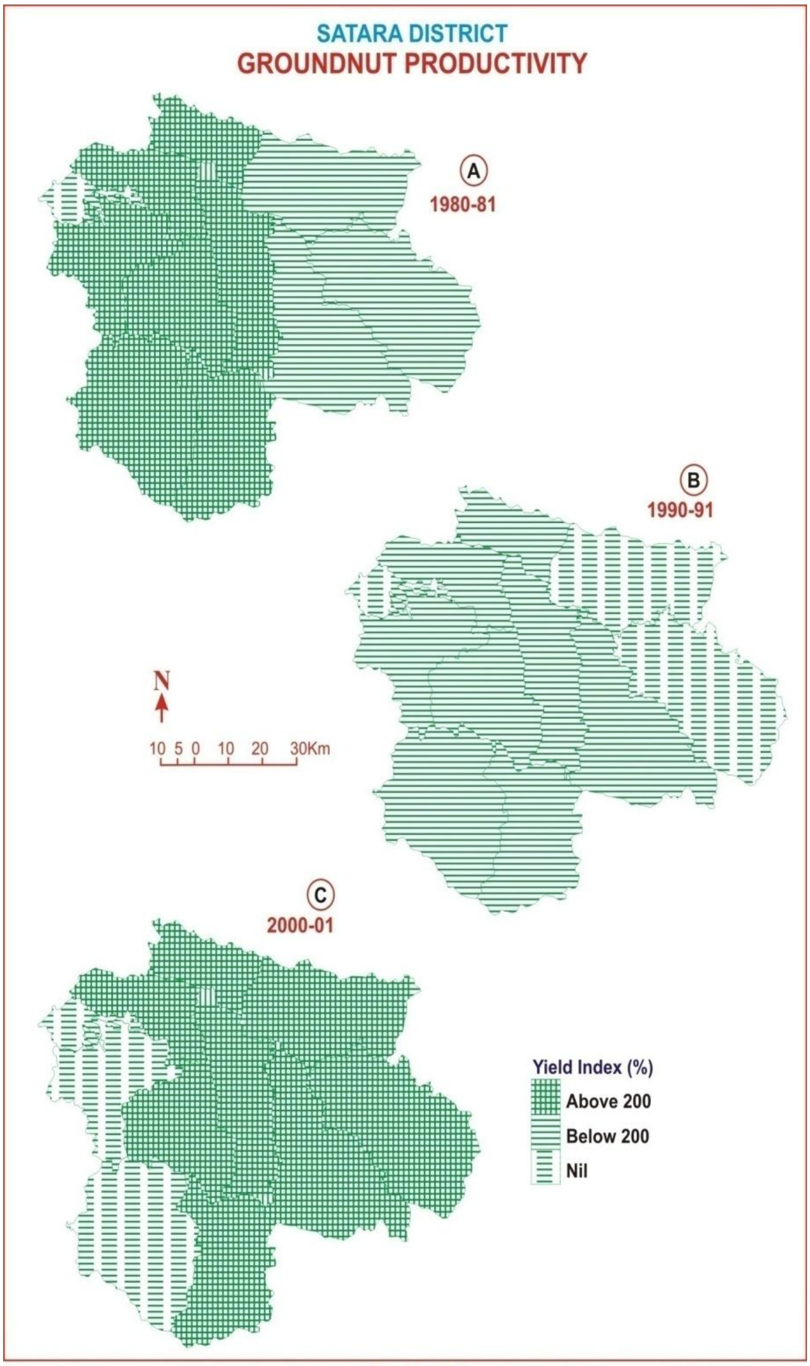

SATARA DISTRICT
GROUNDNUT PRODUCTIVITY
A
1980-81
B
1990-91
N
10 5 0 10 20 30Km
C
2000-01
Yield Index (%)
Above 200
Below 200
Nil

Fig. No. 4.5

4.5.6 GRAM :

The Fig No. 4.6 A.B, C reveals spatial pattern of gram in the study region. There was nil productivity of Gram in Mahabaleshwar taluka and other taluka under low below 100 productivity of gram, No high and moderate productivity of gram in the year 1980-81.

During the year 1990-91 the productivity of gram somewhat improved mean 3 talukas included in moderate (100 to 200) category of productivity i.e. Khandala (100.51 percent index) Phaltan (116.72 percent index), and Patan (110.75 percent index)

In Mahabaleshwar taluka there was no production of groundnut so nil productivity of groundnut low a groundnut productivity shown by Wai (89.24 percent index), Man (18.08 percent index), Khatav (74.23 percent index), Koregaon (76.10 percent index) Satara (97.44 percent index), Jawali (98.63 percent index) and Karad (67.57 percent index) compare last 20 years gram production increased so the productivity of gram is also increased during the year 2000-01.

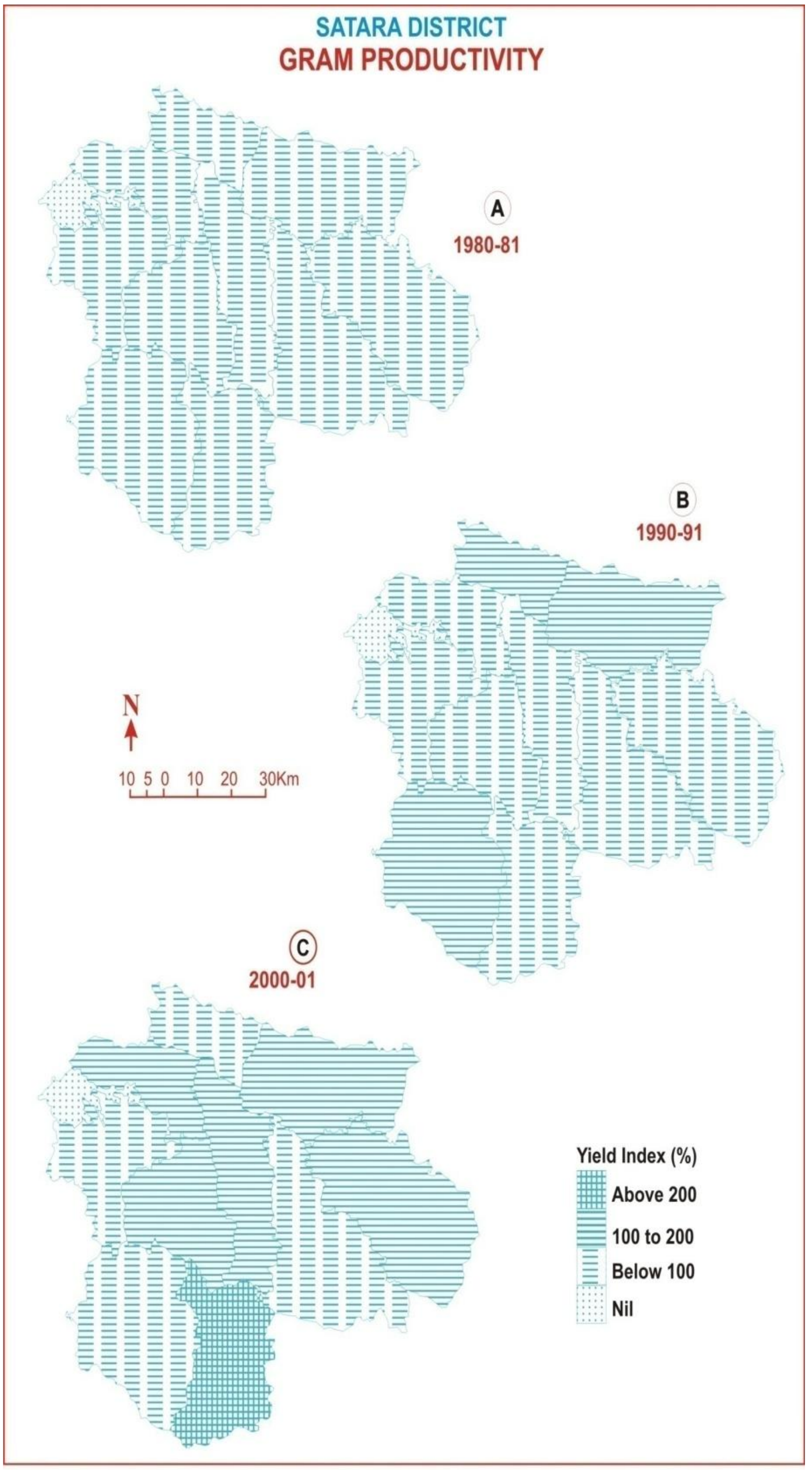

SATARA DISTRICT
GRAM PRODUCTIVITY
A
1980-81
B
1990-91
C
2000-01
N
10 5 0 10 20 30Km
Yield Index (%)
Above 200
100 to 200
Below 100
Nil

Fig. No. 4.6

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CHAPTER

5

FUNCTIONAL CLASSIFICATION OF AGRO SERVICE CENTRES

5.1. INTRODUCTION :

In Indian economy agriculture occupies strategic position. It is main source of livelihood for 70 percent Indian population. The prosperity of the India is largely depends on agriculture and development of agricultural depending on the growth and development of Agro Service Centres.

As per government decision 500 Agro Service Centres established in the economy of the country and this was right stop for the progress. The scheme indented to provide employment in the rural area as well as to accelerate the process of modernization in the villages. It is particularly aimed at providing help to the small farmers and the relatively backward areas. Agro Service Centres playing very significant role in and providing all the required facilities to the farmers. Within a short span Agro Service Centres become an important infrastructure in the process of development of agriculture and rural welfare.

Agro Service Centres are an innovative idea and interesting experiment which holds the great promises to increase agricultural production through more use of fertilizer and wise use of other agricultural inputs.

5.2 DISTRIBUTION OF AGRO SERVICE CENTRES :

In the study area Phaltan and Karad taluka are play a vital role. This region is under the influence of Krishna Koyana basin. Agricultural land used for the crops like Wheat, Rice, Sugarcane and other crops. Within the 2 to 4 sq.km area minimum one Agro Service Centre. Total numbers of Agro Service Centres in Karad taluka are 562 as per 2011 record.

In the eastern part of Satara distrit means in the Man, Khatav and Phaltan taluka 1080 Agro Service Centres Man (284) Khatav (309) and Phaltan (487) . In the western part Patan is leading taluka i.e. (218) Agro Service Centres. The more concentration of Agro Service Centres in central part of the study are i.e. Karad (502), Satara (375), Koregaon (310) and Khandala (192) Agro Service Centres. Total 3086 Agro Service Centres providing facilities to the farmers of district farmers are getting satisfied by purchasing all necessary inputs like fertilizer, weedicides, fungicides and insecticides along with guidance and consultancy service through agro care centres.

TABLE NO.V-I

SATARA DISTRICT

TALUKAWISE DISTRIBUTION OF AGRO SERVICE CENTRES

Sr.No.	Name of the Taluka	No. of ASCs
1	Man	284
2	Khatav	309
3	Phaltan	487
4	Patan	218
5	Jawali	109
6	M.Shwar	82
7	Wai	158
8	Karad	562
9	Satara	375
10	Koregaon	310
11	Khandala	192
Total		**3086**

Source-Agricultural Department, Satara Z.P. Satara

Very less number of Agro Service Centres in Mahabaleshwar taluka being its location in Sahyadry mountain range named as Shambu Mahadeo, due to rigid and rugged topography with dense forest. And very little land is available for cultivation so (below 100) i.e. 82 agro service centrs are there in Mahabaleshwar taluka.(Table No.V.I)

Now a day irrigation facilities are increased in the district that why number of Agro Service Centres increased to provide all required material for agricultural development.

Classification of Agro Service Centres.Agro Service Centres can be classified in to five service groups according to their functions in the study region. (Table No. V. II)

TABLE NO.V-II

SATARA DISTRICT

DISTRIBUTION OF FUNCTIONS AND SERVISES OF AGRO SERVICE CENTRES

Sr. No.	Category	Functions / Services
1	I	Fertilizers, Seeds and Insecticides Facilities
2	II	Agriculture credit Societies,SDCCBank,LDBank
3	III	Veterinary Institutions
4	IV	Markets
5	V	Agricultural Implements

5.2.1 DISTRIBUTION OF PRIMARY AGRICULTURE CREDIT SOCIETY :

A cooperative credit society is commonly known as primary agricultural credit society (PACS) which is very useful for the farmers. PACs plays very important role in the development of agriculture in India. It provides short medium and long term. Loans to the farmers who are members (especially farmer) of primary credit societies. The major functions of primary agricultural credit societies are to supply and distribution of high yielding varieties of seeds and seed drills, it also making available short and medium term loans to the farmers and supplying irrigation facilities, fertilizers insecticides, spray pumps and other agricultural inputs to the farmer and also helps to the farmers in the marketing and other services It is best medium to best the agricultural production within short period.

Generally there are PACs in every village of the district. In the district 950 primary agricultural credit societies are there. Distributions of PAC s uneven in the district .More PAC's are there in Karad taluka i.e. 140.PAC's are spread over the district. There are axo,I, concentration of ASC's are (above 100 Pacs) in the taluka like Karad (140),Phaltan (128), Satara (125) and Patan and

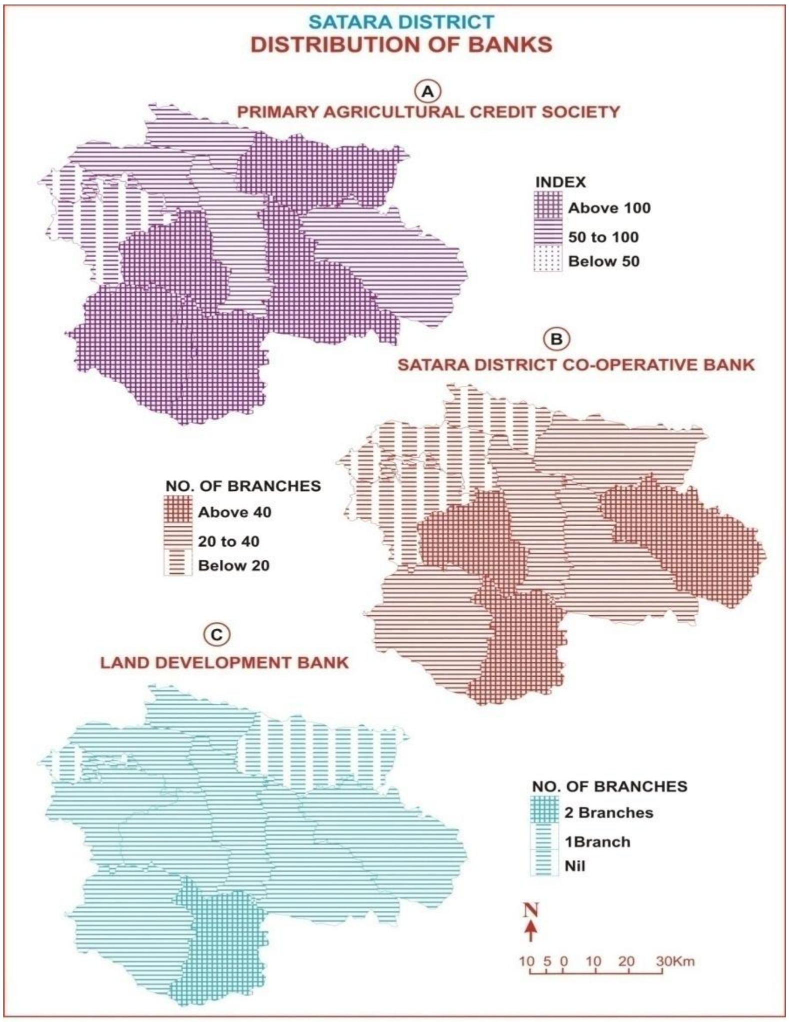

Fig. No. 5.1

Karad (103). Medium concentration of PAC, s (50 to 100 PAC, s) in taluka like Koregaon (90), Man (72), Wai (59) and Khandala (51) taluka and low concentration PAC's in Jawali (49), Mahabaleshwar (10) taluka respectively.

5.2.2 DISTRIBUTION OF BANKS :

The credit, finance or capital supply is one of the most important economic determinants of life blood for the progress of agriculture. Substantial amount of capital is required in several studies highlighted the fact at adequate and timely credit at lower interest is available to famer so that farmer can develop their farms early as possible. The availability of adequate and timely credit facilities promotes dynamic development in agriculture. The financial support required for agriculture to purchase new a land means extension of land, to buy fertilizer, hybrid seeds insecticides, for the labour etc. The credit is of three types' short term, medium term and long term, credit. Short term credit required for carrying out different agricultural operations, to purchase fertilizer, manures seeds etc. Medium term credit serves the purpose of buying cattle's, farm implements and long term credits is required for agricultural machinery like, tractors, threshers, sugarcane cutters etc. It is also helpful for digging well leveling the land to make the farm ponds and for buying additional land material. Credit can make available by different Banks and credit societies. (Fig 5.1) like District Central Co Operative Bank, Land Development Bank, Nationalized, Commercial, Urban banks and Primary Agricultural Credit Societies.

In Satara district the network of Satara District Central Co-operative bank spread all over the district in the form of total 276 branches with some extension centres.The banks provides all requirements and facilities to the farmers. It provides short and medium terms credit or loan to the farmers for the development of agriculture. The main office of Satara district central co-operative bank located in Satara city. The all branches controlled and facilitated of by the main office. Highest number of SDCCB is in

Karad taluka i.e.50 High concentration is in (above 40 branches) Karad and Satara (41).Medium concentration (21 to 40 branches) are in Man (31), Phaltan (30), Koregaon (28) Patan (22), Khatav (24) and remaining talukas are under the category of low concentration (below 20 branches) are in Khandala (20), Wai (16), Jawali (11) and Mahabaleshwar (06) taluka of study area.

The land development bank provides loan for dug well, well improvement and maintenance to purchase oil engine or electric pumps and to purchase costly agricultural equipments previously before 1991 but now a day due to some government policies, worker strikes and uninterested of political leader this bank in crises.

TABLE NO.V-III

SATARA DISTRICT

TALUKAWISE DISTRIBUTION OF FINANCIAL INSTITUTIONS

Sr No.	Name of the Taluka	PAC'S	SDCC Bank's With extension	LDBanks With extension
1	Man	72	31	01(Vaduj,Dahiwadi)
2	Khatav	103	24	01(Pusegaon)
3	Phaltan	128	30	-
4	Patan	103	22	01(Patan)
5	Jawali	49	11	01(Karad I,II)
6	M.Shwar	10	06	-
7	Wai	59	16	01
8	Karad	140	50	02 (Karad I,II)
9	Satara	125	41	01 (Satara,Nagthane)
10	Koregaon	90	28	01(Koregaon)
11	Khandala	51	20	01 (Lonand,Phaltan,Kh.
Total		**950**	**276**	**09**

Sources- i) Annul Report of SDCCBank, Satara. (2010-11)

ii) Annul Report of LDBank, Satara. (2010-11)

So many branches from all over district closed down or merged in nearby branches. But in last few decades the bank did lot for the farmers. Schemes like loans for pipelines tube well and lift irrigation. It also provides loans for improvement in Horticulture, dairy development, rearing cattle and ships. In the study area Satara is the main office. There are total (09) LDBs and only in the taluka like Karad (2) branches and other talukas like Man, Khatav, Patan Jawali, Satara, Koregaon and Khandala one branches are there and in Phaltan and Mahabaleshwar no branch of land development bank. Previously main office of LDB was there in Karad. The Karad and Umbraj branches provide all the service to the farmers. Along with this some Nationalized Commercial, Scheduled Banks And Urban banks helping to the farmers like, HDFC, ICDI, Canara, Baroda, Axis, Syndicate, State Bank, Bank of India, Maharashtra Banks, Bank of India, Corporation bank, federal Banks etc. These banks located of district place and taluka head quarters.

5.2.3 DISTRIBUTION OF MARKETS :

Markets are economically most important and represent regional pattern for the development. The market provides trade and commerce services to the region and also helps in increasing social contacts. Markets are serving as a centre of diffusion and becomes focus for political and some other activities. Distribution of Market centres, the functions Agro Service Centres and diffusion of information of markets plays very important role in the study area. There are three types of market in the study area.

i) Weekly markets,
ii) Submarket yards
iii) Market yards

A) WEEKLY MARKETS :

Weekly markets supply essential goods and services to the rural and urban population. Agro Service Centres supported with weekly functions of weekly market. Weekly markets are located in big towns of the every taluka. Highest weekly markets and there in (above 10 weekly markets) Man (11), Khatav (12) Phatan (14), Karad (14) and Koregaon (12), Medium concentration of Market (6 to 10 weekly market) in Patan (9) Satara (9) and low concentration of weekly markets in the taluka Jawali (4), Mahabaleshwar and Khandala (3) in the study region. Total 96 weekly market places in study area. (Fig . No. 5.3 A)

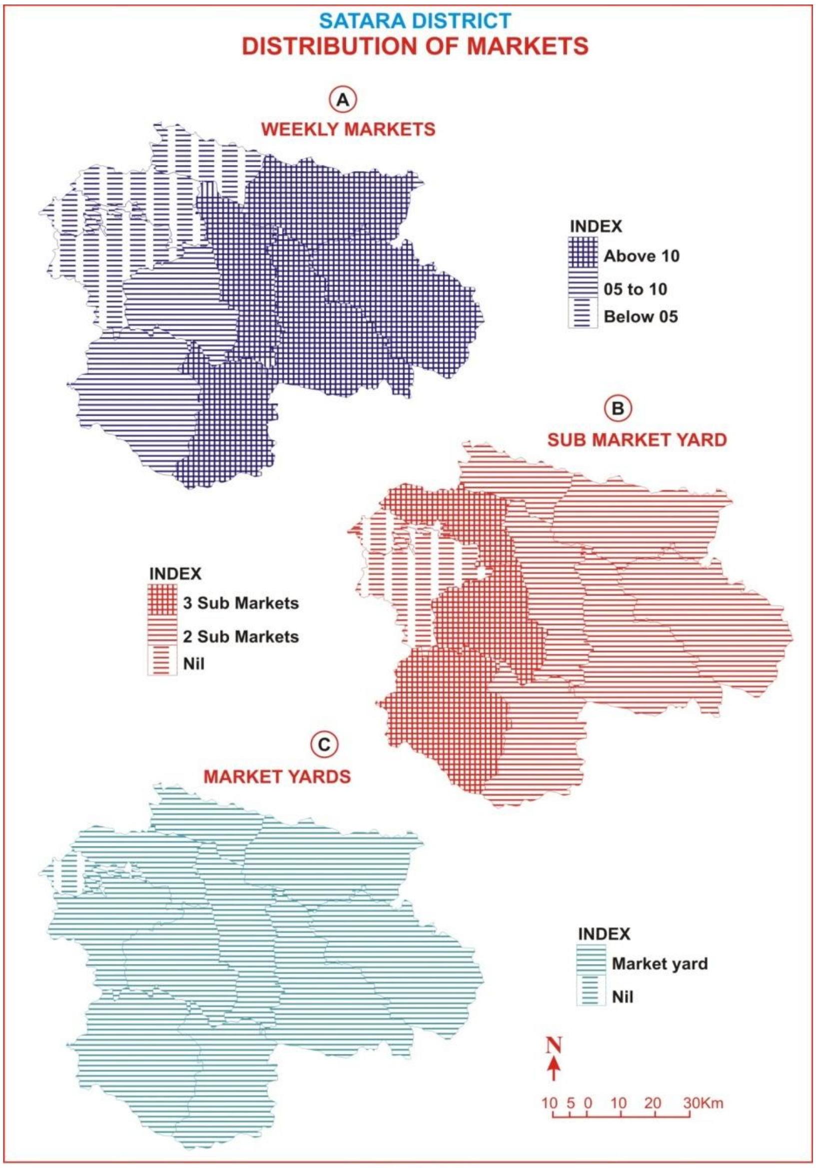

Fig. No. 5.2

B) REGULATED MARKETS :

Regulated market has market yards and sub market yards. These are the collecting centres of agricultural produce from entire region the role of market yard and submarket yard to ensure the farmers for reasonable prices. In study region of every taluka place market yard is there except Mahableshwar.The sub market centers of the every taluka like Karad-2 (Umbraj, Masur) Satara-3 (Vaduth, Nagthane, Gajwadi), Khatav-2 (Pusegaon and Pusesawali), Man-2 (Gondawale, Mhaswed), Phaltan-2 (Bharad, Tardgaon),Koregaon-2 (WatarStation, Rahimtpur), Khandala-2 (Shirwal,Lonand), Wai- 3 (Panchwad,Bhuenj,Surur), and Jawali-2 (Mahableshwer,Pachgani). This markets are regulated and carry out the trade in Jowar, Wheat, Soyabin Bajara, Pulses, Oil seeds, Turmeric, Vegetables, Fruits and other remaining agricultural commodities.

5.2.4 DISTRIBUTION OF VETERINARY HOSPITALS :

Veterinary institution includes veterinary hospitals dispensaries, clinics it includes class I and II dispensary is Manville courts district level insemination centers &state level insemination centers. (Table) The head quarter of veterinary dispensary is located at Satara headed by Dy. Commissioner of animal husbandry. It controls all the dispensary of district and state level. Total 22 state level animal insemination central are run to state government 125 district level animal insemination centers runs Zilla parishad bottom level dispensaries are run by every Panchayat samittees in the study region.

TABLE NO.V-IV

SATARA DISTRICT

TALUKAWISE DISTRIBUTION OF

VETERINARY DISPENSARIES

Sr No.	Name of the Taluka	Class I and Class II	District Level	State Level
1	Man	13	08	-
2	Khatav	18	09	01
3	Phaltan	13	09	01
4	Patan	18	12	-
5	Jawali	11	12	-
6	M.Shwar	04	09	-
7	Wai	08	14	01
8	Karad	17	21	16
9	Satara	16	15	01
10	Koregaon	13	12	01
11	Khandala	08	04	01
Total		**139**	**125**	**22**

Sources-

i) Animal Husbandry Development Department, Satara ZP, Satara.

ii) District Dy. Commissioner of animal husbandry, Satara.

iii) Socio economic Abstract 2010-11

5.2.5 EXTENSION SERVICES :

In the development of Agro Service Centres, role of extension is very significant. Extension service perform the in training visit system introduced by agricultural department Maharashtra state government in the extension service workers, farmar and agricultural officers receive the training on fixed day about agriculture practices and to transmit the same to the farmers through the messages . This concept reference to visiting th the farmers and their fields. Extension service offers direct contact of the farmers to solve their problems related to farm. The Karad taluka is served by the extension services. The training and visit system was introduced in Karad tluka during 1981. The agriculture officer and workers keeping direct contact with farmers and going to field visit for giving practical knowledge. Karad taluka has 34 extension centres. It is very lucky taluka having highest number of extension centres. .

5.2.6 DISTRIBUTION OF FERTILIZERS, SEEDS ANDINSECTICIDES FACILITIES :

Fertilizers are used for not only to obtain greater yield but also to maintain fertility status of the soil. Amounts of fertilizer depends on crop, the amount of nutrients removed by previous crop can be maintained by leaching volatilization and nitrification etc. Predicting the nutrient requirement by crops is a compliers problem. Quality of crop incorporated depends on crop. It can determine the need, requirements of fertilizers. Now a day’s many farmers adopted new technology and started to use improved inputs in the study areas. In the study area 1254 fertilizer distribution centres providing essential fertilizers to the farmers.

More concentration of the fertilizer distribution centre are in Karad (230), and Phaltan (204) taluka, medium concentration (100 to 200) in Satara (148), Koregaon (123) Man (104), Khatav (124) and lower concentration (below 100) is found in Mahabaleshwar (28), Jawali (47) Patan (92) and Khandala and Wai (77) in the study region Karad and Phaltan taluka has recorded highest fertilizer distribution centres due to presence of irrigation facilities like canal and lift water irrigation system. In the (below 100) area irrigation facilities are not available and low purchasing capacity of the farmers due to the poverty

Seeds and hybrid seeds are very important agricultural inputs and it has always been critical higher agricultural production. The Government has established the Maharashtra seed corporation in 1976, this corporation extended to all the districts of the state.

The chemicals in the form of insecticide and pesticides important for the crops, which effectively destroy the insects and pest and resulted into more in production of the crops for the protection of plant insecticide and pesticides are the best measures which can enhance the production. However any pest or diseases occurs in severe form in the large area. It is necessary adopt control measures for the same. Plant protection campaigns are organized by department of agriculture of Zilla Parishad

TABLE NO.V-V

SATARA DISTRICT

DISTRIBUTIONOF FERTILIZERS, SEEDS AND INSECTICIDES

Sr. No.	Name of the Taluka	No. of ASC'S	Fertilizers Permission	Seeds Permission	Insecticides Permission
1	Man	284	104	103	77
2	Khatav	309	124	109	76
3	Phaltan	487	204	163	120
4	Patan	218	92	85	41
5	Jawali	109	47	39	23
6	M.Shwar	82	28	34	20
7	Wai	158	77	41	40
8	Karad	562	230	185	147
9	Satara	375	148	132	95
10	Koregaon	310	123	115	72
11	Khandala	192	77	70	45
Total		**3086**	**1254**	**1076**	**756**

Source-Agriculture Department Satara ZP.Satara.2012

There are 756 insecticide distribution centres. High concentration is observed in Karad (147) and Phaltan (120) Medium concentration of insecticide distribution centres are there in satara (95), Koregaon (72), Man (77), Khatav (76) and 1000 concentration of insectide distribution are in the Jawali (23), Patan (41) Khandala (45), Wai (40) and Mahabaleshwar (20) in the study area.

5.2.7 DISTRIBUTION OF AGRICULTURAL IMPLEMENTS AND MACHINARIES :

Agricultural implements and Machinery are crucial inputs for efficient and timely preparation of land for the cropping. Harvesting and allied agricultural operations facilitating multiple cropping and increases the production. The use of agricultural machinery has been progressively increased the improvement. Irrigation facilities also developed in the study region so that uses of farm implements are also increased. Agricultural implement and hand tools plays a vital role. Extensive demonstration of the suitability and profitability by using advanced implements and hand tools and it extended to small and marginal farmers. More stress has been given to these tools and implements and equipments during first five year plan. Many improved and sophisticated implements and equipments were designed. The most common implement Ploughs, Seed drills. Spray Pumps, Rollers Levelers, Bullock Carts, Tractors and Threshers etc.

TABLE NO.V-VI

SATARA DISTRICTDISTRIBUTION OF AGRICULTURAL IMPLEMENTS AND MACHINARIES

Sr. No.	Taluka	No. of ASC'S	Wooden Ploughs percent	Steel Ploughs percent	Bullock Carts percent	Tractors percent	Diesel Operated Pumps percent	Electricity Operated Pumps percent
1	Man	284	5.35	10.96	11.74	5.08	15.43	9.90
2	Khatav	309	4.18	14.08	16.49	8.44	17.51	15.39
3	Phaltan	487	3.64	10.59	7.84	12.59	6.33	14.07
4	Patan	218	33.00	14.43	9.49	6.00	5.47	2.22
5	Jawali	109	14.73	5.38	2.48	2.40	3.95	1.38
6	M'Shwar	82	2.25	0.59	0.18	0.16	2.21	0.43
7	Wai	158	8.34	8.02	7.12	7.32	10.64	12.51
8	Karad	562	10.13	13.30	15.51	35.85	14.55	20.96
9	Satara	375	11.15	12.48	15.80	9.77	14.25	8.71
10	Koregaon	310	5.41	8.31	11.09	7.84	6.72	11.82
11	Khandala	192	1.80	1.86	3.24	4.76	2.93	2.57
	Total	**3086**	**100**	**100**	**100**	**100**	**100**	**100**

Source-Socio –economic Abstract 2010-11

A) PLOUGH :

In India major two types of plough are used the Deshi ploughs and moulded broad ploughs of western origin. In the study region ploughs are of wood and steel. The more concentration (Above 10 percent) of steel plough is in Phaltan (10.59 percent) ,Man (10.96 percent), Khatav (14.08), Satara (12.48 percent) Patan (14.43) and Karad (13.30 percent) Medium concentration (6 to 10) percent is in the taluka Wai (8.02 percent), Koregaon (8.31 percent) and low concentration of steel plough is teir in Mahabaleshwar (0.59 percent) Khandala (1.80 percent) and Jawali (5.38 percent) in the study area. (Fig No 5.4A)

B) TRACTORS :

Tractors are plying vital role in food crops production. The use of improved variety of seeds fertilizers and other incentive farming practices leading higher returns and farm producer increases the capacity of the farmers to invest and therefore they diverted towards tractor cultivation and further increases number of crops and crop production. So tractors play a dominant role in the development of agriculture. In the study area 6524 tractors are there out of this high concentration of tractors (above 10 percent) Found in the Karad (345.86 percent) Phaltan (12.59 percent). The medium concentration of (6 to 10 percent) tractors in Wai (7.32 percent) Khatav (8.14 percent) Koregaon (7.84percent), Satara (9.77 percent) and Patan (6.00 percent) and low concentration of tractors are in Mahabaleshwar (0.16percent) Khandala (4.47 percent) Man (5.08 percent) and Jawali (2.40 percent). It is observed that where there is more concentration of irrigation there a tractor concentration is also more or high. Fig.No.5.4. B

C) BULLOCK CARTS :

Concentration of Bullock carts is very significant in (above 10percent) Man (11.74percent), Khatav, (16.49 percent), Koregaon (11.09 percent) Satara (15.80 percent) and Karad (15.51percent) Medium concentration (6 to 10 percent) observed in wai (7.12 percent), Phaltan (7.84 percent) and Patan (9.49 percent) and lower concentration of bullock carts found in Mahabaleshwar (0.18 percent) Khandala (3.24 percent) and Jawali (2.48 percent) in the study area. Fig 5.4.c

D) ELECTRIC PUMPS :

For the efficient and timely irrigation purpose irrigation pumps are very important. In the study area 30292 electric pumps are there out of this high concentration (above10 percent) observed in the taluka like Wai (12.51percent), Phaltan (14.7 percent) Khatav (15.39 percent) Koregaon (11.82 percent) and Karad (20.965 percent) Medium concentration of electric pumps are found in (6 to 10 percent) Man (9.90 percent) Satara (8.71 percent) and lower concentration is in Mahabaleshwar (0.47 percent) Khandala (2.52 percent) Jawali (1.38 percent) Patan (2.22 percent) taluka respectively. (Fig 5.4.D)

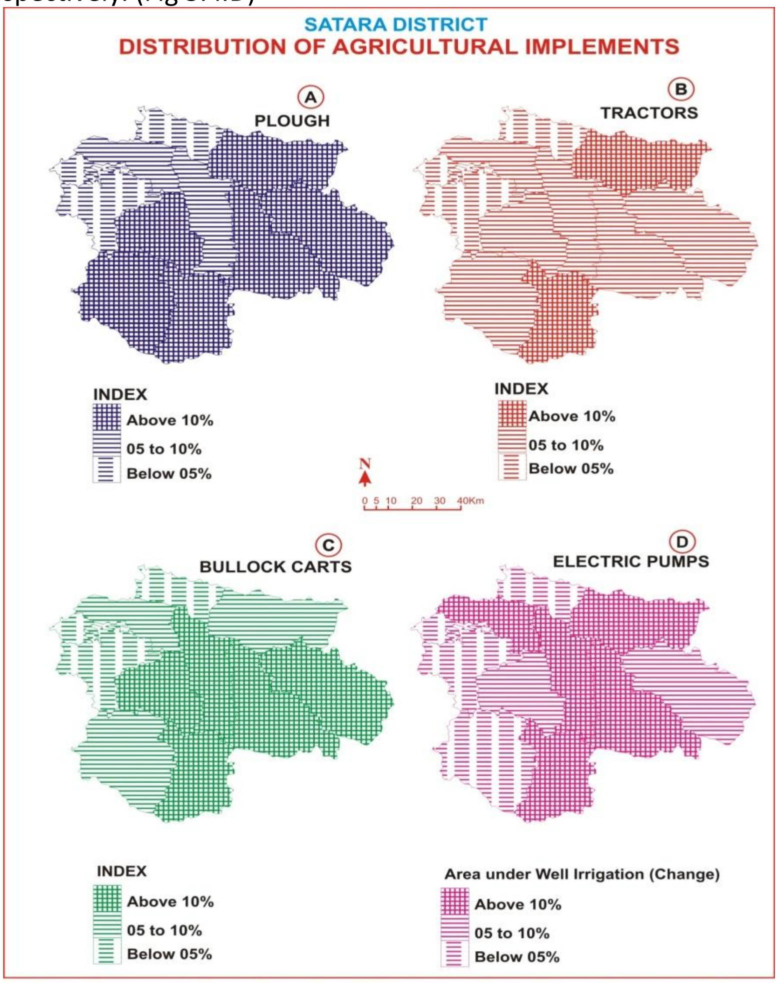

Fig. No. 5.3

CLASSIFICATION OF AGRO SERVICE CENTRES :

For understanding the classification of agro service centre, it is necessary to study the spatial analysis of Agro Service Centres. The objective of the present attempt is to work out an exclusive classification of agro service centers of the study area. It is based on functions and services. Agro Service Centres can be classified by the various central functions and services.

Agro service centre are classified on the basis of their central functions which are associated with different agricultural activities in the study region. The classification of Agro Service Centres are as follows..

5.3 CLASSIFICATION OF AGRO SERVICE CENTRES ON THE BASIS OF THEIR FUNCTIONS :

i) Fertilizers, seeds and insecticides facilities

ii) Bank facilities

iii) Market facilities

5.3.1Classification of Agro Service Centres based on fertilizers, seeds and insecticides distribution facilities :

Fertilizers, seeds and insecticides distribution services important function of any agro service centre in the study region .The distribution of Agro Service Centres in the study region has been shown in table and figure.

Out of 3086 Agro Service Centres 1254 fertilizer distribution centres are there in the study area. High concentration is in the (above 100) Satara, (148), Karad (230) , Koregaon (123), Phaltan (204), Man (104) and Khatav (124),. Medium concentration of fertilizer distribution are there in Patan (92) Khandala (77) wai (77) and lower concentration is there in Jawali (47) and Mahabaleshwar (28) in the Study area due to in accessible undulating surface, dry cultivations and poor status of the farmers.

TABLE NO.V-VII

SATARA DISTRICT

CLASSIFICATION BASED ON FERTILIZER SEEDS AND INSECTICIDES DISTRIBUTION FACILITIES

Sr. No.	Name of the Taluka	No. of ASC'S	Distribution facilities of		
			Fertilizers	Seeds	Insecticides
1	Man	284	104	103	77
2	Khatav	309	124	109	76
3	Phaltan	487	204	163	120
4	Patan	218	92	85	41
5	Jawali	109	47	39	23
6	M.Shwar	82	28	34	20
7	Wai	158	77	70	45
8	Karad	562	230	185	147
9	Satara	375	148	132	95
10	Koregaon	310	123	115	72
11	Khandala	192	77	70	45
Total		**3086**	**1254**	**1076**	**756**

Source-Agriculture Dept.Satara Z.P.2012

1076 Agro service centre have seeds distribution facilities all over the district (above 100) high concentration of seeds distribution centres in satara (132), Karad (185), Koregaon (115) Phaltan (163) Man (103), Khatav (109) Medium concentration is in Patan (85) Khandala (70) and low concentration is observed in Jawali (39), Wai (41) and Mahabaleshwar (34)

Out of 3086 agro service centre 756 Agro Service Centres have facilities of insecticide distributions centres. High concentration (above 100) is in Karad (147) and Phaltan (120) Medium concentration of insecticide distribution facilities Satara (95), Koregaon (72), Man (77), Khatav (76) and low concentration of insecticides distribution are observed in remaining talukas of the districts. (Fig 5.4 A, B, and C)

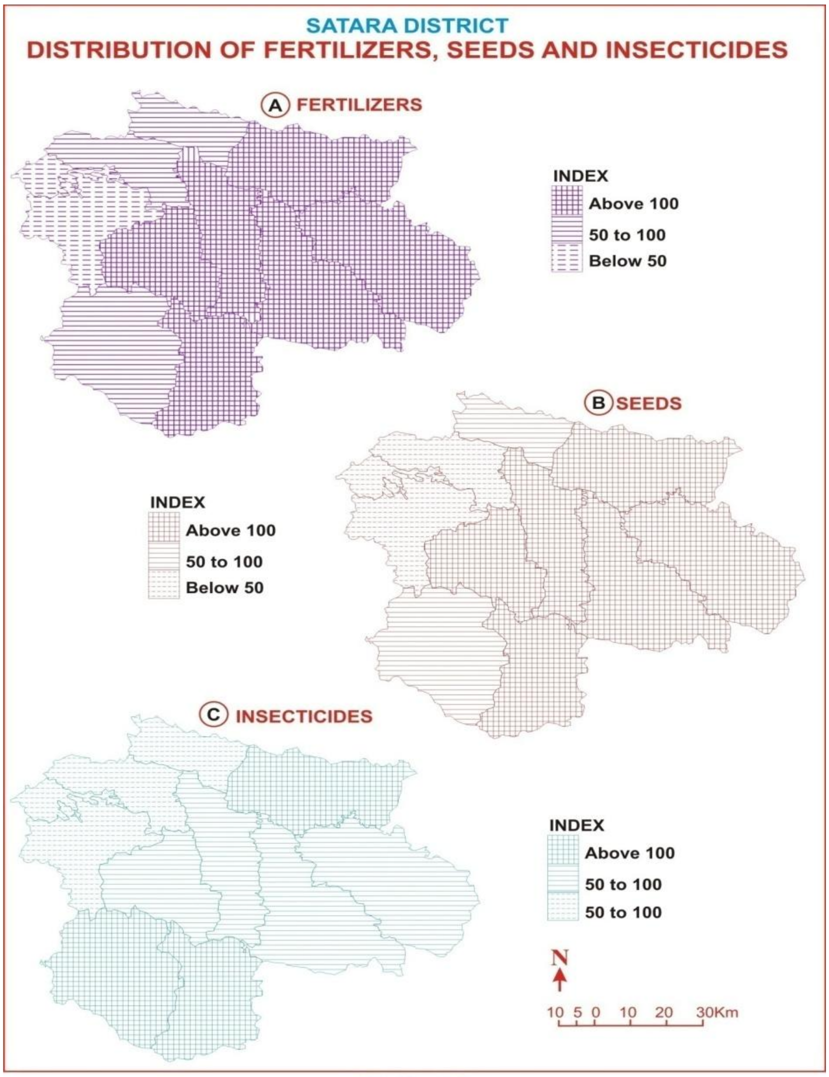

Fig. No. 5.4

5.3.2 Classification based on Primary Agricultural credit societies, Satara district central co-operative bank and land development bank facilities :

There are three very important economic determinant and life blood for Agro Service Centres.

TABLE NO.V-VIII

SATARA DISTRICT

CLASSIFICATION BASED ON DISTRIBUTION OF PACSs, SDCCBs, LDBs

Sr. No.	Name of the Taluka	No. of ASC'S	PAC'S	SDCC Bank's With extension	LD Banks With extension
1	Man	284	72	31	01(Vaduj,Dahiwadi)
2	Khatav	309	103	24	01(Pusegaon)
3	Phaltan	487	128	30	-
4	Patan	218	103	22	01(Patan)
5	Jawali	109	49	11	01(Karad I,II)
6	M.Shwar	82	10	06	-
7	Wai	158	59	16	01
8	Karad	562	140	50	02 (Karad I,II)
9	Satara	375	125	41	01 (Satara,Nagthane)
10	Koregaon	310	90	28	01(Koregaon)
11	Khandala	192	51	20	01(Lonand,Phaltan,Khandala)
Total		**3086**	**950**	**276**	**09**

Sources- i) Annul Report of SDCC Bank, Satara. (2010-11)

ii) Annul Report of LD Bank, Satara. . (2010-11)

In Satara district total 3086 Agro Service Centres. With only a land development banks, 276 SDCC Bank and 950 PAC,s. High concentration Primary agriculture credit society in (above 100) Khatav (1030) Phaltan (128) Patan (103), Karad (140) and satara (125) Medium concentration (5 to 100) is in Man (72), Wai (59) and Khandala (51) and low concentration of PAC;s in (below 50) in Jawali (49), Mahabalieshwar 10.Asc,s with land development bank 2 branches high concentration of LDB is in (above 2) Karad. Medium concentration is in Man, Khatav Patan, Jawali Satara, Koregaon and Khandala for each taluka 1 LDB. Phaltan and Mahabaleshwar no LDB in the study area. ASC,s with Satara District Central Co-Operative Bank. High concentration

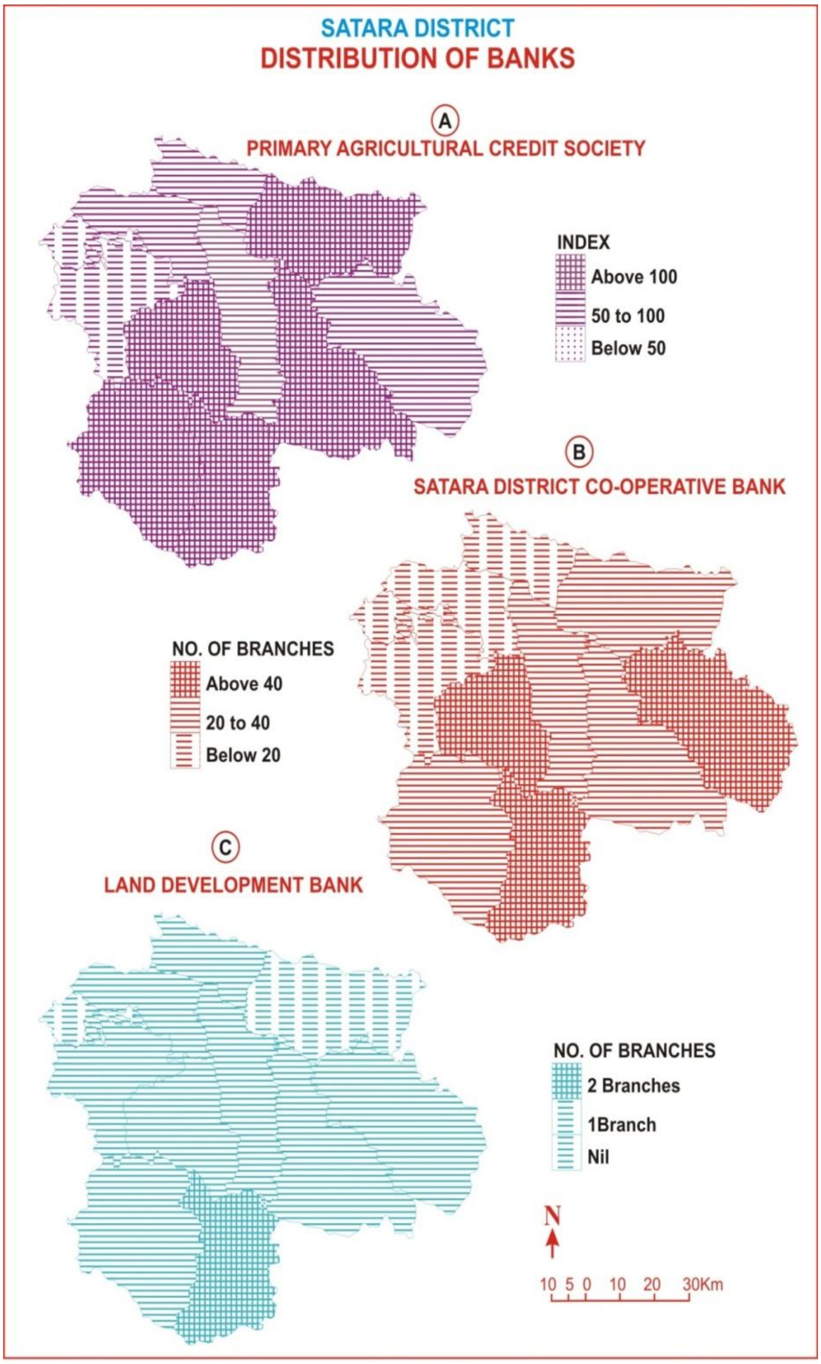
SATARA DISTRICT
DISTRIBUTION OF BANKS
A
PRIMARY AGRICULTURAL CREDIT SOCIETY
INDEX
Above 100
50 to 100
Below 50
B
SATARA DISTRICT CO-OPERATIVE BANK
NO. OF BRANCHES
Above 40
20 to 40
Below 20
C
LAND DEVELOPMENT BANK
NO. OF BRANCHES
2 Branches
1Branch
Nil
N
10 5 0 10 20 30Km

Fig. No. 5.1

(Above 30) in Man (31), Karad (50), Satara (41) Medium concentration of SDCCB to (21 to 30) Phaltan (30), Khatav (24) Patan (22),Koregaon (28) and low concentration of SDCCB (below 20) found in Jawali (11), Mahabaleshwar (06) Wai (16) taluka. (Fig 5.5 A, B, and C)

5.3.3 CLASSIFICATION BASED ON MARKET FACILITIES :

The classification of Agro Service Centres can be done on the basis of availability of market facilities. It has been illustrated with the help of table and figure. 3086 Agro Service Centres are with 95 weekly markets, 23 submarket yard facilities and 10 market yards.

TABLE NO.V-IX

SATARA DISTRICT

CLASSIFICATION BASED ON DISTRIBUTION OF MARKET PLACES

Sr. No.	Name of the Taluka	No. of ASC'S	Weekly Markets	Sub Market yard	Market yard
1	Man	284	11	02	01
2	Khatav	309	12	02	01
3	Phaltan	487	14	02	01
4	Patan	218	09	03	01
5	Jawali	109	04	02	01
6	M.Shwar	82	02	-	-
7	Wai	158	05	03	01
8	Karad	562	14	02	01
9	Satara	375	09	03	01
10	Koregaon	310	12	02	01
11	Khandala	192	03	02	01
Total		**3086**	**95**	**23**	**10**

Source-District Dy.Registrar office, Satara.

For 3086 Agro Service Centres 95 weekly markets. High concentration of weekly markets (above-10) are in Man (11), Khatav (12) Phaltan (14),Karad (14) and Koregaon (12) Medium concentration of weekly markets (6 to 10) in the patan (9): , Satara (9) and low concentration of weekly markets are in Jawali (4), Mahabaleshwar (2) wai (5) and Khandala (3) respectively.

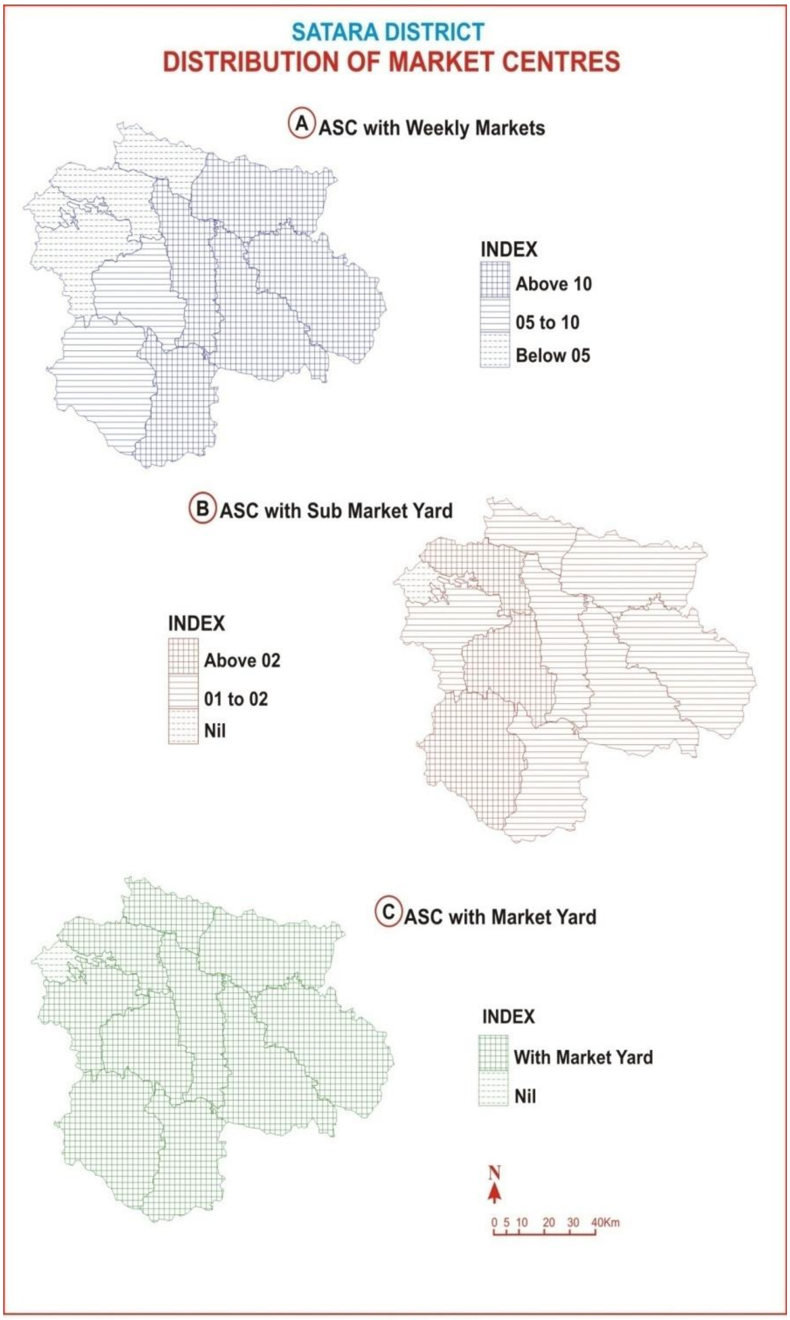
SATARA DISTRICT
DISTRIBUTION OF MARKET CENTRES
A ASC with Weekly Markets
INDEX
Above 10
05 to 10
Below 05
B ASC with Sub Market Yard
INDEX
Above 02
01 to 02
Nil
C ASC with Market Yard
INDEX
With Market Yard
Nil
N
0 5 10 20 30 40Km

Fig. No. 5.6

There are 23 sub market yards for 3086 Agro Service Centres in the study ares. High concentration of submarket yard (above4- 2) are in Patan (3) i.e. Maharpeth, Tarale and Manewadi, Wai (3) Panchwad Bhuienj and Surur, Satara (3) Vaduth Gajawadi and Nagthane, medium concentration of submarket yard is observed in man, Khatav, Phaltan Jawali, Koregaon and Khandala. There is no sub market yard in Mahabaleshwar taluka.

At every taluka place one market yard i.e. Karak, Satara, Wai, Jawali, Patan, Phaltan, Man, Khatav, Koregaon and Khandala and only Mahabaleshwar is taluka where there is no market yard facilities even thought it has 82 Agro Service Centres. Means in Satara district 82 Agro Service Centres with sub market and market yard facilities. (Fig 5.6 A, B, and C)

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CHAPTER

6

KARAD TALUKA: A CASE STUDY

6.1 INTRODUCTION :

An attempt has been made to study the physical set-up of study region, which influences the study of physiographic and land use pattern. The study region as situated in the southern part of Satara district. Regions have location advantages and disadvantages which are found to be reflected in their economic status.

In ancient times, Karad was famous as a commercial place. Karad was known as '*KARHATAK*'. This place is on the bank of the 'Karha River'. Here a **'***kar'* or tax was gathered on the various marketing commodities in Karad Taluka. Many people were gathering a tax on commodities in the study region and surrounding regions. So it was known as 'Karad' referred to '*Kar*' (tax). Karad is well connected to other parts of the Maharashtra. It is the main market place on the National Highway No. 4. Marketing facilities are dominant in this region. Karad is situated on the bank of Krishna river and famous for confluence of Krishna and Koyana Rivers. This place is known as 'Pritisangam'. Karad is one of the important place in the country, where two rivers meeting in front of 180^0 angle.

Karad is Taluka headquarter and famous for Agashive caves. There as an old kot near the sangam still there are some remaining parts which give an idea about fort, which was constructed during Bahamani period. Stepped and well constructed Naktya Rawalchi

Vihir, Masjid Built by Sultan Ali Adilshah (1557-1580). The population of hindu is greater than others Muslim people are also living here. Jain temple, Venutai Chavan Pratishthan Sangharalaya, Muncipalty and Chachegaon caves, the tall Minars are the old monuments this city. As per 2001 census, Karad Taluka has 10 mandal offices and 221 inhabited villages for administrative purpose. The Taluka is divided in 10 sub-divisions like Karad, Supane, Indoli, Masur, Umbarj, Koparde Haveli, kole, Kale, Shenoli, and Undale. Karad taluka lies in the western limits of Deccan pleateau and the southern Maharashtra particularly in Satara district. The entire land of the Taluka belongs to the larger drainage system of the Krishna and Koyana rivers.

Karad Taluka is one of the developed urban centre. Masur, Umbraj, Kale, Shenoli, Undale circles are developed and many people are engaged in primary, secondary and Teritary activities. Taswade MIDC is in between Umbraj and Karad. So Karad city is well developed in industries and commericial activities.

6.2 LOCATION AND BOUNDRIES :

Karad Taluka is one of the important Taluka in Satara district. It is situated on confluence of Krishna and Koyana river. The Taluka extends between $17^0$18' north to $17^0$38' north latitude and 73^0 52'east to $74^0$16' east longititude.

According to 2001 census there are 221 villages in the Karad taluka. It covers an area about of 405.8 sq. km. which is 10.2 percent of Satara district. North – south length of Karad Taluka is 55km. and East-West length is 36 km. Karad is famous place for its good location in Maharashtra. It has historical, political, cultural, social and educational Importance. The Karad is bordered by Satara and Koregaon taluka on the whole of the northern side. Khatav, Kadegaon (Sangli district) taluka from the east side. Shirala, Walwa to the south is from Sangli district and Patan taluka is to the west. (Fig. No. 6.1)

6.3 PHYSIOGRAPHY :

The origin of the word ‘Karad’ form of the ‘Karahatak’ or from the ‘Karha River.’ Karad is situated near the confluence of Krishna and Koyana river and on the eastern part of Sahyadri hilly ranges.

There are two major ranges, the sahyadries and mahadeo. The four hills in the Karad taluka are Agashiv, pal, Sadashivgad and Vasantgad. Agashiv is standing on the southern part of Karad city, about 800 metre from the plain, has a pointed top Agashiv hill is a prominent object about four miles South west to Karad. The sides are steep and scantily covered with scrubs, on the south-east of the hill is a group of Buddhist caves.

Fig. No. 6.1

Pal hill stands alone about two miles south-east of the village Pal. Pal hill having height over 1000 meter from the sea level. On the top of the Pal hill there is a small temple. The sides are not steep and in many parts are under tillage.

The fort Vasantgad, about six kms North West of a Karad city a prominent place from both the Karad-Satara and Karad-Kumbharli roads are a place of great Strength. Its height is 600 Mtr from the sea level. A foot path leads from Talbid to the east of the fort. On the top there are two gateways and temples and other buildings. These are four historical and religious places which enhance the historical importance of Karad city.

Shamgaon Ghat is surrounding to the North – East part of Karad Taluka height over 600 m to 900m above sea level. In the eastern part of Karad, there is Surli Ghat with the height above 600m at sea level.

Sadashivgad range intended in the eastern part of Karad. Agashiv hills are in the southern part of Karad. North west part is identified for pal hill range. Vasantgad range the western part of Karad taluka. (Fig.No. 6.2)

6.4 DRAINAGE :

The river is the main water source of the study region. The entire physiography is affected by the drainage pattern. The river and its tributaries covers major portion of the study region and facilitated intensive irrigation.

In the study region, there are five district river basins:-

1. The Krishna River drains - Flows from Northern part of Karad Taluka entering Gandhi nagar.
2. The Koyana river-Flows to the west and meets toKrishna at Karad.
3. The Tarali drains-North –Western part of studyregion.
4. The Mand river-Flows fast and meets Krishna.
5. The Vang River -South-west portion of KaradTaluka.

The drainage pattern of study region is well developed. The Krishna is one of the third great rivers of southern India. The entire taluka belongs to the larger drainage system of the Krishna river. The Krishna river rises from the eastern part of the old Mahableshwar. The river Krishna enters in Karad Taluka at Gandhinagar near Kashil.

The confluence of Krishna and Koyana rivers is on western side of Karad city. It receives two tributaries from right first is Tarali near Umbraj and another is the Mand near Shivade. Karad is famous for the confluence Rivers. The Koyana is the largest river of rises on the west side of the Mahableshwar plateau. The river Vang meets to Koyana at Yervale. Khodashi dam is built was 1868 on Krishna River.

The water is supplied to farms through Krishna canal. The canals are very useful an extensive network and uses to agricultural areas.

6.5 CLIMATE :

This region belongs to the subtropical category of climate characterized by medium to heavy rainfall and moderate temperature. Three main seasons in the study region are

The Rainy Season (June to Sept).

The winter season (Oct to Jan).

The summer Season (Feb to May).

In the study region averagely maximum temperature is 36^0c and Minimum temperature is 11^0c.is recorded. May is the hottest and December is coldest month of the year.The rainfall varies widely in different parts of the district. Climate of Karad is temperate.

The maximum rainfall is in June to Aug. from south-west monsoon. The average rainfall is 540.40 mm in Karad.

The Table VI-I and Fig. No. 6.3 gives clear idea about annual average rainfall of important stations in Karad Taluka. Below table shows an annual average rainfall in Karad Taluka. Maximum rainfall falls in Umbraj Mandal over 689.2 mm. Minimum rainfall get only around 282.3 mm of Indoli Mandal.

The dryness is marked in the plains than in the hills. During the south-west monsoons seasons the sky is heavily clouded to over cast.

TABLE NO.VI.I

KARAD TALUKA

ANNUAL RAINFALL (2005-06)

Sr. No.	Name of the Circles	Rainfall (mm)
1	Karad	587.6
2	K.Haveli	794.1
3	Masur	334.2
4	Umbraj	689.2
5	Indoli	282.3
6	Supane	318.5
7	Kole	557.4
8	Undale	303.3
9	Kale	413.2
10	Shenoli	368.7

Source-Agriculture Office, Karad.

Winds are generally light to moderate receiving during the south-west monsoon season, when they are stronger particularly on hills. Fogs occur occasionally in the valleys in the cold season.

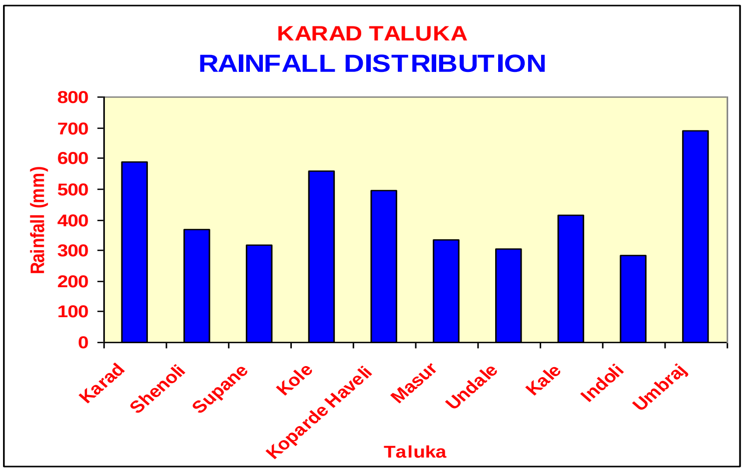


Fig. No. 6.2

6.6 SOILS :

The soils of taluka are generally classified into following three main categories.

6.6.1 Deep Black Soil :

Deep black soil found mainly middle part of Karad Taluka and along with the Krishna and Koyana River. This soil is usually characterized by a rich and fertile black soil. Organic matter content is high. Its colour is dark gray to dark gray Brown. Depth of Black soil in land average is more than 36. (Table No.VI.II)

TABLE NO.VI.II

KARAD TALUKA

DISTRIBUTON OF SOIL TYPES

Sr.No.	Soil Type	Surface Colour
1	Deep Back	Black to Dark Gray
2	Medium Deep Black	Dark to Grayish Brown
3	Deep laterite	Yellowish to Reddish Brown
4	Medium Laterite	Light to Dark Brown

Source-Agriculture Office, Soil Dept. Karad

6.6.2 MEDIUM BLACK SOIL :

Medium Black Soil discovered mainly eastern part of study region. Upper and lower part of Koyana River. Eastern part of medium Black soil locally Known as '*Malron or Murmmad*'.The soil is hard and rocky in Shamgaon region. Surli Ghat region and its surrounding area covered medium black soil. Soil colour is dark brown to grayish brown. Nitrogen, organic carbon and phosphorus can yield good produce only if bulky manures. Heavy fertilizers are used and provided a proper irrigation in medium Black soil.

6.6.3 LATERITE SOIL :

The colour of late rite soil is red and yellowish Brown. Many parts are locally known as '*Tamadi*'. It is found in western part of study region. Especially in mountain range along the Koyana valley. The laterite soils are subjected to heavy rainfall and heavy leaching and high degree of erosion. The reason for the red colour is high content of iron-oxides in the sequin-oxides of at these soils.

6.6.4 MEDIUM LATERITE SOIL :

Medium late-rite soil the colour of is light brown to dark brown. It is found as mainly North-Eastern part of study region. This region is hilly region and less rainfall. less organic matter in this soil. But use a heavy fertilizer to land. Its depth is 0-9”

6.7 LAND USE PATTERN :

Land provides food to the people as well as provides raw material for the agro based industries like sugar factory, oil mills, cotton mills etc. In the study region Land under Cultivation or net Sown Area is about 74.39 percent of total geographical land. 70 percent people engaged in agricultural activities. Basic economy depends upon agricultural area. Land under forest is about 10.07 percents in the study region. Very less area is covered under forest land in the particular region. Land which is not available for cultivation is 4.18 percents as covered to total geographical area. Fallow land as 10.69 percent in the study region. (Table No.VI-III)

TABLE NO.VI.III

KARAD TALUKA

LAND USE PATTERN (2005-06)

Sr. No.	Land Use Pattern	Area In Hectors	Percent to Total
1	Net Sown area	78181.4	74.42
2	Fallow land	11238.62	10.69
3	Land not available for Cultivation	4395.5	4.18
4	Forest Land	11237	10.69
Total		**105062**	**99.98**

Source-Agriculture Office, Karad.

6.8 AGRICULTURE AND IRRIGATION :

Agriculture is most important activity of man since long back 70 percent people the total population are engaged in farming. The economy of the study region mainly depends on agriculture. The agriculture is more dominant in the areas in the main the river Basin i.e. Krishna and Koyana.

The cropping pattern and the agrarian economy of the Taluka have changed because the land under cash crops increased while the land under food-crops, decreased. In the study region different crops are grown kharif and Rabbi is both agricultural seasons important in Karad taluka. It is evident that Rice, Jawar, Pulses, Wheat, Gram, Sugarcane, Oilseeds, sunflower, are the important crops of the region. During the year 2005-06 about 34.28 percent area was under the total food crops and 65.34 percent of the total cropped area was occupied under non food crops in the Karad taluka. Pulses cover 6226 hector area and the Sugarcane covers 20439.22 hector area.

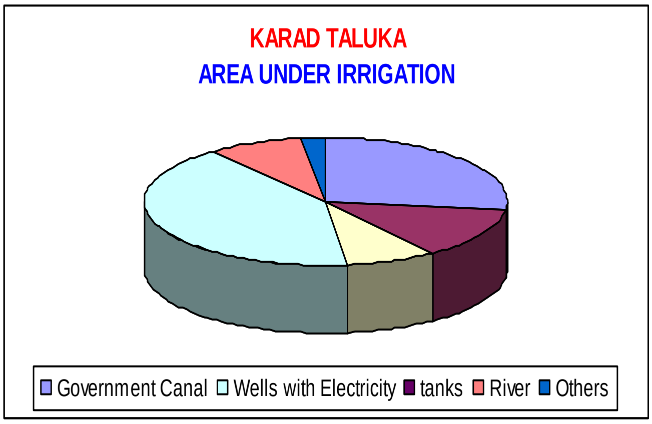
In any area agricultural development depends upon irrigation. Irrigation plays an important role in the development of agricultural sector. In study region there are a various irrigation sources. Mostly irrigated land under river source, averagely government canal, private canal, wells (with electricity) sources are provided for water agriculture.

The following table the table shows the source and area under irrigation in study region.(Table No. VI-IV)

TABLE NO.VI.IV
KARAD TALUKA
AREA UNDER IRRIGATION

Sr.No.	Sources	Area In Hectors	Percent to total
1	Government Canals	1964	9.49
2	Private Canal	93	0.44
3	Wells	510	2.46
4	Wells With Electricity	6524	31.52
5	Tanks	-	-
6	Rivers	8827	42.65
7	Other	2777	13.41
8	Total	20695	99.97

Source-Agriculture Office, Karad.



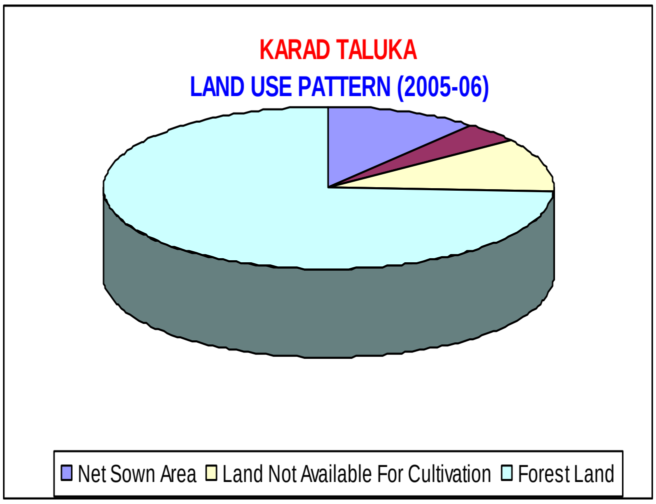


Fig. No. 6.3 A, B

6.9 TRANSPORTATION AND COMMUNICATION :

In the study region, the road network is well developed. Transport and communication play a vital role in economic development of the region. The National highway No. 4 (Pune-Bangalore) stretches from North to South direction about 45 Kms. Karad-Natepute,Khandala-Karad, Karad-Pandharpur, Patan-Karad, Karad-Kokrude are the state roads which account for 123.00 Kms. in length. In the study region Umbraj, Masur, Undale, Supane regions are well connected to state road or National Highway No. 4 Main District Roads length is 230.00 km. in the study region. Many

Villages are connected to other villages and highly scattered village roads are in Karad Taluka. Its length is 533.85 kms

TABLE NO.VI.V

KARAD TALUKA

TRANSPORT ROUTE

Sr.No.	Transport Type	Length (Km)
1	Railways	75
2	National Highway	70
3	State Roads	123
4	Main District Road	230
5	Other District Road	163
6	Village Road	533

Source-PWD Office, Karad

Form the eastern part of the study region. Pune-Bangalore broad gauge railway route stretches north to south about 40km. On this railway route Masur, Karad, Shenoli are the main railway stations.

Table No.VI-V shows the information about Railway Route and Road network of the study region.

6.10 POPULATION CHARACTERISTICS :

It is very important to study the population character of the area for the knowing the economic level of the people. The development of natural resources and the level of economic depend on the population character.

According to 2001 census the total population of Karad taluka is 5,44,296.The Rural population is 4,83,915 and Urban population is 60,340 The sex ratio of the study region is 960 females per 1000 males, which is always higher in the rural areas as compared to urban areas. Male population of Karad taluka is 2, 77,492 and female population is 2, 66,763

6.11 AGRICULTURAL SET-UP :

Agricultural is man’s most important activity since long back. After independence entire face of agriculture is changed. Agricultural is main occupation of people and seventy percent of the total population depends on agriculture. Agriculture provides food to the peoples as well as it provides raw material for the agro based industries like as sugar factory oil mills, cotton mills etc.

A remarkable change in agricultural production due to availability of inputs and the technique by adopting tractors, harvesters etc. Increase in production from agricultural sectors, due to application of a various inputs and services to the farms. Farmers achieved a great success in agriculture.

6.12 GENERAL LANDUSE :

Land use is a geographical concept since it involves specific areas. The land use study in its spatial context is essential to understand the regionalization of the areas of optimum land use degraded areas etc. Shinde, et al (1987).The land use pattern for present study means the proportion of area under different land use.

Land use is an important aspect of graphical studies particularly relevant to agricultural geography Symons,(1970). The importance of the such studies increasing with continuous increase in population, because to get the best out of from the land, diversity of topography and soil should be studied carefully in order to put the land under agriculture

There are various strategic roles in determining economic social and cultural progress, the present study deals with the agricultural productivity of the study region. Such type of study may help in understanding the regional variation in physical factors which correspond with the variation in agricultural productivity. The lane classification based on Census. The land is classified under five major types namely, Net Sown Area, Follow land, Land not Available for Cultivation and Area under Forest.

The total geographical area of the Karad taluka is 1, 04,211 hector areas. Out of the total geographical area about 10.7 percent land as under forest cover, about 74.09 percent land under Net Sown Area, 10.69 percent area out of the total geographical area is follow land, where as 4.18 percent land is not available for cultivaton. The Karad it is observed that the highest percent of land is under cultivation in 2005-06 Karad is divided into 10 different circles showing different land use.

Description of the land use pattern in the study region according to 2005-06 censuses is as given below. Table No.VII-I and Fig No. 6.5

TABLE NO.VI.VI

KARAD TALUKA GENERAL LAND USE PATTERN (2000-2001)

Sr. No.	Name of the Circles	Net Sown Area	Percent	Fallow Land	Percent	Land Not Available For Cultivation	Percent	Forest land	Percent	Total	Percent
1	Karad	4183	63.33	1213	18.36	807	12.21	402	6.03	6605	99.98
2	K.Haveli	8537	67.18	1540	12.11	425	3.34	2205	17.35	12707	99.98
3	Masur	12058	78.33	625	4.06	375	2.43	2334	15.16	15392	99.98
4	Umbraj	5882	80.05	717	9.75	717	9.75	31	0.42	7347	99.97
5	Indoli	8763	75.35	1635	14.05	251	2.15	1002	8.61	11629	100
6	Supane	4306	70.10	774	12.60	197	3.20	865	14.08	6142	99.98
7	Kole	5924	67.57	1207	13.16	344	3.92	1292	14.73	8768	99.98
8	Undale	10408	80.25	1522	11.73	290	2.23	179	5.77	12969	99.98
9	Kale	10778	78.02	1411	10.21	394	2.85	1230	8.90	13813	99.98
10	Shenoli	7449	81.84	595	6.53	596	6.54	461	5.06	9101	99.97

6.12.1 NET SOWN AREA

The highest proportion of Net Sown Area in Karad taluka is 74.39 percent. It is observed that study region is irrigated, fertile soil and plain topography. The area is rain shadow zone in Western Ghats and covered with block cotton soil. The proportion of net sown area is very low in Karad zone (63.32 percent). It is due to the fact that this zone has got more percent of area both of Krishna and Koyana river. So that influencing many factors on agriculture area. In Shenoli zone 81.66 percent many where as Indoli, Umbraj, Masur , Koparde Haveli zone has 75.21 percent 73.38,78.34,67.20 percent area this category respectively. Supane zone has 70.09 percent areas under net sown area category because this zone is not developed as compared with Karad zone.

6.12.2FALLOW LAND :

Karad taluka has 10.69 percent fallow lands to the total geographical area. The proportion of such land is highest in Karad zone, i.e 18.29 percent, where as the less proportion of fallow land in Masur zone i.e. 4.05 percent. Supane and Koparde Haveli zone having medium proportion of fallow land i.e. 12.60 percent and 12.11 percent, Umbraj 8.95 percent. Indoli, Undale, Kole, Kale and Shenoli zone has 14.03, 11.73 percent. !3.76 percent10.20 and 6.61 percent as respectively land under this category.

6.12.3 LAND NOT AVAILABLE FOR CULTIVATION :

Barren and uncultivable lands considered in this category. It is about 4.18 percent of that land. The proportion of such land is highest in Karad zone i.e. 12.16 percent and less proportion of land not available for cultivation of 2.23 percent in Undale zone, where as Kole, Kale, Koparde Haveli, Supane and Indoli zones has between the range of 2 to 4 percent. Umbraj zone has land not available for cultivation is 8.95 percent. Because there is river basin of Tarali river and some part of Krishna river.

6.12.4 AREA UNDER FOREST :

Out of the total geographical area, forest occupies about 10.7 percent in the study area. But there are variations in the regional distributions highest percent is recorded in Koparde Haveli, i.e. 17.33 percent. In Shenoli very less area under forest land is 5.12 percent. In Karad, Supane, Indoli, Umbraj, Masur zone area under forest is 6.80 percent, 14.08 percent, 8.60, 8.60 and 15.16 percent respectively.

6.13 CROPPING PATTERN :

Cropping pattern is utilization of land for cultivation of crop. Cropping pattern in India has undergone an evolutionary process. Rainfall is one of main climatic factors that affect the choice of crops and cultivation practices besides influencing the final yield. Cropping pattern in any place is largely determined by the amount and distribution of rainfall. The soil and other natural environment factors along with the socio-economic factors affect the cropping pattern. In a place and variations in cropping with pattern related to physical and non-physical conditions. Moreover it is decided by farmers cropping choice of land use depends exclusively depends on rainfall.

The spatial differentiations in the cropping pattern there for the study area as well as cultural environmental conditions. In the study region different crops are grown in Kharif and Rabbi Seasons in Karad taluka. It is evident that rice, Jowar, Pulses, Wheat, Gram, Sugarcane, Oilseeds, Sunflower are the important crops of the region. During the year 2005-06, about 34.28 percent areas is under the total food crops and 65.34 percent of the total cropped area as occupied under non food crops in the study region. Pulses covers 6226 hectors area and sugarcane covers 20439.22 hectors area.

These salient features of the agricultural land utilization and important crop of the study region are discussed as follow. Table No III-II and Fig No. 3.2 shows he cropping pattern in the study region.

6.13.1 CEREALS

In the study region Rabi season is the main season. In this season cropping pattern is different. Cereals are including Jowar, Bajara, Wheat, Maize, Rice this crops taking a study region in agricultural sectors. Cereals are most significant crops grown during rainy and winter season. It requires temperature between 15^0 c to25^0 c. It can be grown in areas where rainfall is less than 500mm. Cereals 39.75 percent and area under cereals in Masur region is 6381.73 hectors.

TABLE VI.VII

KARAD TALUKA

CROPING PATTERN

(AREA UNDER CROPS IN PERCENT)

Sr. No.	Name of the Circles	Cereals	Pulses	Sugarcane	Oil Seeds	Other Crops	Total
1	Karad	19.72	1.42	37.85	17.42	23.51	99.92
2	K.Haveli	33.64	4.71	22.3	18.72	20.6	99.97
3	Masur	39.25	25.35	6.2	12.89	16.28	99.97
4	Umbraj	8.3	9.81	41.96	19.53	20.5	100
5	Indoli	25.30	6.13	16.14	42.32	9.62	99.51
6	Supane	36.71	1.74	35.26	12.97	13.56	100
7	Kole	22.15	3.16	27.98	26.23	20.45	99.97
8	Undale	20.13	0.50	45.25	18.84	15.19	99.91
9	Kale	18.9	0.46	38.41	25.98	16.22	99.97
10	Shenoli	32.49	1.62	2.85	19.36	43.65	99.97

Source-Village Record Namuna20 Karad Taluka

In this region has highest proportion of cereals due to irrigated land and fertile soil. Farmers are using modern technologies in agricultural sectors the above reason influenced on the agricultural land. In Umbraj zone area under cereals crops is very less, only 8.03 percent gross cropped area and 516.32 hectors are under cereals crops. Because Umbraj zone is near to Sayadhri Sahakari Sakhar Karkhana ltd, Yashwantnagar. So farmers were not turned to cereals crops in Umbraj zone. Indoli, Karad, Kale, Supane, Kole, Koparde Haveli and Shenoli zone at cropping pattern is different. Undale, Koparde Haveli, supane zone area under cereals crops is high and moderate. In this region due to irrigation facilities cereals are dominant, so that crops are cultivated on large scale.

6.13.2 PULSES :

Cultivation of pulses is less as compared to other crops. The Pulses like gram, urid, matki, chavli, vall, peas, tur, moong are the pulses cultivated in Karad taluka. Area under pulses is 7.15 percent distributed in study region. Pulses are play a vital role in human body and they gives proteins and nutrients. So pulses are important in the cropping pattern. In Karad 6226.2 hectors areas under of pulses. (Fig No. 3.2)

Pulses are mostly highest in Masur zone about 25.35 percent and area is 4721.33 hectares different pulses are taken along with sugarcane and cereals crops. Very less cropped area under pulses in Undale zone is 0.50 percent. The region is more dominant in cash crops like as rice, wheat, sugarcane. So pulses area is less in the southern part of Karad Taluka. Umbraj, Indoli and Koparde Haveli zones, where as moderate and less area under pulses cultivation pulses cultivation found in Karad, Supane and Kole zones during 2000-01.

6.13.3 SUGARCANE :

Sugarcane is most important cash crops occupied 23.47 percent of total cropped area. Karad is famous for cultivation of sugarcane because irrigation facilities and fertile soil. In recent years there is even spatial distribution in the taluka. Sugarcane cultivation is largely confined in Koparde Haveli, Umbraj, Masur, Kale, Supane, Undale and Karad due to availability of fertile and alluvial soil; irrigation facilities are dominant like canal, well and lift irrigation facilities. Area under cultivation is more in Undale 45.25 percent. Cultivation of sugarcane plays a vital role in the development of farmers. Land under cultivation of sugarcane crops is highest in Undale due to irrigation facilities is highly concentrated because mostly area comes in Krishna river and canal, well and lift irrigation. In this zone sugarcane of cultivation is less in Kole, Indoli and Masur zone because farmers are turned to mixed farming and changes in farm by various crops. Karad, Supane, Koparde Haveli, Kale, Umbraj zones highly concentrated in sugarcane cultivation of because this region are near to sugar factories like as Sahayadri Sahakari Sakhar Karkhana Ltd. Yashwantnagar. Very less area is found in Shenoli zone i.e. 1.62 percent.

6.13.4. OILSEEDS :

Groundnut, Sunflower, Soyabean, Jawas etc. are the main oilseeds cultivated in Karad taluka. The area is covered by oilseeds is 22.52 percent during 2005-06. The land under oilseeds cultivation is more in Indoli zone is 12.89 percent (2096.58 hectors).In Kole 26.23 percent, Kale 25.98 percent,Shenoli 19.36 percent, Umbraj 19.63 percent zones having moderate area under oilseeds. Very less area under oilseed cultivation during 2000-01 in Supane, Koparde Haveli i.e. 12.97 and 13.72 percent as respectively. Due to the suitable geographical condition are suitable for the cultivation of oilseeds in study region.

6.13.5 OTHER CROPS :

Other crops spices and condiments like Chilies, Spices, Vegetables, Onion, and Potato etc are grown on large scale in Karad Taluka. Other crops area is moderate as compared to Sugarcane, Cereals, Pulses and Oilseeds. Area under other crops is highly in Shenoli zone 43.63 percent. Onion, Vegetables, Fruits are given category of other crops. All zones take other crops like as water melon, Chikku, Tamarind, Papaya etc. Less area under crops in Indoli zone is 9.32 percent. Increasing area under other crops as compared to different crops because of farmer is concentrated on cereals and sugarcane crops. So there is not increase in the production of other crops. (Table No.VI-VII)

6.14 DISTRIBUTION AND FUNCTIONAL CLASSIFICATION OF AGRO SERVICE CENTRES :

Agriculture occupies very strategic status in Indian economy. It provide main source of livelihood for seventy percent population of our country. The welfare of the society depends on agriculture and development of agriculture depends on Agro Service Centre. For this development Agro Service Centres providing essential agricultural inputs and no doubt it can brings agricultural as well as social prosperity.

6.15 DISTRIBUTION OF AGRO SERVICE CENTRES :

Being the location in Krishna and Koyana basin the Karad taluka is greatly flourished by suitable agricultural condition. Agricultural land is under major Cereals, Pulses, Oilseeds and Sugarcane. In the study region within 2 to 4 km area minimum one Agro Service Centres is there.

In the study region maximum number of Agro Service Centres was there in Karad Circle. Karad representing the head quarter of taluka place. There were 43 Agro Service Centres providing facilities to farmers of the surrounding area. Farmers buying Fertilizers, Pesticides and Insecticides from centre near to the village.

Minimum numbers of Agro Service Centres were there in Indoli Circle. Only 3 Agro Service Centres serving to the cultivators. More than 10 Agro Service Centres in the Kale Shenoli, Masur, Umbraj, Karad circles. (Table No.VI-VIII)

TABLE VI.VIII

KARAD TALUKA DISTRIBUTION OF AGRO SEVRNICE CENTRES

Sr.No.	Name of the Circles	No. of ASC,s
1	Karad	43
2	K.Haveli	04
3	Masur	14
4	Umbraj	03
5	Indoli	14
6	Supane	05
7	Kole	09
8	Undale	05
9	Kale	17
10	Shenoli	13
Total		**127**

Source-Field Work

6.16 CLASSFICATION OF AGRO SERVICE CENTRES :

Agro Service Centres can be classified into five service groups according to their services and functions.

TABLE VI.IX

KARAD TALUKA

DISTRIBUTION OF FUCTIONS AND SERVICES OF AGRO SEVRNICE CENTRES

Sr.No.	Groups	Functions And Services
1	I	Fertilizers Seeds and Insecticides Facilities
2	II	Primary Agricultural Credit Societies Satara District Central Cooperative Banks Land Development Bank Facilities
3	III	Veterinary Institutions
4	IV	Markets
5	V	Agricultural implements

It is worthwhile to mention here that individual services instead of service groups have been considered for the selection of Agro Service Centres from the total study region. The place possessing at least four services or functions termed as Agro Service Centre. There 127 Agro Service Centres in the entire region out of this 40 in urban area and remaining 87 Agro Service Centres were in rural area during 2000-01. (Table No.VI-XI)

6.17 DISTRIBUTION OF PRIMARY AGRICULTURAL CREDIT SOCIETIES (PACS) :

A co-operative Credit society of farmers is commonly known as primary agricultural credit society. It is very useful to farmers Agro Service Centres plays significant role in the development of agriculture. It makes available the short term and medium terms loans to farmers those who are members of the credit society. The major functions of PACS are to supply and distribution of High Yielding varieties of seeds and fertilizers with seed drills. It supplies irrigation facilities; spray pumps, dusters and other agricultural implements and also helps in marketing. It is best option for the progress and development of agriculture.

In Karad taluka there were 135 agriculture credit societies, Spread all over the taluka .

Primary credit societies were unevenly distributed all over the taluka maximum numbers of PAC's were recorded in Kale circle i.e. more than 15. Medium concentration (13 to 15) observed in Supane, Karad, Shenoli, Undale, Koparde Haveli, and Umbraj. Remaining PAC; s below 12 are there in Indoli,Masur, and Kole circle

6.18 DISTRIBUTION OF THE BANKS :

The financial supply is most important economic valuator of the agriculture development. The substantial amount of finance or credit is required for different activities related to agriculture. The timely availability of finance can promote farmers quick and faster progress in the agriculture. The capital required for purchase of manures fertilizers, hybrid seeds and buy machineries for the permanent improvement like a leveling and extension of land. The district central co-operative bank and primary agricultural credit society are the mains sources of finance. In Karad taluka 44 branches of SDCCB located in the entire region provides agricultural Facilities in the form of short, medium and long terms loans to the farmers. In Shenoli circle maximum number of branches of SDDCB s.Low concentration of SDCC banks in Masur, Umbraj,Supane and Kale Circle.

The land development banks provide loans to dug well, repair and maintenance of oil engine or to purchase oil engine or electric pumps. It also makes available loans for pipelines, tube wells and life irrigation schemes. It also funding for animal husbandry and dairy farming.

In Karad city two branches were there branch, one was for south Karad and another for other part of Karad i.e. north Karad,one for and Patan and Umbraj. In Karad taluka some Nationalized, Scheduled, Co-Operative, Commercial Banks with some Credit Societies located at Karad, Umbraj, Masur, Undalle, Shenoli, Kale, Rethare (BK) providing facilities of loans to farmers.

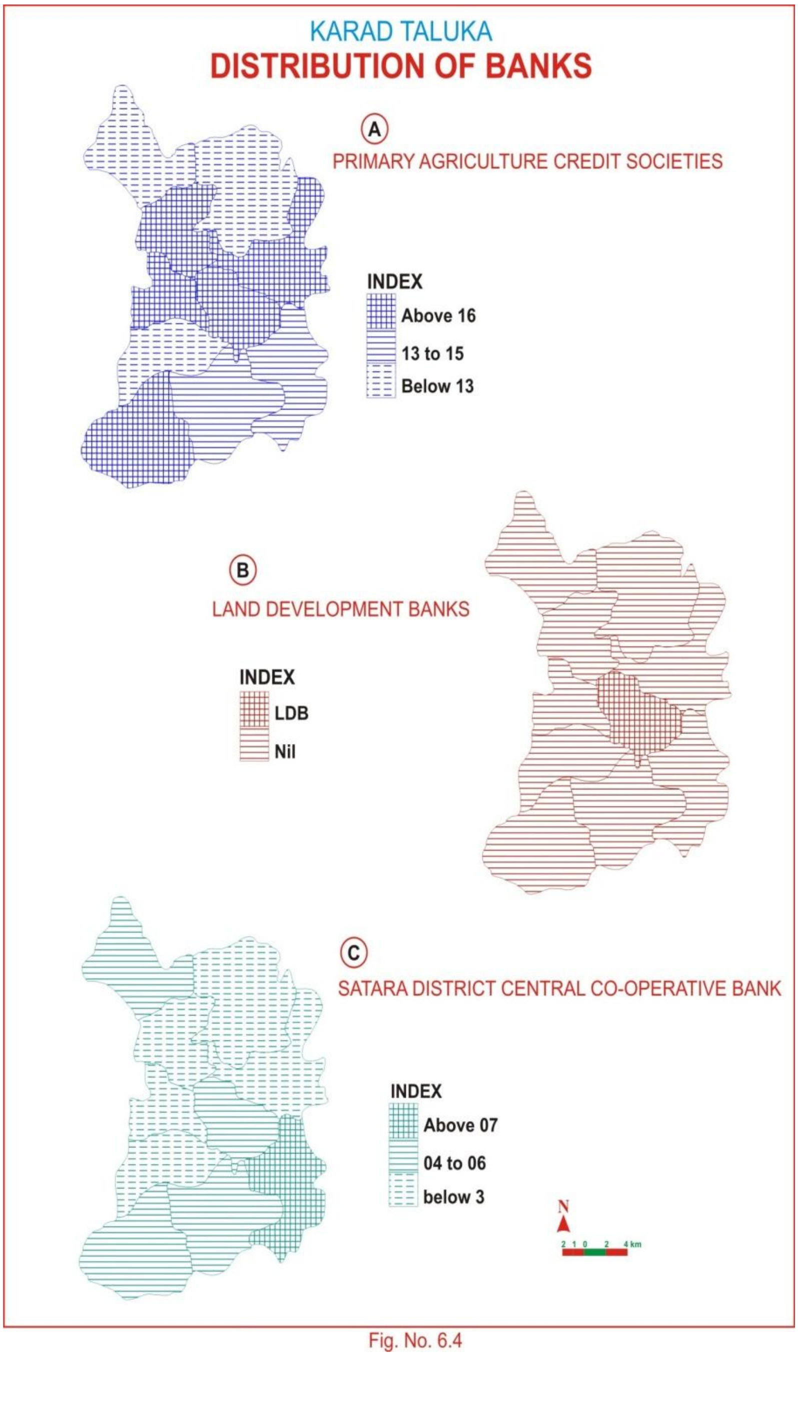

KARAD TALUKA
DISTRIBUTION OF BANKS
A
PRIMARY AGRICULTURE CREDIT SOCIETIES
INDEX
Above 16
13 to 15
Below 13
B
LAND DEVELOPMENT BANKS
INDEX
LDB
Nil
C
SATARA DISTRICT CENTRAL CO-OPERATIVE BANK
INDEX
Above 07
04 to 06
below 3
N

Fig. No. 6.4

6.19 DISTRIBTUTION OF THE MARKETS :

The market provide the facilities like trade and commerce to the region along with deep social contacts and also serving as diffusion and focus other political and other activities with information. There are three main types of the markets.

A) Weekly Market

B) Submarket Yard

C) Market yard

A) Weekly Markets -

The Agro Service Centres in the study area supported by the weekly market function. Weekly markets were located at the main central village which form path network. Most of the medium and small Agro Service Centres have weekly markets.

B) Regulated Markets -

It has market yard and submarket yard services. There are the collection centres of agricultural commodities. It ensures the prizes/ values of farm products. Market yards improved the importance of Agro Service Centre. In the study region two market yard and four submarket yards were found. Market yards were at Karad and Umbraj and Submarket yards were in cities like Karad, Masur, Shenoli, Umbraj This markets regulates and carry out the trades in Jawar, Soya been, Pulses, Oilseeds Jaggery, Vegetables and other farm products.

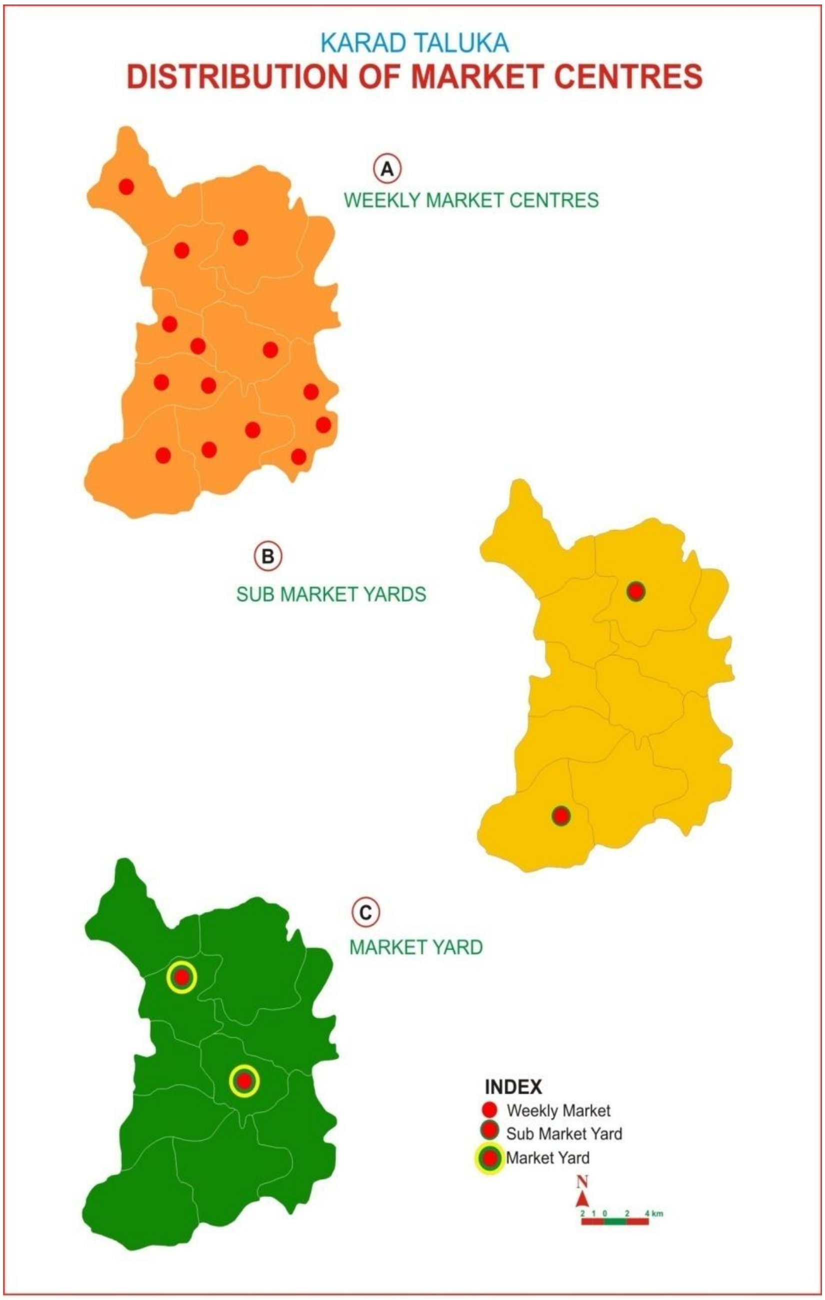

KARAD TALUKA
DISTRIBUTION OF MARKET CENTRES
A
WEEKLY MARKET CENTRES
B
SUB MARKET YARDS
C
MARKET YARD
INDEX
Weekly Market
Sub Market Yard
Market Yard
N
2 1 0 2 4 km

Fig. No. 6.5

6.20 DISTRIBUTION OF VETERINERY HOSPITALS :

It includes dispensaries and Clinics. It consist key village court, state level and district level animal insemination centres.The head quarter of veterinary clinic was at Karad providing Veterinary aid in remote areas of the taluka or the surrounding areas. 16 veterinary dispensaries run by state government and 14 dispensaries wine run by Zill Parishad in 2000-01. (Table No.VI-X)

TABLE VI.X

KARAD TALUKA

DISTRIBUTION OF VETERINARY DISPENSARIES

Sr. No.	Name of the Circles	State Level Veterinary Dispensaries	District Level Veterinary Dispensaries
1	Karad (Head quarter)	Karad(1)	-
2	K.Haveli	Koparde Haveli Karwadi(2)	Surli(1)
3	Masur	-	Shamgaon, Helgaon, Masur (3)
4	Umbraj	-	Umbraj,Talbid,Perale (3)
5	Indoli	Pal ,Chore(2)	--
6	Supane	Supane Tambve(2)	--
7	Kole	Wing.Kole ,Kusur(3)	--
8	Undale	Yelgaon(1)	Talagaon,Mhasoli Undale (3)
9	Kale	Kale ,Wathar(2)	Ond (1)
10	Shenoli	Rethre(B),Vadgaon Haveli,Belawade(3)	Belwade Shenoli Hazarmachi (3)
Total		**16**	**14**

Source-Veterinary Head Office, Karad.

6.21 DISTRIBUTION OF EXTENSION SERVICE :

Extension Service is performed as Training and visit system introduced by Maharashtra Government. The village workers agriculture officers receive training on fixed for the agricultural practices and transmit the same to the farmers. In this concept visit to field and farmers expected. Extension service centres introduced in 1981. Demonstration various experiments in the field with practical knowledge included in this service .Extension service centres largely concentrated in Undale , Karad, and Shenoli circles. (Table No.VI-XI)

TABLE VI.XI

KARAD TALUKA

DISTRIBUTION OF EXTENSION SERVICE CENTRES

Sr.No.	Name of the Circles	No. of Extension Centres
1	Karad	4
2	K.Haveli	3
3	Masur	3
4	Umbraj	2
5	Indoli	3
6	Supane	3
7	Kole	3
8	Undale	8
9	Kale	1
10	Shenoli	4
Total		**34**

Source-Agriculture Office, Karad.

6.22 DISTRIBUTION OF FERTILIZERS, SEEDS AND INSECTICIDES FACILITIES :

The production of the crop not only increased but also fertility of the soil maintained by use of fertilizers. It provides nutrient to the soil. In today, s era farmers adopted new techniques with use of improved inputs. There are 14 fertilizer distribution centres providing fertilizers facilities to the farmers.

More concentration of fertilizer distribution centre found in Karad,Shenoli, Kale, Masur and Umbraj Circles,but in Supane, Indoli, Undale and Kole circles. Less fertilizers distributioln centres seeds are the basin agricultural input, it directly related to high producton of agricultural commodities. Government established state seed corporation in 1976. This extended to the district and taluka level.

Every cultivator knows the potentiality of high yielding varieties of seeds.

In the study region 110 Agro Service Centres provide 20 seed distribution facilities to the farmers. Higher concentration of seed distribution facilities were in Karad Masur, Shenoloi, Kale and Umbraj circle where as low concentration oin Kole, Indoli, Koparde Haveli zone.

Insecticides and pesticides are most helpful to the farmers to their crops from seven attacs of insects and pest. This attack can decrease the production. For the protection of crops, Zilla Parishad launched some campaigns.

There were 13 insecticides distribution facilities. Out of 127 agro service 94 Agro Service Centre providing insecticide facilities. High concentration were in, Karad Kale, Masur circles and Kole, Indoli, Undale recorded low concentration of insecticide facilities. There were no such facilities in Supane circle study area.

6.23 DISTRIBUTION OF AGRICULTURAL IMPLEMENTS AND MACHINERIES :

Farm implements and Machinery are crucial input for efficient and timely preparation of land. Harvest and allied operation facilitating multiple cropping resulted into more production. Irrigation facilities have been development in the study region and the use of farm implements has been increased. (Table No.VI-XII)

TABLE VI.XII

KARAD TALUKA

DISTRIBUTION OF AGRICULTURAL IMPLEMENTS AND MACHINARY

Sr.No.	Circles	Distribution Of Agricultural Implements And Machinery (%)			
		Tractors	Ploughs	Seed Drills	Spray Pumps
1	Karad	7.74	9.85	7.90	8.42
2	K.Haveli	8.02	8.90	8.25	11.04
3	Masur	8.24	8.90	8.36	9.08
4	Indoli	9.96	9.47	9.55	7.78
5	Umbraj	10.10	10.17	11.00	10.79
6	Supane	11.06	10.01	11.34	6.36
7	Kole	8.60	9.85	7.94	11.04
8	Undale	11.40	10.81	12.61	9.29
9	Kale	11.40	11.13	11.15	13.30
10	Shenoli	12.72	10.91	11.00	12.72
Total		**100**	**100**	**100**	**100**

Source-Agriculture book, Karad Taluka (2004-2005)

Agricultural implements and hand tools plays a vital role. Extensive demonstration of suitability and profitability of using advanced implements and tools was extended to small farmers to marginal farers. The most implements are plough, seed drills, spray pumps, dusters, rollers levelers, bullock carts and threshers.

A) Ploughs :

In Indian agriculture two types of ploughs are there i) Deshi plough and ii) molded broad plough of western origin. The wooden and steel (iron) ploughs were found in study region. The high concentration of plough was found in kale circle. It shares bout 11.13 percent to the total, the moderate concentration of plough was found in the circles like Umbraj, Kole, Masur, Supane and Shenoli. There was more number of agricultural workers so the concentration of plough is more.

B) Tractors :

Tractors are playing very important role in agricultural development. It is sign of mechanization of agriculture. Therefore the superior and scientific agricultural operations are possible due to use of the tractors. There are total 1807 tractors in study area Shenoli circle shares 12.72 percent and ranking first in number of tractors due to more irrigation areas, Where as Kale, Supane and Undale shares 11 to 12 percent and shown moderated concentration. It was observed that where there irrigation facilities were more the quantity of tractors was high.

C) Seed drillers :

In the Undale, Kale and Supane circles significant concentration of seed drillers. (Above-11 percent) Moderate concentration of seed drillers were in Shenoli, Indoli and Umbraj (9 to11 percent) and low concentration of seed drillers were in Koparde Haveli, Masur (below 9 percent)

D) Spray Pumps :

The distribution of spray pumps are shown in the D figure. There were 4303 spray pumps in the study area. The high concentration was found in Kale, Shenoli and Koparde Haveli circles i.e. 13.30, 12.72, 11.04 and 11.04 percent respectively. The moderated concentration of spray pumps were in Umbraj, Masur and Undale circles. (9 to11 percent). The lowest concentration of spray pumps were in Indoli, Supane and Karad circles i.e. 7.78, 6.36, and 8.42 percent respectively.

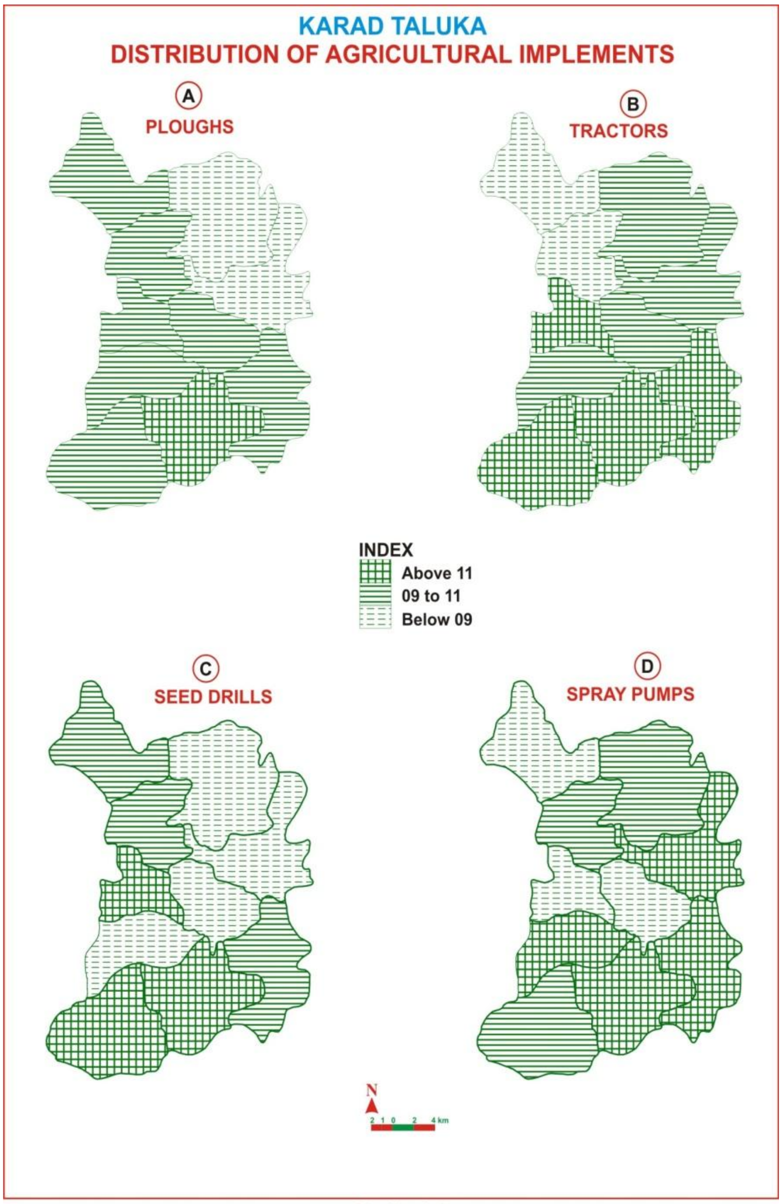


Fig. No. 6.6

6.24 CLASSIFICATION OF AGRO SERVICE CENTRES :

For understanding the classification of Agro Service Centres it is necessary to study the spatial analysis of the agro service

Centres .The classification of Agro Service Centre is based on their services and functions. The following services and functions are performed by Agro Service Centres.

i) Facilities of Fertilizers, seeds and insecticides
ii) facilities of Banking
iii) facilities of Markets
iv) Facilities of extension Services.

6.24.1 Classification of Agro Service Centres based on Fertilizers, seeds and insecticide distribution facilities :

It is very important function to distribute the fertilizers, seeds and insecticides. Distribution of the Agro Service Centre shown is in following table. In the Karad taluka 93 Agro Service Centres had the facilities of distributing fertilizers seeds and insecticides. These Centres are located in Karad city and other large towns.

TABLE VI.XIII

KARAD TALUKA

CLSSIFICATON BASED ON FERTILIZER, SEEDS AND INECTICIDES DISTRIBUTI OF FACILITIES

Sr. No.	Name of the Circles	No. of ASC,s	Number of ASC,s		
			FSI	FS	F
1	Karad	43	40	10	20
2	K.Haveli	04	04	04	04
3	Masur	14	10	15	10
4	Indoli	03	-	-	03
5	Umbraj	14	12	10	10
6	Supane	05	04	08	08
7	Kole	09	05	05	05
8	Undale	05	03	03	03
9	Kale	17	10	15	13
10	Shenoli	13	05	10	10
Total		**127**	**93**	**80**	**68**

Source-Field Work

The main concentration of Agro Service Centre is in Southern Part of Karad taluka.More concentration of Agro Service

Centres in the Karad city whereas lower concentration of Agro service Centres were there in Indoli circle because of very less land under cultivation and poor purchasing capacity of the farmers.

There were 80 agro service Centres had facilities of distribution of fertilizer and seeds. High concentration of such Agro Service Centres were in Masur, Kale circles Karad and Shenoli circles and low concentration such Agro Service Centres ion Koparde Haveli,Supne, Kole and Undale circles of the Karad taluka .Total number of only 68 Agro Service Centres were there in Karad taluka had the facilities of distribution of only fertilizers.Pre were there in Karad and Kale circles and less were there in Indoli , Kole and Koprade Haveli circles.

Some Agro Service Centres perform the function distribute the herbicides, fungicides, farm implements and cattle food.

There were 75 Agro Service Centres had the facility on distribution of the herbicides, fungicides, farming implements and cattle food. The Agro Service Centres of distribution of herbicides and fugitives were more there in the Karad and th Kale circles. Only 23 –Agro Service Centres had the facilities of. Distribution of farm implements like spray pumps and all types of tools required for agricultural activities. 35 Agro Service Centres were providing facilities of availability of cattle foods out of 127 Agro service Centres in Karad taluka. (Table No.VI-XIII)

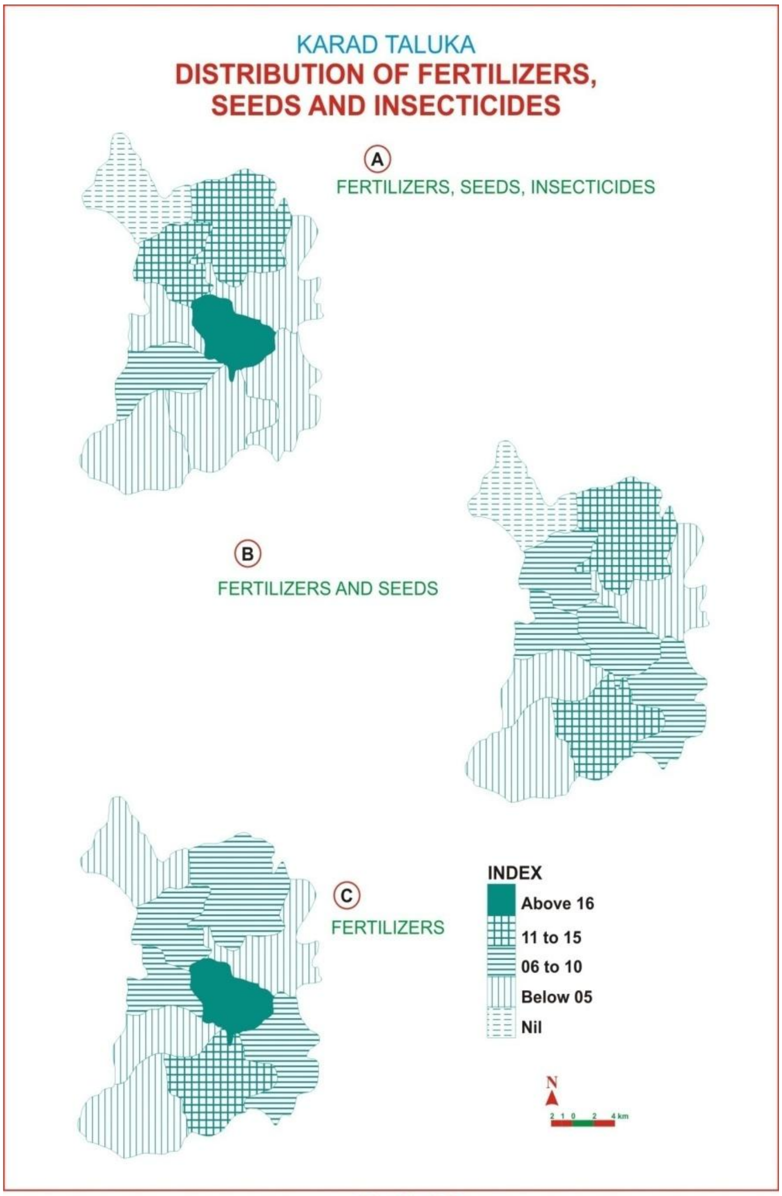

KARAD TALUKA
DISTRIBUTION OF FERTILIZERS, SEEDS AND INSECTICIDES
A
FERTILIZERS, SEEDS, INSECTICIDES
B
FERTILIZERS AND SEEDS
C
FERTILIZERS
INDEX
Above 16
11 to 15
06 to 10
Below 05
Nil
N
2 1 0 2 4 km

Fig. No. 6.7

TABLE VI.XIV

KARAD TALUKA

CLSSIFICATON BASED ON HERBICIDES, FUNGICIDES, IMPLEMENTSAND CATTLE FOOD DISTRIBUTI OF FACILITIES

Sr. No.	Name of the Circles	No. of ASC,s	Herbicides	Fungicides	Implements	Cattle Food Outlets
1	Karad	43	10	25	10	10
2	K.Haveli	04	04	02	-	-
3	Masur	14	05	-	-	10
4	Indoli	03	03	03	-	-
5	Umbraj	14	10	10	05	-
6	Supane	05	-	05	-	03
7	Kole	09	08	-	-	04
8	Undale	05	05	05	03	-
9	Kale	17	15	15	-	10
10	Shenoli	13	10	08	05	-
Total		**127**	**75**	**78**	**23**	**35**

Source – Namuna form 20 Karad.

6.24.2 Classification of ASCs oil based on PACs SDCCBs and LDB facilities :

Financial institutes are the life blood of the Agro Service Centres. In the Karad taluka out of 127 Agro Service Centres were with only 3 land development bank facilities. 91 Agro Service Centres with the facilities of SDCCBs were in Karad circle because of road accessibility, irrigation facilities, fertilize land and large number of agricultural workers.

TABLE VI.XV

KARAD TALUKA

CLSSIFICATON BASED ON PACS, SDCCB, LDB FACILITIES

Sr.No.	Name of the Circles	No. of ASCs	Number of ASC,s with		
			SDCCB, LBD	SDCCB, PACS	PACS
1	Karad	43	01	38	06
2	K.Haveli	04	-	02	02
3	Masur	14	-	09	05
4	Indoli	03	-	02	02
5	Umbraj	14	-	10	01
6	Supane	05	-	02	03
7	Kole	09	-	04	05
8	Undale	05	-	03	02
9	Kale	17	-	15	02
10	Shenoli	13	-	06	07
Total		**127**	**01**	**91**	**35**

Source- Socio economic Abstract 2005-05

In the eastern and northern part of Karad taluka low concentration of LDB and SDCCB, s due to rain shadow area and extreme rural area. (Table No.VI-XV)

6.24.3Classification of agro service Centres on the basics of market facilities :

The classification of Agro Service Centres on the basis of market facilities shown the help of following table and figure 67 Agro Service Centres were functioning with weekly market facilities. There were no weekly markets in Koparade Haveli circle. There were 10 ASC, with market yard facilities in the Masur and the Umbraj circles. No other circles had the facilities of sub markets. There were 56 ASCs with without weekly market facilities in the Karad taluka.High concentration of ASCs with weekly markets in Kale circles.

(Table No.VI-XVI)

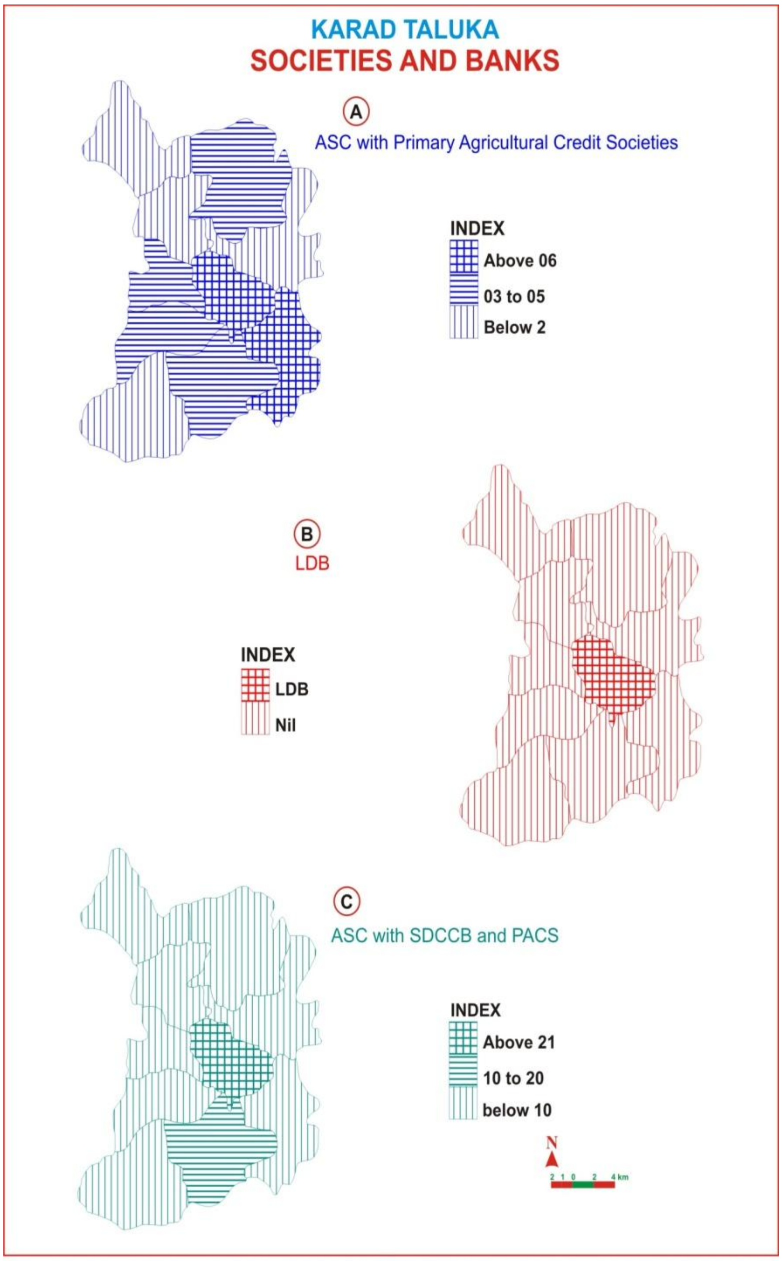

KARAD TALUKA
SOCIETIES AND BANKS
A
ASC with Primary Agricultural Credit Societies
INDEX
Above 06
03 to 05
Below 2
B
LDB
INDEX
LDB
Nil
C
ASC with SDCCB and PACS
INDEX
Above 21
10 to 20
below 10
N

Fig. No. 6.8

TABLE VI-XVI

KARAD TALUKA

CLASSIFICATON BASED ON FACILITIES OF MARKET

Sr. No.	Name of the Circles	No. of ASC,s	ASC,S With Weekly Market	ASC,S With Sub Market yard	ASC,S With Market yard	ASC,S Without Market yard
1	Karad	43	30	-	30	13
2	K.Haveli	04	-	-	-	04
3	Masur	14	08	08-	-	06
4	Indoli	03	02	-	-	01
5	Umbraj	14	08	-	08	06
6	Supane	05	02	-	-	03
7	Kole	09	03	-	-	06
8	Undale	05	02	02	-	03
9	Kale	17	11	-	-	07
10	Shenoli	13	04	-	-	09
Total		**127**	**67**	**10**	**38**	**56**

Source- Socio economic Abstract 2005-05

6.24.4 Classification of ASCs Based On Extension Services :

Development of Agro Service Centres depends on extension services. Extension services are related to in formal education. Collecting information on the field or outdoor it is connected directly to the farmers for the training and guidance. There are 55 Agro Service Centres with extension facilities. Maximum number of Agro Service Centres with extension facilities is in the Masur circles. Moderate concentration were in Kole, Umbraj,Karad, Sheloli circles. 72 Agro Service Centres were without extension Centres out of 1 to 7 Agro Service Centres. During 2005-06 high concentration of such Agro Service Centres in Karad circles. (Table No.VI-XVII)

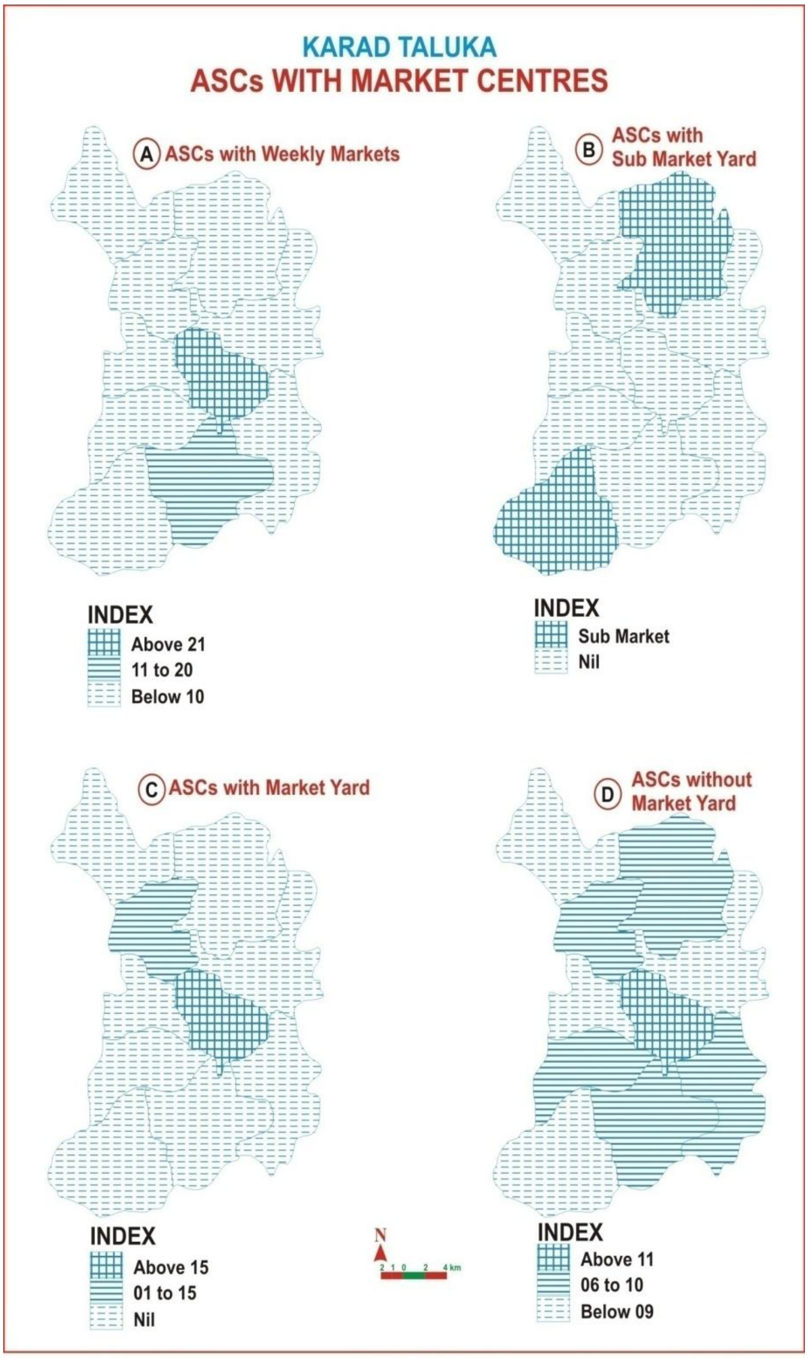

KARAD TALUKA
ASCs WITH MARKET CENTRES
A ASCs with Weekly Markets
INDEX
Above 21
11 to 20
Below 10
B ASCs with Sub Market Yard
INDEX
Sub Market
Nil
C ASCs with Market Yard
INDEX
Above 15
01 to 15
Nil
N
2 1 0 2 4 km
D ASCs without Market Yard
INDEX
Above 11
06 to 10
Below 09

Fig. No. 6.9

TABLE VI.XVII

KARAD TALUKA

CLSSIFICATON BASED ON

THE BASIS OF EXTENTION SERVICES

Sr. No.	Name of the Circles	No. of ASC,s	ASC,s With Extension Service	ASC,s Without Extension Service
1	Karad	43	08	35
2	K.Haveli	04	-	04
3	Masur	14	10	04
4	Indoli	03	01	02
5	Umbraj	14	09	05
6	Supane	05	04	01
7	Kole	09	07	02
8	Undale	05	04	01
9	Kale	17	04	13
10	Shenoli	13	07	08
Total		**127**	**55**	**72**

Source-Agriculture Office, Karad

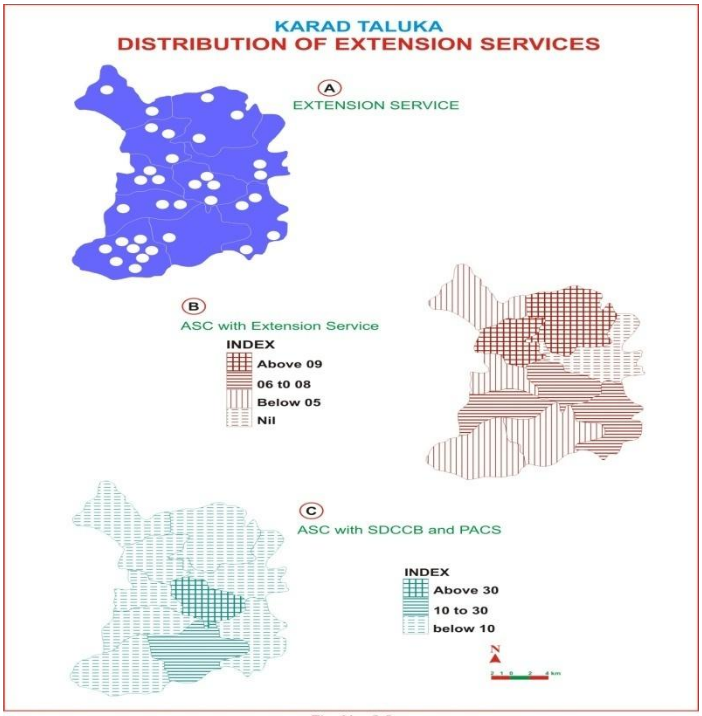


Fig. No. 6.9

6.25 SPATIAL DISTRIBUTION OF AGRO SERVICE CENTRES :

In this part of chapter an attempt has been made to study spatial distribution of Agro Service Centres and their relationship with physical and economical factors are correlated with the number of Agro Service Centres in the study area. These factors are altitude, soil types, net sown area, irrigated area and agricultural implements. Actually the total picture is the result of the cumulative effect of all these factors. Environmental factors are affecting on different categories.

CORRELATION ANALYSIS :

6.25.1 Correlation between Altitude and Number of Agro Service Centres :

An Altitude plays an important role in the distribution of Agro Service Centres. It encourages the growth and development of agriculture. Relief map 2.2 used for the superimposition of the distribution of Agro Service Centre in the study area. Fig No. 6.1. Shows the impact of altitude on distribution of Agro Service Centres in the entire region. In the altitude the zone of more than 900 meters, there is minimum Agro Service Centres while in the below 600 meters altitude circles. 5 Agro Service Centres comes in 900 meter altitude zone and showing distribution on map. Only 9.44 percent Agro Service Centres concentrated in the 900 meters altitude zone. (12 Agro Service Centres). In 600-900 meter altitude zone is mostly belongs from hilly region, this altitude zone comes under Surali Ghat and Shamgaon region. Due to the less availability of the agricultural workers, hilly region and deficiency of irrigation facilities etc. Only 13 Agro Service Centres distributed all over 600-900 meter altitude zone. They constitute 10.23 percent of the total Agro Service Centres in the study area. However, about 80.31 percent of the total Agro Service Centres are located below 600 meter altitudinal circles. The plain topography supported by medium black soil and river basin of Krishna and Koyana river. Many sugar factories located in the region and farmers are taking cash crops in their own farm like as sugarcane, food crops etc.

In hilly region like south and east part of Karad taluka there is low concentration of Agro Service Centres. Many factors are affecting on Agro Service Centres particularly in this zone.

6.25.2 Correlations between Soil Types and Number of Agro Service Centres :

Soil types are also affecting the distribution of Agro Service Centres in the study area. In the study region four soil types are found. These are deep black soil, medium black soil, laterite soil and medium black soil. Superimposition of the distribution of Agro Service Centres over the soil map (Fig. No. 2.3) of the study area The impact of soil types indirectly on the distribution of Agro Service Centres showing the correlation between soil types and ASCs of study region. (Fig No. 6.2). It is observed that 61Agro Service Centres are located in the plain region, where soil is deep black soil and soil depth is more in deep black soil belt zone. Out of 127 Agro Service Centre 59 Agro Service Centres located in medium black soil. 46.45 percent of the total Agro Service Centres are lying in the belt of medium deep black soil region. It is highest concentration of Agro Service Centres comparative of the total Agro Service Centres are found in the deep black soil belts in the study region. Very few order Agro Service Centres are developed in the laterite soil and medium laterite soil. This region comes under the hilly region and rocky features affecting on the region and very poor soil in this region.

6.25.3 Correlations between Agricultural Workers and Number of Agro Service Centres :

Agricultural workers were also affecting the distribution of Agro Service Centres in the study area. In Karad taluka, kale zone have the highest number of agricultural workers and second order of Agro Service Centres.

TABLE NO VI-XVIII

KARAD TALUKA

DISTRIBUTION AGRICULTURAL WORKERS AND NUMBER OF ASCs

Sr.No.	Name of the Circles	Agricultural workers	Number of ASCs
1	Karad	7045	43
2	Koparde Haveli	9040	04
3	Masur	9500	14
4	Indoli	8200	03
5	Umbraj	8000	14
6	Supane	10500	05
7	Kole	10050	09
8	Undale	16115	05
9	Kale	17550	17
10	Shenoli	14000	13
Total		**1,10000**	**127**

Source- Agricultural department of Karad Taluka

On the other hand the zone of Karad and Umbraj have minimum numbers of agricultural workers and highest number of Agro Service Centres, because of this region well developed and mostly region comes through a urban areas. Masur, Kole, Undale, Shenoli zones also maximum number of agricultural workers but they have the moderate number of Agro Service Centres. (Table No.VI-XIII)

Karl Pearson's Rank Correlation Coefficient (rs) method is based on the ranks of given values rather than actual values. In this method, the study of correlation between two variables is studied i.e. agricultural workers and Agro Service Centres.

Karl Pearson's Rank correlation coefficient (rs) is calculated by using following formula.

$$\mathbf{rs = 1 - \frac{6\,\varepsilon\,(R_1-R_2)^2}{n^3 - n}}$$

Where, rs = Coefficient Of Correlation

$R_1 =$ Ranks given to values of first variable.

$R_2 =$ Ranks given to values of second variable.

n = the number of pairs or No. of observation.

The scatter Diagram shows the number of Agro Service Centres on the Y' axis and the agricultural workers on X' axis has been drawn for the study region. (Fig No. 6.11 A).

The scatter diagram apparently demonstrates that there is low relationship between these two variables. The agricultural workers of the zones do not perfectly conform to the number of Agro Service Centres in the respective zones. This fact brings the correlation between the two variables to a degree to almost a perfect correlation. The coefficient of correlation between these two variables indicates low positive relationships, i.e. where r = 0.28

6.25.4 Correlation between Net Sown Area and Number of Agro Service Centres :

Net sown area affects the distribution of Agro Service Centres in the study area. In Karad taluka, Masur zone have the highest net sown area and consequently this zone have the moderate number of Agro Service Centres.

TABLE NO VI-XIX

KARAD TALUKA

DISTRIBUTION OF NET SOWN AREA AND NUMBER OF ASCS

Sr. No.	Name of the Circles	Net Sown Area (Hector)	Number of ASCs
1	Karad	4183.00	43
2	Koparde Haveli	8538.59	04
3	Masur	12058.01	14
4	Indoli	8762.71	03
5	Umbraj	5882.37	14
6	Supane	4306.11	05
7	Kole	5924.69	09
8	Undale	10408.18	05
9	Kale	10778.58	17
10	Shenoli	7349.46	13

Source- Agricultural department of Karad Taluka

On the other hand, maximum net sown area and also have the maximum number of Agro Service Centres. Kale, Shenoli, Umbraj have moderate net sown area and moderate number of Agro Service Centres. It is observed that Masur zone have high net sown area, but have only moderate Agro Service Centres due to the less irrigation facilities. (Table No. VI-XIX)

The Net Sown Area and Agro Service Centres of the zones plotted on graph. The numbers of Agro Service Centres have been shown on the 'Y' axis while the net sown area on the 'x' axis. The scatter diagram exhibits that there is moderate negative relationships between the two variables. The net sown area of the zones does not perfectly conform to the number of agro service in the respective zone. There is so much difference between the ranks for net sown area and number of Agro Service Centres. The discussion shows that their exists moderate degree of negative correlation between these two variables, where

r = -0.042 (Fig No 6.11 B)

6.25.5 Correlation Between Of Agricultural Implements and Number of Agro Service Centres :

Agricultural implements are the major tool in the agricultural operation of a region. Agro Service Centres provide the facilities of repairs and maintenance of implements and the correlation between these variables is significant. In Karad taluka, Shenoli zone have the highest agricultural implements and they have 13 Agro Service Centres. In Masur zone have less agricultural implements and also they have only 14 Agro Service Centres. In Kale, Umbraj zone have higher agricultural implements and remaining zone have moderate Agro Service Centres. Karad zone have less agricultural implements and higher Agro Service Centres. It is observed that, due to this area covered under urban land and less agricultural workers. (Table VI-XX) The quantity of agricultural of agricultural implements and Agro Service Centres of ten zones plotted on the graph. The numbers of Agro Service Centres have been shown on the 'Y' axis while the quantity of agricultural implements shown on the 'X' axis. The scatter diagram (Fig No. 6.11 C) exhibits that there as is positive relationship between the two zones.

The ranks of zones of agricultural implements and no. of Agro Service Centres are identical. It is observed that the ranks for all zones excluding Kole, Koparde Haveli, Supane, Umbraj, Kale very low difference between them.

TABLE NO VI.XX

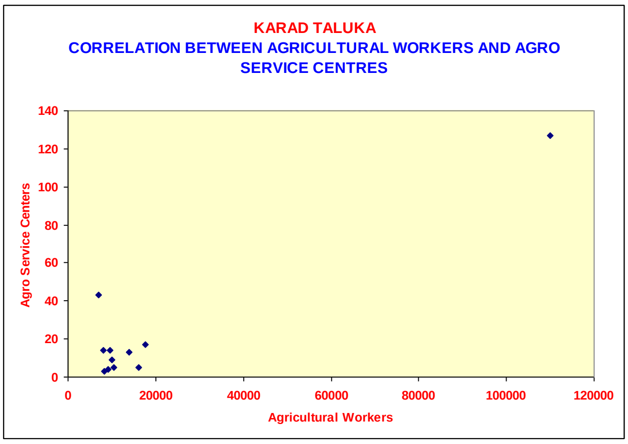
KARAD TALUKA

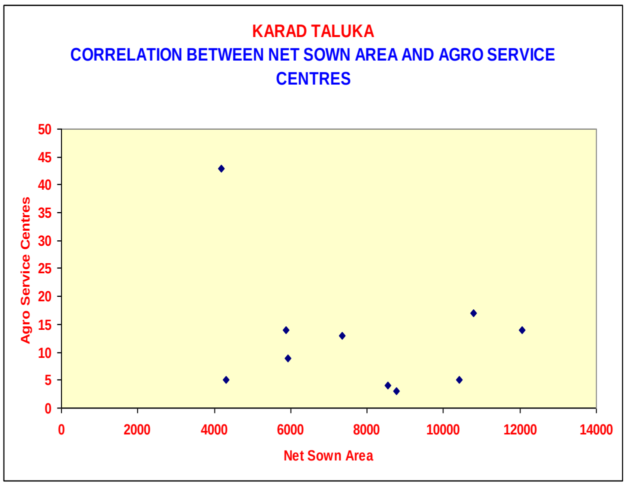
AGRICULTURAL IMPLEMENTS AND NUMBER OF ASCS

Sr.No.	Name of the Circles	Agricultural Implements	No. of ASCs
1	Karad	1505	43
2	Koparde Haveli	1528	04
3	Masur	1464	14
4	Indoli	1701	03
5	Umbraj	1785	14
6	Supane	1668	05
7	Kole	1600	09
8	Undale	1875	05
9	Kale	1957	17
10	Shenoli	1965	13

Source- Agricultural department of Karad Taluka

In the remaining the circles had moderate difference between agricultural implements and ASCs. There is low degree of positive correlation between these two variables, where r = 0.12. (Fig. No. 6.11 C).





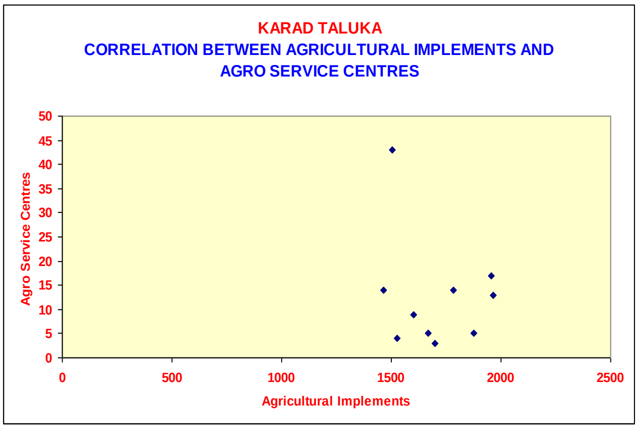


Fig. No. 6.11 A, B and C

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CHAPTER

7

SPATIAL DISTRIBUTION OF AGRO SERVICE CENTERS AND LEVEL OF AGRICULTURAL DEVELOPMENT

A) SPATIAL DISTRIBUTION OF AGRO SERVICE CENTERS

7.1 INTRODUCTION :

In this chapter an attempt has been made to study spatial distribution of agro service centers and their relationship with physical and economical factors. These are correlated with the agro service centers in the Satara district. These factors like altitude soil types net sown area irrigated area and farm implements. The total scenario is the out of cumulative effect of all these factors. The environmental factors are also affecting on different categories.

7.2 CORRELATION ANALYSIS :

7.2.1 Correlation between Altitudes and Number of Agro Service Centers :

An altitude of an any region plays important role and determine the distribution of Agro Service centres . The map of physical features used for superior position of agro service centers the figure no.1 shows impact of altitude on the distribution of agro service centers in the entire study region. (Fig.No.7.1)

In the region of move altitude that is (Above 1200 mt) minimum numbers of agro service centers are recorded i.e 541 (M'Shawar 82, Jawali 158, Wai 100, Khandala 192) service centers ,17.53% .Agro service centers located in the region of above 1200 mt height i.e. M' Shwar, Jaweli ,Khandala , Wai as this region belongs from hilly area of Sahyadri mountain ranges with some hills and hillocks less fertile soil, lack of irrigation facilities less number

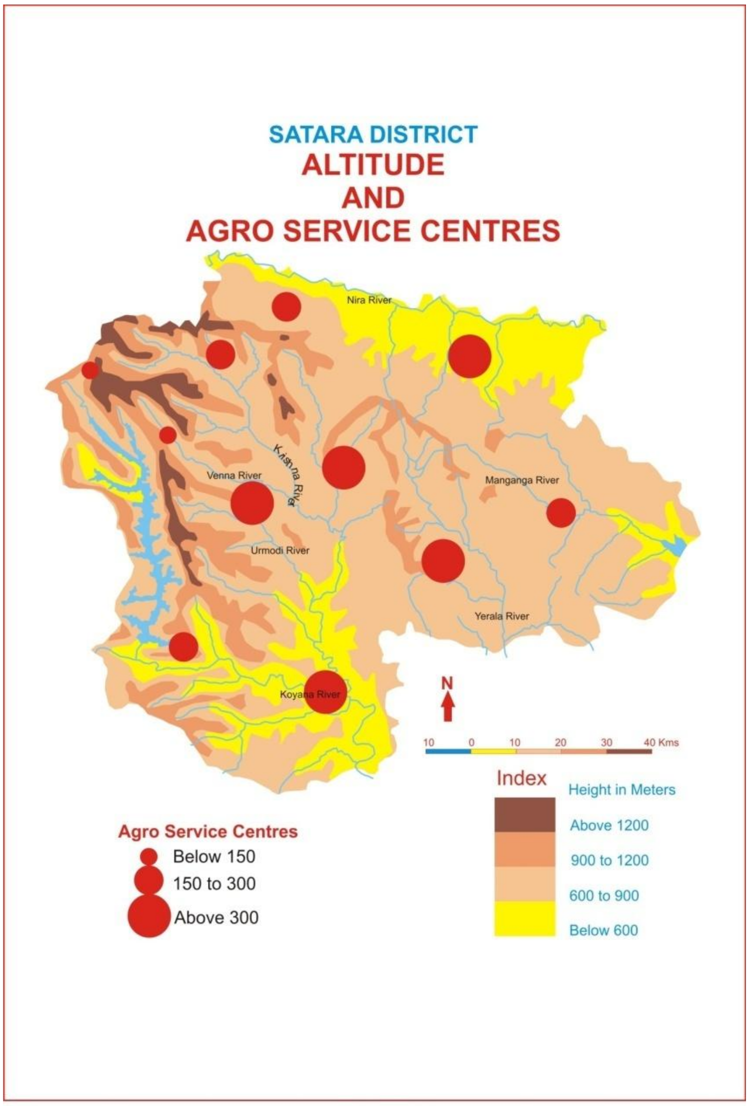


Fig. No. 7.1

of agricultural workers . This region receives move rain but very less amount water is absorbed. This region comes under command are of different irrigation project.

Large numbers of agro service centers are located in the region of height in between 500 to 1200 mt i.e. Patan, Satara, Koregaon, Wai, Karad, Khatav and Man. as this region has irrigation facilities by different sources irrigation, fertile soil, leveled land, availability of finance and conducive climatic and physiographic conditions. Some part of this region is also in drought conditions even there large number of agro service centers 47.27% Agro Service centres observed in region of 600 to 1200 mt. in study region and 35.20%. Agro Service centres recorded in the areas of height below 600 i.e. in Khandala, Phaltan, Karad and Phaltan . Only Karad (18.21%) and Phaltan taluka recorded (15.78%) Agro Service centre and i.e. is highest number in the district as per the 2010-11 record due to plain topography, alluvial soil medium black soil of Krishna Koyana basin. Total and sugar factories are located in this area out of 10 sugar factories are located in this area out of 10sugar factories along with sugarcane farmer are cultivating other food crops.

In the taluka like Mahabaleshwar and Jawali there is less number of Agro Service centres. Many factors affecting the number of Agro Service centres in the region of satara district.

7.2.2 Correlation between soil types and number of Agro Service centres :

Soil types also affecting the distribution of Agro Service centres in the Satara district In the study region four types of soils are found These are shallow black soil, medium deep black soil, deep black soil, shallow laterite soil, medium deep laterite soil and deep laterite soil. The impact of soil type indirectly in the distribution of Agro Service centres, showing correlation between soil type and Agro Service centres It is observed that the Western part of satara district comprised by shallow, medium and deep laterisoil mostly in Jawli, Patan and Mahabalershwar talulka. Some part of Satara taluka also the presence of laterite soil along with western margin of Khatav taluka, central part of Man and major part of Phaltan taluka also has laterite soil even though Phaltan recorded second ranking Agro Service centres. (fig Soil Type)

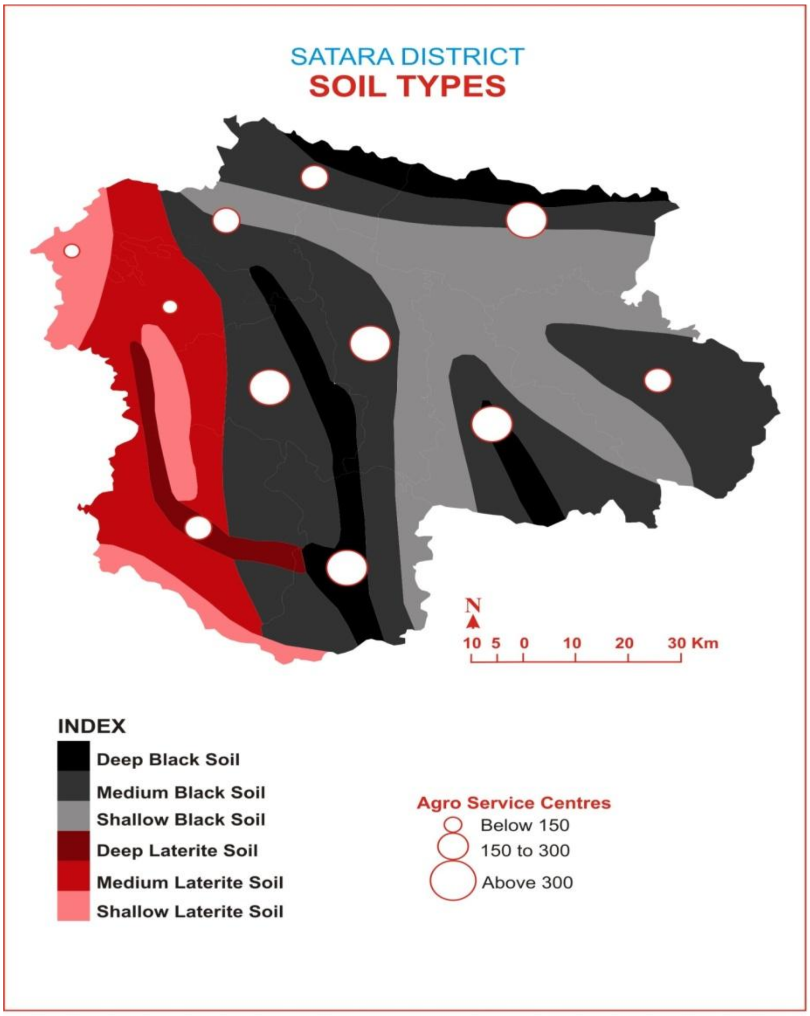


Fig. No. 7.2

Deep, medium and shallow black soil are distributed in north marginal part of Satara district along with Krishna river basin, south eastern part of Khatav and Man taluka, Karad, Satara, Koregaon,Wai taluka has large number of agro servicer centres.

In the areas of laterite soil less number of Agro Service centres i.e. in Jawali, Mahabaleshwar taluka of the district. (Fig.No.7.2)

7.2.3 Correlation between agricultural workers and number of Agro Service centres :

Agricultural workers affecting the distribution of Agro Service centres in the study area. In the satara district highest number of agricultural workers found in Karad taluka, and Phaltan was second ranking taluka in Satara district.

On the other hand, minimum number of Agro Service centres is found in Jawali and Mahabaleshwar taluka. Along with this Khandala, Wai, Man, Satara and Patan moderate number of Agricultural workers.

In Karad and Phaltan taluka highest number of agricultural labours because of irrigation facilities fertile soil, transport, communication facilities and localized in urban area.

TABLE NO.VII.I

SATARA DISTRICT

NUMBER OF AGRICULTURAL WORKERS

Sr.No.	**Name of the talukas**	**No. of ASC'S**	**No. of Agricultural Worker**			
			Main	Marginal	Total	Percent
1	M.Shwar	82	792	1170	1962	0.69
2	Wai	158	12744	6089	18833	6.70
3	Khandala	192	6457	4342	10799	3.84
4	Phaltan	487	31964	9921	41885	14.90
5	Man	284	15377	6340	21717	7.72
6	Khatav	309	19469	10842	30311	10.78
7	Koregaon	310	21632	9681	31312	11.14
8	Satara	375	16111	9907	26018	9.25
9	Jawali	109	4074	4835	8909	3.17
10	Patan	218	12923	14034	26957	9.59
11	Karad	562	43686	18623	62309	22.17
Total		**3086**	**185229**	**95784**	**281013**	**99.95**

Source- Socio Economic Abstract 210-2011

Karl Pearson's rank correlation coefficient method based is on the ranks of given values rather than the actual values. In this method the study of correlation between two variable i.e. agricultural works and Agro Service centres.

Karl Pearson's Rank correlation coefficient (rs) is calculated by using following formula

Karl Pearson's

$$\text{Rank correlation coefficient (rs)} = 1 - \frac{6 \sum (R1-R2)^2}{n^3 - n}$$

Where,

rs - Rank correlation coefficient

R1 – Ranks given to first variables

R2 - Ranks given to second variables

N – Number of Observations

The scatter diagram shown No. of Agro Service centres on the Y' axis and Agricultural workers are on the X' axis. The scatter diagram apparently had shown the very strong correlation ship in between Agro Service centres and agricultural labours. The agricultural workers perfectly confirm to the Agro Service centres in the respective circles. This fact brings perfect correlation between two factors. The coefficient correlation between the two variables indicated strong positive correlation i.e. where r = 0.93(Fig.No.7.3 A)

7.2.4 Correlation between net sown area and Agro Service centres :

The distribution of Agro Service Centres is affected by the net shown areas. In the Satara district Phaltanm, Khatabv, Koregaon, Satara and Karad have highest net sown area consequently large number of Agro Service centres. In the Khandala Man Jawali, Koregaon taluka more net sown area but Agro service centre's are comparatively less due to irrigation facilities are short.

TABLE NO.VII.II

SATARA DISTRICT

NET SOWN AREA (hectors)

Sr. No.	Name of the Taluka	No. of ASC'S	Net Sown Area (Hectors)	Percentage
1	M.Shwar	82	6468	0.92
2	Wai	158	50112	7.20
3	Khandala	192	40903	5.87
4	Phaltan	487	64419	9.25
5	Man	284	55851	8.02
6	Khatav	309	83428	11.99
7	Koregaon	310	68817	9.89
8	Satara	375	92158	13.24
9	Jawali	109	45355	6.51
10	Patan	218	92950	13.35
11	Karad	562	95278	13.69
Total		**3086**	**695739**	**99.93**

Source- Socio Economic Abstract 210-2011

The net sown area and Agro Service centres plotted on the graph. Number of Agro Service centres are on the X axis and Net sown area in hectors are on x axis. The scatter diagram exhibits moderate positive correlation ship between two variables. The Net sown area is perfectly confirming to the Agro Service centres. There is a very slight difference in Net sown area and agro service centre. This presentation shows moderate positive correlation between two variables. (r = 0.55) (Fig.No.7.3B)

7.2.5 Correlation between agricultural implements and number of Agro Service centres :

Agricultural implements are the major tool in the operation of the study region. Agro Service centre's provides the facilities of repairs and maintenance of agro farm implements. The correlation between agricultural implements and Agro Service centre is very significant.

In the Satara district Karad, Patan, Satara, Khatav, Koregaon ,Man and Phaltan taluka have higher number of agricultural implements.

TABLE NO.VII.III

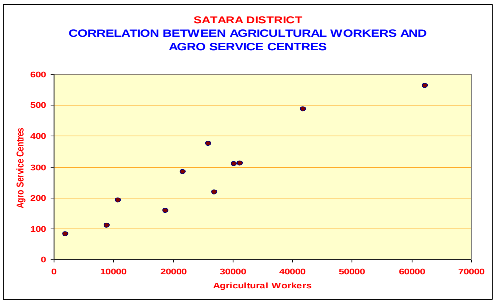
SATARA DISTRICT

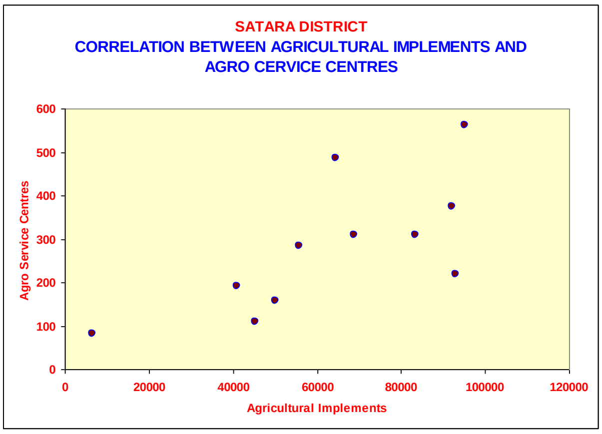
AGRICUTURAL IMPLEMENTS

Sr. No.	Name of the Taluka	No. of ASC'S	Total No. of agricultural implements	Percentage
1	M.Shwar	82	1186	0.91
2	Wai	158	11288	8.75
3	Khandala	192	3253	2.52
4	Phaltan	487	11491	8.90
5	Man	284	12286	9.52
6	Khatav	309	16620	12.88
7	Koregaon	310	11656	9.03
8	Satara	375	15646	12.13
9	Jawali	109	7157	5.54
10	Patan	218	17314	13.42
11	Karad	562	21095	16.35
Total		**3086**	**128992**	**99.95**

Source- Socio Economic Abstract 210-2011

One identical feature noticed here that Wai, Phaltan and Khatav taluka have more number of agricultural implements even though they have comparatively less number of agro services centres.Phaltan has more number of Agro Service centres and less number of farm implements due to rural area more and more agricultural operation done by the human powers.





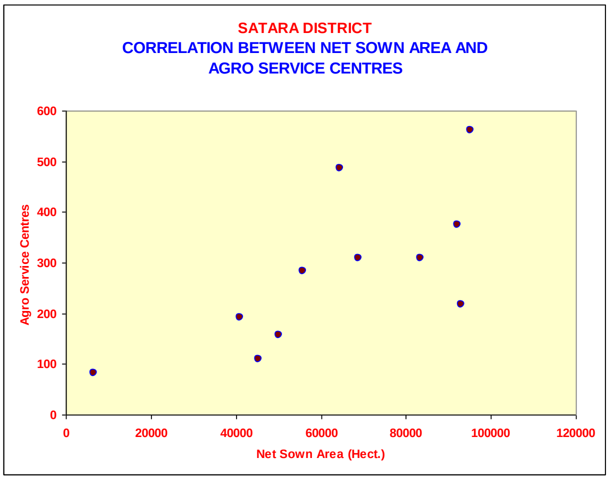


Fig. No. 7.3 A, B and C

The quantity of the agricultural implements and Agro Service centres plotted on graph. The Agro Service centre's are shown on the Y' axis and farm implements are on the X' axis. The scatter diagram exhibit strong positive relationship in between two variables.

The ranks of Agro Service centres and agricultural implements are remarkable. The high difference in two variables shown by Phaltan i.e. more Agro Service centres and fewer farms implement exactly opposite of this is Patan and Khatav taluka number of Agro Service centres and move farm implements.

There is high degree of positive correlation between two variables (r=0.72) (Fig.No.7.3C)

B) LEVEL OF AGRICULTURAL DEVELOPMEN :

7.3 Introduction :

In the Satara district spatial variation in the adoption of improved agricultural practices to ascertain level of agricultural development, The spatial variation is determined with the help of six variables viz. Net soon area, irrigated area, agricultural implements, Agricultural workers Numbered Satara districts central fo-operative banks and crop productivity of yield index of Rice, wheat, Jowar, sugarcane, Groundnut and gram crops. Besides this the development of talukas are taken with their respective categories viz high, medium and low on the basis of scores of standard deviation. These analysis have been carried out by transfer and combining the data relate to 11 variables using Z-score to get composite scores, On the basis of composite Score the talukas have been classified into high;, moderate and low development categories. As a result of the analysis shows that the modern technological inputs through agro service centres have reciprocal relationship with agricultural development in the study area.

The growth rates of total food of grain production were less in the last two decades making traditional farming a non viable agricultural activity. Disparities in productivity across the district and even within crops persist with significant increase in small and marginal land holdings. Agricultural development denotes the equality of agricultural system of the region. It is multidimensional concept which mainly includes development in real strength of cropped area? Farming system and irrigated area, high yielding improved verities of seeds, chemical fertilizers, insecticides and pesticides and specialization and commercialization of agriculture (Mohammed-1986)

The changing scenario of agro-economy drew attention of researcher on diffusion of technological development in agriculture.

Major Indian population depends on agricultural produce, so vast rural mass tries to earn their lively hood from agriculture. Fast increasing pressured of growing population on agriculture,, tradition methods of techniques of production cannot crop with growing demand..As a result new techniques and commercial crops are adopted to develop agro-economy.

7.4 Data base and Methodology :

The assessment of agriculture development secondary data used for the period 2000-01, collected from District statistical handbook, Socio-Economic abstract of district profile of Satara districts. The crops of the districts are Rice, wheat, Jowar, Sugarcane, Groundnut, and gram.

To determining the level of agricultural development various indicators variable have been used such as Net sown area, Irrigated area, Agricultural Implement Agricultural Workers, Number of SDCC Banks and Crop Productivity Yield index of the different crops.

For calculation overall levels of agricultural development and it's even, distribution the data of all variables indicators have been transformed into Z-score techniques.The formula is

$$\text{Z-Score } (Z_i) = \frac{X_i - \bar{X}}{S.D}$$

Where,

- Z_i - Z-Score For i' th observation
- X_i - Original Value of i' th observation
- $\bar{X}$ - Mean value of X' variables
- S.D. - Standard Deviation of X' variable

In order to classify taluka according to their levels of development, the composite Z-score have been grouped into high medium and low.

The result of the standard score obtained for different indicators were aggregated by composite standard score (CSS). So that regional disparities in the level of development of the study regions may be obtained on a common sale. The composite Z-score may be algebraically expressed as

$$CSS = \frac{\sum Zij}{N}$$

Where as ,

CSS - Composite Standard Score

Zij - Scored of an Indicator J in the Districts.

N - Number of indicators.

In order to classify the talukas according to the magnitude of development the composite score were divided into three classes that are high medium and low.

7.5 List of the selected indicators \ variables :

X1-Percentage of Net sown area to total cropped area

X2- Percentage of Irrigated area to total cropped area

X3- Number of Agricultural Implement

X4-Number of Agricultural Workers,

X5-Number of SDCC Banks

X6-Crop Productivity Yield index of the different crops.

X6a - Rice,

X6b - wheat,

X6c - Jowar,

X6d - Sugarcane,

X6e - Groundnut, X6f - Gram.

Agricultural development is a multi dimensional activity and key to which is crop productivity as one of the vital aspect of rural development. The objective of agricultural development is usually increased growth of agricultural output to provide the livelihood to growing population.

TABLE NO.VII.IV

SATARA DISTRICT

STANDARD SCORE FOR AGRICULRAL DEVELOPMENT

Sr. No.	Taluka	X1	X2	X3	X4	X5	X6						Composite Index
							X6A	X6b	X6c	X6d	X6e	X6f	
1	M.Shwar	-2.18	-2.50	-2.18	-1.48	-0.13	-1.8	-1.5	-0.03	-0.1	-	-	- 1.07
2	Wai	-0.50	-0.12	-0.09	-0.4	-0.05	0.41	0.4	0.04	-0.1	-0.35	0.11	- 0.45
3	Khandala	0.00	-0.72	-1.75	-0.92	-0.03	-0.6	0.93	-0.03	0.0	0.14	-0.69	-0.51
4	Phaltan	0.04	1.46	-0.05	1.02	0.05	-	3.1	-0.01	-	2.67	1.20	0.86
5	Man	-0.28	0.04	0.11	-0.24	-0.03	-	0.1	-0.04	--	-0.70	0.44	-0.05
6	Khatav	0.77	0.19	1.01	0.2	0.01	-	-0.4	0.00	0.0	0.41	-2.05	0.01
7	Koregaon	0.21	0.06	-0.01	0.3	0.00	1.30	0.0	0.02	-0.1	0.01	0.51	0.39
8	Satara	1.10	0.16	0.81	0.02	0.11	-0.7	-0.8	0.00	-0.1	-0.10	0.26	0.06
9	Jawali	-0.68	-0.37	-0.94	-1.04	-0.08	0.64	-1.5	0.01	0.1	-	-0.64	-0.40
10	Patan	1.18	0.56	1.15	0.08	0.00	0.08	-0.6	-0.01	-0.1	-	-	0.23
11	Karad	1.24	1.23	1.94	2.3	0.18	0.83	2.11	0.04	0.0	-0.00	1.37	1.02

Source-Complied by researcher

7.6 Distribution of variables/indicators :

7.6.1 Net sown area. (X1) :

The net sown area can be defined as the total area sown in a year. High net sown area higher will be the crop production and reflected in agricultural development. The top position occupied by the Karad taluka (1.24) evident from table No.2 out of 11 talukas are under this category.

The medium group ranges from 1.00 to 0.00) There are only three talukas under this category Wai (-30), Man (-0.28) and Jawali (-0.68) and only one taluka i.e. Mahabaleshwar are under third category i.e. low development.

7.6.2 Irrigated area (X2) :

Irrigation is very vital for any kind of agricultural development and prerequisite for the success of modern technology in agriculture. The need of artificial and additional water supply is always felt in successful farming operation. Irrigation plays significant role in the entire agriculture sector. The changing trends in intensity of irrigation portrays main's dynamic attempt to overcome environmental limitations to transform the potential of the area into agricultural resource (Singh 1974).The total irrigated area has been calculated as percent of the total sown area and further calculated Z-score of total irrigated (above 0.70)

The high level of irrigation has been observed in Phaltan (1.46), Karad (1.23) Man (0.04),Khatav (0.19), Koregaon (0.06) Satara (0.16) and Patan, Medium level of irrigation has been observed in Wai-(0.12), Khandala (0.72) and Jawali (-0.37). There is only one taluka indicates low level of irrigation i.e. Mahabalewhwar (-2.18).

7.6.3Agricultural implements (X3) :

Advanced agricultural technology is not only the package of Hybrid seeds and other modern inputs, but it also incorporates new agricultural practices. This has made the mechanical power necessary for some operations which is very necessary during scarcity of labours relatively high wages labours particularly during peak season. Agricultural implements development or in other works these are the key to the modern agricultural development. The backwardness of the Indian agricultural implements has been recorded in Karad (1.94), Patan (1.15) Jawali (0.81),Khatabv (1.01) and Man (0.110 which ranges above (0.00) which the medium level of agricultural implements shown by Phaltan (-0.05) Wai (00.09), Koregaon (-0.01) Jawali (0.94) and Mahablewhwar land Khandala iln lowest category due to barran land, rugged topography, lack of irrigation.

7.6.4 Agricultural workers (X4) :

Agricultural workers are also important factors for agricultural development like chemical fertilizers. HYV seeds machinaries etc. There are many activities in the field which they perform. The highest number of agricultural labour has been found in Karad taluka (2.3). Other talukas in high category are Phaltan (1.02), Khatav (0.2), Koregaon (0.3) Satara (0.02) and Patan (0.08). The talukas ranging from -0.4), Khandala (-0.92) and Man (-0.24). Mahabaleshwar and Jawali taluka are ranging from below (1.00) category showing lowest level of development in agricultural labours/workers.

7.6.5 Satara District Central co-operative Bank(X5) :

SDCC Bank plays very important role in the agricultural development. The phenomenal growth in the consumption of chemical fertilizers and other modern inputs can be made possible largely because of liberal provision of credit or loan to the cultivators by the co-operative of government. These Banks provide loan and subsidies to the farmers in terms of cash or machines and tools like tractors and pump sets. With the help of these facilities farmers accelerated the productivity of different crops.

Branches of SDCC Bank not equally distributed in the study regions. The high Z-score of SCCC Banks has been recorded in Phaltan (0.05), Khatav (0.01), Koregaon (0.004) Satara (0.11) Patan 90.08) and Karad (0.18) and medium level (-1.00) recorded in

Mahabaleshwar (-0.13), wai 9-0.05) Khandala (-0.03), Man(-0.03) and Jawali (-0.08)

7.6.6Crop Productivity Yield Index (X6) :

Agricultural productivity determines the level of agricultural development in any region. It refers to per acre or hectors of yield in a unit (Kgm/quintals) of any crops of field. A farmer adopt each kind of technique to increase the productivity of crop because it leads to over all developments (social as well as economic) of the farmer The agricultural productivity yield index and Z-score is calculated for selected crops.

7.6.6.1 Rice (X6a) :

Rice is not cultivated in the Phaltan, Man and Khatav taluka as the physiographic and climatic conditions are not suitable for rice crop. The top places in the productivity of rice are secured by Koregaon taluka (1.30). The talukas are under high category Wai (0.41), Jawali (0.64) Patan (0.08) and Karad (0.83) and remaining Mahabaleshwar Khandala, Satara taluka are in medium level category.

7.6.6.2 Wheat (X6b) :

Wheat is produced on large scale in Karad taluka. Other taluka are under high category are Phaltan (3.1), Koregaon (0.000) Wai (0.4) Man (0.1). The talukas under medium (-00.00) category are Khandala (-0.3), Khatab (-0.4), Satara (-0.7) and Patan (-0.6) lowest level observed in Mahabaleshwar (_1.5) and Jawali (-1.5)

7.6.6.3 Jowar (X6c) :

Jowar Is major crop of the district produced everywhere. The taluka under high category above 0.00) are wai (0.04) Khatav (0.00), Koregaon (0.02), Satara (0.00) Jawali (0.01) and Karad (0.04)

The talukas under medium category (-1.00 to .0000) are Mahabaleshwar (-0.03) Khandala (-0.03), Phaltan (-0.01) Man (-0.04) and Patan (0.01).No taluka under low category in the district.

7.6.6.4 Sugarcane (X6d) :

Sugarcane is most significant crop cultivated in the study area where irrigation facilities are available. Karad is the climate taluka in the production of sugarcane due to fertile woil, river basin availability irrigation facilities like lift irritation. Mahabaleshwar , Man and Khatav not indicating the production of sugarcane, . High level of has been observed in Wai (0.1) Phaltan (0.0), Koregaon (0.0), Jawali (0.1) and Karad (0.0). Others talukas are under the category of medium level. i.e. the Khandala (-0.1).Satara (-0.1),Patan (-0.1)

7.6.6.5 Groundnut (x6e) :

Mahabaleshwar, Jawalil and Patan talukas are not producing groundnut. High level (above 0.00) has been observed in the Phaltan (2.67) Khandala (0.14), Khatab (0.41) and Karad (0.00)

The medium level is ranging from (-1.00 -0.00). The medium level ranging from (1.00-0.00) observed in (Wai 0.35) Man (-0.70), Satara (-0.10) taluka.

7.6.6.6 Gram (x6f) :

Wai (0.11) Phaltan (1.20) man (0.44) Korebgaon (0.51) Satara (0.26) and karad (1.37) talukas are under the high level category. Remaing khandala (-0.69) jawali (0.64) are under medium level.Only one taluka I,.e.Khatav under low level of productivety. The taluka Mahabaleshwar, Patan no production of gram is there.

7.7 Levels of Agricultural Development :

To assess the level of agricultural development in Satara district all the eleven variables have been aggregated. The z-score value of all variable transformed and combined with help of Z-score and composite score was prepared (table-composite value). The composite score ranges from (1.02), highest to -1.07) Mahabaleshwar lowest in Satara district. Karad is the most developed block in Satara district and Mahabaleshwar is at the bottom. On the basis of composited Z-score the talukas have been categorized into two classes viz. high and low which clearly shows the spatial variation in level of agricultural development in Satara district on an average six talukas namely Karad (1.02) Patan (0.23) Phaltan (0.86) Khatav (0.01) Koregaon (0.39) and Satara (0.06) which ranges their composite Z-score above (0.00) are highly developed talukas while remaining 5 talukas are under low categories of development Mahabaleshwar (-1.07), Wai (0.45) Khandala (-0.51), Man (-90.5) Jawali (-0.40)

7.8 The Spatial Pattern and Level of Agricultural Development :

The spatial distribution of variables and agricultural development is not uniform in Satara district. It provides very significant information about level of agricultural development. The study highlights that the majority of district come under high development of agriculture and it located at middle and southern part of study region.

TABLE NO.VII.V

SATARA DISTRICT

SPATIAL PATTERN AND LEVELS OF AGRICULRAL DEVELOPMENT

Sr. No.	Z-Score	Level of Development	Number of Taluka	Talukas
1	Above 0.00	High	06	Satara,Patan,Karad,Phal tan Koregaon,Khatav
2	Below 0.00	Low	05	M.Shwar, Wai,Khandala Jawali,Man

Source – Complied by researcher

Agriculture is not developed in Wai, Khandala, Patan, Jawali and Mahabaleshwar due to industrialization, condusive topography and irrigation facilities. For the development there is need of irrigation facilities restrict during the agriculture.

The study highlights the impact of location and Agro Service Centres on agricultural development planning for the study region.

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CHAPTER

8

GOVERNMENT ORDERS ASSOCIATED WITH FERTILIZER SEEDS AND INSECTICIDES

8.1 INTRODUTION :

For the smooth functioning Agro service centres it is very much needed to understand the rules and regulation prescribed both by state and union government specially code of conduct is prescribed by central Government means ministry of Agriculture because whatever we are using for agricultural development it should be government approved. There are different rules and regulation for the commodities available in the Agro service centres in forms of chemicals like

i) Fertilizers

ii) Insecticides

iii) Weedicides

iv) Fungicides and

v) Hybrid seeds.

8.2 FERTILIZERS CONTROL ORDER 1985 :

As per the G.S.R. 758 (E) in exercise of the powers conferred by section 3 of the Essential Commodities Act, 1955 (10 of 1955), the Central Government here by makes the following Orders associated with fertilizers (control) order in 1985 namely

1. **Short title and commencement :**

   1. This Order may be called the Fertilizer (Control) Order, 1985.
   2. It shall come into force on the date of its publication in the Official Gazette.

2. Definitions :

i) "Act" means the Essential Commodities Act, 1955 (10 of 1955).

ii) Bio fertilizer means the product containing carrier based(solid or liquid) living microorganisms which are agriculturally useful in terms of nitrogen fixation, phosphorus solubalisation or nutrient mobilization, to increase the productivity of the soil and/or crop/

iii) Certificate of source means a certificate given by a State Government, Commodity Board, manufacturer, + importer, pool handling agency or –as the case may be, wholesale dealer indicating therein the source from which fertilizer for purpose of sale is obtained.

iv) Commodity Board" means the Coffee Board constituted under section 4of the Coffee Act, 1942 (7 of 1942) or the Rubber Board constituted under section 4 of the Rubber Act, 1947 (24 of 1947), or the Tea Board constituted under section 4 of the Tea Act, 1953 (29 of .1953), or as the case may be, the Cardamom Board constituted under section 4 of the Cardamom Act, 1965 (42 of 1965).

v) "Compound or complex fertilizer" means a fertilizer containing two or more nutrients during the production of which chemical reaction takes place

vi) "Controller" means the person appointed as Controller of Fertilizers by the Central Government and includes any other person empowered by the Central Government to exercise or perform all or any of the powers, or as the case may be, functions of the Controller under this Order.“Customized fertilizer” means the fertilizer specified under clause 20 B

vi) "Dealer" means a person carrying on the business of selling fertilizers whether wholesale or retail or industrial use and includes a manufacturer, +Importer, and a pool handling agency carrying on such business and the agents of such person, manufacturer, importer or pool handling agency..

vii) "Ferti1izer" means any substance used or intended to be used as a fertilizer of the soil Organic fertilizers specified in Schedule IV.

viii) Form means a form appended to this Order.

viii) Grade means the nutrient element contents in the fertilizer expressed in Percentage

ix) "Granulated mixture" means a mixture of fertilizers made by intimately mixing two or more fertilizers with or without inert material, and granulating them together, without involving any chemical reaction.

Importer" means a person who imports fertilizer in accordance with the export and Import Policy of the Central Government, as amended from time to time.

x) "Inspector" means an Inspector of Fertilizers appointed under clause 27.

ll "Industrial dealer" means a dealer who sells fertilizers for industrial purposes.

lll "Industrial purposes" means the use of fertilizers for purposes other than fertilization of soil and Increasing productivity of crops.

x) "Manufacturer" means a person who produces fertilizers or mixtures of fertilizers and the expression "manufacture" with its grammatical variations shall be construed accordingly.

xii). "Mixture of fertilizers" means a mixture of fertilizers made by physical mixing two or more fertilizers with or without inert material in physical or granular form and includes a mixture of NPK fertilizers, a mixture of micro nutrient fertilizers and a mixture of NPK with micronutrient fertilizers.

xiii) Notified Authority ”means an authority appointed under clause 26 "offer for sale" includes a reference to an intimation by a person of a proposal by him for the sale of any fertilizer, made by publication of a price list, by exposing the fertilizer for sale indicating the price, by furnishing of a quotation or otherwise howsoever.

xiv) Organic fertilizer means substances made up of one or more unprocessed materials of a biological nature (plant/animal) and may include unprocessed mineral materials that have been altered through microbiological decomposition process. p ‘physical mixture" means a mixture of fertilizers made by physically mixing two or more fertilizers with or without inert material necessary to make a required grade, without involving any chemical reaction. ‘(pp) “Provisional fertilizer” means fertilizer specified under clause 20 A’.

xv) "Prescribed standard" means:-

i. in relation to a fertilizer included in column 1 of Part A of Schedule-I, the standard set out in the corresponding entry in column 2, subject to the limits of permissible variation as specified in Part B of that Schedule; and

ii. in relation to a mixture of fertilizers, the standard set out in respect of that mixture under sub-clause (1) of clause 13 by the Central Government, subject to the limits of permissible variation as specified in Part B of Schedule-l

iii. in relation to mixture of fertilizers, standard set out in respect of that mixture under sub-clause (2) of clause 13 by the State Government, subject to limits of permissible variation as specified in Part B of Schedule-l.

iv. in relation to a Bio fertilizer included in column 1 of Part A of Schedule-III, the standard set out in the corresponding entry in column 2, subject to the limits of permissible variation as specified in Part B of that Schedule;

v. in relation to a Organic fertilizer included in column 1 of Part A of Schedule-IV, the standard set out in the corresponding entry in column 2, subject to the limits of permissible variation as specified in Part B of that Schedule.

vi. "Pool handling agency" means an agency entrusted by the Central Government with functions relating to handling and distribution of imported fertilizers.

vii. "Registering authority" means a registering authority appointed under clause 26 in respect of mixture of fertilizers and special mixture of fertilizers

viii "retail dealer" means a dealer who sells fertilizers to farmers or plantations for **agricultural use such as for fertilization of soil and increasing productivity of crops.

ix. "Schedule" means a Schedule appended to this Order. "special mixture of fertilizers" means any mixture of fertilizers prepared for experimental purposes in pursuance of a requisition made by any person(including a person engaged in the cultivation of tea, coffee or rubber) for sale to that person in such quantity and within such period as may be specified in such requisition; and.

x. "wholesale dealer" means a dealer who sells fertilizers otherwise than in retail-for agricultural use such as for fertilization of soil and increasing productivity of crops.

3. Fixation of prices of fertilizers :

1. The Central Government may, with a view to regulating equitable distribution of fertilizers and making fertilizers available at fair prices, by notification in the Official Gazette, fix the maximum prices or rates at which any fertilizer may be sold by a dealer, manufacturer, +importer or a pool handling agency.

2. The Central Government may having regard to the local conditions of any area, the period of storage of fertilizers and other relevant circumstances, fix different prices or rates for fertilizers having different periods of storage or for different areas or for different classes of consumers.

3. No dealer, manufacturer +importer or pool handling agency shall sell or offer for sale any fertilizer at a price exceeding the maximum price or rate fixed under this clause.

4. Display of stock position and price list of fertilizers :

Every dealer, who makes or offers to make a retail sale of any fertilizers, shall prominently display in his place of business:-

a. the quantities of opening stock of different fertilizers held by him on each day; Explanation -The actual stocks at any point of time during the day may be different from that of the displayed opening stocks to the extent of sale and receipt of such fertilizers up to the time of inspection during that day

b. a list of prices or rates of such fertilizers fixed under clause 3 and for the time being in force.

5. Issue of cash/credit memorandum :

a. Every dealer shall issue a cash or credit memorandum to a purchaser of a fertilizer in Form M*

6. Allocation of fertilizers to various States :

The Central Government may, with a view to securing equitable distribution and availability of fertilizers to the farmers in time, by notification in the Official Gazette, direct any manufacturer/importer to sell the fertilizers produced by him in such quantities and In such State or States and within such period as may be specified in the said notification.

7. Registration of Industrial dealers and authorization of other dealers :

No person shall sell, offer for sale or carry on the business of selling of fertilizer at any place as wholesale dealer or retail dealer except under and in accordance with clause8:Provided that a

State Government may, if it considers it necessary or expedient, by notification in the Official Gazette, exempt from the provisions of this clause any person selling fertilizer to farmers in such areas and subject to such conditions as may be specified in that notification."

8. Application for intimation or registration :

1. Every person intending to sell or offer for sale or carrying on the business of selling of fertilizer as Industrial Dealer shall obtain a certificate of registration from the controller by making an application in Form A together with the fee prescribed under clause 36 and a Certificate of source in Form O.
2. Every person including a manufacturer, an importer, a pool handling agency, wholesaler and a retail dealer intending to sell or offer for sale or carrying on the business of selling of fertilizer shall make a Memorandum of Intimation to the Notified Authority, in Form A1 duly filled in, in duplicate, together with the fee prescribed under clause 36 and certificate of source in Form O.
3. On receipt of a Memorandum of Intimation, complete in all respects, the Notified Authority shall issue an acknowledgement of receipt in Form A2and it shall be deemed to be an authorization letter granted and the concerned person as authorized dealer for the purposes of this Order.

- Provided that a certificate of registration granted before the commencement of the Fertilizer (Control) Amendment Order, 2003, shall be deemed to be an authorization letter granted under the provisions of this Order:
- Provided further that where the applicant is a State Government, a manufacturer or an importer or a pool-handling agency, it shall not be necessary for it or him to submit Form O.
- Provided also that a separate Memorandum of Intimation shall be submitted by an applicant for whole sale business or retail dealership, as the case maybe:

- Provided also that where fertilizers are obtained for sale from different sources, a certificate of source from each such source shall be furnished in Form O.

9. Grant or refusal of certificate of registration :

The Controller, shall grant a certificate of registration in Form 'B' within thirty days of the receipt of application to any person who applies for it under clause8;

Provided that no certificate of registration shall be granted to a person:

a. if his previous certificate of registration is under suspension; or

b. if his previous certificate of registration has been cancelled within a period of one year immediately preceding the date of application; or

c. if he has been convicted of an offence under the Act, or any Order made there under within three years immediately preceding the date of making.

d. if he fails to enclose with the application a certificate of source ; or

e. if the application is incomplete in any respect; or

f. if he makes an application for obtaining the certificate of registration for industrial dealer and, excepting if he is a manufacturer ,+ importer or pool handling agency, holds [an authorization letter] for wholesale dealer or retail dealer or both, and as the case may be, the vice-versa.

10. Period of validity of certificate of registration and letter of authorization :

Every certificate of registration granted under clause 9 and every authorization letter issued under clause 8 shall, unless renewed, suspended or cancelled, be valid for a period of three years from the date of its issue.

11. Renewal of certificates of registration and authorization letters :

1. Every holder of a certificate of registration granted under clause 9 or authorization letter granted or deemed to have been granted under clause8, desiring to renew such certificate or authorization letter shall, before the date of expiry of such certificate of registration or authorization letter, as the case may be, make an application for renewal to the Controller, in Form C, or to the Notified Authority in Form A1,espectively, in duplicate,8 together with the fee prescribed under clause 36 for such renewal and a certificate of source as required under clause 8.
2. On receipt of an application under sub-clause (1), together with such fee and certificate of source, the controller may renew the certificate of registration or the Notified Authority, as the case may be shall issue acknowledgement receipt of renewal in form A.
3. Provided that a certificate of registration shall not be renewed if the holder of the same did not sell any fertilizer during the period of one year immediately preceding the date of expiry of the period of validity.
4. If any application for renewal is not made before the expiry of the period of validity of the certificate of registration or, as the case may be, the authorization letter but is made within one month from the date of such expiry, the certificate of registration or, as the case may be, the authorization letter shall be dealt as provided in sub-clause (2) on payment of such additional fee as may be prescribed under clause 36 in addition to the fee for renewal.
5. Where the application for renewal of certificate of registration is made within the time specified in sub- clause (1) or sub-clause (3), the applicant shall be deemed to have held a valid certificate of registration until such date as the controller passes orders on the application for renewal.

6. If an application for renewal of a certificate of registration or authorization letter is not made within one month from the date of expiry of their period of validity ,the same shall be deemed to have lapsed on the date on which its validity expired and any business carried on after that date shall be deemed to have been carried on in contravention of clause 7. No person

12. Restriction on preparation of mixtures of fertilizer :

No person shall carry on the business of preparing any mixture of fertilizers. or special mixture of fertilizers, Bio-fertilizers or Organic fertilizers except under and in accordance with the terms and conditions of a certificate of manufacture granted to him under clauses 15 or 16.

13. Standards of mixtures of Fertilizers :

1. Subject to the other provisions of the order

(a) no person shall manufacture any *mixture of fertilizers whether of solid or liquid fertilizers specified in Part a of schedule I unless such mixture conforms to the standards set out in the notification to be issued by the Central Government in the Official Gazette;

(b) No person shall manufacture any bio fertilizer unless such bio fertilizer conforms to the standards set out in the part A of Schedule – III.

(c) No person shall manufacture any Organic fertilizer unless such organic fertilizer conforms to the standards set out in the part A of Schedule IV.

2. Subject to the other provisions of this order, no person shall manufacture any "mixture of fertilizers unless such mixture conforms to the standards set out in the notification to be issued by the State Government in the Official Gazette; Explanation- For the purposes of this sub-clause, mixtureof fertilizers shall not include liquid fertilizers and 100% water soluble fertilizers, containing N,P,K.

3. No Certificate of manufacture shall be granted in respect of any fertilizer which does not conform to the standards set out in the notification referred in sub- clause (1) or (2);

4. Nothing in this clause shall apply to special mixtures of fertilizers

14. Application for certificate of manufacture of mixtures of fertilizers :

1. Every person desiring to obtain a certificate of manufacture for preparation of any mixture of fertilizers or special mixture of fertilizers shall possess such mixture, *and possess the minimum laboratory facility as specified in clause 21A of this Order.

2. An applicant for a certificate of manufacture for preparation of mixture of fertilizers or special mixture of fertilizers shall make an application to the registering authority

a. if he is an applicant for a certificate of manufacture for any mixture of fertilizers in Form D, in duplicate, together with the fee prescribed there for under clause 36; or,

b. if he is an applicant for a certificate of manufacture for any special mixture, in Form E, in duplicate, together with the fee prescribed there for under the said clause 36 and an attested copy of the requisition of the purchaser.

3. Every person desiring to obtain a Certificate of Manufacture for preparation or organic fertilizer or biofertilizer shall make an application in Form D, in duplicate, together with a fee prescribed therefore under clause 36, to Registering authority.

15. Grant or refusal of certificate of manufacture for preparation of mixtures of fertilizers, Biofertilizers or Organic fertilizer :

1. On receipt of an application under clause 14, the registering authority shall, by order in writing, either grant or refuse to grant the certificate of manufacture in respect of any mixture of fertilizer, Bio fertilizer, Organic fertilizer or special mixture of fertilizer and shall, within forty-five days from the date of receipt of

the application, furnish to the applicant a copy of the order so passed;

2. Where an application for a certificate of manufacture for mixture of fertilizers, Bio fertilizer, Organic fertilizer is not refused under sub-clause (1), the registering authority shall grant a certificate of manufacture in Form F and where an application for a certificate of manufacture for a special mixture is not refused under that sub-clause, *[such authority shall within forty five dates from the date of receipt of the application,]grant a certificate of manufacture to the applicant in Form G

16. Conditions for grant of certificate of manufacture in respect of special mixture of fertilizers and period of validity of such certificate :

1. No certificate of manufacture in respect of any special mixture of fertilizers shall be granted to an applicant unless he holds a valid certificate of manufacture under this Order for any mixture of fertilizers.

2. Every certificate of manufacture granted in respect of any special mixture of fertilizers shall be valid for a period of [six months] from the date of its issue; Provided that the registering authority may, if it is satisfied that it is necessary so to do, extend the said period to such further period or periods as it may deem fit, so however, that the total period or periods so extended shall not exceed [twelve months]

17. Period validity of a certificate of manufacture for preparation of mixtures of Fertilizers, Bio fertilizers or Organic fertilizers :

Every certificate of manufacture granted under clause 15 for preparation of a mixture of fertilizers, Bio fertilizer or Organic fertilizers shall, unless suspended or cancelled, be valid for a period of three years from the date of issue.

18. Renewal of certificate of manufacture for preparation of mixtures of fertilizers, Bio fertilizer or Organic fertilizer :

1. Every holder of a certificate of manufacture for preparation of a mixture of fertilizers, Bio fertilizer, Organic fertilizer desiring to renew the certificate, shall, before the date of expiry of the said certificate of manufacture make an application to the registering authority in Form D in duplicate, together with the fee prescribed for this purpose under clause 36.

2. On receipt of an application for renewal as provided in sub-clause (1), and keeping in view the performance of the applicant and other relevant circumstances, the registering authority may, if he so decides, renew the [certificate of manufacture by endorsement on Form F and in case the certificate of 11registration is not renewed; the registering authority shall record in writing his reasons for not renewing the certificate of manufacture.

3. If an application for renewal is not made before the expiry of the certificate of manufacture but is made within one month from the date of expiry of the [certificate of manufacture, the certificate of manufacture] may be renewed on payment of such additional fee as may be prescribed by the State Government for this purpose.

4. Where the application for renewal is made within the time specified in sub clause (1) or sub-clause (3), the applicant shall be deemed to have held a valid [certificate of manufacture] until such date as the registering authority passes order on the application for renewal.

5. an application for renewal of a certificate of manufacture is not made within the period stipulated under sub-clause (1) or, as the case may be, under sub clause (3), the certificate of manufacture shall be deemed to have expired immediately on the expiry of its validity period, and any business carried on after that date shall be deemed to have been carried on in contravention of clause 12.

19. Restriction on manufacture/import, sale and distribution of fertilizers

No person shall himself or by any other person on his behalf:-

a. manufacture/import for sale, sell, offer for sale, stock or exhibit for sale or distribute any fertilizer which Is not of prescribed standard;

b. manufacture/Import for sale, sell, offer for sale, stock or exhibit for sale, or distribute any mixture of fertl11sers, which is not of prescribed standard** (subject to such limits of permissible variation as may be specified from time to time by the Central Government) or special mixture of fertilizers which does not conform to the particulars specified In the certificate of manufacture granted to him under this Order in respect of such special mixture.

c. sell, offer for sale, stock or exhibit for sale or distribute:-

i. any fertilizer the container whereof is not packed and marked in the manner laid down In this Order

ii. any fertilizer which is an [imitation of or] a substitute for another fertilizer under the name of which It Is sold;

ii. any fertilizer which Is adulterated ;Explanation:- A fertilizer shall be deemed to be adulterated, If It contains any substance the addition of which is likely to eliminate or decrease Its nutrient contents or make the fertilizer not conforming to the prescribed standard.

iii. any fertilizer the label or container whereof bears the name of any individual firm or company purporting to be manufacturer/Importer of the fertilizer, which individual, firm or company Is fictitious or does not exist.

iv. any fertilizer, the label or container whereof or anything accompanying therewith bears any statement which makes a false claim for the fertilizer of which s false or misleading in any material particular.

v. any substance as a fertilizer which substance is not, in fact, a fertilizer; or

vi. Any fertilizer without exhibiting the minimum guaranteed percentage by weight of plant nutrient.

20. Specifications In respect of imported fertilizers :

Notwithstanding anything contained in this Order, the Central Government may by an order, published in the Official Gazette, fix separate specifications in respect of imported fertilizers.

20 A. Specification in respect of provisional fertilizer :

Not with standing anything contained in this Order, the Central Government may, by order published in the Official Gazette, notify specifications, valid for a period not exceeding three years, in respect of fertilizers to be manufactured by any manufacturing unit for conducting commercial trials.

20 B.- Specifications in respect of customized fertilizers :

Not with standing anything contained in this Order, the Central Government may by order published in the Official Gazette, notify specification, valid for a period not exceeding three years in respect of customized fertilizer to be manufactured by any manufacturing unit".

21. Manufacturers /Importers pool handling agencies to comply with certain requirements in regard to packing and marking, etc :

Every manufacturer/importer and pool handling agency shall, in regard to packing and marking of containers of fertilizers, Bio fertilizer or Organic fertilizer comply with the following requirements, namely:-

a. Every container in which any fertilizer is packed shall conspicuously be super scribed with the word "FERTILIZER" and shall bear only such particulars and unless otherwise required under any law nothing else, as may from time to time, be specified by the Controller in this behalf, and;]

(aa) Every container in which any Bio fertilizer or Organic fertilizer is packed shall conspicuously be super scribed with the word "Bio-Fertilizer/Organic Fertilizer" and shall bear only such particulars and unless otherwise required under any law nothing else, as may from time to time, be specified by the Controller in this behalf Provided that in case of containers the gross weight of which is 5 kg or less, no such printing of superscription and other particular shall be necessary if such super superscription and other particulars are printed on a separate label which is securely affixed to such container.

(b) Every container shall be so packed and sealed that the contents there of cannot be tampered with without breaking the seal; Provided that where fertilizer manufactured in India are packed in bags stitched on hand, such bags shall bear lead seals, so that the contents thereof cannot be tampered with without breaking the seals; Provided further that lead sealing shall not be necessary:-

(i) if such bags are machine stitched in such a manner that contents thereof cannot be tampered with without a visible break in the stitching; and

(ii) in the case of fertilizers imported from abroad and packed a in bags stitched in hand, in such a manner that the contents there of cannot be tampered with without visible break in the stitching.

Provided also that in case fertilizer bags are in cut, torn or damaged condition during transportation or mishandling during loading or unloading operation, the manufacturer of such fertilizer may, under intimation to the State Government and the Central Government, repack he fertilizer in new bags or restandardise the quantity in terms of declared weight.

c. Every fertilizer bag in which any fertilizer is packed for sale shall be of such weight and size as may be specified by the Central Government from time to time in this behalf

21 A. Manufacturers to comply with certain requirements for laboratory facilities :

Every manufacturer shall, in order to ensure quality of their product, possess minimum laboratory facility, as may be specified from time to time by the Controller.

22. Bulk sale of fertilizers :

Not with standing anything contained in this Order:-

a. a retail dealer may retain at any time one bag or container of each variety of fertilizer in an open and unsealed condition for the purpose of sale;

b. a manufacturer/importer may sell the fertilizer manufactured/imported by him in bulk to a manufacturer of mixture of fertilizers, compound / complex fertilizers or special mixture of fertilizers; and

c. the Central Government may by notification published in the Official Gazette in this behalf authorize a manufacturer/importer to sell any fertilizer manufactured/ imported by him In bulk also direct to farmers for such period as may be specified in that notification: Provided that a certificate indicating the minimum guaranteed percentage of plant nutrients is issued by the manufacturer/importer to each farmer at the time of such sale.

23. Disposal of non-standard fertilizers :

1. Notwithstanding anything contained in this Order, a person may sell, offer for sale, stock or exhibit for sale or distribute [any fertilizer except any fertilizer imported by the Central Government] which, not being an adulterated fertilizer, does not conform to the prescribed standard (hereinafter in this Order referred to as non-standard fertilizer) subject tothe conditions that:

a. the container of such non-standard fertilizer is conspicuously super scribed in red colour with the words "non-standard" and also with the sign "X"; and

b. an application for the disposal of non-standard fertilizers in Form H is submitted to the [Notified authority] to grant a certificate of authorization for sale of such fertilizers and a certificate of authorization with regard to their disposal and price is obtained in Form I.

c. such non-standard fertilizer shall be sold only to the manufacturers of mixtures of fertilizers or special mixtures of fertilizers or research farms of Government or Universities or such bodies.

2. The price per unit of the non-standard fertilizer shall be fixed by the [notified authority] after satisfying itself that the sample taken is a representative one, and after considering the nutrient contents in the sample determined on the basis of a chemical analysis of the nonstandard fertilizer.

3. The Central Government may, by notification in the official Gazette and subject to the conditions, if any, laid down in that notification, and subject to guidelines issued in this regard by the Central Government exempt such pool handling agencies, as it deems fit, from complying with conditions laid down in paragraphs (a) and (b) of the sub-clause (1)

4. Where any fertilizer imported by the Central Government is found to be of non-standard and the Central Government decides that the fertilizer cannot be permitted for direct use in agriculture, it may permit the use of such fertilizer by manufacturers of complex fertilizers, mixture of fertilizers or special mixture of fertilizers to be sold at such price as may be fixed by the Central Government.

5. If a manufacture or importer detects or as reasonable doubt about the standard of the fertilizer manufactured or imported by him, and dispatched for sale as deteriorated in quality during transit due to natural calamity and is not of the prescribed standards, he may, within fifteen days from the date of dispatch from factory or port, apply with detailed justifications to the Central Government for obtaining permission for reprocessing the same in a factory to meet the prescribed standards and the Central

Government may, after considering the facts, permit the re-processing of such fertilizer on the terms and conditions as may be notified by the Central Government in this behalf.

Provided that such application for permission to reprocess the fertilizer by the manufacturer or importer shall be accepted by the Central Government after the expiry of the said period of fifteen days.

24. Manufacturers/Pool handling agencies to appoint officers responsible with compliance of the Order :

Every manufacturing organization, importer and pool handling agency shall appoint in that organization and in consultation with the Central Government, an officer, who shall be responsible for compliance with the provisions of this Order.

25. Restriction on sale/use of fertilizers :

1. No person shall, except with the prior permission of the Central Government and subject to such terms and conditions as may be imposed by such Government, sell or use fertilizer, for purposes other than fertilization of soils and increasing productivity of crops. Provided that the price of fertilizers permitted for sale for industrial use shall be no profit no loss price, excluding all subsidies at the production, import, handling or on sale for agricultural consumers; Provided further that wherever customs or excise duties are chargeable, these may be added to the price so fixed. Provided also that in the case of non-standard fertilizers, reductions shall be made from the no profit no loss price, indicated above, proportionate to the loss of nutrient contents.

2. Notwithstanding anything contained in sub-clause (1), no prior permission for use of fertilizer for industrial purposes shall be necessary when the fertilizer for such purposes is purchased from the Industrial dealer possessing a valid certificate of registration granted under clause 9.

3. Any person possessing a valid certificate of registration for Industrial dealer, unless such person is a State Government, a

manufacturer/importer or a pool handling agency, shall not carry on the business of selling fertilizers for agricultural purposes, including a wholesale dealer or a retail dealer. However, in case of a State Government, a manufacturer or a importer or a pool handling agency possessing a valid certificate of registration for sale of fertilizer for industrial use, and also for sale of fertilizer for agricultural use, whether in wholesale or retail or both, shall not carryon the business of selling fertilizers both for Industrial use and agricultural use In the same premises.

26. Appointment of registering authority :

The State Government may, by notification in the Official Gazette, appoint such number of persons, as it thinks necessary, to be registering authorities for the purpose of this Order [$]for industrial dealers, and may, in any such notification define the limits of local area within which each such registering authority shall exercise his jurisdiction.

26A. Notified Authority :

The State Government may, by notification in the Official Gazette, appoint such number of persons, as it thinks necessary, to be Notified Authorities for the purpose of this Order and define the local limits within which each such Notified Authority shall exercise his jurisdiction.

27. Appointment of inspectors :

The State Government, or the Central Government may, by notification in the Official Gazette appoint such number of persons, as it thinks necessary, to be inspectors of fertilizers for the purpose of this Order, and may, in any such notification, define the limits of local area within which each such inspector shall exercise his jurisdictions.

27A. Qualifications for appointment of fertilizer Inspectors :

No person shall be eligible for appointment as Fertilizer Inspector under this Order unless he possesses the following qualifications, namely:-

1. Graduate In agriculture or science with chemistry as one of the subjects, from a recognized university; and

2. Training or experience in the quality control of fertilizers and working in the State or Central Government Department of Agriculture.

27B. Qualifications for appointment of fertilizer Inspectors for Bio fertilizer and Organic Fertilizer :

No person shall be eligible for appointment as inspector of bio fertilizer and Organic fertilizer under this Order unless he may possess the following qualifications, namely:

(1) Graduate in agriculture or science with chemistry/microbiology as one of the subject; and

(2) Training or experience in the field of quality control of bio fertilizers/organic fertilizers.

28. Powers of Inspectors :

1. An inspector may, with a view to securing compliance with this Order:-

a. require any manufacturer, +importer, pool handling agency, wholesale dealer or retail dealer to give any information in his possession with respect to the manufacture, storage and disposal of any fertilizer manufactured or, in any manner handled by him

b. draw samples of any fertilizer in accordance with the procedure of drawl of samples laid down in Schedule II. Provided that the inspector shall prepare the sampling details in duplicate In Form J, and hand over one copy of the same to the dealer or his representative from whom the sample has been drawn;

(ba) draw samples of any bio-fertilizers in accordance with the procedure of drawl of samples laid down in schedule III.

(bb) draw samples of any organic fertilizers in accordance with the procedure of drawl of samples laid down in schedule IV.

c. enter upon and search any premises where any fertilizer is manufactured/ Imported or stored or exhibited for sale, if he has reason to believe that any fertilizer has been or is being manufactured/imported, sold, offered for sale, stored, exhibited for sale or distributed contrary to the provisions of this Order;

d. seize or detain any fertilizer in respect of which he has reason to believe that a contravention of this Order has been or is being or is [attempted] to be committed;

e. seize any books of accounts or documents relating to manufacture, storage or sale of fertilizers, etc. in respect of which he has reason to believe that any contravention of this Order has been or is being or is about to be committed; Provided that the Inspector shall give a receipt for such fertilizers or books of accounts or documents so seized to the person from whom the same have been seized;

Provided further that the books of accounts or documents so seized shall be returned to the person from whom they were seized after copies thereof or extracts there form as certified by such person, have been taken.

2. Subject to the proviso to paragraphs (d) and (e) of sub-clause (1), the provisions of the Code of Criminal Procedure, 1973 (2 of 1974) relating to search and seizure shall, so far as may be, apply to searches and seizures under this clause.

Provided that the inspector shall give the stop sale notice in writing to the person whose stocks has been detained and initiate appropriate action as per the provisions of this order within a period of twenty one days.

If no action has been initiated by the inspector within the said period of twenty one days from the date of issue of the said notice, the notice of stop sale shall be deemed to have been revoked.

3. Where any fertilizer is seized by an inspector under this clause, he shall forthwith report the fact of such seizure to the

collector whereupon the provisions of sections 6A, 6B, 6C, 6D and 6E of the Act, shall apply to the custody, disposal and confiscation of such fertilizers.

4. Every person, if so required by an inspector, shall be bound to afford all necessary facilities to him for the purpose of enabling him to exercise his powers under sub-clause (1).

29. Laboratory for analysis :

1. A fertilizer samples, drawn by an inspector, shall be analyzed in accordance with the instructions contained in Schedule II in the –Central Fertilizer Quality Control and Training Institute, **Faridabad or Regional Fertilizer Control Laboratories at Bombay, Madras or Kalyani (Calcutta) or in any other laboratory notified for this purpose by the State Government [with the prior approval of the Central Government.

(1A) Bio fertilizer samples, drawn by an inspector, shall be analyzed in accordance with the instructions contained in Schedule III in the –National Centres of Organic Farming, Ghaziabad or Regional Centres of Organic Farming at Bangalore, Bhubaneshwar, Hissar, Imphal, Jabalpur and Nagpur or in any other laboratory notified by the Central or State Government.

(1B) Organic fertilizer samples, drawn by an inspector, shall be analyzed in accordance with the instructions contained in Schedule IV in the –National Centres of Organic Farming, Ghaziabad or Regional Centres of Organic Farming at Bangalore, Bhubaneshwar, Hissar, Imphal, Jabalpur and Nagpur or in any other laboratory notified by the Central or State Government.

2. Every laboratory referred to in sub-clause (1) shall, in order to ensure accurate analysis, of fertilizer samples, possess minimum equipment and other laboratory facilities, as may be specified from time to time by the Controller in this behalf

29A. Qualifications for appointment of fertilizer analyst in the ferti1ser control laboratories :

No person shall be eligible for appointment as fertilizer analyst for analysis of fertilizer samples in the laboratories notified under clause 29 of the Order, unless he possesses the following qualifications, namely:-

1. Graduate in Agriculture or Science with chemistry as one of the subjects from a recognized university; and

2. Training In fertilizer quality control and analysis at Central Fertilizer Quality Control and Training Institute, Faridabad.

Provided that the fertilizer analysts appointed before the commencement of this Order, who do not possess the requisite training, shall undergo prescribed training, within a period of three years, in the Central Fertilizer Quality Control " and Training Institute, Faridabad from the date of commencement of this Order.

29B Laboratories for referee analysis :

1. Every laboratory referred to in sub-clause (1) of clause 29 shall be designated as referee laboratory for the purpose of analysis of any sample of fertilizer:

Provided that no such laboratory which carried out the first analysis of the fertilizer sample shall be so designated in respect of that sample:

Provided further that in respect of any sample the analysis of which has been challenged, may be sent for referee analysis to any one of the other laboratories except those which are located in the State or where the first analysis has been done.

Provided also that the Central Fertilizer Quality Control and Training Institute and Regional laboratories shall be considered as one group of laboratories and a sample first analyzed by any one of them, shall not be sent for referee analysis to any other in that group, but only to any other laboratory notified by a State Government.

2. Not with standing anything contained in this Order, the Appellate Authority as specified under paragraph (b) of sub-clause (1) or paragraph (b) of sub-clause(2) of clause 32, in case of sample analyzed by the State Government laboratory, or the Controller, in case of samples analyzed by Central Fertilizer Quality Control and Training Institute, Faridabad or its Regional Fertilizer Control Laboratories, as the case may be, shall decide and send, one of the two remaining samples, for reference analysis as provided under sub-clause (1).

30. Time limit for analysis, and communication of result :

1. Where sample of a fertilizer has been drawn, the same shall be dispatched along with a memorandum in Form K and in case of Organic fertilizers and Biofertilizers in Form KI to the laboratory for analysis within a period of seven days from the date of its withdrawal.

2. The laboratory shall analyze the sample and forward the analysis report in Form L and in case of Organic fertilizer and Bio fertilizer in Form LI within [30 days] from the date of receipt of the sample in the laboratory to the authority specified in the said memorandum.

3. The authority to whom the analysis report is sent under sub-clause (2) shall communicate the result of the analysis to the dealer/manufacturer/Importer/pool handling agency from whom the sample was drawn within [15 days] from the date of receipt of the analysis report of the laboratory.

31 Suspensions, Cancellation or Debarment :

1. A Notified Authority, registering authority, or as the case may be, the controller may, after giving the authorized dealer or the holder of certificate of registration or certificate of manufacture or any other certificate granted under this Order, an opportunity of being heard, suspend such authorization letter or certificate or debar the dealer from carrying on the business of fertilizer on one or more of the following grounds, namely:-

a. that the authorization letter or certificate of registration or certificate of manufacture, as the case may be, has been obtained by willful suppression of material facts or by misrepresentation of relevant particulars:

b. that any of the provisions of this Order or any terms and condition of the Memorandum of Intimation or certificate of registration or the certificate of manufacture, as the case may be, has been contravened or not fulfilled:

Provided that while debarring from carrying on the business of fertilizer or canceling the certificate, the dealer or the certificate holder thereof may be allowed for a period of thirty days to dispose of the balance stock of fertilizers, if any, held by him:

Provide that the stock of fertilizer lying with the dealer after the expiry of the said period of thirty days shall be confiscated.

2. Where the contravention alleged to have been committed by a person is such as would, on being proved, justify his debarment from carrying on the business of selling of fertilizer or, cancellation of authorization letter or certificate of registration or certificate of manufacture or any other certificate granted under this Order to such person the Notified Authority or registering authority or, as the case may be, the controller may, without any notice, suspend such certificate, authorization letter, as an interim measure:

Provided that the registering authority, Notified Authority or, as the case may be, the controller shall immediately furnish to the affected person details and the nature of contravention alleged to have been committed by such person and, after giving him an opportunity of being heard, pass final orders either revoking the order of suspension or debarment within fifteen days from the date of issue of the order of suspension: Provided further that where no final order is passed within the period as specified above, the order of interim suspension shall be deemed to have been revoked without prejudice, however, to any further action which the registering authority, Notified Authority or, as the case may be, the controller may take against the affected person under sub-clause (1)

3. Wherever an authorization letter or certificate is suspended, cancelled or the person is debarred from carrying on the business of fertilizer, the Notified Authority, registering authority, or as the case may be, the Controller shall record a brief statement of the reasons for such suspension or, as the case may be, cancellation or debarment and furnish a copy thereof to the person whose certificate or authorization letter has been suspended or cancelled or business has been debarred.

4. Wherever the person alleged to have committed the contravention is an industrial dealer, the Notified Authority may take action against the holder of such certificate of registration under sub-clause (1) and sub-clause

Provided that where such certificate is suspended or cancelled, the Notified Authority shall, within a period of fifteen days from the date of issue of such order of suspension or cancellation, furnish to the controller also, besides sending the same to the person whose certificate has been suspended or cancelled, a detailed report about the nature of contravention committed and a brief statement of the reasons for such suspension or, as the case may be, cancellation:

Provided further that the controller, shall, in case of the order for suspension passed by the Notified Authority, on receipt of the detailed report and after giving the person an opportunity of being heard, pass final order either revoking the order of suspension or canceling the certificate of registration, within fifteen days from the date of receipt of the detailed report from the Notified Authority, failing which the order of interim suspension passed by the Notified Authority shall be deemed to have been revoked, without prejudice however, to further action which the controller may take against the holder of certificate under sub-clause (1):

Provided also that the order of cancellation passed by the Notified Authority shall remain effective as if it had been passed by the controller till such time the Controller, on receipt of the detailed report from the Notified Authority, and if deemed necessary, after giving the person a fresh opportunity of being heard, pass the final order either revoking or confirming the order of cancellation.

32. Appeals at Central Government level :

1. In any State, where the fertilizer allocation is made by the Central Government under this Order and if the suspension or cancellation of authorization letter of the manufacturer and or pool handling agency or debarment of business, in any way, has an effect of dislocating the said allocation and if the Central Government is of the opinion that it is necessary or expedient so to do for maintaining the supplies, may direct the concerned State Government to furnish detailed report about the nature of contravention and a brief statement of the reasons for such suspension or cancellation and pass such order as it may think fit, confirming, modifying or annulling the order of State Government Provided that if the report called by the Central Government is not received from the State Government within a period of fifteen days from the date of issue of the communication, the Central Government may decide the case without the report, on merit.

2. Any person aggrieved by the analysis report of Central Fertilizer Quality Control and Training Institute or its regional laboratories may appeal to the Controller for referee analysis of such sample within a period of 30 days from the receipt of analysis report. Provided that the Controller may entertain an appeal after the expiry of said period of 30 days from the date of the order appealed.

32A. Appeal at the State Government level :

1. The State Government shall, by notification in the Official Gazette, specify such authority as the Appellate authority before which the appeals may be filed within 30 days from the date of the order appealed against by any person, except by an industrial

dealer, aggrieved by any of the following Orders or action of registering authority or a Notified Authority, namely:-

i. Refusing to grant a certificate of manufacture for preparation of mixture of Fertilizers or special mixture of fertilizers; or

ii. Suspending or canceling a certificate of manufacture; or

iii. Suspending or canceling authorization letter or debarring from carrying on the business of selling of fertilizer, or

iv. Non-issuance of certificate of manufacture within the stipulated period; or

v. Non-issuance of amendment in authorization letter within the stipulated period.

2. Any person aggrieved by analysis report of fertilizer Testing laboratories notified by the State Government may appeal to the appellate authority appointed under sub-clause (1) for reference analysis of such sample within thirty days from the date of receipt of analysis report.

33. Grant of duplicate copies of [authorization letter or Certificate of manufacture] certificate of registrations, etc :

Where [authorization letter or] a certificate of registration or a certificate of manufacture or any other certificate granted or, as the case may be, renewed under this Order is lost or [defaced, the notified authority] registering authority **or, as the case may be, the Controller may, on an application made in this behalf, together with the fee prescribed for this purpose under clause 36, grant a duplicate copy of such certificate.

34. Amendment of certificate of registration :

The Notified Authority, registering or controller, as the case may be, may, on application being made by the holder of an authorization letter, a certificate of registration or certificate of manufacture, together with the fee prescribed for the purpose under clause 36, amend an entry in such authorization letter, certificate of registration or certificate of manufacture as the case may be.

35. Maintenance of records and submission of returns, etc :

1. The controller may by an order made in writing direct the dealers. Manufacturers/ importers, and pool handling agencies:-

a. to maintain such books of accounts, records, etc. relating to their business in Form 'N'. and

b. to submit to such authority, returns and statements in such form and containing such information relating to their business and within such time as may be specified in that order.

2. Where a person holds certificates of registration for retail sale and wholesale sale of fertilizers, he shall maintain separate books of accounts for these two types of sales made by him.

3. Where a State Government, a manufacturer, +an importer and a pool handling agency holds valid certificates of registration for sale of fertilizers in, wholesale or retail or both and also for sale for industrial use, he shall maintain separate books of accounts for these two or three types of sales made by him.

4. Every importer shall inform the Director of Agriculture of the State in which he intends to discharge the imported fertilizer, under intimation to the Central Government, before the import is made or within a period of fifteen days after an indent for import is placed, the with details.

36. Fees :

1. The fees payable for grant, amendment or renewal of [an authorization letter] or certificate of registration or certificate of manufacture a duplicate of such certificates or, renewal thereof under this Order shall be such as the State Government may, from time to time fix, subject to the maximum fees fixed for different purposes by the Central Government and different fees may be fixed for different purposes or for different classes of dealers or for different types of mixtures of fertilizer or special mixture.

2. The authority to whom and the manner in which the fee fixed under sub clause (1) shall be paid, shall be such as may be specified by the State Government by notification in the Official Gazette.

3. Any fee paid under sub-clause (1) shall not be refundable unless the grant or renewal of any certificate of registration or certificate of manufacture or duplicate copy of such certificate or renewal under this Order has been refused.

4. The fees payable for grant, amendment, renewal or duplicate copy of certificate of registration for industrial dealer and the authority to whom and the manner in which such fee shall be paid, shall be such as may be specified by the Controller from time to time by notification in the Official Gazette.

37. Service of orders and directions :

Any order or direction made or issued by the controller or by any other authority under this order shall be served in the same manner as provided in sub-section (5) of section 3 of the Act.

38. Advisory Committee :

1. The Central Government may by notification in the Official Gazette and on such terms and conditions as may be specified in such notification, constitute a Committee called the Central Fertilizer Committee consisting of a Chairman and not more than ten other persons having experience or knowledge in the field, who shall be members of the Committee, to advise the Central Government regarding:-

i. Inclusion of a new fertilizer, under this Order;

ii. Specifications of various fertilizers;

iii. Grades/formulations of physical/granulated mixtures of fertilizers that can be allowed to be prepared in a State;

iv. Requirements of laboratory facilities in a manufacturing unit, including a unit manufacturing physical/granulated mixtures of fertilizers;

v. Methods of drawl and analysis of samples.

vi. Any other matter referred by the Central Government to the Committee.

2. The Committee may, subject to the previous approval of the Central Government, make bye-laws fixing the quorum and regulating its own procedure and the conduct of all business to be transacted by it.

3. The Committee may co-opt such number of experts and for such purposes or periods as it may deem fit, but any expert so co-opted shall not have the right to vote.

4. The Committee may appoint one or more sub-committees, consisting wholly of members of the Committee or partly of the members of the Committee and partly of co-opted members as it thinks fit, for the purpose of discharging such of its functions as may be delegated to such subcommittee or sub-committees by the Central Fertilizer Committee.

5. The State Government may by notification in the Official Gazette and on such terms and conditions as may be specified in such notification, constitute a Committee called the State Fertilizer Committee consisting of a Chairman and not more than .4 other members, having experience or knowledge in the field, including a representative from State Agricultural University, the Fertilizer Industry and Indian Micro Fertilizers Manufacturers Association to advise the State Government regarding the grades/formulations of *mixture or of fertilizers.

39. Repeal and saving :

1. The Fertilizer Control) Order, 1957 is hereby repealed except as respects things done or omitted to be done under the said Order before the commencement of this Order.

2. Notwithstanding such repeal, an order made by any authority, which is in force immediately before the commencement of this Order and which is consistent with this Order, shall continue in force and all appointments made, prices fixed, certificates granted and directions issued under repealed Order and in force

immediately before such commencement shall likewise continue in force and be deemed to be made, fixed, granted or issued in pursuance of this Order till revoked.

8.3 THE SEEDS (CONTROL) ORDER, 1983 :

Government Of India Ministry Of Agriculture, (Department Of Agriculture & Cooperation), New Delhi, Date 30th Dec., 1983, Order GSR 932 (E)–In Exercise Of The Powers Conferred By Section 3, The Essential Commodities Act, 1955 (10 Of 1955), The Central Government Hereby Makes The Following Order, Namely:-

1. Short title and extent:

(i) This Order may be called the Seeds (Control) Order, 1983.

(ii) It extends to the whole of India.

(iii) It shall come into force on the 30th December, 1983.

2. Definitions:

In this Order, unless the context otherwise requires,

(a) “Act” means the Essential Commodities Act, 1955 (10 of 1955).

(b) “Controller” means a person appointed as Controller of Seeds by the Central Government and includes any person empowered by the Central Government to exercise all or any functions of the Controller under this Order;

(c) “Dealer” means a person carrying on the business of selling, exporting or importing seeds, and includes an agent of a dealer;

(d) “Export” means to take or cause to be taken out from any place in India to a place outside India;

(e) “Form” means a form appended to this Order;

(f) “Import” means to bring or cause to be brought to any place in India from outside India;

(g) “Inspector” means an inspector of seeds appointed under clause 12;

(h) “Registering authority” means a licensing authority appointed under clause 11;

(i) “Seeds” means the seeds as defined in the Seeds Act, 1966 (54 of 1966).

(j) “State Government” in relation to a Union Territory means the Administrator thereof by whatever designation known.

3. Dealer to obtain license :

(1**)** No person shall carry on the business of selling, exporting or importing seeds at any place except under and in accordance with the terms and conditions of license granted to him under this order.

(2) Notwithstanding anything contained in sub-clause (1), the State Government may, by notification in the Official Gazette, exempt from the provisions of that sub-clause such class of dealers in such areas and subject to such conditions as may be specified in the notification.

4. Application for license :

Every person desiring to obtain a license for selling, exporting or importing seeds shall make an application in duplicate in Form ‘A’ together with a fee of rupees fifty for license to licensing authority.

5. Grant and refusal of license :

(1) The licensing authority may, after making such enquiry as it thinks fit, grant a license in Form ‘B’ to any person who applies for it under clause 4: Provided that a license shall not be issued to a person-

(a) Whose earlier license granted under this Order is under suspension, during the period of such suspension;

(b) Whose earlier license granted under this Order has been cancelled, within a period of one year from the date of such cancellation?

(c) Who has been convicted under the Essential Commodities Act, 1955 (10 of 1955) or any order issued there under within three years preceding the date of application.

(2) When the licensing authority refuses to grant license to a person who applies for it under clause 4, he shall record his reasons for doing so.

6. Period of validity of license :

Every license under this Order, shall, unless previously suspended or cancelled, remain valid for three years from the date of its issue.

7. Renewal of license :

(1) Every holder of license desiring to renew the license, shall, before the date of expiry of the license, make an application for renewal in duplicate, to the licensing authority in Form 'C' together with a fee of rupees twenty for renewal. On receipt of such application, together with such fee, the licensing authority may renew the license.

(2) If any application for renewal is not made before the expiry of the license, but is made within one month from the date of expiry of the license, the license may be renewed on payment of additional fee of rupees twenty five, in addition to the fee for renewal of license.

8. Dealers to display stock and price list :

Every dealer of seeds shall display in his place of business:

(a) the opening and closing stocks, on daily basis, of different seeds held by him;

(b) a list indicating prices or rates of different seeds.

9. Dealers to give memorandum to purchaser :

Every dealer shall give a cash or credit memorandum to a purchaser of seeds.

10. Power to distribute seeds :

Where it is considered necessary to do so in public interest, the Controller may, by an order in writing direct any producer or dealer to sell or distribute any seed in such manner as may be specified therein.

11. Appointment of licensing authority :

The State Government may by notification in the Official Gazette appoint such number of persons as it thinks necessary to be licensing authority and may also define in that notification the area within which each such licensing authority shall exercise his jurisdiction.

12. Appointment of Inspectors :

The State Government may by notification in the Official Gazette appoint such number of persons as it thinks necessary to be inspectors and may in such notification define the local area within which each such Inspector shall exercise his jurisdiction.

13. Inspection and punishment :

(1) An Inspector may with a view to securing compliance with this Order- (a) require any dealer to give any information in his possession with respect to purchase, storage and sale of seeds by him;

(b) Enter upon and search any premises where any seed is stored or exhibited for sale to ensure compliance with the provisions of this Order;

(c) draw samples of seeds meant for sale, export and seeds imported, and send the same in accordance with the procedure laid down in Schedule I, to a laboratory notified under the Seeds Act, 1966 (54 of 1966) to ensure that the sample conforms to standard of quality claimed;

(d) seize or detain any seed in respect of which he has reason to believe that a contravention of this Order has been committed or is being committed; (e) seize any books of accounts or document relating to any seed in respect of which he has reason to believe that a contravention of this Order has been committed or is being committed. Provided that the Inspector shall give a receipt, in respect of the books of accounts or documents seized, to the person from whom they have been seized.

Provided further that the seized books of accounts or documents shall be returned to the person from whom the same had been seized after copies thereof or extracts there from as certified by such person have been taken.

(2) Subject to the provision of paragraph (d) of sub-clause (1), the provision, of section 100 of the Code of Criminal Procedure, 1973 (2 of 1974) relating to search and seizure shall, so far as may be, apply to searches and seizures under this clause.

(3) Where any seed is seized by an Inspector under this clause, he shall forthwith report the fact of such seizure to a Magistrate where-upon the provisions of sections 457 and 458 of the Code of Criminal Procedure, 1973 (2 of 1974) shall, so far as may be, apply to the custody and disposal of such seed.

(4) Every person, if so required by an Inspector, shall be bound to offer all necessary facilities to him for the purpose of enabling him to exercise his power under this clause.

14. Time limit for analysis :

The laboratory to which a sample has been sent by an Inspector for analysis under this Order shall analyze the said samples and send the analysis report to the concerned Inspector within 60 days from the date of receipt of the sample in the laboratory.

15. Suspension/Cancellation of license :

The licensing authority may, after giving the holder of the license an opportunity of being heard, suspend or cancel the license on the following grounds, namely:-

(a) that the license had been obtained by misrepresentation as to a material particular; or

(b) that any of the provisions of this Order or any condition of license has been contravened.

16. Appeal :

Any person aggrieved by an order-

(a) refusing to grant, amend or renew the license for sale, export or import of seeds;(b) suspending or cancelling any license, may within sixty days from the date of the order, appeal of such authority as the State Government may specify in this behalf, and the decision of such authority shall be final.

17. Amendment of license :

The licensing authority may, on receipt of a request in writing together with a fee of rupees ten from a dealer, amend the license of such dealer.

18. Maintenance of records and submission of returns, etc :

(1) Every dealer shall maintain such books, accounts and records relating to his business as may be directed by the State Government.

(2) Every dealer shall submit monthly return relating to his business for the preceding month in Form 'C' to the licensing authority by the 5th day of every month.

8.4 THE INSECTICIDES ACT, 1968, 1971 and 1989 :

An Act to regulate the import, manufactures, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matter connected there with [2nd September, 1968] Be it enacted by Parliament in the Nineteenth Year of the Republic of India as follows:

1. Short title, extent and commencement :

(1) This Act may be called the Insecticides Act, *1968.*

(2) It extends to the whole of India.

(3) It shall come into force on such date 1 as the Central Government may, by notification in the official Gazette, appoint and different dates may be appointed for different States 2 and for different provisions of this Act.

2. Definitions.-In this Act, unless the context otherwise requires,

(a) "animals" means animals useful to human beings and includes fish and fowl, and such kinds of wild life as the Central Government may, be notification in the official Gazette, specify, being kinds which in its opinions, it is desirable to protect or preserve;

(b) "Board" means the Central Insecticides Board constituted under Sec. 4;

(c) "Central Insecticides Laboratory" means the Central Insecticides Laboratory established, or as the case may be, the institution specified under Sec. *16*

(d) "Import" means bringing into any place within the territories to which this

Act extends from a place outside those territories;

(e) "insecticide" means

(i) such other substance (including fungicides and insecticides) as the Central Government may, after consultation with the Board, by notification in the official Gazette, include in the schedule from time to time; or

(ii) Any preparation containing any one or more of such substances;

(f) "Insecticide Analyst" means an insecticide analyst appointed under Sec.19;

(g) "Insecticide Inspector" means an insecticide Inspector appointed under Sec. 20;

(h) "Label" means any written, printed or graphic matter on the immediate package and on every other covering in which the package is placed or packed and includes any written, printed or graphic matter accompanying the insecticide;

(i) "licensing officer' means a licensing officer appointed under Sec. 12;

(j) "Manufacture", in relation to any insecticide, includes

(i) any process or part of a process for making, altering, finishing, packing, labeling, reaking up or otherwise treating or adopting any insecticide with a view to its sale, distribution or use but does not include the packing or breaking up of any insecticide in the ordinary course of retail business; and

(ii) Any process by which preparation containing an insecticide is formulated;

(k) "Misbranded"-an insecticide shall be deemed to be misbranded

(i) if its label contains any statement, design or graphic representation relating thereto which is false or misleading in any material particular, or if its package is otherwise deceptive in respect of its contents; or

(ii) if it is an imitation of, or is also under the name of, another Insecticide; or

(iii) if its label does not contain a warning or caution which may be necessary and sufficient, if complied with to prevent risk to human beings or animals; or

(iv) if any word, statement or other information required by or under this Act to appear on the label is not displayed thereon in such conspicuous manner as the other words, statements,, designs or graphic matter have been displayed on the label and in such terms as to render it likely to be read and understood by any ordinary individual under customary conditions of purchase and use; or

(v) If it is not packed or labeled as required by or under this Act; or

(vi) If it is not registered in the manner required by or under this Act; or

(vii) If the label contains any reference to registration other, than the registration number; or

(viii) if the insecticide has a toxicity which is higher than the level prescribed or is mixed or packed with any substance so as to alter its nature or quality or contains any substance which is not included in the registration;

(l) "Package" means a box, bottle, casket, tin, barrel, case, receptacle, sack, bag wrapper, or other thing in which an insecticide is placed or packed;

(m) "Premises" means any land, shop, stall or place where any insecticide is sold or manufactured or stored or used, and includes any vehicle carrying insecticides;

(n) "Prescribed" means prescribed by rules made under this Act;

(o) "Registered", with its grammatical variations an cognate expressions, means registered under this Act;

(p) "sale", with its grammatical variations and cognate expressions, means the sale of any insecticide whether for cash or on credit and whether by wholesale or retail, and includes an agreement for sale, an offer for sale, the exposing for sale or having in possession for sale of any insecticide and includes also an attempt to sell any such insecticide;

(q) "State Government", in relation to a Union territory, means the administrator there of;

(r) "Worker" means a person employed under a contract of service or apprenticeship.

Heading of the section :

The headings prefixed to a section or sets of sections may be read along with the enacting part of sections while construing them with a view to resolve any doubt they may have as to ambiguous words. But the heading cannot be used to give a different effect to the clear words in the section. The heading of a section does not also prevail, where the intention of the Legislature can be gathered by reference to other sections.

3. The Central Insecticides Board :

(1) The Central Government shall, as soon as may be, constitute a Board to be called the Central Insecticides Board to advise the Central Government and State Governments on technical matters arising out of administration of this Act and to carry out the other functions assigned to the Board by or under this Act.

(2) The matters on which the Board may advise under sub-section (1) shall include matter relating to

(a) The risk to human being or animals involved in the use of insecticides and the safety measures necessary to prevent such risk;

(b) The manufacture, sale, storage, transport and distribution of insecticides with a view to ensure safety to human beings or animals..

(3) The Board shall consist of the following members, namely

(i) The Director-General of Health Services, *ex officio,* who shall be Chairman;

(ii) The Drugs Controller, India, *ex officio;*

(iii) The Plant Protection Adviser to the Government of India, *ex officio;*

(iv) The Director of Storage and Inspection, Ministry of Food, Agriculture,

Community Development and Co-operation (Department of Food) *ex officio;*

(v) The, Chief Adviser of Factories, *ex officio;*

(vi) The Director, National Institute of Communicable Diseases, *ex officio'*

viii) The Director-General, Indian Council of Agricultural Research, *ex officio;*

(viii) The Director-General, Indian Council of Medical Research, *ex officio;*

(ix) The Director, Zoological Survey of India, *ex officio;*

(x) The Director-General, Indian Standards Institution, *ex officio;*

(xi) The Director-General of shipping or, in his absence, the Deputy Director-General of Shipping, Ministry of Transport and Shipping *ex officio;*

(xii) The joint Director, Traffic (General), Ministry of Railways (Railway Board), *ex officio;*

(xiii) The Secretary, Central Committee for Food Standards, *ex officio;*

[(xiii-a)] The Animal Husbandry Commissioner, Department of Agriculture, *ex officio;*

(xiii-b) The joint Commissioner (Fisheries), Department of Agriculture, *ex officio;*

(xiii-c) The Deputy Inspector-General of Forests, Department of Agriculture *ex officio;*

(xiii-d) The Industrial Adviser, Directorate-General of Technical Development, *ex officio;]*

(xiv) One person to represent the Ministry of Petroleum and Chemicals, to be nominated by the Central Government;

(xv) One pharmacologist to be nominated by the Central Government

(xvi) One medical toxicologist to be nominated by the Central Govern

(xvii) One person who shall be in charge of the department dealing with public health in a State, to be nominated by the Central Government;

(xviii) Two persons who shall be Directors of Agriculture in States, to be nominated by the Central Government;

(xix) Four persons, one of whom shall be an expert in industrial health and occupational hazards, to be nominated by the Central Government;

(xx) One person to represent the Council of Scientific and Industrial Research, to be nominated by the Central Government;

(xxi) One ecologist to be nominated by the Central Government.

(4) The persons nominated under Cls (xiv) to 2[(xxi)] inclusive, of sub-section (3) shall, unless their seats become vacant earlier by registration, death or otherwise, hold office for three years from the date of their nomination but shall be eligible for re nomination: Provided that the persons nominated under Cls. (xvii) and (xviii) shall hold office only for so long as they hold the appointments by virtue of which their nominations were made. 3

(5) No act or proceeding of the Board, the Registration Committee or any committee appointed under Sec. 6, shall be called in question on the ground merely of the existence of any vacancy in, or any defect in the constitution of the Board, the Registration Committee or such committee, as the case may be.

4. Registration Committee :

(1) The Central Government shall constitute a Registration Committee consisting of a Chairman, and not more than five persons who shall be members of the Board (including the Drugs Controller, India and the Plant Protection Adviser to the Government of India)

(i) to register insecticides after scrutinizing their formulae and verifying claims made by the importer or the manufacturer, as the case may be, as regards their efficacy and safety to human beings and animals; and

(ii) To perform such other functions as are assigned to it by or under this Act.

(2) Where the Chairman is not a member of the Board, his term of office and other conditions of service shall be such as may be determined by the Central Government.

(3) Subject to the provisions of sub-section (2), a member of the Registration Committee shall hold office for so long as he is a member of the Board.

(4) The Committee may also co-opt such number of experts and for such purpose or period as it may deem fit, by any expert so co-opted shall have no right to vote.

(5) Registration Committee shall regulate its own procedure and the conduct of the business to be transacted by it.

5. Other Committees :

The Board may appoint such committees as It deems fit and may appoint to them, persons who are not members of the Board to exercise such powers and perform such duties as may, subject to such conditions, if any, as the Board may impose, be delegated to them by the Board.

6. Procedure for Board :

The Board may, subject to the previous approval of the Central Government, make bye-laws for the purpose of regulating its own procedure and the procedure of any committee thereof and the conduct of all business to be transacted by it or such committee.

7. Secretary and other officers :

The Central Government shall

(i) Appoint a person to be the Secretary of the Board who shall also function as Secretary to the Registration Committee; and

(if) provide the Board and the Registration Committee with such technical and other staff as the Central Government considers necessary.

8. Registration of insecticides :

(1).any person desiring to Import or manufacture any insecticide may apply to the Registration Committee for the registration of such Insecticide and there shall be separate application for each such insecticide, Provided that any person engaged in the business of import or manufacture of any insecticide immediately before the commencement of this section shall make an application to the Registration Committee within a period of 1[seventeen months] from the date of such commencement for the registration of any insecticide which he has been importing or manufacturing before that date, Provided further that where any person referred to in the preceding proviso fails to make an application under that proviso within the period specified therein, he may make such application at any time thereafter on payment of a penalty of one hundred rupees for every month or part thereof after the expiry of such period for the registration of each such insecticide.

(2) Every application under sub-section (1) shall be made in such form and contain such Particulars as may be prescribed.

(3) On receipt of any such application for the registration of an insecticide, the Committee may, after such enquiry as it deems fit and after satisfying itself that the insecticide to which the application relates conforms to the claims made by the importer or by the manufacturer, as the case may be, as regards the efficacy of the insecticide and its safety to human beings and animals, register 3 on such conditions as may be specified by it and on payment of such fee as may be prescribed, the insecticide, allot a registration number thereto and issue a certificate of registration in token thereof within a period of twelve months from the date of receipt of the application, Provided that the Committee may, if it is unable within the said period to, arrive at a decision on the basis of the materials placed before it, extend the period by a further period not exceeding six months, Provided further that if the Committee is of opinion that the precautions claimed by the applicant as being sufficient to ensure safety to human beings or animals are not .such as can be easily observed or that notwithstanding the observance of such precautions the use of the insecticide Involves serious risk to human beings or animals, it may refuse to register the insecticide. 4[(3-A) In the case of applications received by it prior to the 31st day of March, 1975, notwithstanding the expiry of the period specified in sub-section (3) for disposal of such applications, it shall be lawful and shall be deemed always to have been lawful for the Registration Committee to dispose of such applications at any time after such expiry but within a period of one year from the commencement of the Insecticides (Amendment) Act, 1977 (24 of 1977),Provided that nothing contained in this sub-section shall be deemed to make any contravention before the commencement of the Insecticides (Amendment) Act, 1977 (24 of (1977), of a condition of a certificate of registration granted before such commencement, an offence punishable under this Act.

(3-B) Where the Registration Committee is of opinion that the insecticide is being introduced for the first time In India, it may, pending any enquiry, register it provisionally for a period of two years on such conditions as may be specified by it.

(3-C) The Registration Committee may, having regard to the efficacy of the insecticide and its safety to human beings and animals, vary the conditions subject to which a certificate of registration has been granted and may for that purpose require the certificate-holder by notice in writing to deliver up the certificate to It within such time as may be specified in the notice.]

(4) Notwithstanding anything contained In this section, where an Insecticide has been registered on the application of any person, any other person desiring to import or manufacture the insecticide or engaged in the business of, import or manufacture thereof shall on application and on payment of prescribed fee be allotted a registration number and granted a certificate of registration in respect thereof on the same conditions on which the insecticide was originally registered.

Scope and applicability :

The factum of the requirement for the petitioners' cultivation have not been denied by the respondents. Therefore, since there is no dispute in regard to the factual aspect of the matter, Sec. 9 does not have any manner of application in the facts and circumstances of the case.

Statutory rule :

A statement contained in a statute or. Statutory rule of the factual background leading up to the enactment has ordinarily to be accepted and acted upon by the Court as wholly correct.

9. Appeal against non-registration or cancellation :

Any person aggrieved by a recession of the Registration Committee under Sec. 9 may, within a period of thirty days from the date on which the decision is communicated to him appeal in the prescribed manner and on payment of the prescribed fee to the Central Government whose decision thereon shall be final: Provided that the Central Government may entertain an appeal after the expiry of the said period, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

10. Power of revision of Central Government :

The Central Government may, at any time, call for the record relating to any case in which the Registration Committee has given a decision under Sec.9 for the purpose of satisfying itself as to the legality or propriety of any such decision and may pass any such order in relation thereto as it thinks fit: Provided that no such order shall be passed after the expiry of one year from the date of the decision, Provided further that the Central Government shall not pass any order prejudicial to person unless that person has had a reasonable opportunity of showing cause against the proposed order.

11. Licensing officers :

The State Government may, by notification in the official Gazette, appoint such persons as it thinks fit to be licensing officers for the purposes of this Act and define the areas in respect of which they shall exercise jurisdiction.

12. Grant of license :

(1) Any person desiring to manufacture or to sell, stock or exhibit for sale or distribute any insecticide, 3[or to undertake commercial pest control operations with the use of any insecticide] may make an application to the licensing officer for the grant of a license, Provided that any person engaged in the business of manufacturing or selling, stocking or exhibiting for sale or distributing any insecticide immediately before the commencement of this section shall make an application to the licensing officer for the grant of a license within a period of 4[seventeen months] from the date of such commencement,[Provided further that any person engaged in the commercial pest control operations immediately before the commencement of the Insecticides (Amendment) Act, 1977 (24 of 1977), shall make an application to the licensing officer for the grant of a license within a period of six months from the commencement of the said Act.]

(2) Every application under sub-section (1) shall be made in such form and shall contain such particulars as may be prescribed.

(3) On receipt of any such application for the grant of a license, the licensing officer may grant a license in such form, on such conditions and on payment of such fee as may be prescribed.

(4) A license granted under this section shall be valid for the period specified therein and may be renewed from time to time for such period and on payment of such fee as may be prescribed, Provided that where a license has been granted to any person who has made an application under 1[the first proviso or, as the case may be the second proviso] to subsection (1), that license shall be deemed to be cancelled in relation to any insecticide, the application for registration whereof has been refused or the registration whereof has been cancelled, under this Act, with effect from the date on which such refusal or cancellation is notified in to official Gazette. 2[(5) In prescribing fees the grant or renewal of licenses under this section, different fees may be prescribed for the sale or distribution of insecticides for purposes of domestic use and for other purposes.

13. Revocation, suspension and amendment of licenses :

(1) If the licensing officer is satisfied, either on a reference made to him in this behalf or otherwise, that

(a) The license granted under Sec. 13 has been granted because of misrepresentation as to an essential fact; or

(b) the holder of a license has failed to comply with the conditions *subject* to which the license was granted or has contravened any of the provisions of this Act or the rules made there under, then, without prejudice to any other penalty to which the holder of the license may be liable under this Act, the licensing officer may, after giving the holder of the license an opportunity of showing cause, revoke or suspend the *license.*

(2) Subject to any rules that may be made in this behalf, the licensing officer may also vary or amend a license granted under Sec. 13.

15. Appeal against the decision of a licensing officer :

(I) Any person aggrieved by a decision of licensing officer under Sec. 13 [except under the proviso to sub-section (4)] or Sec. 14 may, within a period of thirty days from the date on which the decision is communicated to him, appeal to such authority in such manner and on payment of such fee as may be prescribed: Provided that the appellate authority may entertain an appeal after the expiry of the said period if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time.

On receipt of an appeal under sub-section (1), the appellate authority shall, after giving the appellant an opportunity of showing cause, dispose of the appeal ordinarily within a period of six months and the decision of the appellate authority shall be final.

15. Central Insecticides Laboratory :

The Central Government may, by notification in the official Gazette, establish, a Central Insecticides Laboratory under the control of Director to be appointed by the Central Government to carry out the functions entrusted to it by or under this Act:

Provided that if the Central Government so directs by a notification in the official Gazette, the functions of the Central Insecticides Laboratory shall, to such extent as may be specified in the notification, be carried out at any such Institution as may be specified therein and thereupon the functions of the Director of the Central Insecticides Laboratory shall to the extent so specified, be exercised by the head of the institution.

16. Prohibition of Import and manufacture of certain insecticides :

(1) No person shall, himself or by any person on his behalf, import or manufacture

(a) Any misbranded insecticides;

(b) Any insecticide the sale, distribution or use of which is for the time being prohibited under Sec. 27;

(c) Any insecticide except in accordance with the condition on which it was registered;

(d) Any insecticide in contravention of any other provision of this Act or of any rule made there under, Provided that any person who has applied for registration of an insecticide 3[under any of the provisos] to sub-section (1) of Sec. 9 may continue to import or manufacture any such insecticide and such insecticide shall not be deemed to be a misbranded insecticide within the meaning of sub-section (vi) or sub-clause (vii) or sub clause (viii) of Cl. (k) of Sec. 3, until he has been informed by the Registration Committee of its decision to refuse to register the said insecticide.

(2) No person shall, himself or by any person on his behalf; manufacture any insecticide except under, and in accordance with the condition of, a license issued for such purpose under this Act.

17. Prohibition of sale, etc. of certain insecticides :

(1) No person shall, himself or by any person on his behalf, sell, stock or exhibit for sale, distribute 1[transport, use, or cause to be used] by any worker

(a) Any insecticide which is not registered under this Act;

(b) Any insecticide, the sale, distribution or use of which is for the time being prohibited under Sec. 27;

(c) Any insecticide in contravention of any other provision of this Act or of any rule made there under.

(2) No person shall, himself or by any person on his behalf, sell, stock or exhibit for sale or distribute 2[or use for commercial pest control operations] any insecticide except under, and in accordance with the conditions of, a license issued for such purpose under this Act.

18. Insecticide Analysts :

The Central Government or a State Government may, by notification in the official Gazette, appoint persons in such number as it thinks fit and possessing such technical and .other qualifications as may be prescribed to be Insecticide Analysts for such areas and in respect of such insecticides or class of insecticides as may be specified in the notification, Provided that no person who has any financial interest in the manufacture, import or sale of any insecticide, shall be so appointed.

19. Insecticide Inspectors :

(1) The Central Government or a State Government may, by notification in the official Gazette, appoint persons in such number as it thinks fit and possessing such technical and other qualifications as may be prescribed to be Insecticides Inspectors for such area as may be prescribed to be Insecticide Inspectors for such area as may be specified in the notification, Provided that any person who does not possess the required qualifications may be so appointed only for the purposes of Clauses. (a) and (b) of sub-section (1) of Sec. 21: Provided further that no person who has any financial interest in the manufacture, import or sale of any insecticide shall be so appointed.

(2) Every Insecticide Inspector shall be deemed to be a public servant within the meaning of Sec. 21 of the Indian Penal Code (45 of 1860), and shall be officially subordinate to such authority as the Government appointing him may specify in this behalf.

20. Powers of Insecticide Inspectors :

(1) An Insecticide Inspector shall have, power (a) to enter and search, at all reasonable times and with such assistance, if any, as he considers necessary, any premises in which he has reason to believe that an offence under this Act or the rules made there under has been or is being or is about to be committed, or for the purpose of satisfying himself that the provisions of this Act or the rules made there under or the conditions of any certificate of registration or license issued there under are being complied with;

(b) to require the production of, and to inspect, examine and make copies of, or take extracts from, registers, records or other documents kept by a manufacturer, distributor, carrier, dealer or any other person in pursuance of the

(c) to make such examination and inquiry as he thinks fit in order to ascertain whether the provisions of this Act or the rules made there under are being complied with and for the purpose stop any vehicle;

(d) to stop the distribution, sale or use of an insecticide which he has reason to believe is being distributed, sold or used in contravention of the provisions of this Act or the rules made there under, for a specified period not exceeding twenty days, or unless the alleged contravention is such that the defect may be removed by the possessor of the insecticide, seize the stock of -such insecticide;

(e) to take samples of any insecticide and send such samples for analysis to the Insecticide Analyst for test in the prescribed manner; and

(f) To exercise such other powers as may be necessary for carrying out the purposes of this Act or the rules made there under.

(2) The provisions of the Code of Criminal Procedure, 1973 (2 of 1974), shall, as far as may be, apply to any search or seizure under this Act as they apply to any search or seizure made under the authority of a warrant issued under Sec. 94 of the said Code.]

(3) An Insecticide Inspector may exercise the powers of a police officer under 2[Sec. 42 of the Code of Criminal Procedure, 1973 (2 of 1974)], for the purpose of ascertaining the true name and residence of the person from whom a sample is taken or insecticide is seized.

21. Procedure to be followed by Insecticide Inspectors :

(1) Where an, Insecticide Inspector seizes any record, register or document under Cl. (b) sub-section (1) of Sec. 21, he shall, as may be, inform a Magistrate and take his orders as to the custody there of.

(2) Where an Insecticide Inspector takes any action under Cl. *(d)* of sub-section (1) of Sec21- -

(a) he shall use all dispatch in ascertaining whether or not the insecticide or its sale, distribution or use contravenes any of the provisions of Sec. 18 and if it is ascertained that the insecticide or its sale, distribution or use does not so contravene, forthwith revoke the order passed under the said clause or, as the case may be, take such action as may be necessary for the return of the stock seized;

(b) if he seizes the stock of the insecticide he shall, as soon as may be, inform a Magistrate and take his orders as to the custody thereof;

(c) without prejudice to the institution of any prosecution, if the alleged contravention be such that the defect may be remedied by the possessor of the insecticide, he shall, on being satisfied that the defect has been so remedied, forthwith revoke his order and in case where the Insecticide Inspector has seized the stock of insecticide, he shall, as soon as may be, inform a Magistrate and obtain his order as the release thereof.

(3) Where an Insecticide Inspector takes any sample of an insecticide, he shall tender the fair price thereof and may require a written acknowledgment there for.

(4) Where the price tendered under sub-section (3) is refused, or where the Insecticide Inspector seizes the stock of any insecticide under Cl. (d) of sub-section (1) of Sec. 21, he shall tender a receipt there for in the prescribed form.

(5) Where an Insecticide Inspector takes a sample of any insecticide for the purpose of test or analysis, he shall intimate such purpose in writing on the prescribed form to the person from whom he takes It, and €n the presence of such person unless he willfully absents himself, shall divide the sample Into three portions and effectively seal and suitably mark the same and permit such person to add his own seal and mark to all or any of the portion so sealed and marked,Provided that where the insecticide is made up in

containers of small volume, instead of dividing a sample as aforesaid, the Insecticide Inspector

(6) The Insecticide Inspector shall restore one portion of a sample so divided or more one container, as the case may be, to the person from whom he takes it and shall retain the remainder and dispose of the same as follows:

(i) One portion or container, he shall forthwith send to the Insecticide Analyst for test or analysis; and

(ii) The second, he shall produce to the Court before which proceedings, if any, are instituted in respect of the insecticide.

22. Persons bound to disclose place where insecticides are manufactured or kept :

Every person for the time being in charge of any premises where any Insecticide Is being manufactured or is kept for sale or distribution shall, on being required by an Insecticide Inspector so to do, be legally bound to disclose to the Insecticide Inspector the place where the insecticide is being manufactured or is kept, as the case may be.

23. Report of Insecticide Analyst :

(1) The Insecticide Analyst to whom a sample of any insecticide has been submitted for test or analysis under sub-section (6) of Sec. 22, shall, within a period of sixty days, deliver to the Insecticide Inspector submitting It a signed report in duplicate In the prescribed form.

(2) The Insecticide Inspector on receipt thereof shall deliver one copy of the report to the person from whom the sample was taken and shall retain the other copy for use in any prosecution in respect of the sample. '

(3) Any document purporting to be a report signed by an Insecticide Analyst shall be evidence of facts stated therein, and such evidence shall be conclusive unless the person from whom the sample was taken has within twenty-eight days of the receipt of a copy of the report notified in writing the Insecticide Inspector or the

Court before which any proceeding in respect of the sample are pending that he intends to adduce evidence In controverting of the report.

(4) Unless the sample has already been tested or analyzed in the Central Insecticides Laboratory, where a person has under sub-section (3) notified his intention of adducing evidence in controversies of the Insecticide Analyst's report the Court may, of its own motion or its discretion at the request either of the complainant or of the accused, cause the sample of the insecticide produced before the Magistrate under sub-section (6) of Sec. 22 to be sent for test or analysis to the laboratory, which shall make the test or analysis and report In writing signed by, or under the authority of, the Director of Central Insecticides Laboratory the result thereof, and such report shall be conclusive evidence of the facts stated therein.

(5) The cost of a test or analysis made by the Central Insecticides Laboratory under subsection

(6) Shall be paid by the complainant or the accused as the Court shall direct.

24. Confiscation :

(1) Where any person has been convicted under this Act for on ravening any of the provisions of this Act or of the rules made there under, the stock of the insecticide in respect of which the contravention has been made shall be liable to confiscation.

(2) Without prejudice to the provisions contained in sub-section (1), where the Court satisfied on the application of an Insecticide Inspector or otherwise and after such inquiry as may be necessary, that the insecticide is a misbranded insecticide, such insecticide shall be liable to confiscation.

25. Notification of poisoning :

The State Government may, by notification in the official Gazette, require any person or class of persons specified therein to report all occurrences of poisoning (through the use or handling of any insecticide) coming within his or their cognizance to such officer as may be specified in the said notification.

26. Prohibition of sale, etc. of Insecticide for reasons of public safety :

(1) If, on receipt of a report under Sec. 26 or otherwise, the Central Government or the State Government is of opinion, for reasons to be recorded in writing, that the use of any insecticide specified in sub-clause (iii) of Cl. (e) of Sec. 3 or any specific batch thereof is likely to involve such risk to human beings or animals as to render it expedient or necessary to take immediate action then that Government may, by notification in the official Gazette, prohibit the sale, distribution or use of the insecticide or batch, in such area, to such extent and for such period (not exceeding sixty days) as may be specified in the notification pending investigation into the matter:

Provided that where the investigation is not completed within the said period, the Central Government or the State Government, as the case may be, may extend it by such further period or periods not exceeding thirty days in the aggregate as it may specify in a like manner.

(2) If, as a result of its own investigation or on receipt of the report from the State Government and after consultation with the Registration Committee, the Central Government, is satisfied that the use of the said insecticide or batch is or is not likely to cause any such risk, it may pass such order (including an order refusing to register the insecticide or cancelling) the certificate of registration, if any, granted in respect thereof as it deems fit, depending on the circumstances of the case.

27. Notification of cancellation of registration, etc :

A refusal to register any insecticide or a cancellation of a certificate of registration of any insecticide shall be notified in the official Gazette and in such other manner as may be prescribed.

28. Offences and punishment :

(1) Whoever, (a) imports, manufactures, sells, stocks or exhibits for sale or distributes any insecticide deemed to be misbranded under sub-clause (I) or sub-clause (iii) or sub clause (viii) of Cl. ,(k) of Sec. 3; or

(b) Imports or manufactures any insecticide without a certificate of registration; or

(c) Manufactures, sells, stocks or exhibits for sale or distributes an insecticide without a license; or

(d) Sells or distributes an insecticide, in contravention of Sec. 27; or

(e) Causes an insecticide, the use of which has been prohibited under Sec. 27, to be used by any worker; or

(f) obstructs an Insecticide Inspector in the exercise of his powers or discharge of his duties under this Act or the rules made there under, shall be punishable' -

(I) for -the first offence, with imprisonment for a term which may extend to two years, or with fine which may extend to two thousand rupees, or with both;

(ii) For the second and a subsequent offence, with imprisonment for a term which may extend to three years, or with fine, or with both.

(2) Whoever uses an insecticide in contravention of any provision of this Act or any rule made there under shall be punishable with fine which may extend to five hundred rupees.

(3) Whoever contravenes any of the other provisions of this Act or any rule made there under or any condition of certificate or registration or license granted there under, shall be punishable.

(f) For the first offence, with imprisonment for a term which may extend to six months, or with both;

(if) for the second and a subsequent offence, with imprisonment for a term which may extend to one year, or with fine or with both.

(4) If any person convicted of an offence under this Act commits a like offence afterwards it shall be lawful for the Court

before which the second or subsequent conviction takes place to cause the offender's name and place of residence, the offence and the penalty imposed to be published in such newspapers or in such other manner as the Court may direct.

30. Defense which may or may not be allowed in prosecutions under this Act :

(1) Save as hereinafter provided in this section, it shall be no defense in a prosecution under this Act to prove merely that the accused was ignorant of the nature or quality of the insecticide in respect of which the offence was committed or of the risk involved in the manufacture, sale or use of such insecticide or of the circumstances of its manufacture or import.

(2) For the purposes of Sec. 17 an insecticide shall not be deemed to be misbranded only by reason of the fact that

(a) there has been added thereto some innocuous substance or ingredient because the same is required for the manufacture or the preparation of the insecticide as an article of commerce in a state fit for carriage or consumption, and not to increase the bulk, weight or measure of the insecticide or to conceal its inferior quality or other defect; or

(b) In the process of manufacture, preparation or conveyance some extraneous substance has unavoidably become intermixed with it.

(3) A person not being an importer or a manufacturer of an insecticide or his agent for the distribution thereof, shall not be liable for contravention of any provision of this Act, if he proves

(a) That he acquired the insecticide from an importer or a duly licensed manufacturer, distributor or dealer thereof;

(b) That he did not know and could not, with reasonable diligence, have ascertained that the insecticide in any way contravened any provision of this Act; and

(c) That the insecticide, while in his possession, was properly stored and remained in the same state as when he acquired it.

31. Cognizance and trial of offences :

(1) No prosecution for an offence under this Act shall be instituted except by, or with the written consent of, the State Government of a person authorized in this behalf by the State Government.

(2) No Court inferior to that of a 1[Metropolitan Magistrate or a Judicial Magistrate of the first class] shall try any offence under this Act.

32. Offences by companies :

(1) Whenever an offence under this Act has been committed by a company, every person who at the time the offence was committed was in charge of, or was responsible to the company for the conduct of the business of the company as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly Provided that nothing contained in this sub-section shall render any such person liable to any punishment under this Act if he proves that the offence was committed without his knowledge or that he exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect, on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Explanation.-For the purpose of this section:

(a) "Company" means anybody corporate and includes a firm or other association of individuals; and '.

(b) "Director", in relation to a firm, means a partner in the firm.

31. Power of the Central Government to give directions :

The Central Government may give such directions to any State Government as may appear to the Central Government to be necessary for carrying into execution in the State any of the provisions of this Act or of any rule or order made there under.

32. Protection of action taken in good faith :

No prosecution, suit or other proceeding shall lie against the Government, or any officer of the Government, or the Board, the Registration Committee or any Committee of the Board, for anything in good faith done or intended to be done under this Act.

33. Power of the Central Government to make rules :

(1) The Central Government may, after consultation with the Board and subject to the condition of previous publication, by notification in the official Gazette, make rules for the purpose of giving effect to the provisions of this Act:

Provided that consultation with the Board may be dispensed with if the Central Government is of opinion that circumstances have arisen which render it necessary to make rules without such consultation, but in such a case the Board shall be consulted within six months of the making of the rules and the Central Government shall take into consideration any suggestions which the Board may make in relation to the amendment of the said rules.

(2) In particular and without prejudice to the generality of the foregoing power, such rules may prescribe

(a) The method of packing and labeling;

(b) The manner of registration of an insecticide;

(c) *The* functions of the Board and of the Registration Committee and the travelling and other allowance payable to members of the Board, the Registration

34. Power of the State Government to make rules : (1) The State Government may, after consultation with the Board and subject to the condition of previous publication, by notification in the official

Gazette, make rules for the purpose of giving effect to the provisions of this Act and not inconsistent with the rules, if any, made by the Central Government.

(2) In particular and without prejudice to the generality of the foregoing power, such rules may provide for -

(a) the authority to which, the manner in which, and the fee on payment of which, an appeal may be filed under Sec. 15 and the procedure to be followed by the appellate authority in disposing of the appeal;

(b) The delegation of any of the powers and functions conferred by this Act on the State Government to any officer or authority specified by that Government.

35. Retrospectives of an amendment :

If the suit was pending on the date when the amendments in the principal Act were brought into force, the amended provisions of the Act will govern the disposal of the suit.3 It is well-settled rule of construction that every statute or statutory rule is prospective unless it is expressly or by necessary implication made to have

36. Doctrine of implied repeal :

The doctrine of implied repeal is based on the postulate the Legislature which is presumed to know the existing state of the laws did not intend to create any confusion by retaining conflicting provisions. Court in applying this doctrine are supposed merely to give effect to the legislative intent by examining the object and scope of the two enactments. But in a conceivable case, the very existence of two provisions may by itself, and without more, lead to an inference of mutual irreconcilability if the later set of provisions is by itself a complete Code with respect to the same matter. In such a case the actual detailed comparison of the two sets of provisions may not be necessary. It is a matter of legislative intent that the two sets of provisions were not expected to be applied simultaneously

37. Exemption :

(1) Nothing in this Act shall apply to (a) The use of any insecticide by any person for his own household purposes or for garden or in respect of any land under his cultivation;

(b)Any substance specified or included in the schedule or any preparation containing any one or more such substances, if such substance or preparation is intended for purposes other than preventing, destroying, repelling or mitigating any insects, rodents, fungi, weeds and other forms of plant or animal life not useful to human beings.

(2) The Central Government may, by notification In the official Gazette, and subject to such conditions, if any, as it may specify therein, exempt from all or any of the provisions of this Act or the rules made there under, any educational, scientific or research organization engaged in carrying out experiments, with insecticides.

SEED ORDER. 378 (E) dated the 26th May, 1989 :

Whereas, with a view to reviewing the continued use in India of pesticides that are either banned or restricted for use in other countries, the Government of India, had set up an Expert Committee. Now, therefore, after considering the recommendations of the said Expert Committee, and in consultation with the Registration Committee, set up under the

Insecticides Act, 1968, the Central Government, in exercise of the powers conferred on it, under sub-section (2) of Sec. 27 read with Sec. 28 of the Insecticides Act, 1968, hereby passes the Following order:

(1) The use of DDT in agriculture is hereby withdrawn. In very special circumstances warranting the use of DDT for plant protection work, the State or Central Government may purchase it directly from Messrs. Hindustan Insecticides Limited, to be used under expert Governmental supervision.

(2) The use of DDT for the public health programme to 10,000 MTs per annum, except in case of any major outbreak of epidemic is hereby restricted.

(3) The Central Government further orders that the registration certificates issued by the Registration Committee to various registrants under Sec. 9 of the said Act shall stand Modified/cancelled to give effect to this order.

(4) It is also ordered that all the holders of the registration certificates for manufacture and import of DDT should return their registration certificate to the Secretary, Registration Committee, Directorate of Plant Protection, Quarantine and Storage, NH-IV Faridabad (Haryana) by the 15th June, 1989.

(5) However, non-endorsement/correction of the registration certificates will not be taken as permission/approval to operate upon original certificate of registration it contravention of the provisions of this order.

(6) Certificates not submitted by the due date shall be deemed to have been cancelled.

SEED ORDER. 5 6 9 (E), dated the 25th July, 1989 :

Whereas the Government of India had set up an Expert Committee with a view to reviewing the continued use in India of pesticides that are either banned or restricted for use in other countries. Now, therefore, after considering the recommendations of the said Expert Committee, and in consultation with the Registration Committee, set up under the Insecticides Act, 1968, the Central Government in exercise of the powers conferred

2. Published in the Gazette of India Extraordinary, Pt. II, sec. 3(II) dated 25th July, 1989 :

Insecticides Act, 1968 29 on it, under sub-section (2) of Sec. 27 read with Sec. 28 of the Insecticides Act, 1968, hereby passes the following order

(1) Chlorobenzilate is hereby banned for use in agriculture. If required it can be imported by Government/Semi-Government

Organization and prepared folbexstrips for making it available to be keepers for controlling mites of honeybees.

(2) Dibromo-Chloropropane (DBPC) is hereby banned and the registration certificates issued by the Registration Committee to 'various registrants shall stand cancelled.

(3) Toxaphene (Camphechlor) is hereby banned and the registration certificates issued by the Registration Committee to various registrants shall be cancelled.

(4) The **use** of Sodium Cyanide shall be restricted for fumigation of cotton bales by Plant Protection Adviser to the Government of India under expert supervision.

(5) Penta-Chloro-Nitor-Benzene (PCNB) is hereby banned and the registration certificates issued by the Registration Committee to various registrants shall stand cancelled.

(6) Captafol shall be used only as seed dresser. Its use as foliar spray is hereby banned.

(7) All the holders of the registration certificates for manufacture and import, of these insecticides should return their registration certificates to the Secretary, Registration Committee, Directorate of PP, Q&S, NH-IV Faridabad (Haryana) by the 31st July, 1989.

(8) Non-endorsement or correction of the registration certificates will not be taken as permission or approval to operate upon original certificate of registration in contravention of the provisions of this order.

(9) Certificates not submitted by the due date shall be deemed to have been cancelled.

THE INSECTICIDES RULES, 1971 :

Preliminary –

1. Short title and commencement.-

2. (1) these rules may be called the Insecticides Rules, 1971.

3. (2) they shall come, into force on the 30th of October, 1971.]

3. Definitions.-In these rules, unless the context otherwise requires

(a) "Act" means the Insecticides Act, 1968 (46 of 1968);

(c) "Expiry date" means the date that is mentioned on the container, label or wrapper against the column 'date of expiry';]

(d) "Form" means a form set out in the First Schedule;

(e) "Laboratory" means the Central Insecticides Laboratory;]

(f) "Schedule" means a schedule annexed to these rules;

(h) "Pests" means any insects, rodents, fungi, weeds and other forms of plant or animal life not useful to human beings.

(i) "Primary package" means the immediate package containing the insecticides

(j) "Principal" means the importer or manufacturer of insecticides, as the case may be

(k) "Registration" includes provisional registration

(l)"Rural area" means an area which falls outside the limits of any Municipal Corporation or Municipal Committee or a Notified Area Committee or a Cantonment

(m) "Schedule" means a Schedule annexed to these rules

(n) "Secondary package" means a package which is neither a primary package nor a transportation packs'

(o) "Section" means a section of the Act;

(p) "Testing facility" means an operational unit where the experimental studies are being carried out or have been carried out in relation to submission of data on product quality or on safety or on efficacy, or an residues or on stability in storage of the insecticides for which an application for registration is made

(q) "Transportation package" means the outer most packages used for transportation of insecticides.

Functions of the Board, Registration Committee and Laboratory

3. Functions of the Board :

The Board shall, in addition to the functions assigned to it by the Act, carry out the following functions, namely:

(a) Advise the Central Government on the manufacture of insecticides under the Industries (Development and Regulation) Act, 1951 (65 of 1951);

(b) Specify the uses of the classification of insecticides on the basis of their toxicity as well as their being suitable for aerial application;

(c) Advice tolerance limits for insecticides, residues and an establishment of minimum intervals between the application of insecticides and harvest in respect of various commodities;

(d) Specify the shelf-life of insecticides;

(e) Suggest colorization, including coloring matter which may be mixed with concentrates of insecticides, particularly those of highly toxic nature;

(f) Carry out such other functions as are supplemental, incidental or consequential to any of the functions conferred by the Act or these rules.

4. Functions of Registration Committee :

The Registration Committee shall, in addition to the functions assigned to it by the Act, perform the following functions, namely

(a) Specify the precautions to be taken against poisoning through the use handling of insecticides;

(b) Carry out such other incidental or consequential matters necessary for carrying out the functions assigned to it under the Act or these rules.

5. Functions of Laboratory :

The functions of the Laboratory shall be as follows

(a) to analyze such samples of insecticides sent to it under the Act *by any* officer or authority authorized by the Central or State

Governments and submission of certificates of analysis to the concerned authority;

(b) To analyze samples of materials for insecticides residues under the provisions of the Act;

(c) To carry out such investigations as may be necessary for the purpose of ensuring the conditions of registration of insecticides;

(d) To determine the efficacy and toxicity of insecticides;

(e) To carry out such other functions as may be entrusted to it by the Central Government or by a State Government with the permission of the Central Government and after consultation with the Board.

5. Manner of registration :

(1) (a) An application for registration of an insecticide under the Act shall be made in Form I and the said Form including the verification portion, shall be signed in case of an individual by the individual himself or a-person duly authorized by him ; in case of Hindu Undivided Family, by the *Karta* or any person duly authorized by hum ; in case of partnership firm by the managing partner ; in case of a company, by any person duly authorized in that behalf by the Board of Directors ; and in any other case by the Registration Committee and the Licensing Officer.

(b) The Registration Committee may, if necessary direct inspection of the 'testing facility for establishing the authenticity of the data.

(2) An application form duly filled together with a treasury challan evidencing the payment of registration fees of rupees one hundred shall be sent to the Registration Committee, Insecticides Act, Department of Agriculture, Government of India, New Delhi.

(3) The registration fee payable shall be paid by a demand draft drawn on the State Bank of India, Faridabad, in favour of the Accounts Officer, Directorate of Plant Protection, Quarantine and Storage, Faridabad, Haryana.

(4) The certificate of registration shall be in Form II or Form II-A, as the case may be and shall be subject to such conditions as

specified therein.6-A. Issue of duplicate certificate of registration.-A fee of rupees five shall be paid for a duplicate copy of a certificate of registration if the original is defaced, damaged or lost.] Comment When the original certificate of registration is defaced, damaged or lost, a fee of rupees five shall be paid for a duplicate copy of a certificate of registration.

6. Appeal :

(1) An appeal against any decision of the Registration Committee under Sec.9 shall be preferred in writing [in Form 11-B in duplicate] to the Central Government in the Department of Agriculture.

(2) The appeal shall be in writing and shall set out concisely and under distinct heads the grounds on which the appeal is preferred.

(3) Every appeal shall be accompanied by a treasury chaplain evidencing the payment of a fee of rupees ten and a copy of the decision appealed against.

(4) The fees payable for preferring an appeal shall be paid by a demand draft drawn on the State Bank of India, Faridabad, in favour of the Accounts Officer, Directorate of Plant Protection, Quarantine and Storage, Faridabad, Haryana.

(5). Manner of publication of refusal to register or cancellation of the certificate of registration.-A refusal to register an insecticide or a cancellation of the certificate of registration of an insecticide shall also be published in any two English and Hindi newspapers which have circulation in a substantial part of India and in any of the journals published by the Department of Agriculture of the Government of India.

7. Grant of Licenses :

Licenses to manufacture insecticides -

(1) Application for the grant of renewal of a license to manufacture any insecticide shall be made in Form III or Form IV, as the case may be, to the licensing officer and shall be accompanied

by a fee of rupees fifty for every insecticide for which the license is applied, subject to a maximum of rupees five hundred.

(2) If an insecticide is proposed to be manufactured at more than one place, separate applications shall be made and separate licenses shall be issued in respect of every such place.

(3) A license to manufacture insecticides shall be issued in Form V and shall be subject to the following conditions, namely

(i) The license and any certificate of renewal shall be kept on the approved premises and shall be produced for inspection at the request of an Insecticide Inspector appointed under the Act or any other officer or authority authorized by the licensing officer.

(ii) Any change in the expert staff named in the license shall forthwith be reported to the licensing officer.

(iii) If the licensee wants to undertake during the currency of the license to manufacture for sale of additional insecticides, he shall apply to the licensing officer for the necessary endorsement in the license on payment of the prescribed fee for every category of insecticides.

(iv) An application for the renewal of a license shall be made as laid down in rule 11.

(v) The licensee shall comply with the provisions of the Act and the rules made there under for the time being in force. A licensing officer may, after giving reasonable opportunity of being heard, to the applicant, refuse to grant any license.(4-A) No license to manufacture an insecticide shall be granted unless the licensing officer is satisfied that necessary plant and machinery, safety devices and first-aid facilities, etc., exist in the premises where the insecticide is proposed to be manufactured.

(4) A fee of rupees five shall be paid for a duplicate copy of a license issued under this rule, if the original is defaced, damaged, or lost.

(5) The fee payable under sub-rule (1) for the grant or renewal of a license shall be rupees twenty for every insecticide for

which the license is applied, subject to a maximum of rupees three hundred. There shall be a separate fee for each place, if any insecticide is proposed to be sold, stocked or exhibited for sale at more than one place Provided that the maximum fee payable in respect of insecticides commonly used or household purposes and registered in such shall be rupees ten for every place Provided further that if the place of sale is established in the rural areas, the fee shall be one-fifth of the fee specified in this sub-rule.

(6) If any insecticide is proposed to be sold or stocked for sale at more than one place, separate applications shall be made and separate licences shall be issued in respect of every such place. [and for every insecticides.]

(7)A license to sell, stock or exhibit for sale or distribute insecticides shall be issued in FormVIII and shall be subject to the following conditions namely:

(i) The license shall be displayed, in a prominent place. in the part of the premises open to the public.

(ii) The license shall comply with the provisions of the Act, and the rule made there under for the time being in force.

(iii) Where the licensee wants to sell, stock or exhibit for sale or distribute any additional insecticides during the currency of the license, he may apply to the licensing officer for necessary endorsement on the license on payment of fees specified in sub rule.

(i) Every person shall along with his application for grant or renewal of a license to undertake, operations or shall, stock or exhibit for sale or distribute insecticides, file a certificate from the principal whom he represents or desires to represent.

(ii) The certificate to be issued by the principal shall be addressed to the licensing officer of the concerned area and shall contain full particulars of the principal including their registration and manufacturing license numbers, full name and address of the person proposed to be authorized and also the type of formulations to be used in commercial pest control operations, sold, stocked or exhibited, for sale or distribution.

(iii) In order to verify the genuineness or otherwise of the certificate, the principal shall send to the licensing officer of the State where he intends to sell his products an adequate number of copies of the specimen signature or the specimen signatures of the persons authorized in writing to issue the principal's certificate.

(iv) In case of suspension, revocation or cancellation of the certificate, the principal shall forthwith intimate the licensing officer having jurisdiction.]

(5) A licensing officer may, after giving a reasonable opportunity of being heard to the applicant refuse to grant any license.

(6) A fee of rupees five shall be payable for a duplicate copy of a license issued under this rule if the original is defaced, damaged or lost.

(b) All such stocks then shall be disposed of in such a manner as may be specified from time to time by the Central Government in consultation with the Central Insecticides Board.10-B. Special provision with regard to sulphur In regard to insecticides sulphur and its formulations, all licensees shall,

(a) Observe all precautions to prevent its theft;

(b) Report any such theft to the nearest police authorities promptly; and

(c) Maintain a separate register showing names and addresses of all the persons to whom it has been sold or distributed and the quantities to be sold or distributed. The same building where any articles consumable by human, beings or animals are manufactured stored or exposed for sale.

8. Duration of licenses :

(a) Any license issued or renewed under this chapter shall, unless sooner suspended or cancelled, be in force for a period of two calendar years: Provided that the license to manufacture insecticides, if any, issued on the basis of provisional registration granted under sub-section (3-B) of Sec. 9, shall expire on the date of expiry of the provisional registration Provided further that the license granted by endorsement on the main license under Cl. (iii) of sub-rule (8) of rule 9 or under Cl. (iii) of sub-rule (4) of rule 10 or under sub- rule (3) of rule 10-A shall expire or be renewable along with the main license.

(b) An application for the renewal of a license shall be made before its expiry and if such an application is made after the date of expiry but within three months from such date, a late fee of

(i) rupees fifty for the first month or part thereof, rupees one hundred for the second month or part thereof and rupees one hundred and fifty for the third month or part thereof in the case of license to manufacture insecticides or to carry pest control operations

(ii) rupees ten for the first month or part thereof, rupees twenty for the second month or part thereof and rupees thirty for the third month or part thereof, in case of any other license shall be paid along with the application for renewal: Provided that where the main pest control operation unit or the place of sale is located in the rural areas, the late fee shall be one-fifth of the said late fee Provided further that in case of death or disability of the license the licensing officer may, after recording reason in writing, exempt the applicant from payment of the late fee.

(c) The license shall continue to be in force until it is renewed or revoked or where an appeal is preferred under Sec. 15, until the disposal of appeal,

(d) A licensing officer may, after giving an opportunity of being heard, refuse to renew the license.'

12. Conditions of license :

(a) Subject to conditions laid down in sub-rule (3) of rule 9 under sub-rule (4) of rule 10, a license shall not be granted to any person under this chapter unless the licensing officer is satisfied that the premises in respect of which license is to be granted are adequate and equipped with proper storage in respect of which the license is granted.

(b) In granting a license, the licensing officer shall have regard, among other things to(i) the number of licenses granted in the locality during any year; and

(ii) the occupation, trade or business carried on by the applicant.

13. Varying or amending a license :

The licensing officer may either on an application made by the licensee or if he is satisfied that the conditions under which a license has been granted under this chapter have been changed that it is necessary so to do, vary or amend a license, after giving an opportunity of being heard to the person holding the license.

14. Transfer of license :

(1) The holder of a license may, at any time, before the expiry of the license, apply for permission to transfer the license to any other pawn.

(2) The application under sub-rule (1) shall be accompanied by a fee of rupees five.

(3) The licensing officer may, after such inquiry as he thinks fit accord permission to transfer the license and on such permission being given an endorsement to that effect shall be made in the license.

(4) If the permission to transfer a license is refused, the fee paid therefore shall be refunded to the applicant.

15. Issuing cash memo and maintenance of records :

(1) All sales of insecticides shall be made by a bill or cash memo in the form prescribed under any law.

(2) All sales of insecticides made to a licensed manufacturer (formulator or packer), stockiest, distributor, dealer, retailer or to a bulk consumer shall be entered insecticide wise, in a register in Form XIII and a state wise monthly return of all sales to actual

consumers shall be sent to the licensing officer, in Form MV within 15 days from the close of the month.

(3) Every importer or manufacturer of insecticide shall maintain a stock register in Form *XV* for X technical grade insecticides and in Form XVI to formulate insecticides.

(4) Without prejudice to the foregoing, the Central Government or the State Government or any other person authorized by it may, by notice in writing require any importer or manufacturer or any other person dealing in insecticides to furnish within the time specified in the notice, such information with respect of any insecticides or any batch thereof, including the particulars or all persons to whom it has been sold or distributed, as it may consider necessary.

16. Prohibition of sale or distribution unless packed and labeled :

No person shall stock or exhibit for sale or distribute any insecticide unless it is packed and labeled in accordance with the provisions of these rules.

17. Packaging of insecticides :

(1) Every package containing the insecticides shall be of a type approved by the Registration Committee.

(2) Before putting any insecticide into the primary package, every batch thereof shall be analyzed as per the relevant specifications of the manufacture thereof, in accordance with the approved methods of analysis and the result of such an analysis shall be recorded in the register maintained for the purpose. If any insecticide is put in the package it shall be presumed that it is fit and ready for sale, distribution or use for which it is intended, notwithstanding the fact that any further steps are still required to be taken to make it marketable.

18. Leaflet to be contained in a package :

(1) The packing of every insecticide shall include a leaflet containing the following details, namely

(a) The plant disease, insects and noxious animals or weeds for which the insecticide is to be applied, the adequate direction concerning the manner in which the insecticide is to be used at the time of application;

(b) Particulars regarding chemicals harmful to human beings, animals and wild life, warning and cautionary statements including the symptoms of 'poisoning suitable and adequate safety measures and emergency first-aid treatment where necessary;

(c) Cautions regarding storage and application of insecticides with suitable warnings relating to inflammable, explosive or other substance harmful to the skin;

(d) Instructions concerning the decontamination or safe disposal of used containers;

(e) A statement showing the antidote for the poison shall be included in the leaflet and the label;

(f) If the insecticide is irritating to the skin, nose, throat or eyes, a statement shall be included to that effect.

(g) Common name of the insecticide as adopted by the International Standards Organization and where such a name has not yet been adopted such other name a may be approved by the Registration Committee.

(2) Two copies of the leaflets duly approved by the Registration Committee and signed by the Secretary, Registration Committee, shall be returned to the manufacturer and one copy to the State licensing officer.

19. Manner of labeling :

(1) The following particulars shall be either printed or written in indelible ink on the label of the innermost container of any insecticide and on the outer most covering in which the container is packed:

(i) Name of the manufacturer (if the manufacturer is not the person in whose name the insecticide is registered under the Act, the relationship between the person in whose name the insecticide has been registered and the person who manufactures, packs or distributes or sells shall be stated).

(ii) Name of insecticide (brand name or trade mark under which the insecticide is sold).

(iii) Registration number of the insecticide.

(iv)Kind and name of active and other ingredients and percentage of each.

(Common name accepted by the International Standards Organization or the Indian Standards Institutions of each of the ingredients shall be given and if no common name exists, the correct chemical name which conforms most closely with the generally accepted rule of chemical nomenclature shall be given).

(v) Net content of volume. (The net content shall be exclusive of wrapper or other material. The correct statement of the net content in terms of weight, measure, number of units of activity, as the case may be, shall be given. The weight and volume shall be expressed in the metric system).

(vi) Batch number.

(vii) Expiry date, i.e. up to the date the insecticide shall retain its efficiency and safety.

(viii) Antidote statement.

(2) The label shall be so affixed to the container that it cannot be ordinarily removed.

(3) The label shall contain in a prominent place and occupying not less than one-sixteenth of the total area of the face of the label, a square, set at an angle of 450 (diamond shape). The dimension of the said square shall depend on the size of the package on which the label is to be affixed. The said square shall be divided into two equal triangles, the upper portion shall contain the symbol and signal word specified in sub-rule (4) and the lower portion shall contain the color specified in sub-rule (5).

(4) The upper portion of the square, referred to in sub-rule (3) shall contain the following Symbols and warning statements

(i) insecticides belonging to Category I (Extremely toxic) shall contain the symbol of a skull and cross-bones and the word "*Poison*" printed in red; the following warning statements shall also appear on the label at appropriate place, outside the triangle

(a) "*Keep Out Of The Reach Of Children*"

(b)"*If Swallowed Or If, Symptoms Of Poisoning Occur Call physician Immediately*";

(ii) insecticides in Category II (highly toxic) will contain the word "POISON "printed in red and the statement "*Keep Out Of The Reach Of Children*"; shall also appear on the label at appropriate place, outside the triangle,

(iii) Insecticides in Category III (moderately toxic) shall bear the word

"*Danger*" and the statement "*Keep Out Of the Reach Of Children*"; shall also appear on the label at suitable place outside the triangle;

(iv Insecticides in Category I V (slightly toxic) shall bear the word "Caution".

(5) The lower portion of the square referred to in sub-rule (4) shall contain the colour specified in column (4) of the table below, depending on the classification of the insecticides specified in the corresponding entry in column (1) of the said table.

(6) In addition to the precautions to be undertaken under sub- rules (3), (4) and (5) the label to the affixed in the packages containing insecticides which are highly inflammable shall indicate that it is inflammable or that the insecticides should be kept away from the heat or open flame and the like.

(7) The label and the leaflets to be affixed or attached to the package containing insecticides shall be printed in Hindi, English and in one or two regional languages in use in the areas where the said packages are likely to be stocked, sold or distributed.

(8) Labeling of insecticides must not bear any unwarranted claims for the safety of the producer or its ingredients. This includes statements such as, "Safe", "Nonpoisonous", "Non-injurious" or

"Harmless" with or without such qualified phrase as "when used as directed" (6) of Sec. 22 for analysis to the Central Insecticides Laboratory. Therefore, it is not as if, that an accused that is not served with a copy of the report under sub- section (2) of Sec. 24 is precluded from having the sample tested or analyzed with the Central Insecticides Laboratory.

20. Prohibition against altering inscriptions, etc. on containers, labels or wrappers of insecticides :

No person shall alter, obliterate or deface any inscription or mark made or recorded by the manufacturer on the container, label or wrapper of any insecticide Provided that nothing in this rule shall apply to any alteration of any inscription or mark, made on the container, label or wrapper of any insecticide at the instance, direction or permission of the Registrar

Insecticide Analysis and Insecticide Inspectors :

21. Qualifications of Insecticide Analyst :

A person shall be eligible for appointment as an insecticide analyst under the Act only if he possesses the following qualifications, namely

(a) A graduate in Agriculture or a graduate in Science with Chemistry as special subject; and

(b) Adequate training in analyzing insecticides in a recognized laboratory.

22. Powers of Insecticides :

Analyst.-The Insecticides Analyst shall have the power to call for such information of particulars or do anything as may be necessary for the proper examination of the samples sent to him either from the Insecticide Inspector or the person whom the sample was obtained.

23. Duties of Insecticide Analyst :

(1) The Insecticide Analyst shall analyze or cause to be analyzed or test or cause to be tested such samples of insecticides as may be sent to him by the Insecticide Inspector under the

provisions of the Act and shall furnish report or results of such tests or analysis.

(2) An insecticide analyst shall, from time to time, forward to the State Government reports giving the result of analytical work and investigation with a view to their publication at the discretion of the Government.

24. Procedure on receipt of sample :

(1) On receipt of a package from an Insecticide Inspector containing a sample for test or analysis, the Insecticide Analyst shall compare the seals on the packet with the specimen impression received separately and shall note the condition of the seals on the packet.

(2) In making the test or analysis of Insecticides, it shall be sufficient of the Insecticides, Analyst follows that specifications and the month of examination of samples as approved by the Registration Committee.

(3) After the test or analysis has been carried out under sub-rule (2), the Insecticides Analyst shall forthwith supply to the Insecticide Inspector a report in triplicate in Form IX of the result or test or analysis.

25. Fees payable for testing or analysis :

(1) The fees payable for testing or analyzing insecticides under sub-section (5) of Sec. 24 of the Act shall be as specified in the Second Schedule.

(2) The fee payable for testing or analyzing samples received from the Insecticides Inspector shall also be as specified in the Second "Schedule Provided that the Central Government may, after taking into consideration to genuine difficulties, of any particular State Government, exempt from payment of the fee For such period as it may consider reasonable.

26. Qualifications of Insecticide Inspector :

A person shall be eligible for appointment as an Insecticide Inspector under the Act only if he possesses the following qualifications, namely

(a) graduate in Agriculture, or graduate in Science with Chemistry as one of the subjects;

(b) Adequate field experience.

27. Duties of Insecticide Inspector :

The Insecticide Inspector shall have the following duties, namely:

(1) To inspect not less than three times in a year all establishment selling insecticides within the area of his jurisdiction;

(2) To satisfy himself that the conditions of license are being complied with;

(3)To procure and send for test and analysis, samples, of insecticide which he has reason to suspect are being sold, stocked or accepted for sale in contravention of the provisions of the act or rules made there under;

(4) To investigate any complaint in writing this may be made to him;

(5) To institute prosecution in respect of breaches of the Act and the rules made there under;

(6) To maintain a record of all inspections made and action taken by him in the performance of his duties including the taking of samples and seizure of stocks and to submit copies of such record to the licensing officer;

(7) To make such inquiries and inspections as may be necessary to detect the sale and use of insecticides in contravention of the Act.

28. Duties of Inspectors specially authorized to inspect manufacture of insecticides :

Shall be the duty of any Inspector authorized to inspect the manufacture of Insecticides

(1) to inspect not less than twice a year all premises licensed for the manufacture of insecticides within the area of his jurisdiction and to satisfy himself that the conditions of the license and the provisions of the Act or the rules made there under are being observed;

(2) to send forthwith to the licensing officer after each inspection, a detailed report indicating the conditions of the license and the provisions of the Act or rules made there under which are being observed and the conditions and provisions, if any, which are not being observed;

(3) To draw samples of insecticides manufactured on the premises and send them for test or analysis in accordance with these rules;

(4) To report to the Government all occurrences of poisoning.

29. Prohibition of disclosure of information :

Except for the purpose of official business or when required by a court of law, an Insecticide Inspector shall not disclose to any person any information acquired by him in the performance of his official duties.

30. Form of order not to dispose of stock :

An order by the Insecticide Inspector requiring a person not to dispose of any stock in his possession shall be in Form X.

31. Prohibition of sale :

No person in possession of an insecticide in respect of which an Insecticide Inspector has made an order under rule 30 shall, in contravention of that order, sell or otherwise dispose of any stock of such insecticide.

32. Form of receipt for seized insecticides :

A receipt by an Insecticide Inspector for the stock of any insecticide seized shall be in Form XI.

33. Form of intimation of purposes of taking samples :

Where an Inspector takes a sample of an insecticide for the purpose of test or analysis he shall intimate such purpose in writing in Form) (II to the person from whom lie takes it.

34. Dispatch of samples for test or analysis :

(1) Samples for test or analysis under the Act shall be sent by registered post or by hand in a sealed packet together with a memorandum in Form GI in an outer cover addressed to the Insecticide Analyst.

(2) The packet as well as the outer cover shall be marked with a distinct mark.

(3) A copy of the memorandum in Form XIII together with a specimen impression of the seals of the Inspector and of the seals, if any, of the person from whom he takes such samples, shall be sent separately by registered post or by hand to the Insecticide Analyst.

Transport and storage of insecticides in transit by rail, road or water –

35. Manner of packing, storage while in transit by rail :

(1) Packages containing insecticides, offered for transport by rail, shall be packed in accordance with the conditions specified in the Red Tariff, issued by the Ministry of Railways.

(2) No insecticide shall be transported or stored in such a way as to come into direct contact with foodstuffs or animal feeds.

(3) No foodstuffs or animal feeds which got mixed up with insecticides as a result of any damage to the packages containing insecticides during transport or storage shall be released to the consignees unless it has been examined for possible contamination by competent B authorities, as may be notified by the State Government.

(4) If any insecticide is found to have leaked out in transport or storage it shall be the responsibility of the transport agency or the storage owner to take such measure urgently to prevent poisoning and pollution of soil or water, if any.

36. Conditions to be specified for storage of insecticides :

(1) The package containing insecticides shall be stored in separate rooms or premises away from the rooms or premises used for storing articles or shall be kept in separate cupboard under lock and key depending upon the quantity and nature of the insecticides.

(2) The rooms or premises means for storing insecticides shall be well built, dry, well-lit and ventilated and of sufficient dimension.

37. Medical Examination :

(1) All persons who are engaged in the work of handling, dealing or otherwise coming in contact with the insecticides during manufacture/formulation of insecticides or being engaged spraying during operation shall be examined medically before their employment and at least quarterly in the case of those engaged in manufacturing /formulation units any yearly in any other cases including operators while in service by a qualified doctor who is aware of risks to which such persons are exposed. Medical examination shall be entered in a register in Form. XVII. Where the insecticide in question is an oregano phosphorous compound or a carbonate compound, the blood cholinesterase level shall be measured at least once a month of all persons working in the manufacturing units. The blood residue estimation shall be done once in a year in the case of persons working with oregano chlorine group of insecticides in a manufacturing/formulation unit. In the case of spraying people working with the pest-control operators, the estimation of cholinesterase level (if working with phosphorous or carbonate compounds) and blood residue (if working with organochlorine group) shall be conducted as and when advised by the doctor as part of the general medical test.

(2) Any person showing symptoms of poisoning shall be immediately examined and given proper treatment.

38. First aid measures :

In all cases of poisoning first-aid treatment shall always be given before the physician is called. The Indian Standard Guide for handling cases of insecticide poisoning Part I First-Aid Measures [IS : 4015 (Part I)-1967] and Part II

39. Protective clothing :

(1) Persons handling insecticides during its manufacture, formulation, transport, distribution or application, shall be adequately protected with appropriate clothing.

(2) The protective clothing shall be used wherever necessary, in conjunction with respiratory devices as laid down in rule 40.

(3) The protective clothing shall be made of materials which prevent or resist the penetration of any form of insecticides formulations. The materials shall also be washable so that the toxic elements may be removed after each use.

(4) A complete suite of protective clothing shall consist of the following dresses, namely:(a) Protective outer garment/overalls/hood/hat;

(b) Rubber gloves or such other protective gloves extending half-way up to the forearm, made of materials impermeable to liquids;

(c) dust-proof goggles; (d) Boots.

40. Respiratory devices :

For preventing inhalation of toxic dusts, vapours or gases, the workers shall use any of the following types of respirators or gas-masks suitable for the purpose, namely

(a) Chemical cartridge respirator;

(b) supplied-air respirator;

(c) Demand flow, type respirator;

(d) Full-face or half-face gas-masks with canister.

In no case shall the concentrates of insecticides in the air where the insecticides are mixed exceed the maximum permissible values.

41. Manufacturers, etc. to keep sufficient quantities of antidotes and first-aid medicines :

The manufacturers and distributors of insecticides and persons who undertakes to spray insecticide on a commercial basis (hereafter in these rules referred to as operators) shall keep sufficient stocks of such first-aid tools, equipments, antidotes, injections and medicines as may be required to treat poisoning cases arising from inhalation, skin, contamination, eye contamination and swallowing.

42. Training of workers :

The manufacturers and distributors of insecticides and operators shall arrange for suitable training in observing safety precautions and handling safety equipment provided to them.

43. Aerial spraying operations :

The aerial application of insecticides shall be subject to the following provisions, namely: - (a) marking of the area shall be the responsibility of the operators;

(b) The operators shall use only approved insecticides and their formulations at approved concentration and height;

(c) Washing decontamination and first-aid facilities shall be provided by the operators;

(d) All aerial operations shall be notified to the public not less than twenty-four hours in advance through competent authorities;

(e) Animals and persons not connected with the operations shall be prevented from entering such areas for a specific period; and

(f) The pilots shall undergo specialization training including clinical effects of the insecticides.

40.Disposal of used packages, surplus materials and washings of insecticides : (1) It shall be the duty of manufacturers, formulators of insecticides and operators to dispose packages or surplus materials and washing in a safe manner so as to prevent environmental or water pollution.

(2) The used packages shall not be left outside to prevent their re-use.

(3) The packages shall be broken and buried away from habitation.

41. Places at which the insecticides may be imported :

No insecticides shall be imported into India except through one of the following places, namely

1. Ferozepore Cantonment and Amritsar railway stations in respect of insecticides imported by rail across the frontier with West Pakistan. Ranaghat, Bongaon and Mahiassan railway stations in respect of insecticides importer by rail across the frontier with the East Pakistan.1

2. Madras, Calcutta, Bombay, Cochin and Kandla in respect of insecticides imported by sea into India. Madras, Calcutta, Bombay, Delhi and Ahmedabad-in respect of insecticides imported by air into India.

42. Travelling and other allowances payable to the members of the Board, etc :

The members of the Board, Registration Committee and any other Committee appointed by the Board shall be entitled to such travelling and other allowances for attending meetings of the Boards, Registration Committee or other Committee, as the case may be, as are for the time being admissible to Grade I officers of the Central Government.

❖ **PROBLEMS OF THE AGRO SERVICE CENTRES :**

1. Artificial shortage of fertilizers during seasons by the dealer and

Retailers

2. Flexible rate of fertilizers which is not affordable to every farmer and proprietor of ASC, s
3. Artificial shortage of hybrid seeds.
4. Quality and quantity of fertilizers and hybrid seeds should be superior.
5. Unnecessary stock of fertilizers, hybrid seeds and insecticides by the dealer

6. Very less profit to the ASC,s owner due to less subsidies or direct subsidies on the bank account of the farmers given by the government.
7. Some ASC,s are providing all required inputs to the farmer on credit but unfortunately no return it back which became headache to the proprietor.
8. Consultancy regarding any problem is on mobile is on mobile it diverted the farmers.
9. *BSNL*'s kisan card also diverted farmers to the *FREE* Government help centres.
10. Variation fertilizers rate that can change farmer's attitude. Open policy related to fertilizer. There should be fixed prices of Fertilizers, Hybrid seeds and insecticides.
11. Code of conduct is not implemented properly everywhere in the district
12. Samples of various inputs provided by different agencies many times failed to prove themselves.
13. There should be specific margin level to the proprietor
14. Lack of technical knowhow in the small land holders.
15. Not involvement in the annual budget of any government.
16. Supply of goods should be well in time
17. Very less response and consumption of fertilizers due to high cost all items.
18. Policies related to transport about getting minimum stone load of inputs of deferent in puts should minimum up to 1 ton for small ASC,s.
19. Implementation of different Government schemes with agent that's why owner should not get direct benefits.
20. Due to lack of money in the some areas no customers are there. Due to natural calamities like drought and famine

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CHAPTER

9

SUMMERY, FINDINGS AND SUGGESTIONS

The present investigation has presented Agro Service Centre and Agricultural Development in Satara District (1981to 2001) in its totality. It is the time to present all the significant and relevant results of investigation. The main objective of the researcher is to present findings of investigation through this chapter.

Satara District is one of the District iln the Maharashtra has significant location like a stare. The Krishna, Koyana, Venna, Taralil, Mand ,Vasna, Vangna covers major portion of the District. The rivers facilitate the irrigation facilities. The river basin is covered by fertile soil in river basins and low quality sol in other part of the region. The region to east central is plain and to the west hilly mountainous region. The rivers basins are covered by highly fertile soil and iln other portion deep, medium and shallow laterite soil. The climate of satara is hot and dry even though world famous tourist centre Mahabaleshwar and Panchgani located in the western part of the District. The amount of rainfall varies from east to west. Heavy rainfall is at west region and less or some scanty in eastern region it creates very severe droughts many time. At the point of view of agriculture it is sufficient.

Agriculture is more dominant in the main river basin i.e. Krishna and Koyana. The land is useful for dry and irrigated farming in the study region. The different crops are growing Kharip and rabbi, these season changed seasons the agrarian economy of the study region changed because day by day the land under cash crop is increasing for example, sugarcane, rice, wheat, fruits-grapes, pomegranate etc.

Out of total workers 80 percent workers engaged in different agricultural activities which shows economy of study area depends on agriculture, Transporting is most important factor that influences on the Agro Service Centres. All Agro Services Centres are well connected with roads. The Satara District divided into eleven talukas Man, Khatav, Phaltan Patan, Jawali, Mahabaleshwar, Wai, Khandala Koregaon, Satara and Karad. The highest agricultural worker found in Karad taluka because it comes in urban area people are engaged in all three activities. In the study region area under net sown area is there in Karad, Patan, Satara and Khatav taluka because of fertile soil, irrigation facilities and plain topography. In karad talulka lift irrigation is most important and in other areas well and canal irritation in study region. Out of total cropped area maximum area under food crop. Jowar is staple food and sugarcane and grapes and pomegranate are the cash crops. Sugarcane is most important cash crop along with Krishna and Koyana rivers. Karad is largest producer of sugarcane production due to irrigation facilities fertile soil and well developed transport network.

Agro Service Centres are playing very important role in providing advanced technology services and inputs for different agricultural activities. All the farmers The functions of Agro Service Centres are clearly related with agricultural activities Agro services Centres classified into with facilities of primary agricultural credit society, banks, Markets, veterinary dispensaries and the distributing of hybrid seeds, insecticides and fertilizers Agro Service Centres are located many in urban as well as in rural area. More number of primary agricultural credit societies are there in Karad taluka ,Phaltan, Satara Patan i.e.(above 100), Maximum concentration of SDCC Bank is in Karad and satara (above 40 branches). Less branches of SDCC bank are in Khandala, Wai, Jawali and Mahabaleshwar. Karad taluka has two LDB, s is there and remaining talukas have one branch.

Markets are economically important and represents regional pattern of development. Daily, weekly market is market yards and market yards are the in the District. Veterinary dispensaries closely related to the Agro Service Centres.22 veterinary hospitals are found in study area which is run by state government and 125 veterinary dispensaries are operated by Zilla Parishad.

The role of extension service centres is also considerable these are not spread everywhere in the District only in Karad taluka maximum concentration is there as per 2004-2005 record. It consist 34 extension services centres for127 Agro Service Centres. Other taluka of the District not having such facilities.Fertilizers plays very important role in the agricultural development. It is not only increasing production but also maintaining fertility status of the farm. The Karad Phaltan and Khatav taluka more concentration of fertilizers distribution centres and lower in M'shwar,Wai and Khadanla. In karad, Khatav and Phaltan taluka more concentration of seeds distribution centres as these area has more land under agriculture.

Out of 3086 Agro Service Centres 1254 are fertilizers distribution centres, 1076 are seeds distribution centres and 756 are insecticides distribution centres in Satara District which enables the farmer to take more production from agriculture

In the Satara District total 96 weekly market centres, 22 submarket yards and 10 market yards which facilitate to 3086 Agro Services Centres. In Mahabaleshwar taluka no submarket yard and market yard facilities. A farmer from these taluka depends on Wai and Jawali market yards.

Physical and economical factors are correlated with agro services centres. Total picture is the result of cumulative effect of these factors. Recently the development of transport, communication and industrial area can also determine the number of Agro Service Centres .In the last 30 years span tremendous increase in number of Agro Service Centre. The high concentration of Agro Service Centres is in plain and deep black soil belt and lower concentration in shallow and medium laterite soil belt in the study area.

Agricultural workers also affecting the distribution of Agro Service Centres.The more number of agricultural workers found in Karad Phaltan and Khatav taluka of the District and less number of agricultural workers are found in Khadala, M'shwar and Jawali taluka as this taluka are in the hilly area. Remaining taluka has moderate number of agricultural workers.

The ranks of taluka of agriculture implements and number of Agro Service Centers is very identical, the coefficient correlation between agriculture workers and number of Agro Service Centers is very strong i.e. 0.93 ($r = 0.93$)

The rank of the taluka net sown area and number of Agro Service Centers is remarkable. The coefficient correlation in between Nets own area and number of Agro Service Centres is moderate i.e. 0.55 ($r = 0.55$)

And the coefficient correlation between Agricultural implements and number of Agro Service Centers is also high degree positive i.e. 0.72($r=0.725$)

The spatial distribution of variables and agricultural development is not uniform in Satara district. It provides very significant information about level of agricultural development. The study highlights that the majority of district come under high development of agriculture and it located at middle and southern part of study region.

Agriculture is not developed in Wai, Khandala, Patan, Jawali and Mahabaleshwar due to industrialization, condusive topography and irrigation facilities. For the development there is need of irrigation facilities restrict during the agriculture.

The study highlights the impact of location and Agro Service Centres on agricultural development planning for the study region.

In case of Karad taluka very weak correlation coefficient (-0.042) is in about Net Sown Area and number of Agro Service Centers, the correlations coefficient is positive i. e. 0.12 where as the coefficient correlation between agriculture workers and number of Agro Service Centers is 0.28

Agro Service Centers are very important for the development of agriculture. Day by day the need of it increasing .It came into notice by the study, increasing trend in number of Agro Service Centers all over the District

Now- a- days everyone who are interested to set up the Agro Service Centers. He / She can obtain permission for it. Only they have to go in proper channel.

The proprietors' are just finding chance to maximize the income. They require fix benefit or profit but due to change in the policies of government they suffered more.

Many Agro Service Centres suffering from different problems like high transportation cost, fertilizers and chemicals not reaching well in time and increasing MRP values. In the Karad taluka of District has high number of Agro Service Centers, huge net sown area and high number of agricultural worker.

Exactly opposite of this Man and Phalatan taluka have high number of Agro Service Centres but agricultural workers and Net Sown Area is less

Mahabaleshwar is the taluka where there less number of Agro Service Centres due to less Agricultural workers and less Net Sown Area no chances to extent the agricultural production.

Fertilizers are reaching well in time to the farmers through the Agro Service Centres. Most of the seller importing chemicals and other necessary material from state or out of state

The central and union government opened up all the control orders regarding to Fertilizers, Seeds and Insecticides to the common people so the people of lower strata of the society are also knows everything about Agro Service Centres. In these orders all details are given so it becomes very possible to everyone to set up Agro Service Centres and to provide all the required inputs to the development of agriculture.

The production of cereal crops and cash crops are increasing day by day because the Agro Service Centres are increasing. The educated people also diverted themselves towards agriculture to take maximum advantage of farm land with the help of Agro Service Centres.

It is observed that in the last 20 years span the number of Agro Service Centres are increasing even though eastern part of the study area is in permanently drought prone area. Some irrigation projects proved boon to the study area like Urmodi, Jihe Katapur, Vasana and Wangna projects.

Due to artificial shortage of fertilizer, seeds and other required material farmers are suffering more. Sufficient provision should be there of fertilizers, seeds and chemicals.

Government should form a policy regarding to the material availability, quality through Agro Service Centres, sufficient storage of all these goods.

Whatever samples are given, many times that samples are failed to prove themselves. It means to play with agriculture, resulted into complex problems so samples should be given after testing its quality and quantity so that poor farmer should not suffer.

There should be a proper policy regarding to the permission of Agro Service Centre. It should be given to such a person who has completed graduation and some training or some specific qualification related to Agro Service Centres should be there.

Many time state and central government giving subsidies to the farmer on Fertilizer and Seed, so the owners are not getting any profits.

Poor status of Indian farmers is also one of the unsolved questions for proprietor. There is acute problem of the recovery of the sums.

Advanced means of communication and transportation are also helpful for the development. For every kind of problem solutions are there today

Government toll free numbers are there for agricultural assessments. All lines open for the farmers all the time. So the farmers can consult any kind of problems with the experts.

The prices of the commodities available in Agro service center should be same everywhere, but there is change in rates or prices. It should be fixed for specific span.

Change in price can change the attitude of the farmers due to that farmers are giving up to purchase the inputs.

The code of conduct prescribed by the government implemented everywhere. Agro Service Centres can misguide the farmers unfair trade can practice by them.

There should be specific benefits to the propitiator for providing all the essential service to the farmers.

Regarding to subsidy given to fertilizers and seeds. It should be considered in the annual budget by the both government and it should be highlighted.

There should be coordination in between companies and Agro Service Centres owner, all inputs should be available at reasonable prices, as per our status many times it is not possible to purchase the inputs due to poor economic condition of the farmers

Policies related to transport of goods should changed. It can exploit the Agro service Centre's owner and farmers. Direct benefits are to the proprietors of the Agro Service Centres.

Due to frequently drought condition less consumption of fertilizers and other chemicals.

During the time of natural calamities owner and farmer should get help very soon as early as possible.

Soil testing laboratories should be at every taluka places at reasonable prices. Farmer should get results well in time.

Every Agro Service Center should be accessed by cattle food and farm implements facilities.

For introducing and spread the use and its importance proper acknowledgement should be there through the means of mass communication.

Along with chemicals there should be some organic material available at Agro Service Centres because it is the need of age. It can protect soil from degradation. More stress on the introduction of organic farming because of huge potentials to the organically produced agricultural goods in national and international markets.

Agro service centers should enlisted in the list of essential services.

Authority and workers of shops should be well trained and qualified.

All Agro Service Centres should connect with ministry by the internet for the transparent conduct in trade activities. Due to difference in soil types and other physical obstacles area wise introduction of chemicals and fertilizers should be there It is needed to enhance to the agricultural production with the help of Agro Service Centre to meets the ever growing demand of food materials.

It is very much needed to formulate the plans for the development of agriculture because it is the only way which can accommodate everyone. By keeping view of the problems recommendation narrated. I am sure this would defiantly help to enhance the level of agricultural development in the study region.

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