

AGRO-BASED INDUSTRIES IN KOLHAPUR DISTRICT

A GEOGRAPHICAL PERSPECTIVE

A Thesis Submitted To

Tilak Maharashtra Vidyapeeth, Pune

For the Degree of

Doctor of Philosophy (Ph.D)

(Vidyavachaspati) in Geography

Under the Faculty of Moral and Social Science

By

Ashok Shrirang Khade

Under the Guidance of

Dr. V.T. Gharpure

Retd. Principal and Research Guide

Department of Geography

Mahila Mahavidyalaya, Karad

District: Satara -415001 (M.S.)

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DECLARATION

I hereby declare that the thesis entitled “Agro-Based Industries in Kolhapur District: A Geographical Perspective” completed and written by me has not previously formed as the basis for the award of any Degree or other similar title of this or any other University or examining body

Ashok Shrirang Khade

Research Student

Place: Pune

Date:

Dr. V. T. Gharpure

Phone: 02164-225595

Retd. Principal and Research Guide

Mobile: 9822791711

Mahila Mahavidyalaya, Karad

EMailid:vtg_1950@rediffmail.com

Karad-415110 District: Satara

CERTIFICATE

This is to certify that the thesis entitled “Agro-Based Industries In Kolhapur District : A Geographical Perspective” which is being submitted herewith for the award of the Degree of Vidyavachaspati (PhD) in Geography of Tilak Maharashtra Vidyapeeth, Pune is the result of original research work completed by Mr.Ashok Shirang Khade under my supervision and guidance. To the best of my knowledge and belief the work incorporated in this thesis has not formed the basis for the award of any Degree or similar title of this or any other University or examining body.

Place:Pune

Dr. V. T. Gharpure

Date:

Retd. Principal and Research Guide

Department of Geography

Mahila Mahavidyalaya, Karad

District: Satara.

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**“AGRO-BASED INDUSTRIES IN KOLHAPUR DISTRICT:
A GEOGRAPHICAL PERSPECTIVE”**

ABSTRACT

The term ‘Industry’ which is loosely used in common speech describes a wide range of activities and has many meanings from work performed from economic gain to operations by which raw materials are processed and good products. “The processing of raw material to exchange its value”. Besides the term ‘Industry’ refers mainly to manufacturing activity and essential function of it is the transformation of materials into a product, which is of greater value than the original materials.

Industrialization means the growth of manufacturing industry. It is a basic process for achieving rapid development through harnessing a region's natural resources and rendering them into production wealth. Industrialization promotes economic status of a society. Therefore in any society or region or country industrialization can be a very effective tool to achieve economic development.

After the first and second world wars rapid industrialization has started in most of the countries of the world. Several new types of industries came into existence. Besides, an agro-based industry was also in existence. Industry and agriculture both are important components of the economy of the developing India. The country like India, the problem of unemployment becomes a main problem in the economy. The industrialization is the only way to overcome the problem of unemployment and enough industrial production.

Agro-based industries have an important role in India's industrial and economic development. They are reducing imbalances and avoiding the concentration of industries in one place. They result in the proper utilization of agricultural products. The locational characteristics are responsible for the distribution of agro-based industries in the region. The measurement of level of industries is measured by numbers of indicators and finds stages in real development of the region. The agro-based industries serve as a development backbone of the rural areas. As a result most of the economists, regional planners and economic geographers are attracted to the new study of industries, with a view to the development of the country.

Economic geographers started to study the new discipline i.e. industries related to geographical factors.

In this view, we are going to assess the history, growth, development, spatial distribution, concentration and the problems of agro-based industries in the Kolhapur District.

Industrial geography is essential associated with production efforts of man for manufacturing the things to satisfy his needs. Industrial geography is the study of the distribution of manufacturing industry.

In the 19th Century industrialization began in India. At present India is the well industrially developed and one of the largest industrial nations in the world. Maharashtra is one of the advanced state in the country as far as industries are concerned. Similarly Kolhapur is also one of the industrially advanced districts. In this district co-operative industrial estates have been developed in the district. Maharashtra Industrial Development Corporation has developed about 806.47 hectors land for SSIs as well as large-scale industries. Apart from the MIDC plots have been given to Maharashtra State Road Transport Corporation and central ware housing corporation for their godowns.

Kolhapur District is one of the leading districts in the State in crop production e.g. Rice, Sugarcane, Groundnut, Soya bean, Jowar, Tobacco, Oilseeds and Cotton etc. Sugarcane is grown in a large scale all over the district. There are fourteen co-operative sugar factories in the district is endowed with most of the economic resources required for setting up of industries. This has made the Kolhapur district to become one of the industrially advanced districts of the state. To promote the industries over here Kolhapur Engineering Association had arranged exhibitions at Kolhapur. Though the last two decades and new economic policies the industry has been suffering from very bad patch. In such circumstances industry requires the new product range, export market, foreign collaboration to have a new start. In the proposed research work an attempt will be made to assess and analyses the agro-based industries in the study region the geographer's viewpoint.

CHAPTER- I

APPRAISAL OF THE PROBLEM

CHAPTER-I

APPRAISAL OF THE PROBLEM

- 1.1 INTRODUCTION
- 1.2 MEANING OF AGRO INDUSTRIES
- 1.3 CLASSIFICATION OF AGRO INDUSTRIES
- 1.4 SIGNIFICANCE OF AGRO-BASED INDUSTRIES
- 1.5 INDUSTRIAL GEOGRAPHY
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- 1.7 CHOICE OF THE REGION AND TOPIC
- 1.8 AIMS AND OBJECTIVES OF THE PRESENT STUDY
- 1.9 DATA BASE AND MOTHODOLOGY
- 1.10 REVIEW OF LITERATURE
- 1.11 CHAPTER SCHEME

CHAPTER I

APPRAISAL OF THE PROBLEM

1.1 INTRODUCTION

The term 'Industry' in its widest sense refers to all economic activities. Industries can be classified into three major groups-primary, secondary and tertiary which have many sub-divisions amongst them again.

The word 'Industry' is loosely used to denote a vast range of human activities which are economically gaining and undergone the process of production. The term 'Industry' is often used by itself to denote manufacturing.

The term 'manufacturing' includes those activities concerned with the processing and altering of raw materials and semi-finished products into finished products. These transforming operations are conducted in factories to which are brought raw materials from various source regions and from which go finished products to diverse market regions.

Another important principle of manufacturing is that the more processing and altering a material is subjected to, the more valuable it becomes. In this sense manufacturing may be defined as "the processing of raw material to enhance its value."

An industry is a group of enterprises who came together or united for common purposes. "The processing of raw materials to exchange its value" is another sense in which we use the term 'industry'.

A very few of the primary products of agriculture, fishing, forestry, mining and animal etc. are in the forms in which man can use them directly. They have to pass through a process before coming to the form as required by man. The various processing steps undertaken by man for converting the unprocessed primary products (raw materials) into articles of utility may be called as industrial activity and the sites at which raw- materials are processed are termed as factories. In other words, industry involves in the production of consumer and producer goods, especially in factories.

The term 'industry' in a border sense, then, is quite flexible and embraces all these economic activities whereby goods are extracted from the earth, they are transformed into useful finished products and finally taken them away from the production centre's to the market.

To overcome the confusion of range of economic activities and for the convenience of study, geographers usually use the term 'industry' in its strict sense to describe the activities in the secondary sector and particularly concerned with manufacturing (an economic activity involves mechanical processing of raw materials and assembly of produced part to give them more useful, value added form), which excludes agriculture and mining.

Therefore on the basis this meaning (according to the operational process that term industry uses) industry can be classified into four groups-extracting, processing, assembling and servicing. Each group requires specific inputs (raw material, capital, labour, water) from specific sources for its operations and provides specific outputs for purchase in specific markets and market areas.

Besides above, the term 'industry' refers mainly to manufacturing activity and the essential function of it is the transformation of material or materials into a product which is of greater value than the original materials. The purpose of manufacturing industry is to alter and to process materials so that they serve new ends and satisfy different requirements.

The term 'industry' refers mainly to manufacturing activity, agriculture, and mining and most other services are excluded from it. And it is in this sense that the term 'industry' will be mainly used in the present study.

1.2 MEANING OF AGRO-INDUSTRIES

'Agro-industries' include industrial activities based on the processing of agricultural raw materials and on the manufacture of products required for the land, and its people. The agro industries are those industries which are linked with, and are set up to meet the needs of the agriculture. Actually all industries draw their raw materials from agriculture.

The term 'Agro-industries,' may be defined as those industries which are dependent on agriculture and draw their raw materials from agriculture, horticulture and Seri-culture, etc. which create supplementary sources of employment in addition to agriculture and allied activities.

Conceptually 'agro-industries' are those industries depend not only on the out-put of agriculture and allied activities, but also on the inputs in agriculture like agriculture equipment, fertilizers and pesticides.

The concept of 'agro-industries' is not however, new although the term is recent. Formerly they referred to industries which survived in rural areas and which had either a direct or an indirect link with population in the rural areas.

The 'Agro-industries' also includes the various production units engaged in processing the agricultural produce such as wheat milling, rice mills, dal mills, oil crushing, cotton ginning, sugar and khandsari units, jaggery, tobacco manufacturing, bidi, cigarette, canning and preservation of fruits and vegetables and so on. It can be safely deduced that 'Agro-industries' have both forward and backward linkages.

The definition given by United Nations Industrial Development Organization (UNIDO) is based on functional criteria and establishes a fairly sound basis for the understanding of the term. According to the UNIDO, the term 'Agro-industries' signifies those industries which use raw manufactured goods are produced on a commercial scale. The agriculture as used in this context also includes fisheries and forestry and in certain cases, the term 'Agro-based industries' is also used to describe these industries.

The term 'Agro-industries' as referred to in the national context applies to 'those industries which are contributing for the development of agriculture including agricultural produce' these are further clarified as input based industries, such as fertilizers and pesticides, and output based industries, such as rice milling, paper products and leather products.

The 'Agro-industries' can be defined as those industries which are dependent on agriculture and or on which agriculture is dependent. It can be further elucidated as those industries which utilize the agricultural produce for processing/fabrication of various products, process/ fabricate inputs used for agricultural production depend on agriculture for production, help in protection of agricultural produce, and utilize agricultural by-products and waste products for processing / fabrication of products used in agricultural production or commercial purposes.

1.3 CLASSIFICATION OF AGRO-INDUSTRIES

The Agro-industries can be classified into the following categories, namely

- 1) Agro-based industries; b) Agro-allied industries; c) Agro-related industries; and d) Agro-service industries.
- a) Agro-based industries: These industries utilize raw material from agriculture the main material for processing / fabrication of various products. The industries which come under this category are: (i) Grain milling; (ii) Processed cereals, pulses, oilseeds, tap roots and tuber crops; (iii) Processed fruits and vegetables; (iv) Sugar; (v) Tobacco products; (vi) Spices and condiments; (vii) Milk and Milk Products; (viii) Meat, fish and poultry products; (ix) Brewery; (x) Agro-based pharmaceutical and cosmetic products; (xi) Natural perfumery products; (xii) Natural/colours, flavours and preservatives; (xiii) Cotton textiles; (xiv) Leather and leather products; (xv) Wood processing and wood products; (xvi) Natural gums and resins; (xvii) Jute and coir products; (xviii) Paper and paper products; (xix) Surgical cotton and bandages; (xx) Drying oil for paints; (xxi) Natural rubber and their products; and (xxii) Wool and woolen products.
- b) Agro-allied industries /Agro-inputs industries: These industries process / fabricate inputs used for agricultural production. These are i) Chemical fertilizers; ii) Biofertilisers; iii) Agricultural machinery and tractors; iv) Pesticides; v) Poultry equipment; vi) Seeds and other propagation material; vii) Soil amendments; and viii) Irrigation and drainage-material such as tiles and pipes.
- c) Agro-related industries: The industries which are dependent on agriculture (such as sericulture and apiculture), utilize by products or waste material for production of either inputs for agriculture or commerce (such as compost, feed and oil bran) or help in protection of agricultural produce, such as packing, warehousing, cold storage come under this category.
These are: i) Bee-keeping; ii) Sericulture; iii) Lac culture; iv) Animal feeds; v) Composting; vi) Packing; vii) Cold storage and refrigeration; viii) Warehousing, storage bins and silos; ix) Oil bran; x) Active carbon and particle board from husk and coconut shell; xi) Furfural from corn cobs; xii) Paper and board from groundnut shell; xiii) Cement for masonry mortar work husk; xiv) Cashew nut

shell and shell liquid; xv) Alcohol; xvi) Bees wax and products; and xvii) Animal casings, surgical sutures, brushes, ghee, buttons, handles, combs, horn meal and foam components made from animal by-products.

- d) Agro-service industries: These industries are concerned with the organization of services and custom hiring for effective agricultural operations. Areas covered under this category are: i) Land development; ii) Water management; iii) community nursery and storage; vi) Tube-well drilling; vii) Repair, overhaul and supply of spare parts; and viii) Crop protection services.

1.4 SIGNIFICANCE OF AGRO-BASED INDUSTRIES

India lives in villages. The agriculture and allied sectors contribute nearly 22 per cent of Gross Domestic Product (GDP OF India), while about 65-70 per cent of the population is dependent on agriculture for their livelihood. Agricultural produce forms the back-bone in providing the basic raw materials to several industries all over the country.

Developing countries are characterized by large population, mostly dependent on agriculture, unemployment, poverty and underemployment. These countries are inhabited by poor people with low levels of living, lack of capital resources and managerial skill. According to J.P.Lewis, the dangers of unemployment and 'low-end-poverty' look 'most inflammable' in the large towns and cities, and the countryside appears comparatively uniform in its backwardness. Rural poverty becomes 'explosive' as agriculture spins off its excess population into the large towns and cities but the modernized sectors there cannot fruitfully absorb that population with the result that it is constrained to live there in 'accumulated misery' shorn of ability of incentive to its places of origin. But this is true not only of India but also of several western countries. South Italy has experienced for long a high rate of population growth and immigration on a mass scale. The rural areas in North Italy have suffered from demographic and economic depletion. On the contrary, Rome and northern industrial belts have been faced with excessive concentration of population and activities. In France, migration from the rural to the industrial regions has been on increase. In Germany, there has occurred an enormous exodus of population from the rural to urban areas, causing disequilibrium in the settlement pattern. The United States of America has depressed areas in the

countryside on account of mechanization of agriculture, depletion of natural resources, and lack of jobs, adverse climatic conditions and distance from the major market centers'. Migration of the cream of the rural society to the big towns and cities owing to limited employment opportunities leads to its further impoverishment and deprivation besides producing an injurious effect on those towns and cities.

The solution lies in a systematic planning of idle man-power in each village. This should require a highly decentralized development of rural industries particularly the agro-based industries for meeting the local needs by introducing higher productive techniques and labour intensive small-scale projects of rural industrialization. The remedy for eradicating poverty and unemployment lies in taking industry to agriculture. This will have a multiplier effect by creating new avenues of employment. The emergence of new agro-industries will definitely change the rural complex and will provide additional source of livelihood, social amenities and effective community organization.

The increasing population of the world in developed as well as underdeveloped countries cannot be fully engaged in large scale industries. They can also be absorbed by the decentralized small units of agro-industries to a large extent. These industries can be run as ancillaries and subsidiaries to add to their earnings. By relieving the pressure of population on land they help to raise average productivity. They can also provide the basis for an essentially decentralized economy. The incidence of costs, such as overheads, interest on capital invested, depreciation on machineries, heavy cost of distribution etc. is relatively low in agro-industries and as such they are the most suitable industrial enterprises for the developing economies.

Rural industries particularly agro-industries play an important role not only in the developing countries but also in some of the advanced countries of the world. Small industries, employing less than 50 people each, constitute more than 98 per cent of all industrial establishments and produce about one third of all manufactured goods in the United States. In Japan, industrial units in the small sector account for over 99 per cent of all enterprises, employing 83 per cent of the total workers and yielding 55 per cent of the output. About 90 per cent of the West Germany establishments, each having less than 100 employees, claim 27 per cent of the total number of industrial workers and 23 per cent of the total output. If this is reported by the best

industrialized countries of the world, the case for small-scale industries particularly of agro-industries for developing countries like India is more justified.

Developing countries have no subsidiary industries to engage the manpower, but the peasantry of other farming countries is more fortunate in this respect. Agro-industries assume great significance in an economic prosperity of the nation, would, depend upon integration of its agriculture with industry. Hence, the bulk of our population and their emancipation from evils arising out of economic imbalance would depend upon how best we diversify our rural economy. Small farmers and individual farm ownership are economic realities with which we have to live for a very good future. Taking away a few million of people from village to the industrial cities would not remove the fundamental problems of increasing pressure of population on land. Lack of employment opportunities in the rural areas and unequal distribution of national income responsible for economic distortions are the two main problems before us. Our strategy of economic growth has, therefore, to be such that it integrates rural and urban economics by eliminating regional imbalances.

The micro and small enterprises (MSEs) sector provides livelihood, checks rural-urban migrations, generates export earnings, and touches upon the lives of the remotest and most marginalized people. Worldwide, MSMEs have been recognized as engines of economic growth. In India, MSEs (till recently, known as village and small enterprises) are, instruments of inclusive growth which touch upon the lives of the most vulnerable, the most marginalized-woman, Muslims, SCs, and STs and the most skilled being the largest source of employment after agriculture. The following points will explain the significance of agro-based industries for the development of rural areas.

1) Growth of employment

Agro-based industries develop human resources through the employment of the technically skilled and the semi skilled workers of the region along with the managerial staff. They promote local entrepreneurship, generate employment and provide jobs for rural workers and put a check on the migration of rural labour to urban areas. The role of agro-industries is immense in fostering, strong linkages between agriculture and industry and thereby accelerating the process of industrialization in the rural areas. The progress in the agriculture sector not only

provides food grains to the people but also brings about progress in the field of industry.

2) Industrialization of the rural areas

Industrialization of the rural area can be achieved by taking industries in the rural areas on the large scale. For this purpose the industries can play a very important role. Agro-industry in our countryside holds great promise to bring about substantial improvement in the quality of life of rural people. Agro-industries, if they setups on the large scale in the rural areas. It purifies the rural atmosphere and brings about the desired social and economic changes. That's why the policy makers have laid emphasis on the rural development. The following points would be emphasized in this regard.

- a) They bring prosperity of the rural areas as well as scope for saving and investment and provide incentives for rural areas.
- b) Direct investment into rural sector is likely to build up the industrial base.
- c) Regulating investment for exploiting inter-industry linkages as well as for increasing productivity for labour and capital.
- d) Ameliorating the lost of the rural poor and other deprived classes of the society.

Our planner's emphasis to achieving the aforesaid objectives in quite justified in the wake of widening rural urban disparities.

3) Interlinking between agriculture and industry

A developing country should have an integrated and coordinated plan to achieve balanced economic growth with proper emphasis on both agriculture and industry. Development of industries cannot progress beyond a certain stage without the assistance of agriculture. Likewise, agricultural development beyond a certain stage is subject to industrial development. Industry depends upon agriculture for labour force, raw materials and foreign exchange required to import industrial machinery through the agricultural exports. A prosperous agricultural sector provides market for industrial products. Industry, in its turn, fosters agricultural growth by providing fertilizers, pesticides, various agricultural implements, tractors, etc. further it will siphon off excess labour force from overcrowded agricultural sector and thus help to increase agricultural productivity. This is to say, surplus population depending upon land for their livelihood will be

absorbed by the industrial sector and thus facilitate increased yield from land. Thus agricultural and industrial sectors are interlinked and interdependent and in the process of economic development they exert profound influence on each other.

Agriculture and industry are complementary to each other; industrial expansion depends on increase in agricultural produce and agricultural improvement depends on industrial development. In this context, agro-industries which support agriculture and process agricultural produce of manufacture other goods there form have a crucial role to play in building up an agro industrial economic structure.

4) A toad for rural transformation

Industrialization of the rural areas brings structural changes in the society. Development of agro-based industries being a part of the overall process of economic development also brings about changes in the rural sector through the establishment of linkages between agriculture and industry. When the establishment is strengthens then that will be the balanced growth of these sectors and it would be leaves the healthy impact on the overall economy of the region.

The fundamental requirement for the aforesaid linkage between these sectors is to bring about an increase in agricultural productivity. Improvement in agricultural productivity would result in agricultural surplus which in turn would encourage growth of output and employment in the industrial sector. Improvement in agricultural productivity cannot be achieved without the support of industrial activity.

5) Advantages of agro-industries

The emergence of new agro-industries and agro services will definitely changes the rural complex and provides source of livelihood, social amenities and effective community organization. The importance of agro-industries in this regards as such

- i) Agro-based industries are comparatively easy to setup and generate income in rural areas with comparatively less investment, thus they are suitable for the rural industrialization and they makes the use of local resources and skill.

- ii) Agro-based industries disseminate the fruits of industrial progress to rural areas by enlarging the flow of goods and services both ways.
- iii) They can fight and create job opportunities and lessen the burden of unemployment in the rural areas.
- iv) To setup rural industrialization, agro-industries also help to growth of entrepreneurship in rural areas on dispersed basis and thus check concentration of economic power.
- v) Agro-industries by transmitting industrial cultural in rural areas bring modernization and innovations in agriculture, thus dynamiting the rural economy.
- vi) Agro-industries boost agricultural production. They facilitate effective and efficient utilization of agricultural raw materials. They encourage and stimulate farmers to enhance the production and productivity of each agricultural crop.
- vii) Agro-industries can set up on co-operative basis ensuring participation of the people in process of development.
- viii) Some of the agro-industries have tremendous scope in rural areas e.g. oil mills, dal mills, rice mills, processed foods and fruits and also they have tremendous export potential.
- ix) Agro-industries help to eradicate the social and economic imbalances.

At present, it is agreed on all hands that the agro-based industries can play a vital role in the national economy. Industrial development is today considered as prerequisite for modern economic development. That is why all countries of the world whether big or small, rich or poor, and developed or developing are channelizing their resources to promote rapid industrialization. Before the rise of the modern industrial system India had a flourishing state of cottage and household industries and Indian manufacturers had a world-wide market. The government of India has made considerable efforts to develop the industrial sector since the beginning of the five year plans of the country.

A number of measures, such as package of incentives, launching development programmes, enhancing plan allocation and financial support through the network of financial institutions were undertaken.

At present, still 64 per cent population of the district (study region) is engaged in primary sector, 17 per cent in secondary and 19 per cent in service sector. Still today many of the peoples from backward and hilly areas of the region are migrated towards urban and semi-urban areas or near by the towns in search of the jobs and services. To overcome this problem needs to take projects using more labour intensive techniques, local resource-based and demand based industries should envisaged in the various parts of the district. Necessary and adequate infrastructural facilities should be provided for the industry. The study region is rich in agricultural potential. It is essential to utilize all agricultural potential for the development of agro-based industries; more presence of resources in any region does not necessarily make for their development in an economic sense. Therefore whatever, resources the region possesses they should be utilized effectively and optimum.

There is heavy concentration of large, medium and small scale industries in and around the Kolhapur city. Agro-based industries like sugar factories scattered nearly in the every tahsil of the district. They have changed the social and economic status of the people in the sugar producing belt of the region. If this is the reality, then there would not be the other alternative except the development of agro-industries in the rural areas and the towns of the study region.

1.5 INDUSTRIAL GEOGRAPHY

Industrial Geography is one of the youngest and well established branches of economic geography. After the first and second world war rapid industrialization has started in most of the countries of the world. The traditional and village industries slowly started to disappear and several new types of industries came into existence.

Besides, small scale industries have also expanded considerably, due to this, the industrial structure has become more diversified and expanded. As a result most of the sociologists, economists, regional planners and economic geographers are attracted towards the new study of industries, with the view in the development plans of the country.

Economic geographer started to study the new discipline i.e. industries related to geographical factors. The location factors are determined either

by the economic conditions or by natural conditions or by both. However, there are other factors also which have some bearing on the location of industries. Economic Geography sort out the most favorable locational factors those go to develop the industries. Even, the industrialists' ultimate sources will depend upon his behavior in the geographic environment.

However, the study of industries from geographical point of view was until 1950 were more concerned with theoretical matters. Most of the work till this period was done in the content of industrial location as a response to the physical environment. The era of new concepts in industrial geography started only with the work of Hortshorn, Walter Christaller, George Renner and E.M.Rawston.

What is geography of manufacturing? What features of manufacturing are significant? The Geographers' interested primarily in three aspects of manufacturing: its pattern of distribution, its relationships to other elements within its region of location, and its relationships to other regions.

Industrial Geography is essentially associated with productive efforts of man for manufacturing the things to satisfy his needs. Therefore, simply defined, industrial geography is the study of the distribution of manufacturing industry. In the broadest sense "industrial geography is concerned with the interpretation of present distribution patterns-global, continental, national or regional. The geographic approach using the map as the chief tool of analysis is eminently suited to type of study.

1.6 INDUSTRIAL GEOGRAPHY APPROACH

In the field of industrial geography, we can study in depth the resource based industries particularly those related to agriculture, forests, minerals etc. such a study is very essential for the backward regions which are far away from industrial resource development of any region, industrial geographic approach is desirable particularly in a backward areas of the study region.

Traditionally there are two approaches in the industrial geography for studying the distribution of manufacturing industry by industry and by region. First approach is to account for difference in the development of particular industries as between nations, while the second and more useful approach is to

analyse the distribution of industries within a smaller area for example a nation, state or a region and district. The former is analytical while the later is synthetic.

Due to the first approach (analytical) industrial geography becomes relatively precise study of the distribution of factories that collectively make up in industry. By considering the distribution of many plants in several industrial areas of nations, it becomes possible to formulate general principle of location. Such geographical generalization about manufacturing industry may prove meaningful. However, there are several types of industries and each industry has its own locational characteristics. Therefore, most generalization that can be made about the economic geography of one industry is irrelevant, for the other industry and vice versa. Therefore, synthetic approach of industrial geography becomes sometimes meaningful and more useful.

1.7 CHOICE OF THE REGION AND TOPIC

The choice of the area and the topic under investigation has been influenced by several considerations.

Firstly, the Kolhapur district has comprising the 12 tahsils 18 towns and 1217 villages. The district is situated in the extreme southern part of Maharashtra state. The district lies in the eastern plateau of the micro level division of Deccan plateau. The district as whole is a table land which descends towards south-east. The physiography of the district has distinct characteristics and they influenced on socio-economic setting of the study area.

Secondly, where the district having hilly and intervening areas are the small valleys a number of streams has originates. There are the farmers growing hill millets and paddy in this area. There are seven tahsils came under this division. The plateau region of the district having gentle slope towards east and thick layers of alluvium soils and yield good crops of kharif jowar and groundnut, sugarcane, vegetables and tobacco are also grown intensively. This is the favorable condition to set up and development of agro-based industries in the district.

The river basins of the river Krishna and its tributary river Warna has developed a thick layers of alluvium soil which very retentive in moisture and fertile. Rice, sugarcane, jowar, groundnut, tobacco and vegetable etc. are grown in the basin. There are many agro-based industries developed in the river basins, especially in the Hatkangale, Shirol and Karveer tahsils of the district. There is still scope for the development of the agro-based industries in the area.

Thirdly, about 90 to 95 per cent annual rainfall is received during the south-west monsoon season. This percentage is decreases in the north-east to about 60 per cent. The winter season accounts only 10 per cent rainfall in the district. The Kolhapur district known for the K.T. wears and it is useful for the irrigation purposes. There are 4 major, 11 medium and 47 minor irrigation projects in the district. The 79566 hectare area irrigated (58.87 %) by different sources of irrigation against the gross area (135151 hectare) irrigated in the in the district. There is scope for the irrigation and there is the opportunity to growing crops. There is effect of good yield of crops and a result; it would be favorable for the set up and the development of agro-based industries in the study region.

Fourthly, the region has Laterite, shallow and medium and Black soils. The agriculture is developed in the deep and medium black soils because they are having good irrigation facilities. They are favourable for the good yield of crops in the region and provide very good condition for the agro-based industries in the study region.

Fifthly, the chief mineral of the district is Bauxite. Copper, gypsum, iron and kaolin are found in small quantities and they are important economically. Hence there is no scope for the mineral based industries.

Sixthly, the pressure of population on agriculture land was more in last twenty years. The per capita cultivated land was only 0.16 hectare. It varies from tahsil to tahsil. It is essential to divert the population towards the agro-based industries in the study region.

Seventhly, the development of agro-based industries specifically, sugar factories have come up as growth points, which provide the financial assistance to the peasants the study region particularly for agricultural

inputs. There is a significant growth in the area under cash crops with increasing facilities of irrigation, modern implements etc. so the crops give good returns of yield.

Eighthly, there is a wide scope for the production of oil seeds, pulses, fruits, and other cereals in the study region. Ultimately this production will support to the small scale agro-based industries in the study region.

It is felt that the system of agro-based industries offers a helpful approach to obtain a more complete understanding of the problems and prospects of the agro industries.

Moreover, the composite circumstances that contribute to the existing problems facing by agro-based industries today a time and space perspective that may be appreciated.

All these considerations motivated the researcher and he has turned his attention to this region and its agro-based industrial development.

1.8 AIMS AND OBJECTIVES OF THE OF THE PRESENT STUDY

The main aim of the proposed research work is to map, describe and analyze the present distribution of agro-based industries in the study region from the geographers view point. The specific objectives as under:

1. To investigate the brief review of development of agro-based industries in the study region.
2. To find out the spatio-temporal development of agro-based industries in the study region.
3. To classify the agro-based industries in the various groups and their distribution.
4. To find out concentration, diversification of agro-based industries.
5. To evaluate the efforts made by the individuals, co-operative societies and Government Agencies for the growth of agro-based industries in the study region.
6. To examine problems arise in the development of agro-based industries in the study region.
7. To assess the existing agro-based industries and expected agro-based industries in the study region.

8. To suggest remedies over come to the problems and provides better frame work for the growth of agro-based industries.

1.9 DATA BASE AND METHODOLOGY

The data collected and used for the research comes both from the primary and secondary sources. The primary data is the raw data collected through different sources for which special questionnaires were designed. The basic unit of the investigation is tahsil as well as major group of agro-based industries. Particularly these questionnaires were used for the collection of data from different agro-based industries in the tahsils. For the generation of the primary data the field work was carried out by sampling method and personal observations. It would not be possible to collect the data in each case of the agro-industries. Therefore the questionnaire is circulated to selected sample industries to obtain information about input and output.

The basic data regarding population, irrigation, land use pattern, animal husbandry, agricultural implements, improved seeds, chemical fertilizers, cropping pattern, electricity, market and transportation etc. has obtained from the socio-economic review of the district, district statistical abstract, district census handbook, district gazetteers, agricultural epitomes' periodical season and crop reports published by the depart of agriculture.

The secondary data regarding agro-based industries has been collected from the District Industrial Centre, Maharashtra Agro Industries Development Centre, and District Maratha Chambers of commerce and Industries, Khadi and Gramodyog Mahamandal.

The obtained data is applied to find out the levels of industrialization of the district. The data thus collected, through primary and secondary sources, were processed and represented by statistical and cartographic techniques. The statistical data arranged in several tables and percentages are used for the analysis of location aspects of agro-based industries, land use, irrigation and agriculture. It is worthwhile to study the crop land use, agriculture landuse as basis of development of agro- based industries.

The locational analysis of agro-based industries is derived through the Bhatia's crop concentration method, it will be used for the class of

concentration e.g. to show high, medium and low grades of concentration of these industries spread within the district. The diversification of agro-based industries is dealt with Gibb's and Martin's method. For the case study of agro-based industries the researcher has carried out the intensive field work through questionnaire method.

1.10 REVIEW OF LITERATURE

For the present investigation, the literature from the different disciplines has been refereed. The role of geographer is very vital in analyzing and synthesizing and the comprehensive study of an issue. Studies in the field of industrial geography by Indian geographers can be traced back to early forties of the twentieth century. Before Independence very little work was done in the field of Industrial Geography by Indian geographers in the various parts of the country. The following are the notable studies done by the geographers in this field. Iyengar C.V.V.(1930) studied "The Oil Industry in Coimbotore", Rao R.H. (1930), 'A Note on the Home Industries of Coimbatore District', Rao R.S.(1931) studied "Cottage Industries of Malabar", Loknathan (1932, 1936, 1939) studies 'Localization of Industry in India, Recent Trends in Cotton Textile Industry and Industries of Madras', Kalyansundaram (1934) examined 'Geographical Basis of Iron and Steel Industry', Prakash Rao V.L.S.(1941) studied "Geographical Factors and the Ship Building Industry", Ghosh S.C.(1946) studied 'Spatial Distribution of Industries in India', Gandhi (1945) studied 'Problems and Prospect of Sugar Industry in India'.

After the independence many studies in the field of industrial geography have been undertaken by the geographers. The following studies are the notable. Among them Panday R.S. (1951) has studied "Bagelkhand: A Study of Industrial Geography", Rangappa K. (1962) worked on 'Industrial Geography of Mysore state', Panachal Nandkishore (1967) has done their work on 'Industrial Geography of Madyapradesh', Reddy K.V. (1972) has completed their work on "Industrial Geography of Telengana", Pandey Ram and Dutt (1983) have completed their work on "Chota Nagpur main Virat Udyog ka Bhougolik Vishleshan Audyogik Bbhogol main ek adhyayan", Shisodia M.S. (1983) has studied 'Industrial Geography of Ghaziabad Town', Shrama S.D. (1985) has worked on 'Industrial Geography of Gwalior Division'.

Apart from the above noted scholars a few geographers have done their work in the state of Maharashtra among them some notable are Dshmkh S.B. (1983) studied 'Gur and Sugar Industries in Kolhapur District', Gatade D.G. (1983) has studied "Industrial Geography of Konkan excluding Bombay", Khadake S.G. (1983) has worked on 'A Geographical analysis of Village and Cottage Industries in Kolhapur District', Keche P.J. (1986) worked on "Industrial Geography of Matathwada Region", Ganpule A.D. (1989) has studied "Industrial Geography of Sangali District", Bhanje B.M. (1995) has completed his work on "Sugar Co-operatives and Rural Transformation: A Geographical Perspective of Comand Area of Warna Factory", Yadav D.K.(1995) worked on "Spatio-temporal Dimension of Industrialization in Satara District: A Geographical Perspective", Gulave M.N. (1998) has completed his work on "A Study of Small Scale Agro-based Industries in Beed District", Patil R.R.(2003) has completed his work on ' A Spetio-temporal Analysis of Sugar Industry in Solapur District', Gaikwad S.B.(2004) has done their work on " Geographical Perspective on Growth of Sugar Industries in Maharashtra", Raut P.(2004) have completed their work on 'Textile Industries in Solapur City: A Geographical Perspective'.

The above mentioned work shows a dominant trend of research in the field of industrial geography in India in the post independent period. Various geographers have done their research work in the field of industrial geography. It is not possible to take review of all geographers' research. Some of the noted reviews are given bellow.

Mrs. Surinder Shahi (1962)

She has analyzed, 'Agro-Industrial Relationship in the Sarayupar Plain of U.P.: A Geographical Analysis'. The study presents the relationship of agriculture and industry in the Sarayupar Plain, which comprise five district of Uttar Pradesh. The study proceeds to analyse measure and explain the actual agricultural and industrial conditions. It depicts their relationship and trends as also their economic significance.

The work is divided into four sections and nine chapters which deal with almost all the related aspects of the problem. The first section deals with the Geographical background of the area. The first chapter deals with the physical setting and the

second and second with cultural setting of the study region. The second section deals with the raw material obtained from this region. The third chapter deals with these raw materials. They include raw cash crops such as sugarcane, oil seeds and jute and food grains such as rice, wheat, barley, maize and pulses.

The raw materials obtained indirectly from agriculture are discussed in the fourth chapter. Third section deals with the industries, which are discussed in fourth chapter. The fifth chapter troughs light on the major industries based agricultural raw materials. These are sugar and jute industries. Sugar industries is by far the most important agro-industry of the region and therefore, exhaustive of sugar industry has been made.

The sixth chapter deals with the byproducts of these major industries which can be developed. The small scale and cottage industries based on agriculture raw materials along with their historical background are discussed in the seventh chapter and the eighth chapter deals with the structure of employment in the Sarayupar plain and the importance of industry in the economy of the people living in this region. The forth section deals with planning for the balanced agro-industrial development and with conclusion. In the ninth chapter on planning, efforts have been made to suggest as owned agriculture planning, development of large scale, small scale and cottage industries.

K. V. Reddy and K. S. Reddy (1979)

The authors have studied and analyze the locational pattern of the large and medium scale manufacturing industries in Andhra Pradesh. He made an attempt to highlight the potential and the lines on which industries can be developed in the years to come. His study is based on the data compiled from the directory of Medium and Large scale industrial undertakings in published by the department of industries Andhra Pradesh in 1978.

For the purpose of the study of industrial units in the state he has grouped units into the following categories on the basis of the primary raw material used.

1. Agro-based industries,
2. Engineering industries,
3. Chemical industries,

4. Mineral-based industries,
5. Forest-based industries,
6. Food and Beverage based industries,
7. Other industries.

Author has calculated the rank correlation co-efficient by Spearman's method of rank correlation co-efficient. He found that the ranking of the above mention industries along with the labour and capital variables reveals that the agro-based industries get the first rank in respect of labour employed, while it ranks third in regard to the capital invested. In this way, one may realize the importance of agro-based industries, as they are highly labour intensive and expansion of this section would go a long way to solve the employment problem particularly in rural areas. There does exist a wider scope for the expansion and investment of more capital in this sector. The engineering group of industries ranks first in regard to capital invested, though it ranks only third in respect of labour employed. Most of the engineering industries do located at the capital city of Hyderabad. Author makes a detailed study of agro-based industries, engineering industries, chemical industries, mineral based industries, forest-based industries, food and beverages and other industries.

The author has concluded that, the industrial development is not even throughout the state. It has concentrated in a few industrial conurbations, particularly, at the capital city of the state. Industrial locations normally oriented either to raw materials or to the market. Industries in the category of agro-based, forest based and mineral based are all raw material oriented. In order to eliminate industrial backwardness in the state several new schemes has been taken up by the state government during the fifth five year plan period.

The author reveals that, there exists vast scope for the expansion and development of agro-based industries and mineral based industries.

A.P.Singh (1983)

Author has completed his work entitled "Impact of Agro-Industrialization on Agricultural Landuse: A case study of Baramati Taluka, Pune

District". This study addresses itself to the impact on agro-industrialization on agricultural landuse in Baramati taluka of Pune district, Maharashtra state.

Chapter first deals with the introduction of the topic defining the objectives and new transformation taking place in the rural areas. Chapter second explains the geographical personality of the study area. Chapter third deals with the agricultural landuse in the Baramati Taluka and the last chapter four explains the agro industrialization as dynamics of change.

The data pertaining to the changes in percentage of acerages of certain key crops such as jowar, wheat, sugarcane, and cotton from 1957-58 to 1980-81 has been collected and analysed. Numbers of wells and pumpsets per 100 hectares of N.S.A. have been analysed. Regionalization based upon principle component analysis, factor analysis and cluster analysis has also been attempted by choosing specific parameters.

In conclusion it is observed that the taluka is undergoing transformation from 1957 to 1981.all the major crops show an increase in the acerage as a function of one or major factors. This increase is due to increase in irrigation, demand, agro industrial base and function of rising economic standards. Net sown area is being diverted to cashcrops. But there has to be a balance between cashcrops and food crops.

D.G. Gatade and M. D. Tawade (1983)

He has examined "industrial potential of Konkan region of Maharashtra". Author has been considered physical characteristics, potential of natural resources such as water, geographical condition for the generation of hydel power, mineral resources, and agricultural resources. This study mainly focused on the depletion of resources and suggestion for their better utilization for economic development of the region. In this study resources existing in the region being considered assess their industrial development. Due to the physiographic condition, the Konkan region has a potential for the development of hydro-electric power which may be considered a drive force for the future development of industries within the region.

Author have pointed out that Konkan region has great potential for the industrial development due to availability of various resources such as agriculture, forest, marine and minerals.

P. A. Jadhav (1984)

He has studied “agro-based industries in the Satara district” (M.S.). His entire work is divided into five chapters. Author has used primary and secondary data for the study region. He used various graphs and maps to interpret the data. He studied cropping pattern of the district. He try to classified and give the spatio-temporal distribution of agro-based industries in the Satara district. He has studied impact of agro-based industries on the cropping pattern in the study region.

His entire work is organized into five chapters. In the first chapter he through light on the importance of the problem, choice of the region, objectives and methodology. In the second chapter he has gives the idea about the geographical background of the study region. The chapter deals with changing cropping pattern of the study region. The fourth chapter deals with spatio-temporal distribution of the agro-based industries. In the fifth chapter the author has discussed agro-potential of the study region. He has concluded at the last.

He has observed that the tremendous change in cropping pattern in the study region. It happens due the development of sugar factories in the study region. The peasants in the study region have attracted towards cash crop like sugarcane and therefore the area under sugarcane is increased on large scale as compare to the last twenty years.

M. S. Gadekar (1989)

Author has worked on “Development of Industries at Ahmednagar: A Ggographical Study” the present sstudy aims at an appreciation of development of industries at Ahmednager. It also undertakes a comparative study of locational advantages of the three major zones viz. i) Ahmednagar city ii) Industrial Estate iii) M.I.D.C.

This work is divided into six chapters. Chapter first is an introduction to the study area on the subject matter. Chapter second and third describe

industrial structure of Ahmednagar and spatial distribution of industries in Ahmednagar. Chapter four brings out the relative significance of different types of industries on the basis of no. of units, employment, capital investment, turnover, profit etc. The characteristics and linkages of the most important industry i.e. engineering are studied in chapter five. The last chapter is devoted to the locational analysis of industries of Ahmednagar, followed by an appendix and bibliography.

It is observed that i) engineering-the most important industry is concentrated at M.I.D.C. The land values at M.I.D.C. as lower as they are controlled by the Government. The employment in the large and small scale industries is more or less the same. The proportion of workers engaged at M.I.D.C. is higher than the city. ii) The large scale industries are material oriented units whereas the small scale units are marketed oriented and both are interdependent. iii) A study of some industrial units with a view to appreciate the difference in capital investment and transportation cost at different centers in Maharashtra reveal that total costs for these units at Ahmednagar are less than Marol (Bombay), Kalyan, Ambarnath, Pune, Nasik and Aurangabad. Beed and Solapur have little lower costs but the difference is marginal.

R. K. Dixit (1991)

Author has studied “Role of Agro-Industries Corporations”. The study of the Agro-Industries Corporations in India with special reference to Rajasthan is a modest attempt to survey the working of state Agro-corporations with special reference to Rajasthan and also to analyse the impact of financial and other operations of the corporation on the agricultural growth of this stage, it is very difficult to measure the contribution of these Agro-Industries Corporations in agriculture development of the state for the this purpose the author has issued the questionnaire to all the state Agro industries Corporations with a view to have their comparative study on similar footing but disappointing the data and could not get the response. Thus, then he has made an attempt to pursue the work on the basis of the existing literature and annual reports of the corporations. His work is the outcome of detailed and intensive study.

The entire work of the study has been arranged into seven chapters. Chapter first provides the conceptual frame work and background of agro-industries corporations’ separately. Chapter second deals with the Agro-industries Corporations in India. In chapter third, growth, functions, working and financial

management of Rajasthan State Agro-Industries Corporations have been discussed. Chapter four presents a detailed analysis of role of Rajasthan State Agro Industries Corporation in the field of mechanization in agricultural development of the state. Chapter five gives an account of various inputs and other important activities of RSAIC. Chapter six seeks to analyse the role played by the State Agro- Industries Corporations in agricultural development of India. In this chapter agricultural development and role played by RSAIC in this direction had been also attempted. Chapters seven, as a prelude, first, summarize whole theme and conclusions of the study. It is followed by problems and suggestions for improvement of the working Agro-Industries Corporations in India.

At the last author has given conclusion, problems and suggestion for the better development and performance of Agro-Industries corporations.

P. L. Mishra (1994)

Author has studied “Agro-industrial development in India”. He has collected the data through the primary and secondary sources available in the study region. He makes the personal visits in the study region and gets the data through the questionnaire supply to the enumerators’.

Author has employed different types of techniques for the quantification, description and distribution of the agricultural and industrial situation in the study region. He has applied the techniques which fall into two categories: a) observational-descriptive and b) observational rational.

He suggests that the investigation in agricultural and agro industrial geography involves four stages such as the identification of the problem, the collection of the relevant data, the formulation of the hypothesis, and the testing and modification of hypothesis to provide an adequate explanation (Coppock-1969). The author has undergone through all these stages.

The investigation has been carried out at different level e.g. regional level, district level, tahsil level and sometimes on block level as a unit for collecting data, mapping and observations. The illustration through maps have been made in details and interpreted in terms of their correlations with physical and human

factors operating in the specific areas. The empirical attributes of the land-use combination, crop combination and agro-industrial development in Moradabad region enabled identification of different type of areas. Author has selected three villages from the entire region for conducting sample studies with the objectives of acquiring detailed information and a deeper insight into the distributional regional patterns and agro-industrial development.

Author has completed his work with the following objectives:

1. To find out close relationship between cultivation, cropping pattern and agro-based industries.
2. To capture paradoxical situation in Moradabad region by maximization of agricultural resources for agro-industries and minimization of agricultural disparities.
3. To analyse the pattern and development of agriculture and agro-based industries.
4. To evaluate the development of potentials for agriculture and agro-based industries in Moradabad region;
5. To suggest modern patterns of integrated agricultural and agro-industrial development in Moradabad region in an intra-regional and inter-regional context; and
6. An attempt is made to relate agricultural productivities, changes in cropping patterns and impact of intensive agriculture with agro-industrial development in Moradabad region.

In the last, the author has gives his opinion about his study which provides an opportunities to test i) the concept of regional variation in agriculture and ii) the relationship between agro-industries and farming.

His entire work is divided into ten chapters. First chapter provides introductory in formations. Geographical background, including spatial relation, physical setting, and cultural setting is provided in chapter two. The third chapter deals with land-use patterns: general and agricultural including one crop area, two crop area, and multi crop area and distribution, per hectare yield and production of various crops, various farming methods have been discussed in chapter four. Chapter five provides direct supply of agricultural raw materials including indirect supply of raw materials from agricultural livestock wealth and measurement of

potential supply of agricultural raw materials. Chapter six and seven are devoted to growth and distributional pattern of major agro-based (Sugar and Cotton Textile Industries) and minor agro-based cottage industries and their role in the economy of the area. Chapter eight deals with livestock industries where as chapter nine Horticulture industries. The suggestions for planning the balanced industrial development are given in the last chapter.

Author has found that the production of crops and development of agro-industries are closely related with each other in an agriculturally pre-dominant region like Moradabad and attempt for planning the balanced agro-industrial development seems to be the only way out for the progress, prosperity and development of the region.

G. J. Reddy and N. B. K. Reddy (1994)

Author has Examined 'Regional Disparities in Industrial Development in Andhra Pradesh'. An attempt has been made by the author to identify industrially backward districts in terms of general and small scale industries. They have been used factor analysis method.

Author has find out that the distribution of industries as revealed by the composition of industries also indicates haphazard and unplanned industrial development in the state. He compiled production wise small scale, large scale and medium scale units by the using of investment and employment in the industries.

Author has used five indicators such as number of industrial units per 10,000 populations, investment per 10,000 populations, industrial workers per 10,000 populations, percentage of industrial workers to total workers and per capita power consumption are selected to study the spatial distribution pattern of industrial development and to identify industrially backward districts in the state. These indicators are subjected to the factor analysis and a unidimensional development of industries is brought out Hyderabad and Rangareddy district of Telangana region, with high factor scores of 7.122 and 7.026 respectively, occupy first and second places in the level of industrial development among the 23 district of the state. The multidimensional industrial development has led to the highest concentration of

industries of all types in these two adjacent districts in and around the metropolitan Hyderabad city. This region forms the mega-industrial magnet of the state. In the state of Andhra Pradesh there are 10 districts identified as industrially backward and 6 other very backward out of 16 backward and very backward districts, eight districts are found in coastal region. Broadly, speaking as many as seventy per cent of the district in the state are industrially backward districts.

It is evident that Andhra Pradesh is backwards in terms of general industrial development. The development and spread of large and medium scale industries in the state are uneven. Author has given his opinion about the imbalance in the development of industries in the state. He states that in the developing economy, it may not be possible to maintain regional balance in the location of large and medium scale industries. In such instances, the development of small scale industries could be spread equitably to bring about homogeneous development and reduce imbalances in industrial development.

Author studied the spatial pattern of small scale industries. He replied he opinion about the development of small scale industries, he mention that in a developing country like India where the economy is essentially agricultural with limited capital and abundant labour supply an efficient method of resource utilization calls for development of agro-based small scale industries and cottage industries. The small scale industries are recognized as the most appropriate means to achieve a rapid and ubiquitous economic development of developing regions with large population.

Author has expressed the level of development of small scale industries in the state based on the factor matrix. Again he mention that in case of SSI units in the in the state the Hyderabad and Rangareddy districts are leading one because they have highest factor score of 11.403 and 6.996 respectively. It may be note that Hyderabad district is the urban district while Rangareddy is the rural district. The author has observed that very extreme disparities in the development in the SSI units in the state. The range of the index value is in between 11.403 to -2.638. The highest index value is recorded in Hyderabad and the lowest value is recorded in the Anantpur district.

Lastly the author has concluded that large and medium scale industries as well as SSI are concentrated in the Hyderabad and Rangareddy district

only. The industrial development in the state is very poor and unbalanced. It may be noted that the higher the level of development the greater is the tendency of diversification of industries.

Dr. N. C. Joshi (1995)

Author has studied "Rejuvenating rural life through industrial growth". He has used some figures to highlight his topic. It is a descriptive work in which author has considered restructuring rural economy, development of agro-industries, infrastructural development to stop the migration from rural to urban and semi-urban areas, improving rural environment, pioneering role of khadi and village industries commission, policy package for small industries, evaluation overdue, thrust on SSI units, industrial backwardness, report of Sivaraman committee, arresting reverse transmission of funds and industrial estates for the discussion.

He concludes that all facets of rural life need to be affected by the latest development so that rural people also raise their standard of living in the modern sense. The productivity rate should improve with the help of better tools, implements, inputs and handwork. The unemployment rural youth should be absorbed in skill formation activities in the village itself. A number of technological institutions need to be set up in villages. All these things sound like a wishful thinking but then a day must come when the majority of people of this country are brought into the mainstream of the present-day development taking place everywhere.

Sandeep Singh (1994)

He has studied, 'Advantages and Structural Weakness of Rural Industries in India'. This is the descriptive study of the paper. Author has not used any time series data for his study. He has given advantages of rural industries. Rural industries have an entirely different pattern of development. These industries employ very small amount of capital and employ more human force as a labour. He gives some of the advantages of these industries. Such as light capital investment, huge employment potential, large variety production of consumer goods, economic equality, beneficial to agricultural laborers, full use localized materials, balanced regional development, economic uplift of the poor and contribution to exports. According to author agro-based industries as well as other gainful employment to our

vast population can ensure balanced, equitable growth. Rural industries can play their rightful role only if they are run on sowed and efficient lines.

Author point out that some problem of rural industries like problem of finance, raw materials, power shortage, problem of marketing, competition with large industries, problem of technology, problem of skilled labour, lack of communication and information, problem of transport bottlenecks and other problems. He has concluded that the growth of rural industries helps in raising the standard of living of the rural population by providing them more income, consumer goods at cheaper rate and social economic overheads. Also he states that rural industries save us from the evil effects of the concentration of industries such as pollution, over urbanization, congestion, growth of slums etc. In short rural industries play an important role in the development of Indian economy.

Dr. M. N. Gulve (1998)

The author has studied, “A Study of Small Scale Agro-Based Industries in Bid District”. The author has used primary and secondary data for the period of 1970-71 to 1994-95. The main objectives of the study were as fallows.

- i) To study the infrastructural and geographical from the view point of industrial development.
- ii) To analyze the trends of area, production and productivity of industrial crops.
- iii) To study the small scale agro-based industries such as dal mills, oil mills, cotton textiles etc.
- iv) To study the role of different agencies in the development of small scale agro-based industries.

Author has used different statistical techniques such as percentage, variability indices, correlation, compound growth rates, location quotient, industrial combination, concentration and industrial diversification for the interpretation of the data. He has also calculated labour productivity and capital labour ratio for the selected small scale industries. Author used 73 tables and 134 maps for the analysis of the data.

His entire work is divided into eight chapters. The first chapter deals with meaning of industry, meaning of agro-based industry, significance of

small scale industries, aims and objectives and methodology etc. In the Second chapter he through light on the changing definition of small scale industries, industrial policy, small scale industrial growth in India, Maharashtra, Marathwada and Beed district. The third chapter deals personality of the study region. In the fourth chapter, he studied trends in area, production and productivity of the industrial crops. Fifth, sixth and seventh chapter deals with small scale agro-based industries like rice mills, oil mills, cotton ginning and pressing etc. author has case of every agro-based industries in concerning chapter. Last chapter deles with conclusion, problems and remedies to solve the industrial problem of small scale industries in the study region.

1) Problem of finance 2) problem of water 3) lack of facilities of securing adequate and regular supply of raw material 4) absence of adequate marketing facilities 5) inabilities of entrepreneurs.

To solve the above mentioned problem author has suggested the following measures.

- a) It is necessary to organize proper survey before the starting the unit in the area.
- b) Government should have provided proper water scheme to the industrial estates.
- c) Various banks should provided lot of working capital to entrepreneurs at low rate of interest.
- d) Government should have fixed marketing prices of finished industrial goods, that prices should be sufficient to the entrepreneurs.
- e) Government of Maharashtra should have set separate centers to provide raw materials to the small-scale agro-based industries in the study region.
- f) Government should have the training to the entrepreneurs regarding their concerning units.

Dr. U. B. Pathare (2000)

He has studied “A Critical Study of Industrial Development in Jalana District.” Author has collected data from primary and secondary sources. The main objectives of his research is as follows

- i) To study large, small scale and cottage industries of Jalana district.

- ii) To study physical and non- physical determinants of from the view point of industrial development.
- iii) To study the efforts for the growth of industries by industrial estates government agencies.

Author has calculated labour productivity, capital productivity, for the study of industrial development. He has also calculated industrial concentration and diversification of the study region. He used co-efficient of variation, annual variation, moving average methods for the analyzing the data. His entire work is divided into eight chapters. Author has found that the various problems like shortage of capital, less capacity utilization, problem of marketing, shortage of raw material, lack of planned working system and problem of monopoly etc.

S. B. Gaikwad (2003)

Author has worked on ‘Geographical Perspective on Growth of Sugar Industry in Maharashtra’. His entire work is divided into seven chapters. Author has collected primary and secondary data for the study. In first chapter author throws light on introduction, importance of theme selected, objectives, data base and methodology, limitations of the study, review of the literature and outline of the work. The second chapter is on the physiographic determinants, Socio-economic factor and agricultural framework of the study region. Whereas third chapter throws light on origin and development of sugar factories in World, India and Maharashtra and role of co-operative sector in the development of sugar industry. Forth, deals with spatio-temporal perspective on sugar industry, whereas, location analysis of sugar industries have been discussed in fifth chapter. Sixth chapter deals with problems, prospects and by products of sugar industries in Maharashtra where as findings and recommendations given in the last chapter.

Author has used location quotient method for the presentation of sugarcane concentration. Ranking co-efficient method, cartographic technique, Karl Pearson’s Co-efficient technique and nearest neighbor technique are used for the interpretation of data. Author has been found that problem like harvesting and transportation of sugarcane, lack of high yielding sugarcane seeds, and shortage of sugarcane adjustment of crushing season, lack of better management, natural hazards, and low price of sugar, high production of sugarcane and changing government policy.

Author found that locational pattern of sugar factories is uneven throughout the region. He found that the nearest neighbor analysis of locational pattern of sugar industry at district level reveals that the uniform pattern of location of factories in Aurangabad, Akola, Sholapur, Jalana, Osmanabad, Beed, Wardha, Pune, Jalgaon, and Sangli districts. Whereas the absolute clustering pattern has been represented by Buldhana, Amarawati and Bhandara districts.

Omprakesh V. Shahapurkar (2002)

Author has completed his work entitled “Industrial Development of Nanded District: A Geographical Analysis”. Author used primary and secondary data for the period of 1970-71 to 1996-97. The main objectives of the study were as follows.

1. To study the availability of infrastructural and geographical factors on which the development and growth of industries are depend.
2. To study industrial development in India, Maharashtra and Marathwada and Nanded district.
3. To study the population characteristics and its effect on agriculture and industries.
4. To analyze and map the spatio-temporal distribution of irrigation facilities and its effects on industrial cropping pattern.
5. To assess the effect of non-physical determinants on agricultural development.
6. To amp, describe and interpret the distribution of large and medium industries in the study region.
7. To study the performance of small scale units in Nanded district.
8. To study the trends in industrial development in the Nanded district specially form 1971 onwards.
9. To study the cottage and village industry of the study region.
10. To study the efforts for the growth of industries by industrial estates and government agencies.
11. To find out the industrial problems and suggest suitable remedies to solve them.

Author used different statistical techniques such as per centage, variability indices, correlation, location quotient, industrial combination and concentration, industrial diversification for the interpretation of the data. He has also

calculated labour productivity, capital labour ratio for the selected small scale industries.

His entire work is divided into eight chapters. The first chapter throws light on introduction and appraisal of the problem. In the second chapter he throws light on the industrial policy, industrial development through five year plans, and development of industries in the study region. The third chapter covers the geographical and socio-economic setting of the study region. Chapter four is divided into three parts; whereas tahsilwise land use pattern; the index numbers of the crops, changing industrial cropping pattern and tahsilwise trends in industrial cropping, the growth, yield and productivity of industrial crops are discussed respectively. Fifth chapter through light on the efforts made by the indigenous people for the development of large and medium scale industries in the study region

Sixth chapter deals with the growth of SSI units, labour force, investment, production cost, sale value and profit, tahsilwise distribution of SSI units, industrial combination and changes therein, number of SSI in per hundred square kilometers, and per thousand population, concentration and diversification also studied in the same chapter.

Chapter seven is devoted to the development of village and cottage industries in the study region. In the last he covers conclusion, problems and remedies to overcome to them.

Author concluded that the government of India made an effort through five year plans and implement industrial polices for the development of industries in India. He has taken the review of the strategies and success of the industrial policies in India. He found that Out of 274 large and medium scale industries in Marathwada region, about 74.44 % units were found in Aurangabad district. The share in the remaining district is much neglected. Most of the units are sick due to shortage of raw material, lack of skilled labour, strikes, and transports lack of proper guidance etc.

There is same picture about the SSI units in the Matathwada region. Author has suggested some of remedial measures over come to the problems faced by the industries in the study region.

Chauhan P. R. and Singh S.K. (2009)

Author has studied 'Industrialization and Regional Development in Chhatisgarh, India'. The study focuses attention on the levels of industrialization and regional development. Author has calculated Z Scores for the understanding of the levels of industrialization in the Chhattisgarh for the year 2007. Author has been collected data from the secondary sources. The data regarding different indicators have been obtained from Directorate of Agriculture, Raipur, 2007; Directorate of industries Raipur, 2007; District-wise indicators of economic development of Chhattisgarh, 2007 and economic survey of Chhattisgarh, 2007.

Author has studied levels of industrialization, indicators of industrialization and levels of regional development. The regional development pattern has been assessed by them on the basis of agricultural sector, industrial sector, social sector and infrastructural sector. Author has studied district level indicators of different sectors and regional development level of the areas has been determined. The district level absolute data have been transformed in Z scores. On the basis of the district level Z scores values they determined and indicates spatial pattern of regional development from high level of development to low level development. Also they studied impact of industrialization on regional development.

Author has concluded that industrialization is capable to generate developmental activities in any region. This is because of the principle that development starts at point and further disperses in the surrounding that says that development at any centre as the location of industries starts up as a mild concentration and further winds up as a massive localization.

1.11 CHAPTER SCHEME

The present study is divided into the following chapters.

- The first chapter is devoted to introduction and appraisal of the problem.
- Chapter second deals, the geographical personality of the study region.
- Chapter third is devoted to assessment of the role of individual, co-operative sector and government agencies for the development of agro-based industries in the study region.

- Chapter four reveals general land use and agricultural land use.
- Chapter five through light on the agro-based industries in the study region.
- Chapter six covered the concentration and diversification of these industries.
- Chapter seven covers conclusion, constraints of development of agro-based industries and planning and suggestions for the future development of agro-based industries in the study region.

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CHAPTER- II

GEOGRAPHICAL SETTING OF THE REGION

CHAPTER-II

GEOGRAPHICAL SETTING OF THE REGION

SECTION-I PHYSICAL SETTING OF THE REGION

- 2.1 INTRODUCTION
- 2.2 LOCATIONS, BOUNDRIES AND AREA
- 2.3 HISTORICAL BACKGROUND AND TERRITORIAL CHANGES
- 2.4 PHYSIOGRAPHY
- 2.5 GEOLOGY AND MINERALS
- 2.6 DRAINAGE
- 2.7 CLIMATE
- 2.8 SOILS
- 2.9 NATURAL VEGETATION

SECTION-II SOCIO-ECONOMIC SETTING

- 2.10 POPULATION
- 2.11 SETTLEMENT
- 2.12 IRRIGATION
- 2.13 LANDUSE PATTERN
- 2.14 ANIMAL HUSBANDARY RESOURCES
- 2.15 AGRICULTURAL IMPLEMENTS
- 2.16 IMPROVED SEEDS
- 2.17 CHEMICAL FERTILIZERS
- 2.18 AGRICULTURAL CREDIT AND FINANCE
- 2.19 ELECTRICITY
- 2.20 MARKETING
- 2.21 TRANSPORT AND COMMUNICATION
- 2.22 SUMMARY

CHAPTER-II

GEOGRAPHICAL SETTING OF THE REGION

SECTION-I PHYSICAL SETTING

2.1 INTRODUCTION

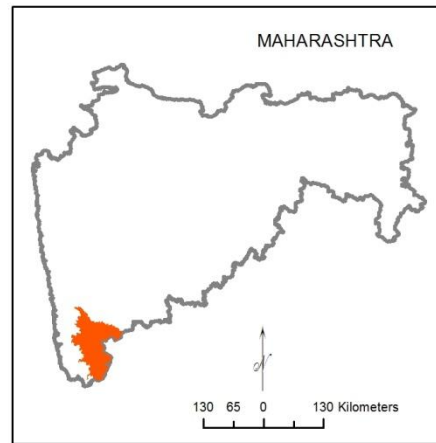
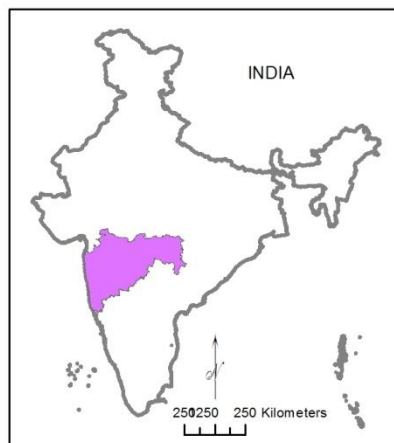
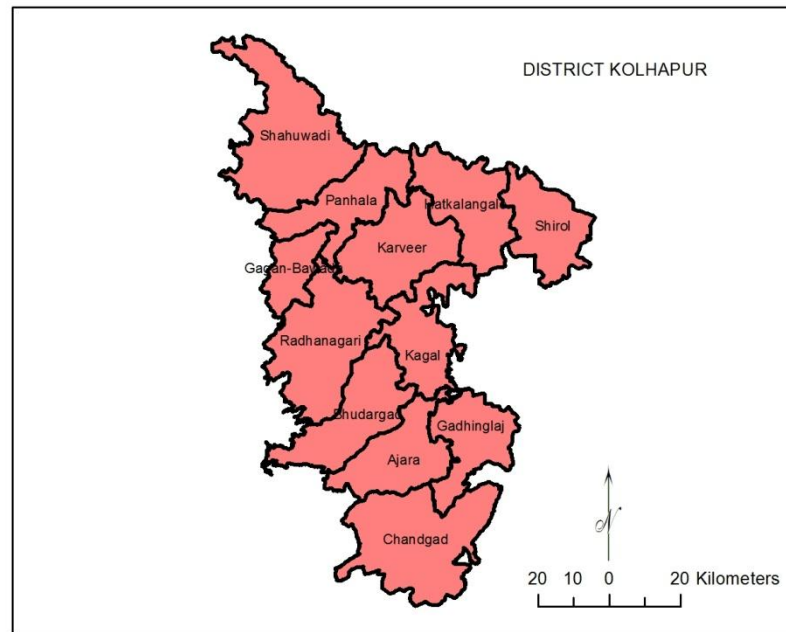
The second chapter covers physical and socio-cultural factors like location, boundaries and area, historical background, territorial changes, physiography, geology and minerals, drainage, climate, soil, natural vegetation and population, irrigation, land use pattern, animal husbandry, agricultural implements, seeds, chemical fertilizers, electricity, marketing, transportation and communication and other facilities are covered respectively. It would be necessary to discuss the above mentioned factors from the view point of agricultural development as the key of agro-based industries in the study region. Both are the important aspects of the prosperity as well as economic development of the region.

2.2 LOCATIONS, BOUNDARIES AND AREA

Kolhapur district is situated in the extreme southern part of Maharashtra state. It lies between 15°43' and 17°17' North latitude and 73°40' and 74°42' East longitude (Map.No.2.1). It is surrounded by Sangli district to the north, Belgaum district of Karnataka state to the east and south and Ratnagiri and Sindhudurg district to the west. The Sahyadri ranges to the west and Warna River to the north form the natural boundaries.

The district has an area of 7685 sq.km which is about 2.50 % of the total area of the state. The height of the region is in between 390 to 600 meters from mean sea level. There are 12 tahsil, 18 towns and 1217 villages of which 21 are uninhabited as per 2001 census. For administrative and revenue purposes the twelve tahsils of the district divided into four revenue sub-divisions. Karveer, Panala, Shahuwadi and Kagal have come under the revenue sub-division of Karvir; Hatkanangale and Shirol tahsils came under the Ichalkaranji revenue sub-division; Gadhingalaj, Chandgad and Ajara came into sub-division of Gadhingalaj; Bhudhargad, Radhanagri and Gaganbavada came under the revenue sub-division of Radhanagari.

LOCATION MAP



Map. No.2.1

2.3 HISTORICAL BACKGROUND AND TERRITORIAL CHANGES

Kolhapur is one of the oldest cities in the country. It derives its importance from its past political associations and its position as a great, commercial, religious and educational centre. As a religious centre, Kolhapur derives its application of Kashi of the south from the imposing the ancient temple of Mahalaxmi.

According to 'puranas' this tract of the country was originally called 'Karvir' from the goddess Mahalaxmi wring her mace (kur) in lifting her favored retreat from the waters of the great deluge.

According to another legend the name 'Kolhapur' is derived from the story that a demon 'Kole' (Kolhapur) was defeated and killed on a hill in vicinity of Kolhapur. Fresh light has been thrown by the recent theory put forward by professor G.H.Khare according to him the name might have been evolved by its Geography.

The originally Kannada word 'kolla' or 'Golla' (river bed) must be the source as the Kolhapur is situated on the bank of the river Panchganga.

The history of Kolhapur can be broadly divided into three periods viz. early Hindu period (about A.D.1347), Muslim Period (from A.D.1347 to about A.D.1700) and Maratha period (1700). In the year 1948, the Kolhapur state was merged with the Indian nation. In 1949, 956 villages together with five villages from the former state of Kurundwad, one village from state of Miraj and seven villages from Belagum district, were formed into the new district of Kolhapur, Raybag and Katkol were transferred to Belgum.

The new district consisted of Shahuwadi, Hatkanangale, Shirol, Karvir, Radhanagari, Kagal, Bhudhargad and Gadhingalaj talukas and Panhala, Bavda and Ajra mahals. In 1956 Chandgad taluka was transferred from Belgum with the reorganization of states, the was included in Bombay state in 1956. It forms a part of Maharashtra since 1960. Census 1961 has recorded 9 talukas and 3 mahals with 1086 villages and 11 towns.

During 1961-71 decade the mahals were upgraded and accordingly 12 tahsils with 1093 villages and 11 towns were recorded in 1971 census. For 1981

census 12 tahsils 1208 villages and 12 towns including one newly created town were recorded.

During 1981-91 decade two villages from Chandgad tahsil were transferred to Sawantwadi tahsil and 53 villages from Bavada tahsil were transferred to newly created Vaibhavvadi tahsil of Sindhudurg district. In 1991 census 12 tahsils with 1203 villages (including 15 uninhabited) and 12 towns were recorded. Now as per 2001 census 12 tahsils were recorded in the Kolhapur district.

2.4 PHYSIOGRAPHY

The district as a whole is a part of the Deccan table land and slopes towards the south-east. The physiographic parts decides the extent of economic activities of the region. The tahsil wise percentage of physiographic divisions in the district shows that (Table No.2.1) the variation in the relief. In general, the physiography of the district may be grouped into three parts i.e. (Map.No.2.2).

2.4.1 The Sahyadri Hill

These are spread in a north-south direction along the western boundary of the district and a height of between 800 to 1000 meters'. Some peaks have height of more than 1000 meters'. They spread in tahsils of Shahuwadi, Bavada and parts of Panhala, Karvir, Radhanagari, Bhudargad, Ajara, Chandgad and parts of Gadhinglaj.

A number of finger like spurs run eastwards from the hills and finally they merge with plateaus and they are densely forested. An interesting feature of the crest line of this region is the existence of truncated valleys of the streams of the plateau streams. The upper reaches of such valleys have been captured by the Konkan streams so that these form well marked gaps in the sahyadari rampart. From the view point of climate it is possible that these gaps mean a better South-west monsoon rainfall in the plateau, and valleys.

From the human point of view their importance is no less. In history of Maharashtra, these gaps had a tactical importance, even in the present times, the routs, from the plateau to the Konkan run through these gaps. The hilly region having 45.64 percent of the total geographical area of the district.

2.4.2 The plateau

They situated to the east of the Sahayadri hills. It includes the entire Kagal, Gadhingalaj, and parts of Hatkanangale, Karvir, Radhanagri, Bhudhargad, Ajara and Chandgad tahsils. They have a height of between 600 and 800 meters. Some hillocks have a height of over 700 to 800 meters'. The slope of the plateau towards the east. These are the eastern slope and offshoots of the Sahayadri hills which are dissected by numerous streams and are partly covered with forests.

The western part of plateau is dissected and uneven in surface while eastern part is relatively smooth. The western part of the plateau is partly covered by the forests. The proportion of plateau and foot hill zone is about 30.53 percent to the total geographical area.

2.4.3 The river valleys

A succession of river valleys draining the district towards the east characteristics the landscape of the districts from the Warana valley in the north to the upper tributaries of the Gataprabhain the south. The Krishna basin is located in the northern part of the district and covers the entire tahsil of Shirol and parts of Hatkanangale and Panhala.

This region has a height of about 600 meters' with gradual slopes towards east and south-east. Near the course of river Krishna the surface is relatively smooth. Form the human point of view these are the most important areas of the district and have fertile soils. The area is well cultivated and densely populated. Therefore there is the large sized settlements are located in this part. The lowland region or plain having only 23.83 percent of the total geographical area and is confined to Shirol, Hatkangle, Karveer, Kagal, and parts of Gadhingalaj tahasils.

Table No. 2.1
Kolhapur District: Tahsilwise physiographic classification
(In per centage)

Sr.No.	Tahsil	Hilly region	Foot hill region	Plains & low land region
1.	Karveer	32.06	22.36	45.58
2.	Panhala	68.32	18.41	13.37
3.	Hatkanangle	13.11	37.71	49.18
4.	Shirol	1.33	22.35	76.12
5.	Kagal	18.58	32.24	49.18
6.	Gadhingalaj	31.46	44.76	23.78
7.	Chandgad	45.63	39.86	14.51
8.	Ajara	66.54	28.38	5.08
9.	Bhudargad	49.70	45.72	4.58
10.	Radhanagri	72.75	24.00	3.25
11.	G.Bavda	89.91	10.19	---
12.	Shauwadi	58.39	40.47	1.14
	District	45.64	30.53	23.83

Source: Ground water survey and Development agency, Govt.of
Maharashtra, 1972-73

2.5 GEOLOGY AND MINERALS

So far as the geological survey is concerns the district has antiquity in the geological formation; are as follows.

Soil and Laterite – Recent and sub Recent.

Deccan Trap – Lower Eocene.

Lower Kaladgi series – Cuddapah.

Granite – gneiss Dharwads – Archaean.

Geologically the Sahyadri hills are mainly consisted of Deccan Trap with inter trepan beds; however some small patches of Dharwar system and Penganga beds are also found. Kolhapur plateau consists mainly of Deccan Trap with inter-trepan beds. However, some small patches of Penganga beds, pakhal and

kaladgi series are also found in the south-western part of the plateau .river basins are consisted of same formation.

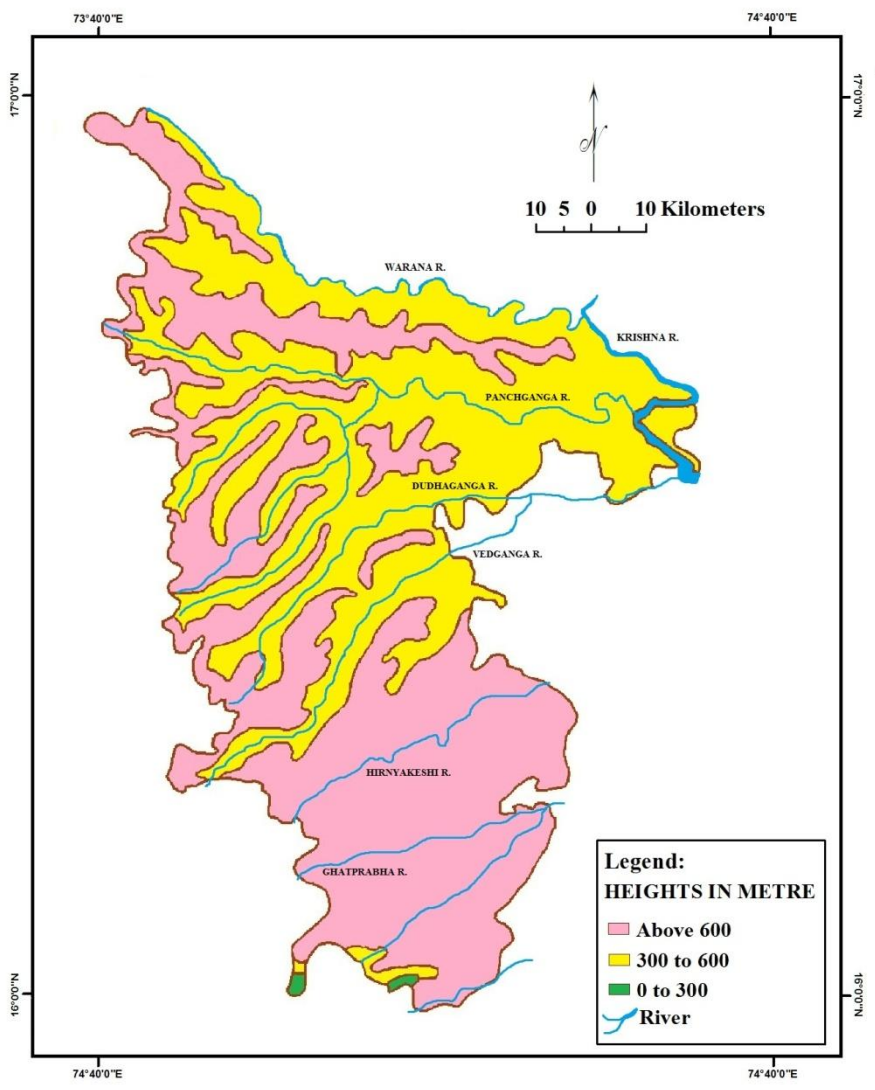
The dharwad phyllites and amphibolites intruded by granite gneiss are the oldest rocks found as small inliers in district. Phyllites and amphibolites are noticed near Ajara. Granite-gneiss crops out as four small inliers along the junction of the Kaladagis and the Deccan trap near Hadalage, Nesari, Tarewadi and Chandewadi. The lower Kaladagi series next in the chronological order rests unconformable over the Dharwars and the granite-gneiss. It consists of conglomerates, compact to gritty quartzite with minor ferruginous bands and stains, variegated and sandy shale's and re-crystallized sandstones.

The Deccan traps formations overlies the kaladagi beds and is spread over almost the entire district. These volcanic lava flows are spread out in the form of horizontal sheets or beds. A great part of the lava beds have been subjected to large scale erosion along the river valley, exposing the under Kaldagi and Dharwad group of rocks. The trap rocks are dark gray to greenish gray in colour, although brownish to purplish tints are also met with. The Deccan traps exhibits characteristic spheroidal weathering and form rounded boulders.

The lava beds at the plateau tops are capped by laterite, a product of weathering. Laterite is usually noticed at an altitude of 900 meters or more. The lateritic forming vertical cliffs or scarps, usually varies between 6 to 30 meters'. It is a kind of scoriaceous and variegated clayey rock, with characteristics red and brown, and is composed essentially of hydrated oxides of alumina and iron. Rich aluminous varieties of laterite known as bauxite occur as irregular pockets or layers.

In Kolhapur district Bauxite is the chief mineral of economic value. It occurs in large quantities as laterite capping in the hills along the eastern margin of the district. Irregular nodules of kankar occur in the soils, especially in the eastern part of the district, which on burning yields good lime, copper, Gypsum, iron and kaolin is found in small quantities and is not important economically. The district is well endowed with building stones, hard, compact, fine, to medium grained Kaladagi sandstones and quartzite are quarried for construction materials near Nesari, Harur, Gajargaon, Ajara and Gargoti. Trap rock being hard, dense and durable is a most suitable material for building purposes.

Kolhapur District Physiography and Drainage



Map. No. 2.2

2.6 DRAINAGE

The district has a well developed drainage pattern. The drainage pattern of the district is mostly dendritic and sub dendritic. Drainage is the most important single factor that influences landscape and lives of the people any region. At some places major irrigation dams were constructed, a dam on the river Warana and another on Bhogawati, south of Kolhapur, is the major irrigation works. Added to these are the benefits of the lift irrigation practiced on a large scale in Panchganga basin. All the rivers of the district originate from the Sahayadri ranges in the west and flow in a general eastward direction through the district to the Bay of Bengal. The Krishna River flows only for a short distance through the district mainly on its eastern boundaries. The main rivers of the districts from north to south are the Warana, Panchganga, Dhudhaganga, Vedganga and Hiranyakeshi. The Warana has a long course but a restricted basin. The Panchganga on the other hand, commands a large drainage area through its main tributaries. The southern rivers, the Dhudhaganga with its main tributaries the Vedganga and the Hiranyakeshi, have long course but smaller and independent valleys (Map.No. 2.2).

2.6.1 The Warana

The Warana which takes its rise in the Sahyadris, about 21 kms north of Kolhapur limits, forms the northern boundary of Kolhapur for about 128 kms. It flows with a fairly straight south-east course along the border of Malakapur, Panhala, Alata and Shirol and falls into the Krishna at Haripur about 1.6 km. south-west of Sangli. The sloping banks of the Varna yield good cold weather crops. It has two chief feeders the Kansa and Kadavi in tahsils of Malkapur and Panahala respectively. In the fair season the Varna and its chief feeder the Kadavi are fordable but during the rains boats ply at five places on the Varna and at three on the Kadavi.

2.6.2 The panchganga

The Panchganga is formed from north to south of four streams, the Kasari, the Kumbhi, the Tulshi, and Bhogavati. The fifth stream is the underground Saraswati.

The Kasari is an important stream. It rises in the Sahyadris near the village of Gajapur in Malakapur and flows east for about 80 kms till it joins the united waters of the Kumbhi and the Tulashi at Padli about 5 kms west of Kolhapur. During its course of 80 kms the Kasari receives several minor streams of which the chief are the Mangar, the Jambhali and the Gadavali.

The Kumbhi rises near Bavada, flows about 24 kms north-east, and then, with a winding course, turns east and joins the united Tulashi and Bhogavati near Bahireshtar about 13 kms south-west of Kolhapur.

The Tulshi rises about 8 kms east of the Kumbhi and after a north-easterly course of about 24 kms falls into the Bhogavati about 13 kms south-west of Kolhapur.

The Bhogavati, which is the chief of the four streams, takes its rise in the Sahyadris a few kms south of the Fonda pass, and after a nearly northly course of about 45 kms, almost parallel to the Phonda road, joins the Tulsi river near historical village of Bid. About 3 kms north-west of Bid the Bhogavati receives the Kumbhi and about 13 kms further north they are joined from the left by the Kasari about 5 kms west of Kolhapur.

From Kolhapur the Panchganga, as the river now called, winds about east about 48 kms till it falls into the Krishna at Kurundwad. In the 48 kms of its course, to the east of Kolhapur the Panchganga receives only one considerable stream the Hatkalangada or Kabnur which, rising from the Alata hills and passing Hatakalangada and Korochi joins the Panchganga near Kabnur about 24 kms below Kolhapur.

The waters of all these streams which join to form the Panchganga are much used for the growing sugarcane. In October towards the close of the south-west rains, a series of fair-weather earthen dams are built across the river beds and the water is raised by lifts irrigation systems.

The meeting of the Bhogavati and Kasari has much local sanctity, being like Allahabad known as Prayag or Triveni, and being visited by large numbers of pilgrims during the cold months. The valley of the panchaganga is

reckoned the most fertile in Kolhapur and is famous for its hay. The bed of the river is shallow and its sloping banks yield rich crops during the cold weather.

At Kolhapur the Panchaganga is crossed by two beautiful bridges one near the Brahamapuri hill on the north side of Kolhapur town on the road leading to the Amba pass, and the other a few kms to the east on the Poona road. The Panchaganga and its feeders are fordable in the hot season. In the rainy season large and small boats ply at twenty –three fords.

2.6.3. The Dudhganga

The Dhudhganga has its source in the Sahyadris near the Nardava pass in the Bhudargad sub-division about 56 kms south-west of Kolhapur. After a course of about 32 kms to the north-east near Kagal, where it is bridged, it flows east for about 10 kms and about a 1.5 km before it receives the Vedganga from the south, it enters Belgaum and flows east about 24 kms till it falls into the Krishna near Kallol. The river bed is shallow and muddy and in the fair weather crops are grown on its eastern banks. In Budargad its water are used for watering sugarcane. Except in the rainy season, the river is at all times fordable. In the rainy season it is crossed by ferry-boats at ten places.

2.6.4. The vedganga

The Vedganga raises a few kms north of Rangana, and after a course of about 61 kms to the north –east joins the Dudhganga in the Chikodi sub-division of Belgaum. Its chief feeder is the Chikotra, which flows through the Kapasi valley and joins it near Chikhali about six kms to the south of its meeting with the Dudhganga.

The bed of the Vedganga is shallow and muddy. In Kagal its banks yield rich crops during the cold season and in Bhudargad a large area is watered. The river is bridged near Yamgarni on the Poona-Belgaum road. It is fordable except during ths rains, when it is crossed by ferries in nine places.

2.6. 5. The Hiranyakeshi

The Hiranyakeshi takes its rise in the Amboli pass in the extreme south-west of the district. It has an irregular north-east course of about 64 kms to near Sankeshvar,

where it enters Belgaum, and after a South-easterly course of about 24 kms joins the Ghatprabha about 8 kms south-east of Hukeri.

Its bed is shallow and its banks yield good crops though not so rich as those grown on the Panchganga. Its chief tributary is the Chitri which takes its rise near the village of Aundi in the Ajara petty division, and after a northerly course of about 16 kms joins the main streams near the town of Ajara. Two first class ferries cross these streams one at Ajara on the Hiranyakeshi on the Amboli road, the other across the Chitri on the Nesri road. First class ferry boats are also kept at Hitni, Harli, Bhadgaon, and Jarli on the Hiranyakeshi, carrying fifty to seventy passengers and half tons of luggages.

2.6.6. The Ghatprabha

The Ghatprabha takes its rise in the south slopes of the Parpoli pass in the south of the District. It flows about 40 kms north-east through the south of the District and about 32 kms further to the north-east, and joins the Hiranyakeshi about 8 kms south-east of Hukeri. During the 40 kms of its course through Kolhapur its banks and bed are rocky. During the rainy season a small boat carrying eight passengers is kept at Nesri in Gadhinglaj.

2.6.7. The Tamraparni

The river Tamraparni takes its rise in the south-western part of the Chandgad tahasil. It has very small water course and flows from the south-west to the north-east through the southern portion of the tahasil.

The areas of river valleys' are economically most important because of they have created fertile flood plains and terraces which is useful for the cultivation of cereals and cash crops of the District.

More over the physical setting of the area is favorable for the construction of Kolhapur type badharas are known as K.T.Weirs. They are well-known in the field irrigation of agriculture that provides facility of irrigation to the peasants in the respected areas.

The Radhanagari dam (Laxmi Tank) one of the hydro-electric schemes was constructed on the river Bhogavati. It was started by the former

Kolhapur Chhatrapati Shahu Maharaj mainly for the purpose of irrigation and generation of electricity.

2.7 CLIMATE

The climate of the Kolhapur district is generally temperate. The western part of the district, near the Sahyadries it is always cooler than the eastern part which is liable to hot winds during April and May. The nights over the entire districts are generally cool.

The year in respect of Kolhapur district may be divided into three periods, hot weather from March to May, rainy period from June to October and cold weather from November to February.

The district gets rain from the south-west as well as the north-east monsoon. The amount of rainfall received decreases rapidly from west to east, the range between the maximum and minimum is large and vagaries of rainfall are great.

The average annual rainfall within the district varies widely from about 600 mm in Shirol tahsil in the east to 6000 mm in Bavda tahsil in the west (Map.No.2.3).

However three broad divisions may be defined as follows.

1. The western zone receiving heavy and assured rainfall.
2. The middle zone receiving moderate but fairly regular rainfall.
3. The eastern zone receiving low, irregular and uncertain rainfall.

The south-west monsoon commences by about the first week of June and last till about the end of September. With the on set of the south-west monsoon there is a rapid fall in the day temperatures (Fig.2.5.A).

By the end of September the south-west monsoon loses its strength and gives way to the north-east monsoon which provides Rabi rain to the eastern part of the district.

Table No.2.2**Monthly Average Temperature**

(In Degree Celcius)

Sr. No.	Months	Maximum Temperature	Minimum Temperature	Range of the Temperature
1	January	31.2	14.4	16.8
2	Feburary	31.0	14.6	16.4
3	March	35.7	17.9	17.8
4	April	38.3	22.0	16.3
5	May	34.3	22.5	11.8
6	June	29.9	22.4	7.5
7	July	26.7	21.4	5.3
8	August	28.0	21.3	6.7
9	September	29.9	20.5	9.4
10	October	30.7	20.5	10.2
11	November	31.1	16.9	14.2
12	December	29.9	13.3	16.6
	Year 2009	38.3	13.3	---

Source: Ndc IMD Pune.

The central part of the district also gets some rain from the north-east monsoon which is helpful for ssRabi sowing and sugarcane. The extreme portion of the district receives 90 to 95 percent of the annual rainfall during the south-west monsoon seasons. This percentage decreases in the north-east to about 60 per cent near Kurundwad. In winter, although day temperature remain higher than the monsoon season, the mean minimum temperature is the lowest and it ranges from 14⁰c to 16⁰c (Fig.2.5.A). December and January are the coldest month of the year and the daily range of the temperature is rather large.

There is a rapid rise in temperature in March, reaching the maximum in April. Daily minimum temperatures exceeding, 38⁰c are fairly frequent in April (Fig.2.5.A). Thunderstorms are common in April and May. The rainfall in this season accounts for about 10 percent of the total annual rainfall.

Table No.2.3

Kolhapur District:

**Showing tahsils having normal and actual rainfall
2009.**

(Rainfall in mm)

Sr. No.	Tahsil	Normal Rain	Actual Rain	% To Normal	Rainy Days
1	Shirol	610	766	126	51
2	Shauwadi	1802	1945	108	75
3	Radhanagari	3774	5155	137	101
4	Bhudargad	1598	1730	108	83
5	Hatkangle	1072	984	92	53
6	Panhala	1710	1498	88	66
7	G.Bavda	6022	4759	79	114
8	Karveer	1043	901	86	60
9	Kagal	947	891	94	65
10	Gadhinglaj	1089	1042	96	65
11	Ajara	2104	1967	93	78
12	Chandgad	2912	2733	94	98

Source: <http://www.mahaagri.gov.in/rainfall/abb/asp>

The rainfall in the Kolhapur district is irratic in nature. Unevenness in its seasonal and areal distribution poses the problem of dividing the rigion in suitable zones. However on the basis of average rainfall (Map.No.2.3) returns for the series of years justify the different zones of the region as follows:

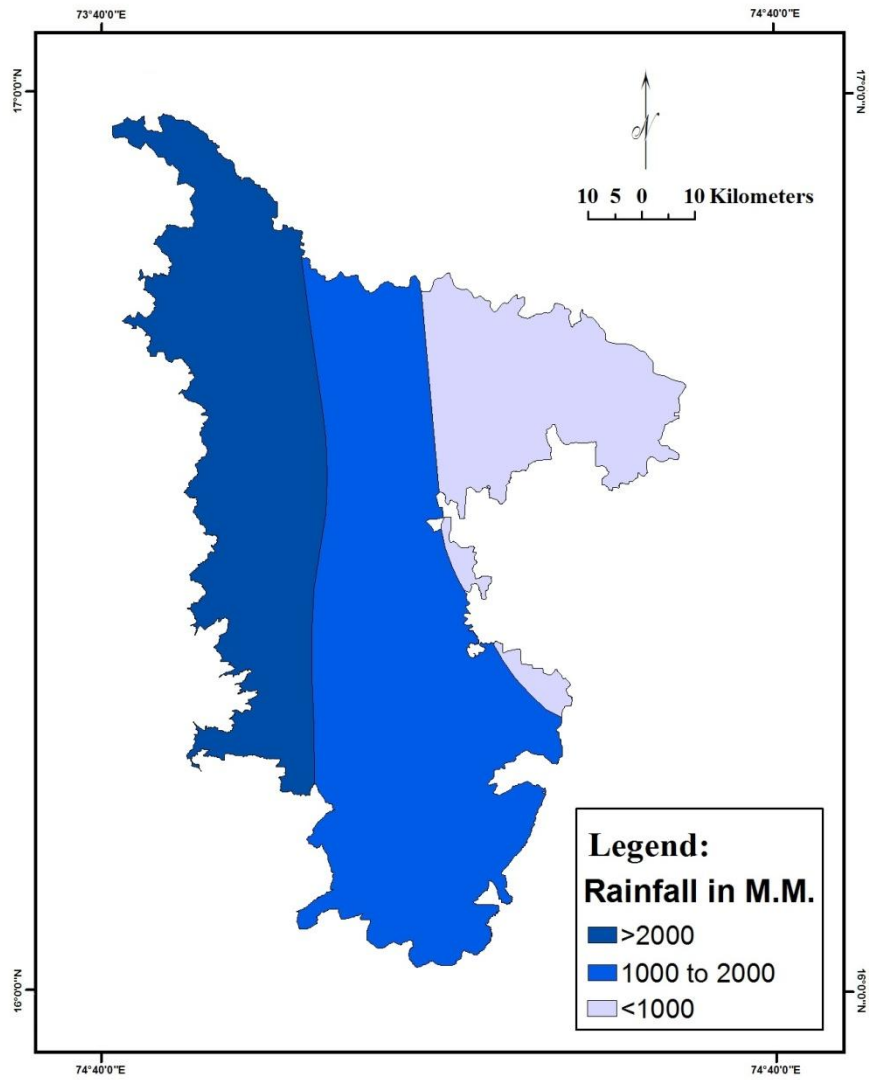
1. Western zone of heavy and assured rainfall

The western part of the district is mountainous region with 2000 mm to 6000 mm. rainfall per annum. This is roughly parallel to the crest of the Sahyadri ranges. Seven tahsils are included in this zone .i.e.Chandgad, Ajara, Bhudargad, Radhanagri, Gaganbavada, Shauwadi, and Panhala. This zone is never affected by droughts.

2. Central zone of moderate but fairly regurly rainfall

This is the foot hills zone of Sahayadriyan ranges receving rainfall between 1000 mm to 2000 mm.three tahsils are included in this zone i.e. Karveer, Kagal and Gadhinglaj. In this belt also rainfall decreases towards east.

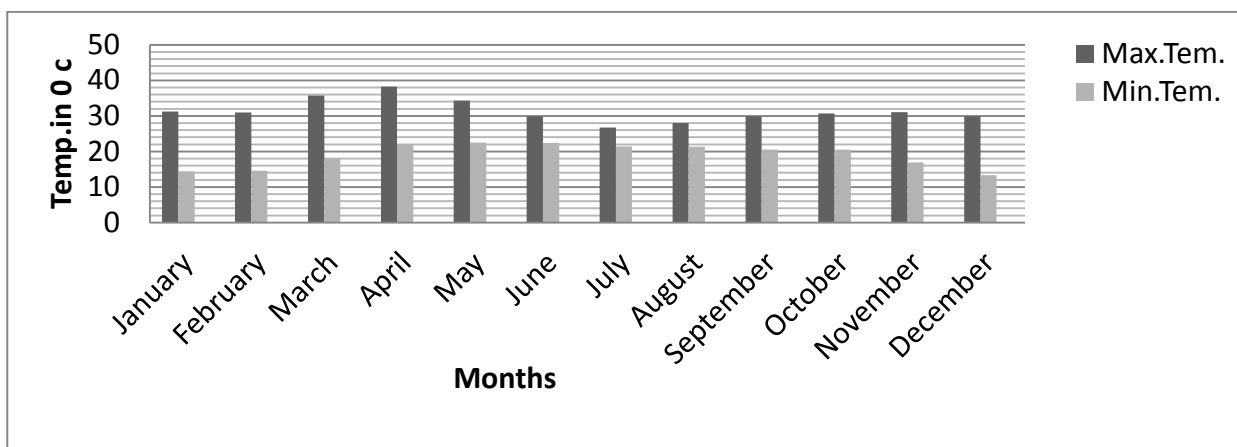
Kolhapur District Average Annual Rainfall



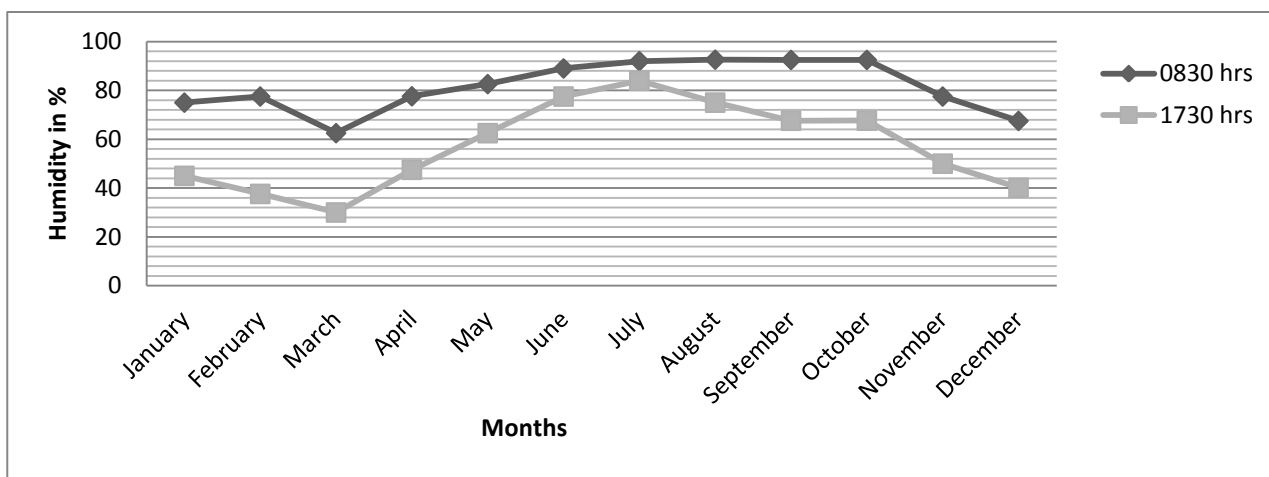
Map. No. 2.3

Kolhapur District: Climate

(A) Average Temperature



(B) Relative Humidity



(C) Rainfall

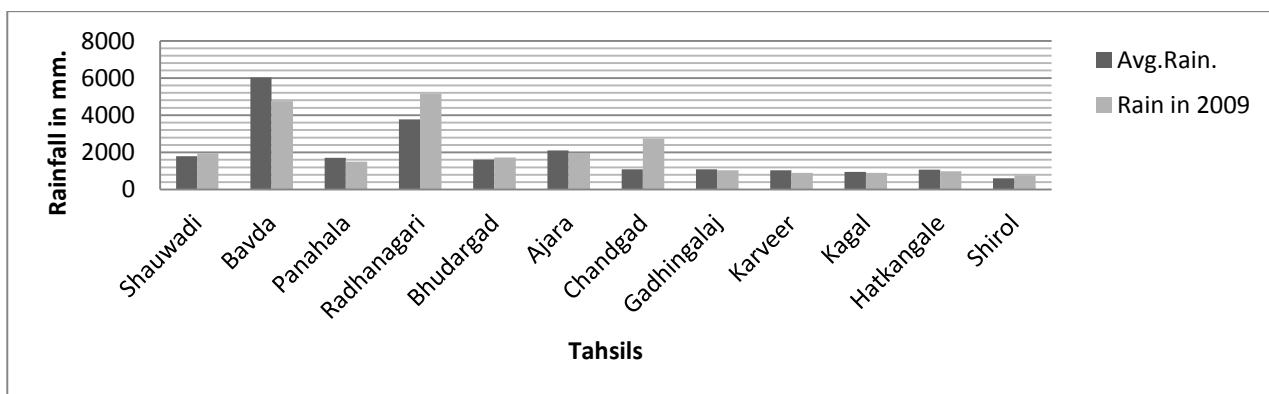


Fig.No.2.5

3. Eastern zone of uncertain rainfall

The most eastern part of the district comprising Hatkangale and Shirol tahsils with 500mm to 1000 mm. rainfall forms this zone. It is frequently affected by droughts, rainfall decreases towards eastern side.

The seasonal distribution of rainfall reveals that rainfall is highly concentrated during rainy season, which creates scarcity of water during the dry season. During the post monsoon, the eastern part of the study area receives over 20 percent rainfall of the total, whereas the western tahsils receives below 10 percent of the annual. About 2 percent rainfall of the yearly total is uniformly distributed all over the region, in cold season (December-February), which is useful to rabi crops. During the hot weather season (March-May) or pre monsoon about 5 percent of the annual total rain occurs which is generally associated with thunder storms and highly concentrated in the eastern parts of the study region.

2.7.1 Season

On the basis of climatic parameters i.e. temperature, humidity and rainfall of the region and their changes during the year there are three seasons being noted in the region.

1. Summer season (March to May)

In this season temperature is high in April and May (38.7°C). The range of the temperature during this season is between 11°C to 17°C (Fig. 2.5.A). The high temperature in this season is helpful for the crops and fruits. In this season the region receives negligible amount of rainfall & is associated with thunderstorms. The relative humidity in March to May is about 65 percent in the morning and 35 to 40 percent in the evening (Fig.2.5.B). Wind blowing mainly from the West. The days are hottest and nights are cooled by winds.

2. Rainy Season (June to October)

The region has got rainfall about 90 percent in this season. The first week of month of June is known for the onset of the monsoon in the region. During this season the content in the atmosphere is high and air is nearly saturated on the several days. The relative humidity from June to September is about 87 percent in

the morning and 77 percent in the evening. The mean daily maximum temperature for July and August is 26 to 28⁰c respectively (Table No. 2.2), towards the end of September temperature again begin to rise. The direction of winds during this period is mainly westerly. There is a complete change over in October when the winds are mainly from North-East to East. The annual rainfall varies widely in the district from 500 mm in the North –East to 6000 mm in the west (Table 2.3 and Map.No.2.4). This is main rainy season.

3. Cold Winter Season (November to February)

The temperature decreases during November to February, the whole season is mainly dry except rainfall receiving from North-East monsoon associated with cyclones. The mean minimum temperature is the lowest and it ranges from 13 to 16⁰c. December and January are the coldest months of the year. The mean relative humidity for the season is 63 percent in the morning and 33 percent in the evening. Low temperature and moderate humidity are the main characteristics of this cold season.

On the whole, the cool weather season is a period of cool & bracing climate, light and variable winds, fair & sunny weather with clear, blue skies.

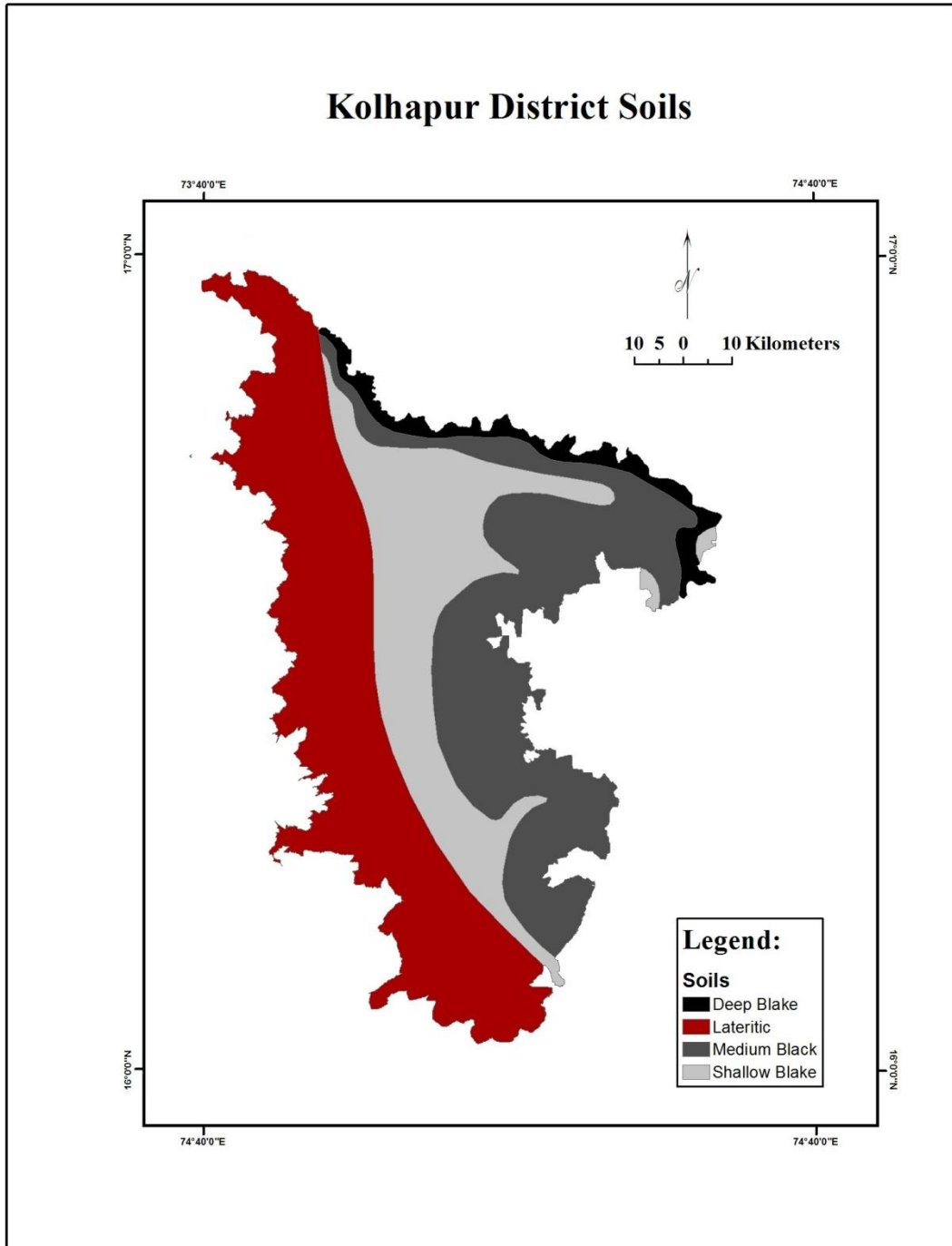
2.8 SOILS

The soils of the district are mainly derived from trap, except in the forest covered area in the west where they are of lateritic origin. On the basis of different physical characteristics three broad soil zones can be distinguished

- i) The western of heavy rainfall is covered with Laterite soils
- ii) The central part with coarse shallow and medium black soils
- iii) The eastern part with precarious rainfall is covered with black soils varying depth.

On the basis of the different physical characteristics various soil types in the districts were shown (Map.No.2.4).

Kolhapur District Soils



Map. No. 2.4

2.8.1 Leterite Soils

Leterite soils occur mainly in the Western hilly tracts of heavy rainfall, on the hilltops which are not covered by forests. They are red to brownish-red in colour, mostly eroded and shallow. These soils are acidic with low phosphoric content. They are not retentive of moisture. Laterite soils are derived from the weathering of several types of rocks.

The overall share of these soils is 10.62 percent of total soil cover. They are largely concentrating in Gagan-bavada (82.97) and Radhanagri (32.18). Hill Millets are taken from them but in valleys where they are fairly deep, paddy happens to be the main crop when applications of nitrogen and phosphates are found quite useful. These soils are fertile and rich in humus.

2.8.2 Raddish brown soils

They are mainly derived from trap and are dark brown in colour, with a raddish tint. They are rich and fertile with excellent granular structure, almost neutral in reaction and well supplied with calcium. They have a sandy and lomy texture and their productive capacity is low. These soils are found in the north-western part of the district, particularly on the hill slopes. The overall share of these soils is 32.81 percent of the total soil cover. These soils have been found in Radhanagri (100 %), Panhala (50.30%) and Radhanagari (42.83).

These soils receive moderate and fairly regular rainfall, rice, jowar and groundnut are grown in the kharif season. Sugarcane and vegetables are grown wherever irrigation facilities are available. Jaggery produced from sugarcane grown in these soils is well-known throughout the country.

2.8.3 Course shallow soils

These are residual soils and are derived from trap. The undulating uplands, foothills and sloping areas are covered by these soils. Compactness, sandy low water holding capacity, well drainage, moderate to poorly fertile, granular in structure, slightly alkaline in reaction, moderate to low nitrogen, potash and phosphate content etc. are the main characteristics of these soils.

They cover 25.60 percent of the total area and are located in Hatkangale (63.28%) and Ajara (71.24%) tahsils. In Panhala, Karveer, Bhudargad and Gadhinglaj its proportion ranges from 20 to 60 percent. While in Kagal, Chandgad and Radhanagari its proportion is below 20 percent. There are moderately productive. Groundnut, wheat, jowar are ripen when they are well manured and irrigated.

2.8.4 Medium black soils

These soils are derived from trap and vary in depth considerably from place to place. It is developed on uplands. High silt and clay proportion, good moisture retentive capacity, compact and difficult to plough in the dry situation, moderately fertile, neutral to strongly alkaline in reaction moderate to high nitrogen and potash, low to moderate phosphate content etc. are the major characteristics of this soils.

They are useful for paddy, sugarcane, soyabean and vegetables. They covers about 19.65 percent of total geographical area. They are found from Shirol (40.91%), Kagal (63.76%), Gadhinglaj (39.92%) and Chandgad (36.87%), of the district.

2.8.5 Deep black soils

These soils occupy the vallys, trraces, flood plains and lower parts of the the basins being enriched heavily by wash, creep and innumerable small water courses. Their colour is much darker than the medium black soil and thickness of the profile much deeper. These soils also have a larger fraction of clay. These soils have covered an area of about 11.30 percent, and major concentration is found in Shirol tahsil. They are also found in Hatkangale, Kagal and Gadhingalaj tahsils.

They are confining closer to river courses particularly on the flood plains of the river Warna, Panchganga, Dudhaganga, Vedganga and Hiranyakeshi. They are deposited by the flood waters of these rivers during the rainy season.

Thus narrow strips have been formed of deep alluvial, which has been ranges from 6 to 8 metres indepth from the surface. The soils along these river valleys are intensively cultivated and particularly suitable for the growing jowar, wheat and sugarcane.

2.9 NATURAL VEGETATION

Generally thick forests are seen in the Sahayadari Mountains and hilly regions of Kolhapur district. Climate variations have affected on the types of the plant species. The Bhudargad, Chandgad and Radhanagari tahsils have thick forests. Gaganbavada, Ajara and Shauwadi tahsils too have forests.

The Kolhapur district has 21.85 percent area under forests. The forest in the district has classified into the following categories on the basis of nature of forests.

2.9.1 The sub-tropical evergreen forests

These types of forests existed in the western part of the district where intensity of rainfall is high. The trees like ain, jambhul, hirada, anjani, surangi, panjambhul, teak etc. mostly came in this category. The Gaganbavada, Shauwadi, Radhanagari, Bhudargad and Chandgad tahsils have this type of forests.

2.9.2 The moist deciduous and semi-evergreen forests

These types of forests existed in the foot hills of the Sahyadris where rainfall is generally high and found in the western slopy areas of the district. The forests composed with chandan, sissu, kenjal, jambhal, panjambhal, amba, nana, asana, kumbhi, bhava, teak, ain, umber, biba etc. Shauwadi, Panhala, Karveer, Ajara, Gadhinglaj tahsils have these types of forests.

2.9.3 The dry deciduous forests

They are scattered in its nature. It is mainly found in the eastern part of the district where rainfall is scanty in nature. The shrubs, bushes and grasses are generally found in the tahsils of Shauwadi, Panhala, Hatkangale, Kagal, Karveer, and Shirol.

Moreover department of forests has classified the forests of the districts into different category (Table No. 2.4). Some minor products like firewood, timber, tamalpatra, karvi, honey and wax, shikekai, karanj, hirada, have got from these forests. Hirada is consumed for the extraction of tannin. At some places the cashewnut plantation kept

in practices. Firewood and grasses are the main marketable products from these forests.

Table No. 2.4

Kolhapur District: Area under forests. (2007-2008)

(Area in sq.km)

Sr.No.	Division	Reserved forests	Protected forests	Unclassified forests	Total forests
1	Administrative	1	1	1	3
2	Forest department	632	416	691	1739
3	District total	633	417	692	1742

Source: Kolhapur District Socio-Eco.Review, 2007-2008.

SECTION-II SOCIO-ECONOMIC SETTING

Like physical factors, socio-economic factors are also important for the growth, development and distribution of different economic activities e.g. agriculture, industries, transportation, commerce etc. in the district. Socio-economic factors mainly population, rural-urban ratio, irrigation, agriculture and transportation etc. have their influence on the growth and development of industries.

2.10 POPULATION

Man as a resource is an important part of the inputs necessary for the development of a region. Growth of population, density of population, man land ratio sex ratio and literacy are the elements of population which are important in the social, cultural and industrial development of the region.

Man being a powerful geographical factor on the earth surface determine the economic pattern of resource utilization but is he a very dynamic and important resource for the society.

Man is the most vital resource for they alone utilize natural resources and provide trained and skilled man-power for the economic development of any

region. He plays a vital role in the utilization of economic resources and development of the region. Various aspects of the population like growth rate, density, the rural-urban proportion; economic classification, occupational structure etc. give an idea about features, availability of man power in the region.

Kolhapur District: Growth of population

(1901-2001)

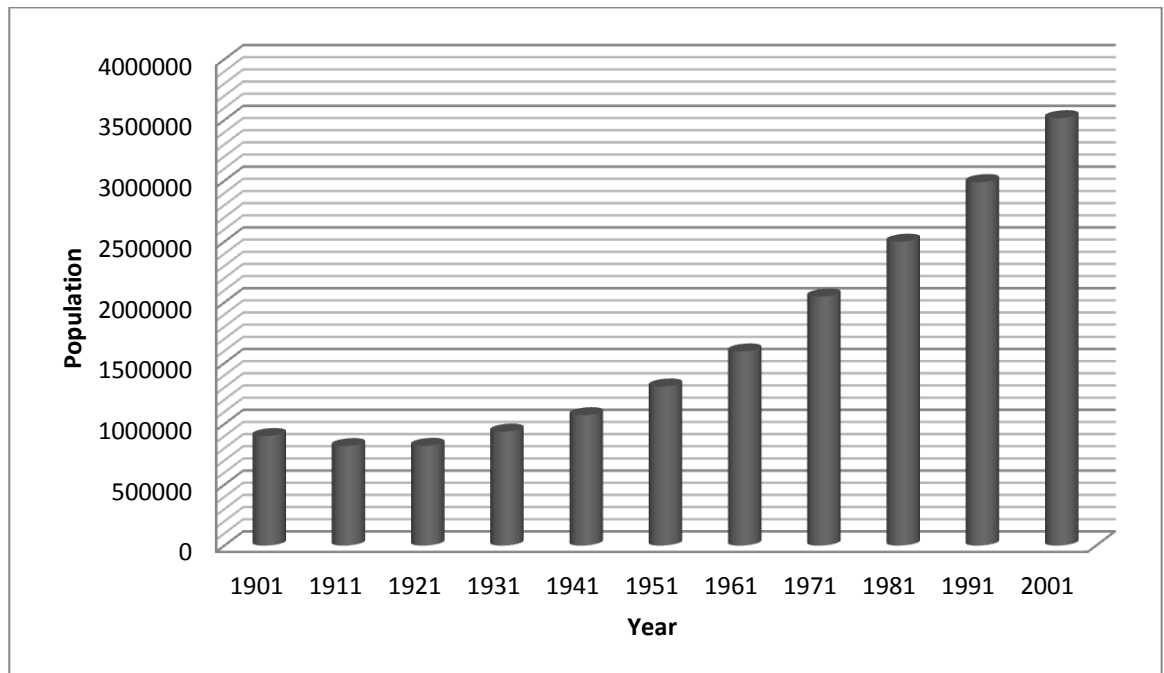


Fig. 2.7

2.10.1 Growth of population

The population of the district is 3.63 percent of population of Maharashtra. The population of the district has been increased with period. The total population of the district in 1951 was 13.08 lakh and it has increased upto 35.23 lakh in 2001. The decadal growth is 17.59 percent and it shows that the decrease in the rate of variation as compare to the previous decade. Table 2.4 gives the population of the district and its decadal variation at each since 1901.

The year 1921 is known as a significant demographic divide in the history of growth of population of the district. In the decade 1901 to 1911 the population of the district was decreased by 9.17 percent. Since 1921 there has been a distinct

change in the trend of population growth. Population has grown continuously at an increasing rate (Map.No.2.5).

The tahsilwise growth rate of population is different in the district. The most populated tahsils have been seen in the eastern part of the district. While in the western part e.g. Bavada, Ajara, Bhudargad, Shauwadi and Chandgad tahsils have less population.

2.10.2 Density of population

The district of Kolhapur with an area of 7685 km² has a density of 455 persons per km². It exceeds the state average (315). It ranks fifth in terms of density. It is just next to the Pune district. The high density in the district is mainly due to high agricultural base characteristics with its high production efficiency, agro-industrial development and urbanization especially tahsils like Karveer, Hatkangale and Shirol. Within the region the highest density was recorded in Karveer tahsil (1351) whereas the lowest is in Gaganbavda tahsil (116). It is shown in the table no 2.5.

The analysis of the population density shows that the great contrast in the western, central and eastern parts of the study region (Map.No. 2.5). Tahsilwise pattern of density indicates that economically backward hilly tahsils viz. Shauwadi, Gaganbavda and Chandgad have very low density (below 200). Tahsils like Radhanagri, Bhudargad and Ajara have low density (200 to 399).

Table No.2.5

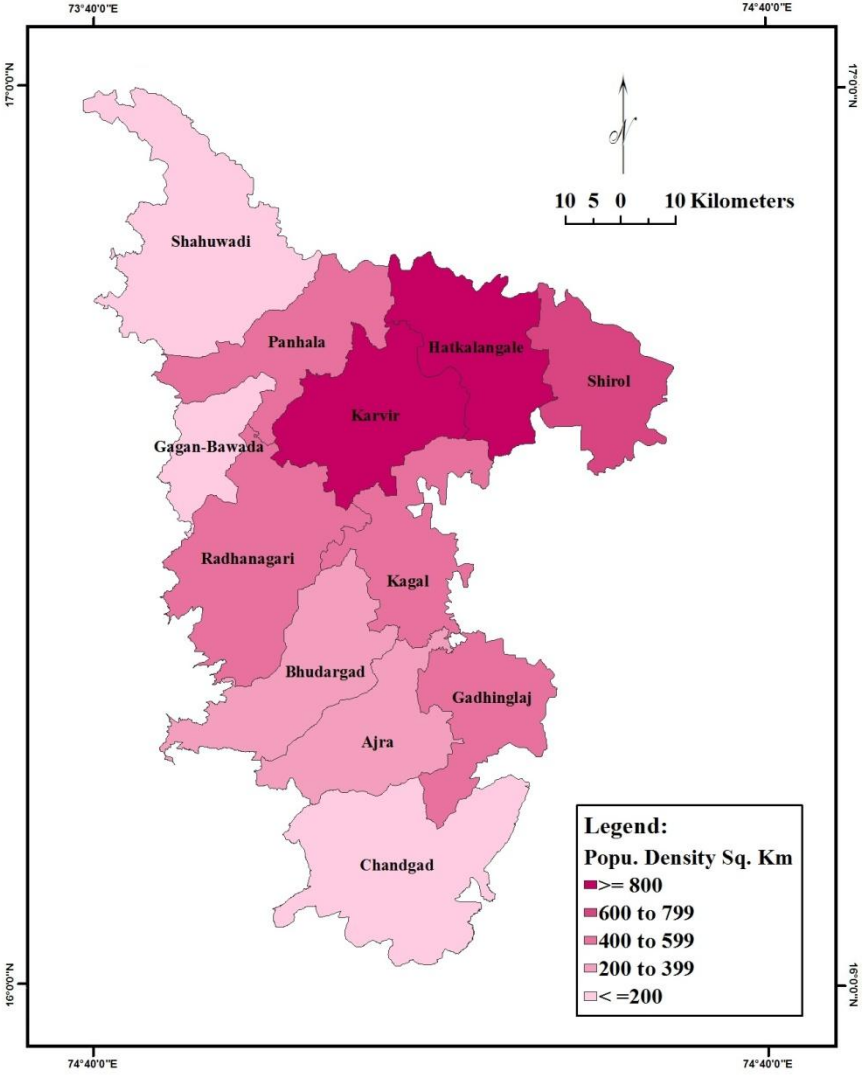
**Kolhapur District: Growth of Population and Decadal Variation
(1901-2001)**

Sr. No.	Year	Population	Decadal Variation	Rate of variation
1	1901	900,570	---	---
2	1911	817,976	-82,594	-9.17
3	1921	820,032	+2056	+0.25
4	1931	937,303	+117,271	+14.30
5	1941	1,072,444	+135,141	+14.42
6	1951	1,308,060	+235,616	+21.96
7	1961	1,596,643	+288,583	+22.05
8	1971	2,048,049	+451,406	+28.26
9	1981	2,499,437	+451,388	+22.03
10	1991	2,989,447	+490,030	+19.60
11	2001	3,515,413	+525,966	+17.59

Source:Censes handbook of Kolhapur district, 2001.

The moderate density (400 to599) is observed in the tahsils of Panhala, Kagal and Gadhinglaj which are comparatively plain and agriculturally peograssive, associated with moderate development of agro-based Industries and transpHigh density (600 to 799) is confined to the tahsil of Shirol where socio-economic factors are favourable. This tahsil has been experiencing agricultural and industrial development. Very outstanding density is observed in the tahsil Karveer and Hatkangale.Kolhapur city is a big urban and industrially developed centre is situated in Karveer tahsil and provides all types of services and having high density of population. Besides this, the Karveer tahsil is also agriculturally and industrially developed. In the Hatkanangale tahsil where Ichalkaranji is the major centre of textile industry. It is also experiencing the agricultural and agro-based industrial development.

Kolhapur District Density of Population 2001



Map. No. 2.5

2.10.3 Sex Ratio

The sex ratio is calculated in terms of number of females per thousand males. The sex ratio varies from tahsil to tahsil. The sex ratio of the state as a whole was 922 in 2001. As against this, sex ratio of the district is greater than the state (949).

Within the district, sex ratio varied between 1082 in the Ajara tahsil and 911 in the Hatkangale tahsil. Tahsils of the western side of the district where migration of males has been taken place towards the eastern tahsils and especially in the Kolhapur city and elsewhere. It is observed that there was a wide uniformity in sex ratio of some of the tahsils e.g. Shirol (941), Radhanagari (946), Kagal (949), Gaganbavda (969). It is an indirectly stabilizing factor for the economy and social well being of the district (Table 2.6).

2.10.4 Urban / Rural Population Ratio

Urban population of the Kolhapur district is 29.8 percent of the total population which is far less than state average (42.43%). It is important to note that Karveer (60.50%) and Hatkangale (50%) tahsils are higher urbanized. It is evident that the district figure of urban population is less than these two tahsils. The western hilly tahsils viz. Chandgad, Bhudargad, Radhanagari and Gaganbavada are mainly rural. The Gadhinglaj (11.7 %), Kagal (13.3 %) and Shirol (17.9 %) tahsils have very less urban population than the district average. The analysis of the table 2.6 shows that the western tahsils are lagging far behind the eastern part of the district so far urbanization is concerned.

Table No. 2.6**Kolhapur District: Population density, Sex ratio, Rural-Urban Population and Literacy****2001**

Sr.No	Tahsils	Area in km ²	Population	Density per km ²	Sex ratio	Population in percentage		
						Urban	Rural	Literacy
1	Karveer	712.9	906866	1272	917	60.5	39.5	83.20
2	Panhala	536.6	238383	444	921	1.4	98.6	74.20
3	Hatkanangale	654.1	709628	1085	911	50.0	50.0	80.30
4	Shirol	570.9	359179	629	941	17.9	82.1	80.20
5	Kagal	656.3	248237	378	949	13.3	86.7	73.60
6	Gadhinglaj	484.4	216257	446	1016	11.7	88.3	71.80
7	Chandgad	961.0	180781	188	1033	---	100	66.70
8	Ajara	556.9	121430	218	1082	12.2	87.8	69.40
9	Bhudargad	619.0	144910	234	995	---	100	72.90
10	Radhanagari	907.0	188107	207	946	---	100	71.30
11	Gaganbavada	280.0	32525	116	969	---	100	60.70
12	Shahuwadi	906.9	176859	195	1049	3.1	96.9	66.90
	District	7685.0	3523162	458	949	29.8	70.2	76.90

Source: Kolhapur District Socio-Eco.Review, 2007-2008.

2.10.5 Literacy

A person who can both read and write with understanding in any language is to be taken as literate by the Indian census. Children in the age group 0-6 are not considered literate even if they are able to spell out some words or alphabets.

According to about 76.93 per cent population of the district was literate as per census 2001. It is equal to that of the state average (76.90%). Among

tahsils, Karveer (83.20 %), Hatkanangale (80.30 %) and Shirol (80.20 %) have the highest percentage of literate population.

The tahsils in central and eastern parts of the Kolhapur district are having high proportion of literacy due to economic development and general awareness among the people and mass movement in the field of education.

The tahsils Panhala, Kagal, Bhudargad, Gadhinglaj and Radhanagari have more than 70 per cent literacy. The remaining tahsils viz. Ajara, Chandgad, Shahuwadi and Gaganbavada have shown low literacy which was much less than the average literacy rate of the district.

2.11 SETTLEMENTS

Settlements are human dwelling of various sizes distributed in geographic space by a set of occupational forces. It is one of the basic needs of man. They are located considering with the factors e.g. water, fertile soil safe location and transportation. The distributional characters of settlement refer to their frequency and spatial organization in a given space. It also attempted to study the size the size of villages and urban centres with their characteristics.

2.11.1 Rural Settlement

As per the 2001 census there were 1196 inhabited villages in Kolhapur district. These villages vary in their population size. The number of villages at tahsil level reveals that Chandgad tahsil has highest number (156), while the lowest numbers of villages are in Gaganbavada (39) tahsil. The stratification of villages according to population has been demonstrated in the following table.

There were 12.80 per cent villages with a population of less than 500. The medium size villages with a population size of 500-2000 were 55.43 per cent, which form a major population size. Further, there were 23.74 per cent villages with a population size of 2000-5000. However the largest sized villages with more than 5000 population were only 8.03 per cent.

Table No. 2.7**Kolhapur District: Village Population Size Group-2001**

Sr. No.	Tahsil	Number of villages							
		Population size							
		Village	Below 200	200-499	500-999	1000-1999	2000-4999	5000-9999	Above 10000
1	Karveer	125	1	9	12	28	61	12	2
2	Panhala	130	3	13	35	48	24	6	1
3	Hatkanangle	58	0	0	5	6	19	15	13
4	Shirol	54	0	0	0	5	25	19	5
5	Kagal	86	0	1	6	33	39	7	0
6	Gadhingalaj	91	2	4	20	28	29	8	0
7	Chandgad	156	0	34	53	52	16	1	0
8	Ajara	96	3	22	25	38	7	1	0
9	Bhudargad	114	6	15	43	32	17	0	1
10	Radhanagari	114	2	14	30	35	29	4	0
11	Gaganbavada	39	1	9	16	12	1	0	0
12	Shahuwadi	133	4	10	42	59	17	1	-
	District	1196	22	131	287	376	284	74	22

Source: District Census Handbook, Kolhapur 2001.

2.11.2 Urban Settlement

There is an increase of urban population by 3.32 per cent as compare to 1991 urban population. The 29.65 per cent population of the district lives in urban areas as per 2001 census. There are 18 urban centres in the district (Table 2.8).

Table No. 2.8**Kolhapur District: Urban Areas-General Statistics-2001**

Sr.No	Urban Area	Area in km ²	Population	Density of Population	Sex Ratio	Status	Class
1	Gadhingalaj	3.4	25357	7502	945	M.Cl	III
2	Gandhinagar	0.4	12374	30181	910	C.T.	IV
3	Hupari	17.2	28265	1648	946	C.T.	III
4	Ichalkaranji	29.9	257610	8619	893	M.Cl	I
5	Jaisingpur	9.0	43067	4780	956	M.Cl	III
6	Kabnur	8.4	28250	3355	894	C.T.	III
7	Kagal	5.2	23776	4537	963	M.Cl	III
8	Kolhapur	66.8	493167	7381	928	M.Cor.	I
9	Kurundwad	25.9	21327	825	965	M.Cl	III
10	Korochoi	6.7	18120	2713	879	C.T.	IV
11	Malkapur	1.9	5504	2837	978	M.Cl	V
12	Murgud	2.1	9204	4425	950	M.Cl	V
13	Panhala	1.6	3452	2185	745	M.Cl	VI
14	Vadgaon	10.0	22758	2276	927	M.Cl	III
15	Uchagaon	9.0	22548	2511	885	C.T.	III
16	Pachgaon	6.7	11991	1798	893	C.T.	IV
17	Kalamba	15	8734	581	893	C.T.	V
18	Ajara	7.9	14849	1884	951	M.Cl	IV
	District	227	1050353	4627	919	-	-

Source: District Censuses Handbook, Kolhapur, 2001.

The district has municipalities, namely Gadhinglaj, Ichalkaranji, Jaysingpur, Kagal, Kurundwad, Malkapur, Murgud, Panhala, and Vadgaon kasba. Kolhapur is the only municipal corporation and remaining eight centres namely Gandhinagar, Hupari, Kabnur, Korochoi, Uchagaon, Pachgaon, Kalamba and Ajara are census towns. Karveer and Hatkanangle tahsils have five each urban centres. Tahsil Shirol and Kagal have two each urban centres. Ajara, Panhala, Malkapur and Gadhinglaj tahsils have one each urban centre.

There are 18 towns in the district ranging from class I to class VI with total area 227.00 km². The two towns (Kolhapur and Ichalkarngi) are class I towns, eight towns (Gadhinglaj, Hupari, Jaysinghpur, Kabnur, Kagal, Kurundwad, Vadgaon and Uchgaon) are class III three towns. Four towns (Gadhinglaj, Korochoi, Pachgaon and Ajara) are class four towns. Three towns (Malakapur, Murgud and

Kalamba) are class V towns and remaining one (Panala) town is of a class VI category.

The process of urbanization is historic in its origin. It was actually started due to the process of industrialization and modernization in Karveer and Hatkanangale tahsils. Shahuwadi and Panhala tahsils have very small size of urban centres in the district as per 2001 census. Gaganbavada, Chandgad, Bhudargad, Radhanagri, and Ajara tahsils are mainly rural.

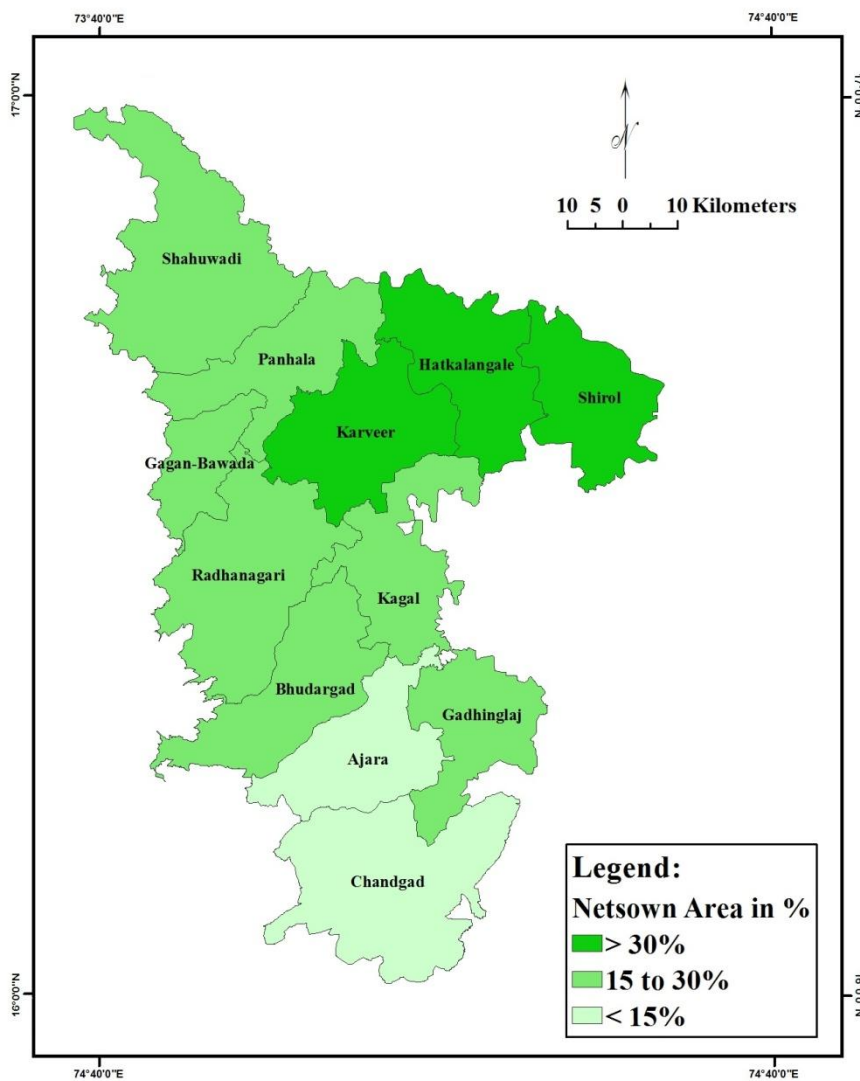
2.12 IRRIGATION

The largest use of water is for irrigating lands, an agricultural input, especially for the production of foodgrains. For the growth of plants, water must be available in the appropriate quantities and at the right time depending on the species of the plant and climatic conditions. There is indisputable evidence that irrigating land leads to increased productivity. Irrigation is a necessary into the high yield varieties of the crops.

One acre of irrigated cropland is worth multiple acres of rainfed cropland. Irrigation allows farmers to apply water at the most beneficial times for the crop, instead of being subject to the timing of rainfall. Another benefit of reservoirs is that stored water can be used for double cropping of fields. The availability of adequate irrigation facilities transforms the subsistence agriculture landscape gradually into commercial one making agrarian economy market oriented (Pawar, 1989). The important sources of irrigation in the region are lift, wells and canals. Surface irrigation shares about 36.27 percent where as well an irrigation share is about 58.87 and others 4.86 percent. The gross cropped area of the district is 5.68 lakh hect as per 2000-2001. Some 23.80 percent of the total cultivated land of the district is irrigated.

The highest percentage of irrigation is observed in Shirol, Hatkanangle and Karveer tahsils with 30 percent and above. Moderate irrigation is observed in Bhudargad, Gaganbavada, Kagal, Radhanagari, Shahuwadi, Gadhingalaj and Panala which ranges from 15 to 30 percent. Low irrigation is

Kolhapur District Total Irrigated Area



Map. No. 2.6

Confined to Ajara and Chandgad tahsils it is below 15 percent of net sown area (Map.No.2.6).The Kolhapur district is generally known for the K.T. weirs (Bandara), which are constructed on various rivers in the region. There are more than 150 K.T. weirs being constructed and many of under construction.

There are 4 major, 11 medium and 47 minor irrigation projects in the Kolhapur districts. The Radhanagri project on the Bhogawati River and Tulashi is on river Tulashi have been completed during 1955 and 1978 respectively. Other major, medium and minor project in the region under construction and remaining work of K.T.weirs is in progress. Major dams at Kalamawadi (Dudhaganga River) and at Chandoli (Warana River) have been completed.

The following table reveals that the actual area irrigated by different sources in the regions.

Table No. 2.9
Kolhapur District: Area Irrigated by different Sources
2000-2001

(Area in Hectare)

Sr. No.	Tahsil	Area irrigated		Net area irri.	Gross area Irri.	Gross cropped area	% of gross irri. area to gross cropped area
		surface	Well				
1	Shahuwadi	4686	6989	11672	11808	56007	21.08
2	Panhala	1579	3214	4793	5491	33662	16.31
3	Hatkanangle	4853	14526	19379	20434	60005	34.05
4	Shirol	8082	9094	17096	17540	48621	36.07
5	Karveer	6671	12047	18718	19392	63369	30.60
6	Gaganbavada	3706	4561	8267	8426	31545	26.71
7	Radhanagari	4521	5689	10210	10874	38824	28.01
8	Kagal	5722	8426	14148	14696	54555	26.94
9	Bhudargad	3194	5248	8442	9095	35322	25.75
10	Ajara	1547	3256	4803	5122	38753	13.22
11	Gadhinglaj	3131	4125	7256	7971	47691	16.71
12	Chadgad	1329	2471	3800	4302	59622	7.22
	District	49018	79566	128584	135151	567976	23.80

Source: Kolhapur District-Socio-Eco.Review, 2009.

Well irrigation occupies an important place in the agriculture of the district. It is an important mean of irrigation. The construction cost of well is low, they are well suited to poor and marginal farmers. In 2000-2001 there were 29,810 wells in the district which irrigated 79,566 (58.90 %) hectare area out of 5, 67,976 hectare gross cropped area in the district.

The following table reveals that the tahsilwise number of wells and area irrigated by the wells.

Table No. 2.10
Kolhapur District: Tahsilwise Well Irrigation
2000-2001

(Area in Hectare)

Sr. No.	Tahsil	No of Wells		Total	Area irrigated	Gross area irrigated	% of area Irri. to Gross area Irrigated
		Used for Irrigation	Not in use				
1	Shahuwadi	629	20	649	6989	11808	59.19
2	Panhala	1523	105	1628	3214	5491	58.53
3	Hatkanangle	7258	109	7367	14526	20434	71.10
4	Shirol	3381	210	3591	9014	17540	51.40
5	Karveer	3493	95	3588	12047	19392	62.12
6	Gaganbavada	274	24	298	4561	8426	54.13
7	Radhanagari	1247	106	1353	5689	10874	52.32
8	Kagal	4007	127	4134	8426	14696	57.31
9	Bhudargad	1534	123	1657	5248	9095	57.70
10	Ajara	489	69	558	3256	5122	63.57
11	Gadhinglaj	3945	2	3947	4125	7971	51.75
12	Chandgad	913	127	1040	2471	4302	57.44
	District	28693	1117	29810	79566	135151	58.87

Source: Kolhapur District-Socio-Eco.Review, 2009.

From the analysis of the table; more than 60 per cent area irrigated by the wells in the tahsils of Hatkanangle (71.10), Ajara (63.57) and Karveer (62.12). Where as the remaining tahsils have below 60 per cent area irrigated by the wells.

The above facilities of irrigation provide the broad base for the growth and development of agriculture in region. Simultaneously it created healthy atmosphere to develop several agro-based industries providing employment opportunities to rural masses.

2.13 LANDUSE PATTERN

One of the most significant features of the landuse in India is the large proportion area suitable for agriculture. Landuse is the surface utilization of all developed and empty land on a specific point at a given time and space. It is a geographical concept and involves specific area. The utilization of land according to its use capability ensures that this resource is utilized to the advantage. Its improper use leads to wastage and can lead to progressive deterioration and loss of productivity of this vital resource.

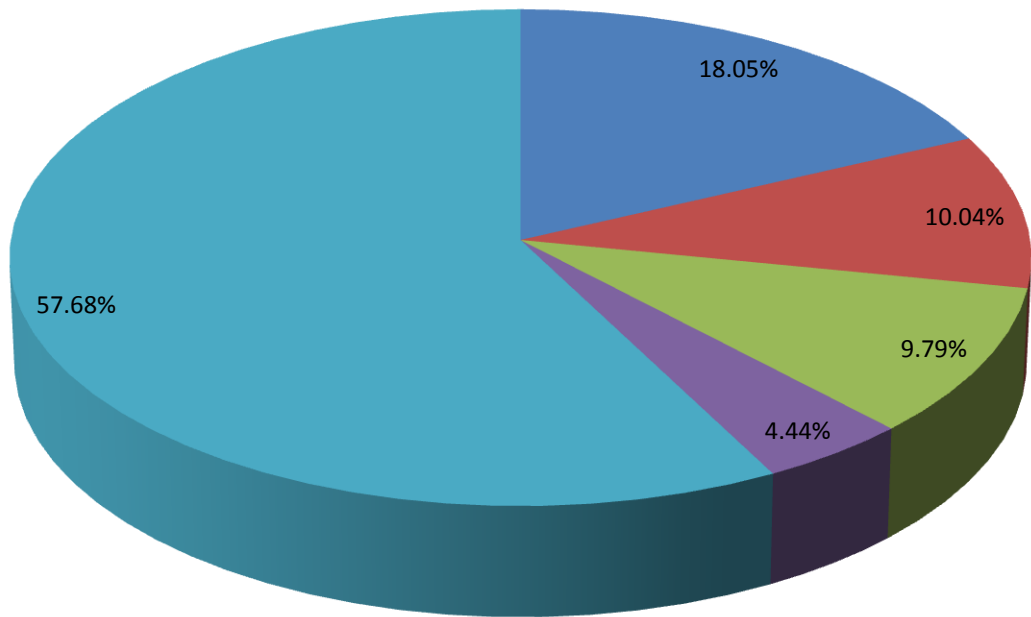
The census of India, has classified the land into nine different categories as forest, barren, cultivable waste, cultivated area etc. but for the present study they grouped into the landuse categories viz. 1) Area under forest, 2) Area not available for cultivation, 3) other uncultivable land, 4) Fallow land and 5) Net sown area.

The study of the landuse pattern of Kolhapur district covers the proportion of area under different landuse.

2.13.1 Total Geographical Area

The total geographical area of the district is 776261 hectares. The net sown area is 447764 hectares that comes to 57.68 per cent to geographical area of the region. This agricultural land includes net sown area with crops and orchards. It includes the irrigated lands.

KOLHAPUR DISTRICT LAND UTILIZATION (2000-2001)



■ Forest

■ Land not available for cultivation

■ Other uncultivated land

■ Fallow land

■ Net sown area

Fig. 2.10

However, the rest of the land, about 42.32 percent of the total area is used for different purposes like forest (18.05 %), land not available for cultivation (10.04 %), other uncultivated land (9.79 %) and fallow land (4.44) (Fig.2.10).

2.13.2 Area under Forest

The percentage of forest land was 18.05 for the whole region. However, the tahsilwise analysis reveals that the tahsils from western hilly zone have more proportion of forest land. Here, the natural vegetative growth is high and having semi-evergreen monsoon forest. These types of forests particularly found in the Radhanagari, Gaganbavada, Bhudargad, Chandgad and Ajara tahsils.

2.13.3 Land not available for cultivation

This category of land use includes the barren, unculturable and land put to non-agricultural uses such as settlements, roads, railways, canals, etc. The regional average total geographical area is 10.04 per cent. However, at tahsil level there is variation in this category i.e. Radhanagari (14.57), Shahuwadi (13.02), Chandgad (11.83) and Karveer (11.86). These tahsils are having above regional level proportion (10.04) and remaining tahsils have below the regional level proportion.

2.13.4 Other uncultivated land

The share of other uncultivated land was 9.79 per cent of the total geographical area of the region. From table 2.11, it is observed that the tahsils Shahuwadi (19.24), Radhanagari (19.24), Karveer (13.24) and Panhala (12.48) have higher percentage of uncultivated land, and remaining tahsils have below the regional level proportion of uncultivated land.

2.13.5 Fallow land

The fallow land includes the land under the current fallow and permanent fallow. The regional average of this category to total geographical area is 4.44 per cent. The tahsil like Ajara, Panahala, Bhudargad and Chandgad are having above regional average proportion of this category and Karveer, Gaganbavada and remaining all tahsils are having below the regional level proportion.

Table No. 2.11**Kolhapur District: Land use pattern in per cent (2000-2001)**

Sr. No.	Tahsils	Geographical area in hectares	Forest	Land not available for cultivation	Other un cultivated land	Fallow land	Net sown area
1	Shahuwadi	104352	21.00	13.02	19.24	1.27	45.47
2	Panhala	56871	20.38	8.80	12.48	11.05	47.29
3	Hatkanangle	60937	2.35	9.66	5.89	1.65	80.45
4	Shirol	50783	1.70	9.61	5.40	1.18	82.11
5	Karveer	67113	1.20	11.86	13.94	2.71	70.29
6	Gaganbavada	28228	37.64	4.54	9.27	2.56	45.99
7	Radhanagari	89232	30.01	14.57	19.24	.35	35.83
8	Kagal	54754	2.03	8.21	3.05	1.18	85.53
9	Bhudargad	64446	36.91	7.12	4.95	9.22	41.80
10	Ajara	54888	22.36	6.10	10.43	18.98	42.13
11	Gadhinglaj	48115	3.78	5.08	1.87	1.28	87.99
12	Chandgad	96542	28.07	11.83	1.91	5.00	53.19
	District	776261	18.05	10.04	9.79	4.44	57.68

Source: Kolhapur District-Socio-Eco.Review, 2009.

2.13.6 Net sown area

The percentage of net sown area of the entire region was 57.68 per cent in 2000-2001. The tahsils situated in western hilly zone have less percentage of cultivable land as compared to regional average (57.68). The central and eastern zone has higher percentage than regional average as a result of suitable physiography and other favourable conditions. The highest percentage of net area sown is confined to Gadhinglaj tahsil.

2.14 ANIMAL HUSBANDARY RESOURCES

Livestock resources plays very important role in the agro-industrial economy of the region. The agricultural wealth i.e. cows, bulls, buffaloes, sheep and goats etc. in the field of farming as well as industry, renders services in several ways to agrarian people. It plays an important role as a base for the development of industries in a particular region. Dairy industry, leather industry, wool industry, bio-gas industry and fertilizer industry are directly related to the animal resources. Cattle are the backbone of the country's agriculture and they play a major role in the rural economy. All the agricultural operations and rural goods movement and transportation are carried out by the draught animals mainly bullocks and he

buffaloes. Thus the cattles are the pillars of our farm life. It also provides subsidiary occupations in semi-urban areas and for people living in hilly, tribal and drought prone areas where farming may not sustain the family. The livestock are raised and maintained by the individual farmer. Table 2.12 indicates that out of the total livestock nearly 15 to 30 % share was occupied by the cattle in all tahsils during 2003. The role of cows and buffaloes is important in the dairy development of the district. The share of the buffaloes is about 52.11 per cent out of the total livestock of the district. Nearly, all the tahsils except Gaganbavada (44.07 %), Radhanagari (46.28%), Shahuwadi (47.16%) and Karveer (48.15%) have the share more than the share of the district (52.11%).

Table No. 2.12

Kolhapur District: Tahsilwise Distribution of Livestock 2003.

Sr. No.	Tahsils	Total cattle	Total buffaloes	Total bovines	Sheep	Goat	Total livestock
1	Shahuwadi	27674 (26.53)	49185 (47.16)	76859 (73.69)	3713 (3.56)	23610 (22.64)	104293 (100)
2	Panhala	30428 (25.10)	65683 (54.18)	96111 (79.28)	10550 (8.70)	14445 (11.92)	121219 (100)
3	Hatkanangle	20614 (12.44)	85560 (51.65)	106174 (64.09)	37852 (22.89)	19283 (11.64)	165654 (100)
4	Shirol	16330 (13.81)	73899 (62.50)	90229 (76.31)	13353 (11.29)	13992 (11.83)	118227 (100)
5	Karveer	38719 (19.34)	96390 (48.15)	135109 (67.49)	48863 (24.41)	15295 (7.64)	200188 (100)
6	Gaganbavada	5963 (27.16)	9677 (44.07)	15640 (71.23)	37 (00.17)	6142 (27.97)	21954 (100)
7	Radhanagari	27684 (28.21)	45419 (46.28)	73103 (74.49)	6395 (6.52)	18271 (18.62)	98130 (100)
8	Kagal	25027 (21.66)	58791 (50.88)	83818 (72.54)	18818 (16.28)	12645 (10.94)	115534 (100)
9	Bhudargad	14886 (23.63)	35957 (57.09)	50843 (80.72)	1888 (2.99)	10003 (15.88)	62986 (100)
10	Ajara	10043 (20.45)	29694 (60.47)	39737 (80.92)	42 (00.08)	9316 (18.97)	49101 (100)
11	Gadhinglaj	19480 (14.85)	66669 (50.85)	86149 (65.70)	23884 (18.22)	20799 (15.86)	131108 (100)
12	Chandgad	27319 (31.40)	47726 (54.86)	75045 (86.26)	2475 (2.84)	9467 (10.88)	86996 (100)
	District	264167 (20.71)	664650 (52.11)	928817 (72.82)	167870 (13.16)	173268 (13.58)	1275390 (100)

Source: Kolhapur District-Socio-Eco.Review, 2009.

(Figures in the parenthesis are the percentages to the total livestock.)

Sheep was ranking first in the Karveer and Hatkangale tahsils. The share of sheep in livestock was below 10 per cent in Panhala, Shahuwadi, Chandgad, Bhudargad, Radhanagari, Gaganbavada and Ajara. The tahsils like Gadhingalaj, Kagal and Shirol have the share more than the share of the district (13.16 %).

Goat was ranking first in the Gaganbavada and Shahuwadi tahsils. The remaining tahsils have the share of goats more than the share of the district (13.58 %) to the total livestock.

The dairy industry is developed to a greater extent in the Karveer, Panhala, Shahuwadi, and Gadhingalaj, kagal, Hatkanagale and Shirol tahsils due to rich livestock and demand from near by markets.

The Kolhapur district is a leading district in dairy farming and it boasts of milk production with huge exports of milk and milkproducts. The setting up of dairies Gokul, Warana and Mayur is a landmark in economic development of the district especially Gokul Milk Co-Op which is one of the biggest dairies in India.

2.15 AGRICULTURAL IMPLEMENTS

The application of science and modern technology in agriculture has improved both quantities and quality of production. The modern inputs such as irrigation, farm implements, mechanical power, use of fertilizers and high yielding varieties of crop etc. are key factors affecting agriculture.

The technological changes including the use of modern hand tools, animal drawn implements, tractors, threshers and other such implements or the more economic patterns of farm management etc. play a vital role in the selection of crops and decision making at the farm level. These changes help in providing the crop yields too. Relief and edaphic climate conditions largely determine the use of agricultural implements and machinery in an area. In addition the quantum of irrigation available, the size of holdings, the degree of intensiveness in farming, the subsistence or commercial character of agriculture and peasant way of life further determine the use of farm implements.

Table No. 2.13**Kolhapur District: Tahsilwise Density of Agricultural Implements 2003.**

(Per 1000 hectare)

Sr. No.	Tahsils	Wooden Ploughs	Iron Ploughs	Electric Pumps	Oil Engines	Tractors
1	Shahuwadi	158.41	7.10	19.47	12.32	5.93
2	Panhala	195.29	54.85	66.37	23.10	25.12
3	Hatkanangle	41.99	32.61	39.60	3.21	8.14
4	Shirol	13.32	18.60	30.04	2.43	11.74
5	Karveer	33.20	21.48	39.89	9.92	25.39
6	Gaganbavada	36.67	3.30	11.32	5.26	1.64
7	Radhanagari	39.82	22.23	4.17	4.38	1.36
8	Kagal	37.65	36.86	39.10	17.63	16.31
9	Bhudargad	216.60	41.90	32.39	29.02	4.27
10	Ajara	98.68	47.10	15.92	19.02	2.17
11	Gadhinglaj	40.32	62.10	151.85	10.84	8.11
12	Chandgad	102.86	115.85	36.16	34.84	7.87
	District	79.24	39.82	41.37	14.19	10.44

Source: Computed by the Author.

The Kolhapur district has been using farm tools since time immemorial in a traditional way. The major farm implements are wooden plough, iron plough, bullock carts, oil engines, electric pumps, sugarcane crushers, thrashers, harrows etc.

Table 2.13 indicates that the district is using both the old and new agricultural implements. Wooden ploughs are dominant in all tahsils except Shirol tahsils. There are five tahsils having large proportion of wooden ploughs more than the average proportion of the district (79.24) per 1000 hectare.

Density of iron plough is very high in Chandgad (115.80) followed by Gadhinglaj (62.10), Panhala (54.85), Ajara (47.10) and Bhudargad (41.10) tahsils. The density of iron plough varies from 3.30 to 115.85 per 1000 hectare. The low density is recorded in Gaganbavada (3.30) tahsil. It is very essential to increase the density of iron ploughs, so that the production of crops will be increased.

The highest density of electric pumps per 1000 hectare was recorded in Gadhinglaj (151.85) whereas the lowest density of electric pumps was recorded in Radhanagari (4.17). The remaining tahsils have recorded below the average proportion of electric pumps of the district (41.17) per 1000 hectare.

The density of oil engines per 1000 hectare varies from 2.43 to 34.84 in the study region. Majority of the tahsils have highest density of oil engines as compare to the density of oil engines of the district (14.19).

The highest density of tractors per 1000 hectare was recorded in Karveer (25.39) followed by Panhala (25.12), Kagal (16.31) and Shirol (11.74). Whereas the lowest density of tractors was recorded in Radhdanagari (1.36) tahsil followed by Gaganbavada (1.64), Ajara (2.17), and Bhudargad (4.27) and Shahuwadi (5.93) tahsils. The density of tractors in the district varies from 1.36 to 25.39 per 1000 hectares.

2.16 IMPROVED SEEDS

The modern inputs such as irrigation, farm implements, mechanical power, use of fertilizers and high yielding varieties of crop etc. are key factors affecting agriculture. Improved seeds have played a vital role in augmenting agricultural production in the study region. High-yielding seed breeding technology is a revolutionary transition from age-old tradition to innovation. These improved seeds have shown better performance than local varieties of seeds in the region. The green Revolution sweeping the agricultural economies of the developing countries is essential the outcome of the use of improved high yielding varieties of different crops. Use of improved seeds is closely related to the quantum of irrigation and the human material involved. Agricultural investment will be more profitable only after adoption of improved seeds, fertilizers and irrigation technology which helps to multiply the productivity per hectare. These improved seeds have shown better performance in the district has changed the traditional pattern to certain extent and marked the beginning of agricultural development. It is supplemented by the expansion of irrigation and use of chemical fertilizers.

To meet the food requirement of increasing population it is necessary to increase the foodgrains, oilseeds and agricultural production. A number of new hybrid and varieties are becoming available. Systematic efforts would be needed to strengthen the production chain in order to reach the varieties to the farmers in shortest possible time.

Improved varieties of foodgrains, pulses, oilseeds, sugarcane and feeders are generally used in the region. The high yielding varieties are distributed in every tahsil.

Table No.2.14 reveals that the use of improved seeds in the study region. During 2008-09 nearly 3, 42,327 Metric tones high yield variety seeds were distributed in the study region. All are using the high yielding variety seeds to increase their agricultural products

Table No. 2.14

Kolhapur District: Tahsilwise Use of Improved Seeds

2008-2009

Sr. No.	Tahsils	Use of H.Y.V. Seeds In Metric tones.	Percentage to the District Total.
1	Shahuwadi	7005	2.05
2	Panhala	26348	7.70
3	Hatkanangle	36717	10.72
4	Shirol	47760	13.95
5	Karveer	92243	26.95
6	Gaganbavada	3408	1.00
7	Radhanagari	20064	5.86
8	Kagal	43218	12.62
9	Bhudargad	10275	3.00
10	Ajara	13788	4.02
11	Gadhinglaj	16967	4.96
12	Chandgad	24534	7.17
	District	342327	100.00

Source: Agriculture Development Officer Z.P. Kolhapur.

In 2000-2001 the area under different crops to gross cropped area in the district is as cereals (31%), pulses (10%), oil seeds (24%) and non foodcrops (42%).

2.17 CHEMICAL FERTILIZERS

Utilization of improved seeds in area under certain crops as paddy, maize, pulses, oil seeds, feeders etc. are implemented for sizeable products. The requirement of fertilizers has rapidly increased by the farmers in the district. They use Urea, Phosphates, Sulphate and other mixed fertilizers in their farms. Farmers have learned by experience the effective use of chemical fertilizers. Use of irrigation, pest and weed control, better cultural practices and the introducing the improved seeds will further increase crop response to the fertilizers.

Table No. 2.15

Kolhapur District: Tahsilwise Use of Chemical Fertilizers

2008-2009

Sr. No.	Tahsils	Use of Chemical Fertilizers in metric tonnes.	Percentage to the District total
1	Shahuwadi	6803	2.98
2	Panhala	18178	7.97
3	Hatkanangle	34205	15.00
4	Shirol	36668	16.08
5	Karveer	27439	12.04
6	Gaganbavada	4541	2.00
7	Radhanagari	15922	6.98
8	Kagal	29640	13.00
9	Bhudargad	11366	4.98
10	Ajara	9086	3.98
11	Gadhinglaj	20491	8.99
12	Chandgad	13671	6.00
	District	228010	100.00

Source: Kolhapur District-Socio-Eco.Review, 2009.

Table 2.15 indicates that nearly 16.08 % were used in Shirol, Kagal, Hatkanangale, Karveer, Gadhinglaj and Panhala. The remaining tahsils were used very little quantity share of the chemical fertilizers in 2007-2008 in the study region. It is essential to use more chemical fertilizers to raise the industrial crop production in the study region.

2.18 AGRICULTURAL CREDIT AND FINANCE

All agricultural inputs require the capital. The farmers make their decision on the basis of capital available in their hand. Market oriented and an industrial crop

requires the capital. Capital and finance have remained vital issues in the adoption of modern agricultural technology as it is costly.

There are 207 branches of District Central Co-op. bank and 16 State Agricultural and Rural Developments banks in the district. They provide loans and finance to the farmers and entrepreneurs. The co-operative movement has constructed a network of co-operative societies in the region and the agricultural loan is primarily sanctioned by the District Co-op. Bank and co-op. societies.

Table No. 2.16

Kolhapur District: Tahsilwise Agricultural Credit Societies

2008-2009

Sr. No.	Tahsils	No of primary agricultural co-op. societies	Loan advances given to the Farmers (Rs.1000)
1	Shahuwadi	91	67141
2	Panhala	215	216460
3	Hatkanangle	130	494538
4	Shirol	140	501375
5	Karveer	239	727154
6	Gaganbavada	55	58483
7	Radhanagari	187	231480
8	Kagal	154	859510
9	Bhudargad	151	40269
10	Ajara	98	83069
11	Gadhinglaj	107	224178
12	Chandgad	121	130301
	District	1688	3633958

Source: Kolhapur District-Socio-Eco.Review, 2009.

Table 2.16 indicates that nearly 363.39 crore loan was distributed in the study region during 2008. All tahsils have got loans for agricultural purposes.

Karveer, Kagal, Shirol and Hatkanagale tahsils have got more benefits of loans from the societies in the study region.

2.19 ELECTRICITY

Rural electrification is one of the most basic needs for transformation of rural life and agricultural production and is a key factor in the development of rural industries. It is vital for the socio-economic betterment of the people living in the

villages. The use of electricity has profoundly changed the structure and role of energy supplies in modern industry and has had certain important consequences on the location of industrial activity.

For any manufacturing activity energy is a prime requirement and this requirement can be met from both animet and inanimet sources. The use of electricity profoundly changed the structure and role of energy supplies in modern industries and has certain important concequances on the location of industrial activity.

Among the infrastructure facilities, the adequate supply of electricity is the most important for the economic progress of any area. Electricity could change the industrial scenario. Formerly industries were mostly located near energy sources. Now industries can be set up in areas far away from its generating sites as because it is possible to large block of power for more than thousand kilometers. The wide availability of this power has facilitate the locational dispersial of industries and to concentrate more on market where local energy sources are inadequate, expensive or entirely lacking.

Before 1955, there were oil machinery power stations in the study region. The power generally used for domestic purposes. The first Hydro-electric scheme was originally started in 1909 by the former Kolhapur state during Chh.Shahumaharaj. It was completed in 1957. It has a power house with 24 MW capacities. The electrification of villages in the district was started in 1921. Now MSEB has completed electrification of 1211 villages and 18 towns (99.50%).

In 2008 nearly 2501546 thousand Kilowat Hours electricity was consumed in the study region. Out of the total consumption about 59.89 % electricity was used in various industrial areas where as 19.64 % electricity was consumed for domestic purposes and only 20.47 % electricity was used for agricultural sector during 2008.

2.20 MARKETING

Marketing is one of the most potent factors greatly stimulating agricultural productions of an area. An efficient market provides the farmer with that infrastructural service, whenin he can sell his surplus produce.

Availability of market is very essential for the development of industry, because finished products of any industry are finally brought to the market for sale, therefore; if the region has several and large market centers, then the region receives more incentives and has good scope for the development of industries.

There are four regulated and twenty one sub market centres in the Kolhapur district. There are 218 district primary marketing societies in the district where the production came from agriculture is marketed and purchases as well as sold to the buyers. Peasant can't get satisfactory price to his articles in the markets. Market and sub-market centers have facing many problems of infrastructure, enough space, warehouse and transport etc.

2.21 TRANSPORT AND COMMUNICATION

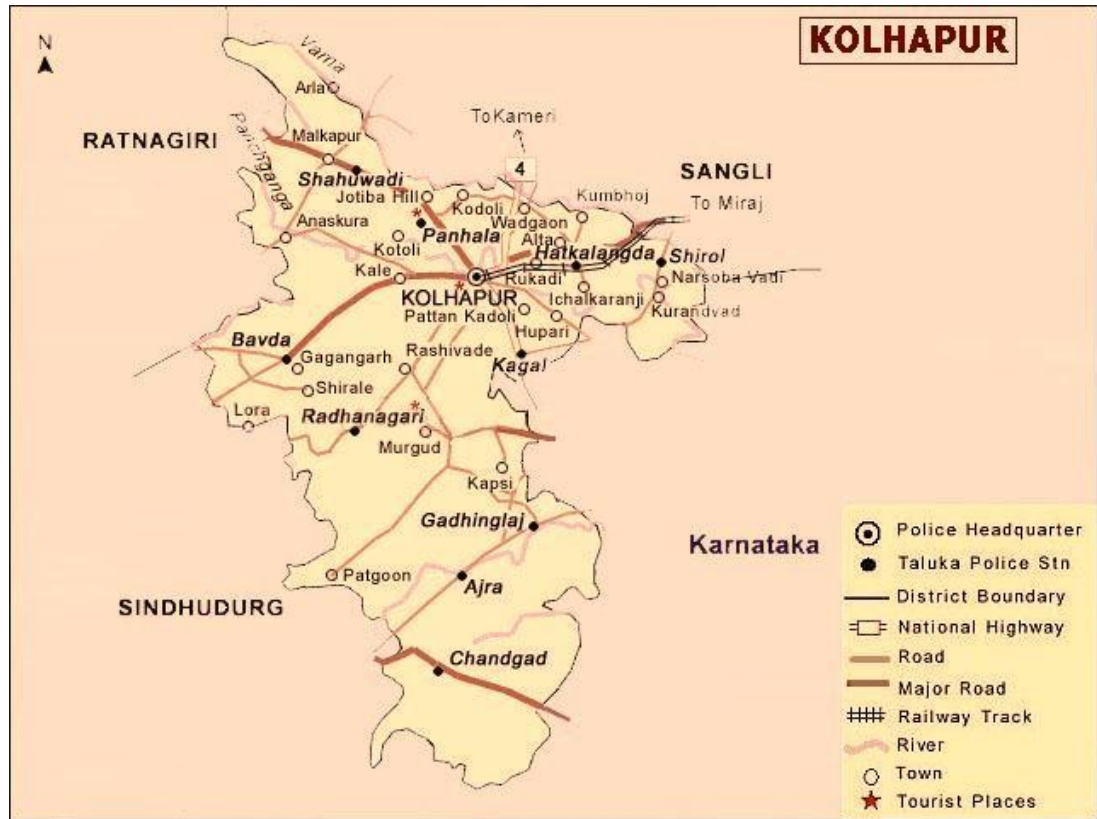
Transport means the movement of men and material from one place to another. Availability of different means of transport may influence location decision as; a firm generally has choice with respect to both to the route and the method of transportation used to move any commodity from one point to another.

Transportation system is essential for the development of agro-based industries. It has an important role in the movement of people and goods, from one place to another place. Raw material and fuel are brought to the factory site by quick transport.

The location of manufacturing is greatly influenced by availability of transportation facilities. Railways and roads are the nerves and veins of the region. The development of the region in all the fields is depends upon the transportation facilities available within the region. For industrial development infrastructure of means of transportation is pre-requisite.

The district headquarter i.e.Kolhapur has been joined to Mumbai by broad gauge railway line of south central division of Indian railways. There are six railway stations with 37.68 Kms. of railway line. Daily train services are available from Mumbai and many other important places to Kolhapur. The district enjoys a good system of communication facility by bus routes. The district had 7876 Kms. Road length. The classes of road have been shown the national highway, state highway, and district

Kohapur District Transport and Communication



Map. No. 2.7

Road, other roads and rural road network. These provide infra-structural facilities for the quick and efficient transportation of goods, passengers, customers and trades, within and outside the district. The roads of Kolhapur district are classified as below (Map.No. 2.7).

i) National Highways

The national highway (N.H.4) i.e.Pune-Benglore Road passes through the study region.the total length of national highway within the district is about 131 Kms.

ii) State Highway

The total length of the state highway within the jurisdiction of the district is about 824 Kms. They run between Kolhapur-Ratanagiri, Kolhapur-Phonda-Sawatwadi, Kolhapur- Sawantwadi and Kolhapur-Sangli.

iii) Major District roads

District roads have gives the transportation facilities within the district. The total length of the district roads is about 1645 Kms.

IV) Other roads

They are approach roads connecting villages and towns in the district. They are designed to serve the tahsils and market places. This category of the roads has 2163 Kms. Length in the district.

V) Village and other roads

There are 1139 villages joined with pucca approach roads in the rural area of the district. Village roads are 3104 Kms. in length and are the rural life line of the rural landscape in the district.

2.22 SUMMARY

It is evident from the foregoing analysis that the study region is not uniformly endowed with the natural resources. The western zone is subjected to serve handicaps on an account of rugged topography, excessively heavy rainfall and poor quality of soil and high rate of soil erosion.

The remaining central and eastern part of the district is endowed with favorable physical-socio-economic factors. They play an important role in the development of agro-based industries in the study region.

The study region has 21.85 percent area under forests. Some marketable products came from the forests. So there is a wide scope for the forest based industries in the study region.

Majority of the farmers are conversant with recent development in agriculture which has been adopted by them. Use of different machines and implements for farm operations and other inputs has been widely accepted. All these have resulted in the intensification of agriculture, particularly in the sugarcane zone.

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CHAPTER- III

DEVELOPMENT OF AGRO-BASED INDUSTRIES IN KOLHAPUR DISTRICT

CHAPTER-III

DEVELOPMENT OF AGRO-BASED INDUSTRIES IN KOLHAPUR DISTRICT

3.1 INTRODUCTION

3.2 THE ROLE OF INDIVIDUAL PERSONALITIES FOR THE DEVELOPMENT OF AGRO-BASED INDUSTRIES IN THE KOLHAPUR DISTRICT.

3.3 THE ROLE OF CO-OPERATIVE SECTOR FOR THE DEVELOPMENT OF AGRO-BASED INDUSTRIES IN THE KOLHAPUR DISTRICT.

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3.5 SUMMARY

CHAPTER- III

DEVELOPMENT OF AGRO-BASED INDUSTRIES IN KOLHAPUR DISTRICT

3.1 INTRODUCTION

“The purpose of industry is obvious. It is to supply man with things which are necessarily useful or beautiful and thus to bring life to body or spirit”. Although the district cannot be said as industrially backward, it is a fact that the development of various industries in the district has not been uniform. Industries have developed rapidly in the district during the 20th century when under the able leadership and foresights of the late Chhatrapati Shahu Maharaj, the foundation of the industrial development in Kolhapur was laid and further fostered by the late Rajaram Maharaj. The industrial development in the Ichalkaranji is mainly attributed to the efforts of Mr. Ghorpade, the ruler of Ichalkaranji princely state. The present development owes its origin to the foresights of the old rulers.

Western Maharashtra is regarded as socio-economically progressive and well developed region. It is politically also powerful. It has given leaders like late Y. B. Chavan, late Vasantdada Patil and ex. Chief Minister of Maharashtra and existing Minister of Agriculture of India Mr. Sharad Pawar. The ‘sugar lobby’ of Maharashtra is regarded as ‘king makers’ in such strong hold area lies the District Kolhapur with Sahyadri on its western side. It is spread over 7685 sq. kms. It has rich water resources and Panchaganga, Vedganga, Dudhaganga, Bhogavati, Kumbhi, Kasari Tulshi, Chitri, Warna and Krishna are the rivers flowing across the district. It has twelve tahsils out of which seven from hilly and forest area of western part.

Shirol, Hatkangale, Karveer, and Kagal tahsils are industrially well developed. All tahsils are having co-operative sugar factories. Ichalkaranji is the centre of powerlooms is known as Manchester of Maharashtra.

Kolhapur city is situated on the bank of river Panchaganga. It has 4.93 lakh populations and has a Municipal Corporation. The district has made progress mainly through Co-operative movement. The present chapter deals with the role of individual

personalities, Co-operative sectors, and Government agencies in the district for the development of agro-based industries in the Kolhapur District.

3.2 THE ROLE OF INDIVIDUAL PERSONALITIES FOR THE DEVELOPMENT OF AGRO-BASED INDUSTRIES IN THE KOLHAPUR DISTRICT.

The industrial development of the study region has made progressive mainly due the foresight and partition of the certain personalities. Late Chh. Shahu Maharaj erstwhile Karveer dynasty is regarded as the father of modern Kolhaupur. The leaders like Late Tatyasaheb Mohite, Late Dattajirao Kadam, Late Tatyasaheb Kore, Late Ratnappa Kumbhar and few others have laid foundation and made rich contribution towardas Co-operative movement and industries in the study region. From some of them are mentioned here.

3.2.1 CHHATRAPATI SHAHU MAHARAJ (1874-1922)

King Chh. Shahu Maharaja was an invaluable gem in the history of Kolhapur. Such great people are born once in a thousand years and spread their light on us and our future generations. King Shahu was related to all progressive activities which contribute to the good of society right from business to women's education. The peak years of his contribution for welfare to society were from 1894 to 1922. His main contribution was to education for which he took the initiative from revolutionary reformer Mahatma Jyotirao Phule. He gave importance to primary education since this is the base to an individual progress. He also gave attention to all other spheres from singing to wrestling to women's education.

He was a great man with a great foresight, a person to be admired and looked upon as an example of great success and hard work.

Chh.shri. Shahu Maharaj is well-known not only in Kolhapur but also in Maharashtra. In his career he worked in various fields and modern economy. He attacked on poverty for the better economic prosperity of the people. The credit of the whole development of Kolhapur state goes to Chh. Shahu Maharaj. Since the movement of

green revolution and development began in his career. Very few kings provided their attention towards the development of the peoples with money, mind and body.

At the time of his career the situation of the people was very poor. They were depending upon agriculture and this ratio was increasing day today. In his state ever increasing population came as obstacle in the path of development. When Britishers came in India along then some business and things also came and our indigenous industries and villages and cottage industries couldn't fight with them. For the development of agriculture he directs with some efforts and thoughts on the industry then the dependence of peoples would be lessen. He thought that every year at least ten students should be sent to England for getting knowledge of agriculture. He wanted to give help to the farmers in the form of loans with low interest, for land development, he established land development banks and co-operative banks. He did help farmers with seeds, manure, agricultural implements, construction of roads and dairy industries. He thought that the government must provide attention towards the development of industry and give protection to them with some facilities. The political leader late Mr. Ranade said that the development of industries is the prime ambition of the government for the prosperity of the country.

The Raobahadur Ganesh Vnektesh Joshi put his thoughts in the public speech and it was published in quarterly magazine published in July 1885. In that he said, industrial corporation should be established to give the education of management of industries and capital shall rise from sell of Indian and foreign bonds. He guided and suggested that the necessity of local raw material and erect industries based upon such raw material further he wanted to take the foreign technological knowledge. It is necessary for the all-round development. The state government should give the facilities like subsidies, low interest loans, prizes for production, and subsidies in the octroi, machines and technology etc.

The princely state of Kolhapur had been made with amazing strides both in industrial progress and social reforms in the career of twenty-eight years of Chh. Maharaj. The evolution of the state begins with the rule of Shahu Chhatrapati. He used every angle of programs of economic development of the peoples for their welfare.

3.2.1.1 INDUSTRIAL DEVELOPMENT

Before the independence of the country there were two types of ruling bodies one is the foreign governance and another one is the princely states. The princely states were free for their internal functions and rules in their states. The physical as well as economic prosperity of the state was purely depending upon the states. Now we see the better development of the industries in the state of Kolhapur is due to the efforts made by the Maharaj. He was the real visionary of the state. After his royal installation and administration he started his efforts to develop the agriculture, industry and trade. There would be no alternative except the development of industries. There were two types of ideas for the industrial development one is the growth of resources and another is the creation of employment for the people. When the factories began in the rural areas then there were the opportunities of the employment to the peoples. There was no need to go in the cities in search of the employment.

Our tradition being very ancient in the making of the handicrafts and handmade goods such cottage and village industries provide better employment and opportunities to the people at local level. He thought that the industrial development and growth is most important for the economic prosperity of the nation. These thoughts were quoted at the time of beginning and function of the Rajaram Industrial School and boarding house in 15th August 1920. He not only instructs his views over them but in real he began implementation and tries his best. At the time of beginning of his rule the rail line being constructed in the state. The construction of railway line is essential for the growth of sources and trade in the state, all these helps to the industrial development of the state.

For the development and distribution of industries in the state he had made efforts. He didn't want to differentiate industries as rural, urban and agro-based. He wanted to start all types of industries in the state. He kept attention towards all round development of the state with the human elements and the skill. He gave help to them. For the industrial development he continuously made the situation for the self-beginning of the industries. It happened only due to his long vision, continuous efforts, daring and organization.

3.2.1.2 SHAHU MILL

At the time of industrialization there was a milestone and it was the beginning of Shahu Mill. It happened only of the protection and loyalty of the Shahu Maharaj. The foundation and beginning of spinning and weaving mill was started with the hands of Shshu Maharaj. He gave capital, land, water etc. for the early start of spinning mill. He gave contract of the mill to the member of the mill but a progress was come in sight when he gave protection to the mill. One of the characteristics of the Kolhapur industrial development was that it was started at the time of his Journey of London. He was inspired when he saw the industrial development in Britain. Since he was inspired and thought that and expressed his views in a speech on industrial development in his state. Then some rich persons came together and thought over the establishment of the mill. He started cotton textile on co-operative basis. He said that the people should come together and start some business and industries in the state then he would give all types assistance to them.

3.2.1.3 CASHEW-NUT FACTORY

When Maharaj came in power he started the journey of the state to know the situation of the state in 1895. At the same time only one cashew-nut factory was running at Shengaon near Gargoti. He observed the factory and guided to them for the growth and production. He decided to start another factory in that area.

3.2.1.4 NEW INDUSTRIES

He encouraged existing industries in the state. He not only encouraged to them but also thought and planned on to start new industries in the state. He had visited the cotton mill, paper mill and silk factory functioning at Pune. He used only own papers made by the paper mill in his state. From these examples we can say that, he provided his attention towards the state. He put his views and wholesomeness for the development of industries in the state. He wanted to start silk, glass and pearl industries in the state. He compared his industries and agriculture with industries and agriculture in Italy. He kept his attention in the beginning of honey making industry, such industry started and working at Rajputwadi for two years.

3.2.1.5 GINNING FACTORY

For the establishment of Shshu Mill at Shirol road, Chh. Shahu Maharaj had given assistance to that ginning factory. In 1908-09 the ginning factory was started at Ichalkaranji in Shirol tahsil. Mr. Laxman Babaji Koregaonkar had started ginning at Gadhinglaj. This factory was working in the cotton season in the month of February to June. Chh. Shahu Maharaj had given two acres of land to the mill. He had taken one of the important decisions, such as he wouldn't start another industry in near future.

That was one of the steps taken by him, when the industry at his beginning stage, there was the necessity to give them protection against new competitor in the way of industry. There is one examples of child, when the child in his childhood, he was to give him protection and help for his growth, just like it has to be done in favour of industry relied on their legs. At that time the beginning of another factory is very harmful and if it happened the old one would be collapsed, therefore he banned the beginning of the new factories.

The report of 1910-11 showed that there is the establishment of new ginning factory at Ichalkarnji with the name of Venktesh Ginning Factory. There were fifty six workers working in the factory. The production of the factory was about Rs. 259000 and the benefit was Rs. 8000 and its expenditure was Rs. 23000. There were six ginning factories in 1912-13. Their distribution was as two at Kolhapur, one at Ichalkarnji, and one at Shirol road, one at Chinchali and one in Gadhinglaj. These factories were facing the lack of raw material. In 1915-16 another factory was started, but in the coming soon these factories faced the function of work.

3.2.1.6 WEAVING FACTORY

There was the beginning and functioning of the weaving factories like that of the ginning factories. At Rayabag there was one weaving factory started by one of the Brahman experts who was helped by the Maharaj. The required capital to the factory was given by the Maharaj. Rayabag is the important weaving centre at that time. He has given lot of facilities e.g. land, debt etc. to the workers, weavers working in the factory. He gave them facilities like loan, land for living and farm activities. The goods like sarees, dhotar etc.

was produced in the factory. Shri. Shahu Weaver's Association was established at Rayabag. There were 200 workers working in the factory. There was some industry working at Ichalkaranji, it was started in 1920-21. As per the report 1920-21 shows that there are 60 workers working in the factory.

3.2.1.7 COLOURING

It was the beginning of colour work for the colouring of the threads at Ichalkaranji. The factory was started by the name of Shri. Venkatesh colour thread factory. There were 35 workers working in the factory. Later the factory was in progress.

3.2.1.8 OTHER INDUSTRIES

The annual report 1912-13 showed that Maysors; Shirgaonkar Brothers started one oil mill with capital of one lakh. This was the first oil mill in the state therefore he gave help to the mill. In 1909 there were 5 grinding factories as per the report 1912-13. The Datar Company has launched new saw mill at Ichalkaranji. There were 11 groundnut factories in the state, out of them 10 in Shahupuri (Kolhapur) and 1 at Gadhingalaj. After that the number of factories came down and it stood on 7 as per report of 1918-19. Out of them 2 were in working position for six months only, it happened due to lack of work. Except these there was one sugar factory. Indian Motor and Cycle Co. Ltd. was started in 1920-21. One wood refinery factory came into existence on exercise basis. The factory produced 100 bags of coal (30 tones) from that tar and Pyrolignous acid separated.

3.2.1.9 GINGAR SOCIETY

Gingar society had made the saddle (khogir) for the horse riders, therefore Maharaj had given encourage to them. He gave permission and help to Mr. Yamnajirao Amble, from Nippani starting the casting furnaces at Shahupuri.

Maharaj believed in the industrial movement. He said that, they would use things made by the Gingar society. He made an industrial nature to this business.

He gave not only help but also inspiration for the new and old one. He created markets for the goods produced in the factories. Trade and industry depends on each other for its development. There wouldn't be price to the goods without trade and commerce and market. This is not possible without industries. For the prosperity of industries he created and started market at Shahupuri near railway station.

3.2.1.10 THINKING ON USE OF SWADESHI (INDEGENEIOUS)

The patriotic mind of Shahu was ever ready to support a swadeshi enterprise. In March 1912 he issued a notification to the public to the effect that it was his desire that his ryots and merchants should use matches manufactured by the Deccan Match Manufacturing Company of Karad. With a view to promoting industry in the new town Shahupuri, Shahu granted a license to R.R.Shirgaonkar promising him that no licence for a similar industry would be granted to any other person for five years. Really, Shahu Chhatrapati was a royal Revolutionary King in historic time.

From the above, we can understand his futuristic vision. It is better for the prosperity of the industrial development in his state.

3.2.1.11 NOTIFICATION AND ORDERS OF HIS HIGHNESS CHHATRAPATI MAHARAJA SAHIB OF KOLHAPUR DYNASTY

NOTIFICATION

General Department, Kolhapur 29 May, 1895.

It happens many times and it is observed frequently that the labourers worked on sugarcane crusher's accidented due to the hand and finger injuries of the hands and it is observed by the Surgeon of the state and he reports to His Highness and he reports pleased, and orders and notify for the welfare of the public in the state.

The notification is published for the general information to the public and there is nothing injury of the labors working with sugarcane crushers, their safety shall be made important from crushing and those who have invent the sugarcane crusher which is safe or those who have find any idea about the safety from crushers, he would report before 1 January,

1896, then he will get good award and like that machine with practical should be sent before the due date towards the divan, who has sign below this.

M. KUVARJI

Diwan Nisbat Sarkar Karveer

(Gazette of Karveer, Part-1 Date 1st June 1895.)

NOTIFICATION

29 May, 1895.

It is published for the public, that Raobhadur Raghunath Shirgaonkar has offered the place for the beginning of oil mill. Therefore also notify that another oil mill shall not be started anywhere in the state within five years for that purpose order of decision No.1016 and Notification No.97, Date 2 April 1912 is released for information.

R.V.SABNIS

Diwan Sarkar Karveer

(Gazette Karveer, Sect.1, Date 18th April 1912.)

3.2.1.12 TRADE AND TRASPOT

When he provided better attention towards industrial development simultaneously he couldn't forget encouragement of the trade. He believed in both sectors for the development for each other as well as development of his state. He knew except trade there wouldn't be possible economic emergence of the state. When we want development of trade and commerce at the same time there is the necessity of allied industries and agricultural development. When he went to England for the coronation, at

that time he was inspired by the industrial revolution done by the England. Then he thought over the beginning of such industrial revolution in his princely state.

When his early days of livelihood and before his coronation he understood the importance of railway line. At the time of construction of railway line in 3 May 1888, he said in a speech 'when we want growth of resources, then there is the necessity of railway'. It supports the trade and industries in the state.

He gave inspiration to the traders for the building of the plots, godown, warehouses and shops in the state. He founded commercial market in 1905. The goods came from agriculture e.g. gur, groundnut and cereals etc. sold in the market on the large scale. In his career in 1921 at that time 4, 70,224 man (40 kg / man.) of gur and sugar trading was done at Shahupuri commercial market and it's worth Rs.30, 00,000. Now Shahupuri is the leading trade and market centre in the district. At that time the functions of trade in-between Kolhapur and Sangli, Chipulan, Nippani, Rajapur, Miraj and Jamkhandi etc. the goods like clothing, glasswears, sugar, gur, and groundnut were mostly trading in the state.

Both trade and industry offer opportunity to the employment of the peoples in the state. The industrial production rose and it is useful for the development of resources in the state. Trade and industry are the basic pillars of the economy and therefore Chh. Shahu Maharaj kept attention on both sectors.

3.2.2 LATE YANTRA-MAHARASHI MAHADABA MISTRI (1903-1977)

Late shri. Mahadeo Nana Shelke was popularly known to all as Mahadaba Mistri. The dedication to work, self confidence and gist to innovate new equipment made "Mahadba", "Yantra mahrshi Mahadaba Mistri" inspite of his illiteracy. He started his own workshop "Kolhapur Auto Works" to manufacture firefighting equipment, Auto Batteries and hanging bodies. In 1942, there was shortage in petroleum products, to overcome this shortage he developed coal gas plant. Only Kirloskar and Mahadaba Mistri were successful in developing the coal gas plant.

His futuristic view and to help farmers in our agricultural country he developed oil engine to draw water from wells. The success of oil engines gave way to his new venture “Vishwas Engines”. He also developed rotating stage for Acharya Atre’s famous play “TO ME NEVECH”. Acharya Atre whole heartedly admired Mahadaba Mistris work and applauded him with “Yantra maharshi”. He constructed the first 70 MM Parvati Talkies, which is named in memory of his wife.

3.2.3 LATE RATNAPPAANNA KUMBHAR (1909-1998)

The veteran freedom fighter and a recipient of the Padamashri award was born in the potter family at Nimshirgaon village in Shirol tahsil. During his youth he was keenly interested in political and social work and mobilized support under the praja-parishad banner against the local princely state rulers. He was actively participated in the freedom movement and went underground for about six years. He was on the fore front of an agitation for dissolution of princely states.

After independence, he became a member of the committee that framed Indian Constitution, later he was elected as a Member of Parliament in 1952. Between 1962 and 1982 and from 1990 till his death he represented Shirol assembly constituency as an MLA. Between 1974 and 1978 he was a minister of state for home and civil supplies. He was instrumental in bringing about the industrial and agricultural prosperity of Shirol and Hatkanagle tahsils of Kolhapur.

3.2.4 LATE TATYASAHEB KORE (1914-1994)

Tatyasaheb Kore who did a magnificent miracle in the land of Warana born on 17th October 1914, he was the son of a farmer in a small village Kodoli. Young Vishwanath alias Tatyasaheb Kore had to overcome several hurdles due the poverty of his family. Establishment of most efficient Co-operative Sugar Factory, which is achieved world record in sugar recovery and efficiency. Sugar unit has won National Awards for efficiency on number of occasions.

The Warana Complex comprises several co-operatives, trusts and societies etc. in which WSC is the nucleus. Sugar unit has promoted a large scale co-operative dairy project, co-

operative poultry farms, and co-operative bank, co-operative consumer stores, co-operative women's societies, world famous children's orchestra, educational activities right from kinder garden to Engineering College and number of other institutions. All these institutes are known as the best managed and efficient unit in their respective field in the whole of the country.

He was the director since the acceptance of Maharashtra State Co-operative Sugar Factories Federation Ltd., Bombay. He was the president of Deccan Sugar Technologists Association, Pune in 1973-75. Since 1983 he was the vice president of Vasant Dada Sugar Institute, Pune. He was the ex-director of the Maharashtra State Co-operative Bank Ltd. He worked as an Ex-member of Indian Central Sugarcane Committee Delhi.

He received a number of honors and awards for their life achievements and corporate sectors for the upliftment's and economic prosperity the native people of the region.

3.2.5 LATE DATTAJIRAO KADAM

A notable co-operator of the district late Dattajirao Kadam was born on 21st January 1919. One of the rural leaders, who fought for the development of cooperate sector in the various fields. He was the founder chairman of The Deccan Co-operative Spinning Mill Ltd. Ichalkaranji and The Yashwant Co-operative Processors Ichalkaranji, He was the founder of Shree Datta Shetkari Sahakari Sakhar Karkhana Ltd. Shirol, Ichalkaranji Powerloom Clothing Market Sahakari Society Ltd. Ichalkaranji, The Ichalkaranji Co-operative Spinning Mill Ltd., Ichalkaranji, The Ichalkaranji Urban Co-operative Bank Ltd. Ichalkaranji and Ichalkaranji Janta Sahakari Bank Ltd., Ichalkaranji. Shirdwad-Shivnakwadi Sahakari Panipurvatha Sanstha. He was the director of various co-operative institutes e.g. Shetkari Seva Sahakari Society Ltd. Shirdwad, The all India Federation of Co-operative Spinning Mills etc.

3.2.6 LATE BABASAHEB KHANJIRE

Babasaheb Khanjire who has co-operates with others but he keeps himself apart from the power and light of the society. In 1956, he has worked for the erection of the Panchganaga Sahkari Sakhar Karkhana at Ichalkaranji. The Deccan Co-operative Spinning Mills, Ichalkaranji was the first Co-operative spinning mill started in 1960; for that he worked with Late Dattajirao Kadam and Late Abasaheb Kulkarni.

He took part in the various co-operative institutes and helps them for the better beginning. For the financial assistance of entrepreneurs he started Icalkaranji Janta Sahakari Bank Ltd., Icalkaranji. He began Yashwant Co-operative process Ichalkarnji. For the purpose of economic assistance of workers works in the textile sector he started, Kamgar Sahakari Bank Ltd., Ichalkarnji. He made an efforts for economic empowerment and self relied of women's he stared Ichalkaranji Mahila Sahakari Bank.

It was his enthusiasm to take part in the erection of Shree Datta Shetkari Sahakari Sakhar Karhana Ltd. Shirol which helped for the economic development of the farmers in and around the Shirol Tahsil. With an effort of him the dream of Venkatesh Sahkari Soot Girni Ltd. Hupari came into reality. Food, clothing and shelter are the necessary wants of the men's for keeping this into consideration he started Sahakari Housing Society for the handloom workers in and around Ichalkarnji. He took part in the foundation of the above co-operative institutes. Though, he kept himself away from the power of such institutes. His political carrier began with the president of Kolhapur Zilla Congress Committee in 1962-63. He was elected on State Legislative Assembly in 1972. He was the representative of the Ichakaranji Constituency.

3.2.7 LATE SHAMRAO PATIL YADRAVAKAR (1934-2004)

One of the social and economic co-operate, who made an effort for the development for rural people who had, took birth in 25th November, 1935 at Yadrav tahsil Shiorl. He was the founder member and president (1968-1974) of the Kolhapur Zilla Shetkari Vinkari Sahakari Soot Girani Ltd. Rajiv Gandhinagar, Ichalkaranji. In 1980-82 formerly he was Vice-President of Maharashtra Rajya Sahkari Soot Girani Sangh, Mumabai. He completed his role as a Vice-President and President of The All

India Federation Co-operative Spinning Mills Ltd. Delhi. In 1978 he had been established Parvati Sahkari Soot Girani Ltd. Kurundwad, Tahasil Shirol. He kept a foundation stone of the Parvati Co-operative Industrial Estate Ltd. Ydarav which has been started in 1981. He was the founder of the Padmavati Co-operative Textiles Ltd. Yadrav and Shetkari Co-operative Textiles Ltd Ydarav.

He was the founder and ex-Chairman of the Sharad Sahkari Sakhar Karkhana Ltd. Narande Taluka Hatkangale. For the benefit of the sugarcane cutters he started and completed his role as founder of Shamrao Patil Yadravkar Sahkari Oosa Todani Wahatook Sansta Narande. He was the founder of many co-operative housing Societies for the workers and backward class of the societies. He started Yadrav co-operative water Supply scheme in 1971. He started Shirol Taluka Yantramag Auodyogik Sahakari Society Ltd. Jaisingpur Taluka Shirol. He was the founder of Yadrav Co-operative Bank Ltd. Yadrav. In 1971-73 he was the president of Maharashtra Rajya Kapad Kharedi Vekari Sangh Ltd. Mumbai.

3.2.8 SHREE. KALAPANNA AWADE

In the field of co-operation one of the leading personality and who has lead erection of Jawahar co-operative sugar factory at Hupari-Yelgud, by Shree. . Kalapanna Baburao Awade. He was born in Jain family on 5th July 1931. He lived at Ichalkaranji in Hatkanagale tahsil. He worked as a director in various fields of co-operation. He was a founder chairman of Jawahar Shetkari Sahakari Sakhar Karakhana Ltd., Hupari. Now he is working as a Chairman of the factory. He was the founder of the Indira Gandhi Mahila sahakari Soot Girni Ltd. Shivnakwadi and Nav Maharashtra Sahkari Soot Girni Ltd. Sajani Tal. Hatkanangale.

He has been working for solution of farmers' problems, decentralizing power loom sector, small scale industries and co-operatives; to study technological development in textile industry and participation of woman in industrial work; housing scheme for industrial workers; and endeavored to implement kallammawadi Irrigation Project.

He is on the body of National Federation of Co-Operative Sugar Factory Ltd. New Delhi. He is a member of the Management body of the Vasant Dada Sugar Institute, Pune. He is a Director of Datta Shetkari Sahakari Sakhar Karkhana Ltd. Shirol. He is the founder of the Jawahar Panipurvatha Yojan Hupari-Yelgud.

He has been conferred with prestigious 'FIE Foundation Award' for outstanding performance in the field of co-operative movement and socio-economic development in Ichalkaranji, spirit behind, progress of Indira Gandhi Mahila Sahakari Soot Girni Ltd., he has founder and ex-chairman i) The Ichalkaranji Janta Sahakari Bank Ltd., Ichalkaranji. ii) The Ichalkaranji Co-operative Spinning Mill, Ichalkaranji. He is an ex-chairman of Maharashtra State Co-operative Spinning Mill Federation, Mumbai. During his tenure as a member of Municipal Council, schemes were implemented for providing civic amenities for rapidly growing needs of the Ichalkaranji town.

3.2.9 SHREE SADASHIVRAO DADOBA MANDLIK

He was born on 7th October 1934. He is a member of the 15th Lok Sabha. He is a founder chairman of Sadashivrao Mandlik Kagal Taluka Sahakari Sakhar Karkhana Ltd., Hamidwada, Taluka, Kagal. It was started in 1976-78. He was the founder Chairman of Shetkari Sahakari Sangh Kolhapur, Krushi Udyog Sangh, District Kolhapur. He works as a director of several co-operative institutes e.g. Dudhaganga Vedganga Sahakari Sakhar Karkhana Ltd., Bidri. Tal. Bhudargad. He worked successfully as a Chairman of Public Works and District Health Department, Zilla Parishad Kolhapur in 1960-62. He worked on Development Council for sugar industries. He is on the body of directors of Maharashtra State co-operative Banks Ltd.; he was a founder of several educational institutes at local level.

3.3 CO-OPERATIVE MOVEMENT IN KOLHAPUR DISTRICT

The co-operative movement in the Kolhapur is back-bone of the economic development of the district. It has touched every field of the district. Many personalities of the study region have laid the foundation of this movement. Among the list of loyal and strong personalities certain names came in queue e.g. Late. Ratnappa Kumbhar, Late. Tatyasaheb Kore, Late. Dattajirao Kadam, Mr. Dadasaheb Patil Kaulavkar, Mr. D. C.

Narake and several others. Literally, in the stage of beginning these personalities visited many villages in the study region. The purpose behind them to get the share from peasant and convince to them but it is very difficult task to them. But they succeed to raise the real future picture in front of poor farmers in the region. The painted picture made it to be truth and did not allow it to die as a dream. The co-operative sugar factories and spinning mills have raised the living standard of farmers and several workers working in it.

3.3.1 NOTIFICATION OF HIS HIGHNESS CHHATRAPATI MAHARAJ SAHEB

Act of cooperative movement, since it is applied by the principality His Highness Chh. Shahu Maharaj in 1912 in his State. For the implementation he gave order and notification to the public and his administration. It is cleared from the following notification which is employed in 1913 in his State.

NOTIFICATION

Legislative department, Kolhapur 28th May 1913.

No. 6 – In supersession of Notification No. 4, dated 4th July 1912, published at page 155, part I of the Kolhapur State Gazette dated 13th July 1912, in so far as it relates to the Kolhapur State, Proper, His Highness the Chhatrapati Maharaja Saheb has been pleased to sanction the introduction, *mutatis, mutandis*, into the State Proper, of Act II of 1912 (The Cooperative Societies Act, 1912) together with rules and orders already passed to be hereafter passed there under, from the 1st June 1913. By order of his highness the Chhatrapati Maharaja Saheb of Kolhapur.

R.V. SABNIS

Diwan of Kolhapur

(Gazette of Karveer Sarkar, Sect.1, Date 31th May, 1913)

3.3.2 CO-OPERATIVE SPINNING MILLS

In the district the important spinning mills are:

1. Kolhapur Zilla Shetkari Vinkari Sahakari Soot Girani, Ichalkaranji, Tal. Hatkanangale.
2. Nav-Maharashtra Sahakari Soot Girani, Ichalkaranji,
3. Ichalkaranji Co-operative Spinning Mill, Ichalkaranji,
4. Deccan Co-operative Spinning Mill, Ichalkaranji,
5. Mahatma Phule Magasvargiya Sahakari Soot Girni Ltd., Peth Vadgaon, Tal. Hatkanangale.
6. Vyanktesh Shetkari Sahakari Soot Girni Ltd., Hupri, Tal. Hatkanangale.
7. Datta Shetkari Vinkari Sahakari Soot Girni Ltd., Plot No.978, Sangli-Kolhapur Road, Post: Hatkanangale.
8. Hatkanangale Taluka Sahakari Soot Girni Ltd., Post: Vadgaon, Tal. Hatkanangale.
9. Janta Shetkari Vinkari Sahakari Soot Girni Maryadit, Ichalkaranji, Tal. Hatkanangale.
10. Rajivaji Sahakari Soot Girni Ltd., Phulewadi, Kolhapur. Tal. Karveer.
11. Choundeshari Sahakari Soot Girni Ltd., Kol-Sangli Road, Post: Dharangutti, Tal. Shirol.
12. Ichalkaranji Co-operative Spinning Mills Ltd., Shivnakwadi Tal: Shirol.
13. Indira Gandhi Mahila Sahakari Soot Girni Ltd., Shivnakwadi Tal: Shirol.
14. Deshbhakta Ratnappanna Kumbhar Shirol Magasvargiya Sahakari Soot Girni Ltd., Kolhapur-Sangali State Highway, Post: Tamdalge-Jaysingpur, Tal. Shirol.
15. Sahakar Maharshi Dattajirao Kadam Sahakari Soot Girni Ltd., Post: Kaulage Tal. Gadhinglai.
16. Ajara Taluka Shetkari Sahakari Soot Girni Ltd., Khdede Post: Madilage Tal. Ajara.
17. Hutatma Swami Warke Co-operative Spinning Mills, Ltd., Gargoti At/Post: Mudhal, Tal. Bhudargad.

As on 31th March, 2010 the production of yarn (soot) was worth Rs. 405.12 lakhs and workers were 34177 in all type of textile mills apart from this, as on 31st March, 2011 there were 10535 powers looms in the study region.

3.3.3 CO-OPERATIVE SUGAR MILLS

Kolhapur district is a famous in the western Maharashtra for the co-operative sugar factories .There are some important sugar mills in the district. The co-operative sugar factories are the gift of the stalwarts of the districts, who have made an effort for the beginning and development of sugar factories. All the development of the district is seen due the sugar factories. The important sugar factories in the district are as fallows.

1. Tatyasaheb Kore Sahakari Sakhar Karkhana Warnanagar Tal.Panhala.
2. Shri. Datta Sahakari Sakhar Karkhana Ltd. Asurle-Porle Tal.Panhala.
3. Bhogavati Sahakari Sakhar Karkhana Ltd. Parite Tal. Karveer.
4. Kumbhi-Kasari Sahakari Sakhar Karkhana Ltd. Kuditre Tal. Karveer.
5. Chh. Rajaram Sahakari Sakhar Karkhana Ltd. Kasba-Bavda Tal. Karveer.
6. Dudhganga-Vedganga Sahakari Sakhar Karkhana Ltd. Bidri Tal. Kagal.
7. Chh. Shahu Sahakari Sakhar Karkhana Ltd. Kagal Tal. Kagal.
8. Sadashivrao Mandlik Sahakari Sakhar Karkhana Ltd. Hamidwada Tal. Kagal.
9. Jawahar Shetkari Sahakari Sakhar Karkhana Ltd., Hupari-Yaldud Tal. Hatkanangale.
10. Deshbhakta Ratanappa Kumbhar Panchganga Sahakari Sakhar Karkhana Ltd., Ichalkarangi Tal. Hatkanangale.
11. Sharad Sahakari Sakhar Karkhana Ltd., Narande Tal. Hatkanangale.
12. Shri. Datta Shetkari Sahakari Sakhar Karkhana Ltd., Shirol Tal. Shirol.
13. Padamshri Dr.D. Y. Patil Sahakari Sakhar Karkhana Ltd., Vesaraf Tal. Gaganbavada.
14. Udaisinha Gaikwad Sahakari Sakhar Karkhana Ltd., Sonawade-Bambavade Tal. Shahuwadi.
15. Indira Gandhi Mahila Sahakari Sakhar Karkhana Ltd., Tal. Bhudargad.
16. Ajara-Renuka Sahakari Sakhar Karkhana Ltd., Tal. Ajara.
17. Gadhingalaj Taluka Sahakari Sakhar Karkhana Ltd., Harali Tal. Gadhingalaj
18. Daulat Sahakari Sakhar Karkhana Ltd., Halkarni Tal. Chandgad.

In the year 2010-11 all the co-operative sugar factories in the study region has crushed 11403045 metric tones' of sugarcane and produced 14018932 Metric tones'

of sugar. There are 6922 regular and 7989 temporary workers employed in the co-operative sugar factories.

3.3.4 CO-OPERATIVE INDUSTRIAL ESTATES IN KOLHAPUR

As on 31st March 2011 there were total 22 industrial estates out of 6 developed by the MIDC in the study region. There are 2790 projects were developed under MIDC areas in the study region. There are 7 areas developed by the Co-operative Industrial Development Corporation in the study region. There are 7 direct investment projects were started with Rs.1346 crore in the study region.

Various aspects of co-operative development are given in the 'socio-economic review of the district 2011. As per the statistics given by the District Deputy Registrar of Co-operative Credit societies, there are 1873 agricultural CO-operative societies, 1846 Non-Agricultural Co-operative Societies and 486 marketing societies in 2010-11. An agricultural credit co-operative society has disbursed Rs. 46611 lakh as debits and Non-agricultural credit societies distribute Rs. 155336 in the study region as per year 2008-2009.

The network of Dairy Co-operatives is spread throughout the district. In 2010-11 there were 4381 co-operatives dairies. There were 21 co-operative sugar factories as per 2010-11. There are 43 co-operative spinning mills out of them 14 is in working position in the district. There were 206 branches of District Central Co-operative Bank and 16 branches of State Co-operative Agricultural and Rural Development Bank in the district who have disbursed Rs. 11,286 million and Rs. 487 million under different heads of disbursement respectively as per 31st 2011.

The Government in the co-operation sector has approved a total of 7 industries estates. The details of these are as below:

Table No. 3.1

Kolhapur District: Co-operative Industrial Estates

(2004)

Sr. No.	Name of Co-op. Industrial Estate	Area (Hect.)	Total Plots	Plots Issued	Functional Units	Total workers
1	Kolhapur Udyam Co-op. Soc.	14.27	129	129	129	1030
2	Ichalkaranji Inds. Estate	206.20	689	580	598	500
3	Parvati Inds. Estate, Yadrav	266	678	629	150	10000
4	Chh.Shahu Inds. Estate, Shirol	12	180	140	58	1000
5	L.K.Akiwate Inds. Estate, Jaysingpur.	73	192	180	89	10000
6	Yashwant Inds. Estate,Hupari.	20	131	128	100	500
7	Laximi Inds. Estate, Hatkanangale.	215	422	354	148	2500
	Total	806.47	2421	2140	1272	44850

Source: A proposal submitted by Department of Industries, Energy and Labor, Ministry of Industries, Energy and Labor. Government Maharashtra Mantralaya, Mumbai.

From the above information, we can note that the development in the field of co-operatives is vital in study region. It helps to the all round development of the every field in the Kolhapur district.

3.4 THE ROLE OF GOVERNMENT AGENCIES FOR THE DEVELOPMENT OF AGRO-BASED INDUSTRIES IN THE KOLHAPUR DISTRICT.

Maharashtra is one of the most developed states in the country as far as industries are concerned. Similarly Kolhapur is also one of the developing districts of the state. The Presence of railway route and road network and infrastructure and location etc. play a better role for the development of industry. There are many small, medium and large scale industries in the district mainly in Kolhapur and Ichalkaranji belt.

The basic decision has been taken by the state Government to develop industries in developing and underdeveloped areas of the state. It will be benefited for dispersal of industries from heavily congested areas of Mumbai, Thane and Pune. Therefore in the study region co-operative industrial estates have been developed at Shirol Hatkanangale, Yadrav, Hupari, Jaysingpur, Ichalkaranji, Kagal and Kolhapur.

3.4.1 PRE-INDEPENDENCE INDUSTRIAL DEVELOPMENT IN KOLHAPUR DISTRICT.

In the 19th century there were local manufacturing units and village industries which were supplying the products as per local needs. However the production and supply were not sufficient. At that time only paper and iron industry was developed but it can't compete with European entrepreneurs. It means except paper and iron industries there was no other industrial background for Kolhapur and most of the population was engaged in agriculture.

In September 1906 the Late Chh. Shahu Maharaj laid the foundation stone of the Shashu Chhatrapati Spinning Mills which was a beginning of industrialization in Kolhapur. Chh. Shahu Maharaj introduced a number of reforms for social, economic and cultural upliftment of the people. In 1912 Edward Agricultural Institute was established. A museum of improved agricultural implements was opened and they were loaned to enterprising farmers. Chh. Shahu Maharaj constructed Radhanagari dam. The Rajaram Industrial School (1921) was opened. Industrious persons were invited to set up industries. Commercialization of agriculture created demand for engineering goods like plough, diesel engine, pumps, and sugarcane crushers. All these reforms led to building of a new economic and cultural society.

In 1934, Chh. Rajaram Maharaj established Kolhapur Sugar Mill in private sector which was converted into a co-operative sugar mill in 1984. This development along with irrigation facilities created an opportunity for the use of diesel oil engines. Some persons had to undertake even the job of manufacturing indigenous spare parts of the oil engines. Those with engineering experience set up engineering work shops. Since Kolhapur is communicated to Pune, Bombay and Bangalore by N.H.4 and to

Konkan by State Highway. It helped the establishment of automobile and truck workshops and shades reconditioning automobile and spare parts. Repair work shops, automobile workshops and fabrication resulted into expansions of engineering industry in Kolhapur. In 1941 Shivaji Udyamnagar Co-operative society was established with 97 industrial plots on which 67 industrial units were established on 42 acres of land surrounding the society was used to develop 185 industrial plots. The real architect of Udyamnagar was renowned educationalist J. P. Naik who developed it with the help of Rajaram Maharaj.

3.4.2 POST-INDEPENDENCE INDUSTRIAL DEVELOPMENT IN KOLHAPUR DISTRICT.

After independence, the traditional industries declined considerably. The modern industries have been developed and concentrated in urban centers. Today, the district is known as one of the developed districts in the state and is famous for the various industrial products.

In 1950-51, the Government of India banned import of diesel oil engines. It accelerated the growth of the oil engine industry. The extension of irrigation facilities in various parts of the country created unprecedented demand for diesel oil engines and pumps. As compared to Kirloskar, Cooper and Ruston engines, Kolhapur manufactures could provide heavy, sturdy and technically foolproof and cheaper engines. Interestingly these engines were manufactured by local highly skilled entrepreneurs. Among them Rambhai Samani and Vishnupant Utkar were having leading position.

Kolhapur oil engine industry suffered a setback in sixties due to 'tagai' loan recovery by the State Government. However, the entrepreneurs diversified their attention to manufacture vertical engines under the leadership of Mr. Y.P. Pawar. Because the change in the technique of production of engines between 1960 and 1970. The companies like Telco, Bajaj, Escorts and Mahindra had been buying spare parts from Kolhapur around 1970.

Mahadba Mistry has done fabulous contribution in the industrial world of Kolhapur. In his early age he had a simple motor cleaner who afterwards become a

mechanic and after 1952 he started several industries like gas plants for passenger cars, grills, body building of firefighters, farm implements, oil engines, foundry and workshop. There are several other names that have done excellent contribution in industrial development of Kolhapur, namely K. D. Kulkarni, S. B. Utkar, Anandrao Jadhav, Vasuanna Potdar, Govindrao Gulavani, And M. S. Hudali, founder chairman of Udyam Co-operative Sakharam Tatyasaheb Ghatge etc.

Many foundries and forging shops were established in sixties. The co-operative sugar factories in the district created demand for fabrication of machinery and recondition of rollers, bearings and crushers etc... The sugar factories necessitated commercialization of agriculture, which in turn badly needed mechanization of agriculture requiring sophisticated agricultural tools such as plough, tillers etc... It also required sugarcane transport and transport mechanism such as development of good bullock-carts etc...

3.4.3 GOVERNMENT OF MAHARASHTRA POLICY

Government of Maharashtra has full-fledged Ministry of Industry, Energy and Labour, with a Cabinet Minister in-charge of the same. Thus, there is total commitment of Government of Maharashtra to help the cause of industrial development and export promotion. It has been initiating various policy measures, which will go a long way in the direction of export promotion.

M I D C is constituted under the Maharashtra Industrial Development Act, 1961 and was established on 1st August, 1962 with the basic objective of setting up industrial areas with a provision of industrial infrastructure in the State for planned and systematic industrial development of the whole State at Maharashtra with emphasis on industrial development of backward areas of the State.

Since its establishment, M I D C has been developing at least one major industrial area in every district of the state. It has developed more than 219 industrial estates (major and mini) across the State; spread over 49,750 hectares of land.

3.4.4 MAHARASHTRA INDUSTRIAL DEVELOPMENT CORPORATION (MIDC)

Maharashtra Industrial Development Corporation (MIDC) is a State agency of the Govt. of Maharashtra, established in the year 1962 with the primary objective to develop industrial infrastructure at different locations in the state. MIDC has so far developed about over 219 major and mini industrial estates in the state. The area covered for development of such industrial infrastructure is over 49750 hectares of land. MIDC has started many prestigious projects at different places in the State. Some of the major activities covered under development of industrial infrastructure near to various cities, district centers and sub-district Level Township are:

- Development of industrial areas by acquiring land
- Preparing layout with suitable grouping of plots of various sizes and allotment of plots on leasehold basis.
- Upgradation of roads, drainage system and provision of streetlights in the industrial areas.
- Planning, implementing and managing water supply schemes.
- Establishing common facility centers by providing accommodations for banks, post offices, telecom facilities, police station, fire station, medical facilities, canteen, etc.
- Establishment of effluent collection and disposal systems for chemical zones.

According to Hundekar's study, apart from the big units in textile, sugar and engineering industry in Kolhapur, especially in Shivaji Udyamnagar, many small engineering units have come up very fast in MIDC Shirol, oil engines, electric spare parts, auto-batteries, metal work foundry, motor and repairs and agriculture implements are produced in small scale industries. A special feature of Udyamnagar and Shirol industries is that they are private and most of them are owned and run by small entrepreneurs rather than big industrialists and majority of them were skilled workers earlier in their life.

Along with Shirol M I D C, there is also Gokul Shirgaon M I D C. In Shirol M I D C the total land is 317.29 hectares and in Gokul Shirgaon it is 202.43 hectares and both of these are on Pune-Bangalore highway.

The industrial area of Shirol has been fully developed with 275 units working in it. It including different industries likes Kolhapur steel Ltd., Manugraph, Maharashtra Engineering society in the Co-operative sector producing Mayur oil engines, foundries, watch assembly units in collaboration with H M T, cement pipe factory, agriculture implements, rubber tyre, bullock-cart etc.. The industrial area of Gokal Shirgaon is now being developed on 106 plots and it has a large milk processing unit under operation flood scheme. As on 31-03-1986 there were 87 units under construction in M I D C Shirol and Gokul Shirgaon. There were 7689 workers in both these areas.

Other industries in Kolhapur also have earned the name in Maharashtra. The tanning and footwear manufacturing industry survey of 1982 shows that there were in all 59 tanners establishments employing 1025 persons. There were also 2018 small cottage and house hold foot wear manufacturing units and nearly 5500 persons were engaged in it.

3.4.5 MAHARASHTRA STATE KHADI AND VILLAGE INDUSTRIES BOARD (MSKVIB)

The Khadi and Village Industries Commission (KVIC) is a statutory organization engaged in the task of promoting and developing khadi and village industries with a view to creating employment opportunities in the rural areas and there by strengthening the rural economy. It was established in 1957 by an act of parliament. It is an autonomous body which took over from its predecessor, the all India Khadi and Village Industries Board, set up in 1953. It was started in 1962 at state level with legislative assembly act. It is functioning with 100 per cent finance. All the schemes were running through the central Government. The main beneficiaries are the peoples living below poverty line, women's, minorities, reserve categories, handicapped persons etc. who have got the benefit of the board through the margin money. Generally the benefits were given to them who have unemployed in the rural areas.

3.4.6 DISTRICT INDUSTRIAL CENTRE

For the planning and development of industries in the state the Directorate of Industries has been functioning under the governance of the Department of Industries, Energy and Labour. It has been working at district, divisional and state level. With the fulfillment of the aims and objectives like motivation and progress of purposed industries, all the mechanics of commissioner of industry has been functioning.

Under the leadership of the commissioner of industries there are six divisional offices except Mumbai and Mumbai pradhikaran were working in the Maharashtra state. Directorate of Development (Industry) is the head of the Commissionerate of Industry. Another staff likes Additional Director of Industry, Joint Director of Industry, and Registrar of industrial Office were help to them.

3.4.7 REGIONAL OFFICES

There are six regional offices made under the Commissionerate of Industry. It is working at Konkan (Thane), Pune, Nasik, Ourangabad, Amarawati and Nagpur. For the fulfillment and working with an objective these Offices were functioning at different places.

3.4.8 ACTIVITIES OF DIRECTORATE OF INDUSTRIES

Here the Directorate of Industries does some activities and is responsible for their duties for the development of the industries. Under the development programs it works with e.g. gives motivation and encourage to the new coming industries and entrepreneurs, finding of solution on problems face by the entrepreneurs, regulation of the industry, implementing the policy of SSI, registration of SSI, fixation of location and issue of no objection certificate in the area of Mumbai Pradhikaran, supply of raw material and its implementation, co-ordination committee at secretary level, committee as industrial friend, co-operative industrial estates, maximum land acquisition policy and its implementation, seed money scheme of unemployed, loan scheme for the district industries. Moreover, with the objectives of under developed and developing areas of the state, where the implementation of investment on large scale has been made through

group encouraging scheme, make up recovery of loans, development of ancillary industries, export consortia, recommendation by the law of industries, industrial statistics etc.. Activities would implemented by the directorate of industries.

3.4.9 DISTRICT INDUSTRIAL CENTRE

As per the industrial policy published by Central Government in 1977, it was started for seeking the development of small and cottage industries in rural sectors and for the guidelines to the local entrepreneur and availability of catalytic services, there were 25 District Industrial Centres that have been started in the state in 1978 except Mumbai and Sub-urban sector. Now there were 33 DICs have been working in the different districts in the state of Maharashtra. The service was given by the DIC as per the guideline released by the commissionerate of industries.

For the development of industries in Kolhapur district DIC was started in 15th March 1979. This centre has done a very prosperous role in the field of industrial development of the district. Under the scheme of industrial development programs the centre has still completed 40 training programs. Through this scheme there were 1071 entrepreneurs have got opportunity and make encouraged by the centre.

There were 367 trainers have got the benefits of the training of handicrafts through this centre. Under the scheme of SAI nearly 404 entrepreneurs got Rs. 24 lakhs and 52 thousand as loan subsidy from the centre. The mount of Rs. 2 crore and 41 lakhs was distributed by the centre to 1942 unemployed entrepreneurs as an economic assistance. The centre has distributed Rs. 55 lakh to co-operative industrial estates at Jaisingpur, Ichalkaranji, Hupari and Udyamnagar in the district in the form of loan.

3.5 SUMMARY

Industrial development in the district has been done in the 20th century. Chh. Shahu Maharaj was the pioneer of the industrialization in historical dynasty. After that many of the old rulers and persons made the efforts for the development of the industries in the district.

District had its location in the western Maharashtra and it was known as the 'sugar bowl' of the western Maharashtra. District has rich in natural resources therefore it has got the benefit in the field of agricultural as well as industrial development.

Eastern tahsils of the district are industrially well developed particularly in the field of co-operative sector. It has made only due to the co-operative movement in the district. For the development of industries in the district different sectors has made an effective effort especially on the individual, co-operative and government levels. It has laid foundation of the industrial development due to the dream and foresight of the some personalities. Among them Shahu Maharaj, Tatyasaheb Mohite, Dattajirao Kadam, Tatayasaheb Kore, Ratnapanna Kumbhar and many others came in front and fought for the development of industries in the district.

Chh. Shahu Maharaj had made continuous efforts for the distribution and development of industries at that time. He kept his attention towards all round development of the state. He gave all types of helps to the entrepreneurs in his state. He started a spinning mill on the co-operative basis at Kolhapur. He afforded the cotton mill, paper mill, silk mill, cashew nut factory and ginning and weaving factory, oil mill, saw mill, ground nut factories, sugar mill, and coal factory etc. He was the strong supporter of the indigenous (swadeshi) entrepreneur. For this purpose he had made and issued some notifications and orders in the state towards the entrepreneurs.

There were some notable personalities who had made a better contribution in the field of industrial development in the district, among them, late Yantra Maharshi Mahadaba Mistri who had produced 'Vishwas Engines'.

Late Ratnappaanna Kumbhar was known as a freedom fighter and social worker in the district although; he worked in the co-operative sector. He started sugar factory and spinning mills in the district. His contemporary late Tatyasaheb Kore was another stalwart in the field of co-operation. He was the founder of the very well known sugar factory in the country. He had received many awards and prizes in course of time.

Late Dattajirao Kadam was the real corporate who had spent his life for the development of different co-operative institutes and factories. Among the queue of

the corporate of the district late Babasaheb Khanjire had taken part in the field of co-operation, but he kept him alive from the popularity in the society.

In the field of co-operative sector and for the development of the industries in the eastern part of the district late Shamrao Patil Yadraokar made the efforts for different co-operative mills. His specific work came into the field of textile in Ichalkaranji which is generally known as 'Manchester of Maharashtra'.

Shri. Sadashirao Dadoba Mandlik is a politician and works in the field of co-operative sector. He is on different bodies of the institutes which work for the development of agro-industries in the district.

The co-operative movement of the district is back-bone of the economic development of the district. The renowned personalities of the district have laid the foundation of the industrial development. The co-operative sugar factories and spinning mills in the district have raised the standard of living of the people of the region.

Chhatrapati Shahu Maharaj implemented the rule of co-operative movement in the state in 1912. Ichalkaranji is known as the 'Manchester of Maharashtra' due to the concentration and development of textile sector. Hatkangale and Shirol tahsils rank tops in the spinning mills sector.

There were eighteen co-operative sugar factories functioning in the district. Now private sugar factories have come into existence.

District has co-operative industrial estates in the study region. There were 22 industrial estates in the study region. As per the statistics given by Deputy Registrar, there were 1873 agricultural co-operative societies, 1846 non-agricultural co-operative and disbursed loans and credit to the peasants. For the better marketing of agricultural commodities there are 486 marketing societies in the district. The dairy co-operatives spread all over the district. .

There were various agricultural and non-agricultural co-operative societies working for the development of the region. The co-operative institute of the district helps the economic development of the district.

Kolhapur district has developed industrially as well as economically. It has been made a remarkable development in the economy of the district. The state government of Maharashtra had taken decision of the dispersal of industries from heavily congested areas e.g. Mumbai, Thane and Pune. Its impact has been seen in the district where they established and began the co-operative industrial estates’.

Before, the independence the space was lifted by the Chh. Shahu Maharaj with the beginning of spinning mill in 1906 and sugar mill in 1934 at Kolhapur. In 1941 Shivaji Udyamnagar co-operative society was established, where 185 industrial plots were developed. J. P. Naik was the real kingmaker of Udyamnagar who built and developed it with the help of Rajaram Mharaj.

After the independence, the traditional industries were showing the decline trend. The place of indigenous industries was replaced by modern industries, though the trend of location of these industries towards the urban areas. Therefore the district would be known as an industrially developed district of the Maharashtra state.

At that time the government of India banned an import of the diesel engines, the indigenous industries had got an opportunities to produces the diesel and oil engines. Therefore it had been demanded by the local people and quality can't compare to them. But it can't survive for a long time because it has gone under the burden of loans and recovery. Therefore the entrepreneurs had diversified their attention towards the making of the vertical engines with a leadership of Y. P. Powar.

Mahadaba Mistri was a well-known person who made contribution in the industrial sector. All entrepreneurs in the district took foresight vision from Chh. Shahu Maharaj of the Kolhapur.

Most of the foundries and workshops were established in sixties. Sugar factories had made market for the goods produced from theses foundries. Agricultural sector made a market for these foundries and tiny industries. However agriculture needed various tools and goods. For this purpose many of the industries had come into existence in and around the Kolhapur.

Government of Maharashtra has a full fledged ministry of industry energy and labour. It kept an attention over the development of industrial sector and initiating various policies measures. Maharashtra Industrial Development Corporation was established in 1962 with an objective of a provision of industrial infrastructure in the state for systematic industrial development. MIDC had targeted rural areas for the establishment of the industries; because of this the controversies would be going to become less. It came into existence with specific aims and objectives.

Many of the small and tiny industries came into existence and get start its production. The MIDC area was at Shirol, Gokul Shirgaon, Shivaji Udyamgar, Kagal, Gadhinglaj, Yaswantnagar, Hatkangale, Ydrav etc. Maharashtra State Khadi and Village Industries Commission have been started to promote and develop the khadi and village industries at different places in the district. Therefore the generation of employment in rural areas would possible in rural and backward areas in the district. It gave hundred percent incentives in the form of subsidies and through margin money. Generally those who have unemployed they would get benefits from the schemes of the commission.

District Industrial Centre works under the guidance of the department of industries, energy and labour. It has been working at district level to propose and motivate to them with some objectives. There were six regional offices set up at different places in Maharashtra for the fulfillment of the industrial development. It helped the unemployed people in the district. It brought scheme of margin money to establish the new enterprise. It provided infrastructural facilities to the entrepreneurs.

In 1978 there were 25 DIC had been started at different places of the district of the Maharashtra. At present 33 DIC had been set up and working at district level. In 1979 DIC was started at Kolhapur. It worked for the development of different types of small scale and large scale industries in the Kolhapur district. District Industrial Centre had also given training to the entrepreneurs, disbursed loans and subsidies and supported them.

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CHAPTER- IV

GENERAL LANDUSE AND AGRICULTURAL LANDUSE

CHAPTER-IV

GENERAL LANDUSE AND AGRICULTURE LANDUSE

SECTION-I GENERAL LANDUSE

- 4.1 INTRODUCION
- 4.2 GENERAL LANDUSE
- 4.3 CLASSIFICATION OF LAND
- 4.4 LAND USE PATTERN
 - 4.4.1 AREA UNDER FOREST
 - 4.4.2 AREA NOT AVAILIABLE FOR CULTIVATION
 - 4.4.3 OTHER UNCULTIVATED LAND
 - 4.4.4 FOLLOW LAND
 - 4.4.5 NET SOWN AREA
- 4.5 LAND EFFICIENCY

SECTION-II AGRICULTURAL LANDUSE

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CHAPTER-4

GENERAL LAND USE AND AGRICULTURAL LAND USE

SECTION-I GENERAL LANDUSE

4.1 INTRODUCTION

The agro-based industries were depends upon the raw material came from agriculture. Hence the study of general landuse, agricultural landuse of cropping pattern is necessary. They form the base of agro-based industries. Therefore here we should through these aspects.

In previous chapter location, physiography, geology, minerals, drainage, climate, soil types, natural vegetation, irrigation, population, settlement, agricultural implements, animal resources, improved seeds, chemical fertilizers, agricultural credits and finance, electricity, marketing, transport and communication these factors are analyzed. This chapter is divided into two parts.

The first part deals with the general landuse, classification of landluse pattern and landuse efficiency. The second part deals with the tahsilwise industrial cropping pattern with conclusion.

Landuse is the human use of land. Landuse involves the management and modification of natural environment to wilderness into built environment such as fields, pastures and settlements.

It has also been defined as “the arrangements, activities and inputs people undertake in a certain land cover type to produces, change or maintain it.” (FAO, 1997; FAO /UNEP.1999). Landuse practices vary considerably across the world.

The United Nations’ Food and Agricultural Organization Water Development Division explains that “landuse concerns the products and / or benefits obtained from use of the land as well as the land management actions (activities) carried out by humans to produce those products and benefits.

Landuse means the surface utilization of all development and vacant land on a specific point at a given time and space. This leads one back to the village farm and farmers, to the fields, gardens, pastures, fallow land, forests and to the isolated farmstead's as a geography deals with the spatial relationship between these aspects and planning. It is due to the landuse changes to meet the variable demands of the land by the society in its new ways and condition of the life.

The demand for the new uses of land may be stimulated by a technological change or by change in size, compositions and requirements of a concerning community. Some changes are short lived while others represent a more constant demand. The study of landuse is of pivotal importance in the point of view of planning and development.

4.2 GENERAL LANDUSE

Landuse of a region is a combined result of the natural setup and human dynamism within socio-economic set up and technological development. A physical limitation of the site finds a direct expression in landuse. Landuse pattern is to understand geographical adjustment of agricultural resources. Many geographers are trying to give the definition of land use. Some of these are following:-land use is also related to conservation of land from major use to another general use.

Land use means surface utilization of all developed and vacant land for a specific point at a given time and space. (Foreman T.W. (1968). Land use means optimum use of every piece of land. (Mandal R.B). Land use is the function of four variables land, water, air and man. Land use means use actually made of any parcel of land. (Ghrpure V.T. 2005).

Land use is an important aspect of studies in agricultural geography and for making of the study of land use; it is classified into different categories. Land classification is based largely on quantity and intensity of the use of land (Ali Mohamad 1978). Census of India has classified land utilization in nine different categories, but in the preset study they have been grouped into five major relatively significant categories.

4.3 CLASSIFICATION OF LAND

Landuse is the geographical concept since it involves specific areas. The landuse study in its spatial context is essential to understand the regional zones of the areas of optimum landuse, degraded areas etc. The utilization of land for different purposes indicates an intimate relationship between prevailing ecological conditions and man.

The efficient use of land depends on the capacity of man to utilize the land and manage it in proper perspective. In view of the predominant agrarian nature of the study region' such studies are the subjects of supreme importance. It is also important to the study of industrial location and its development.

The importance of landuse studies is increasing with continuous increasing population. Industrial areas should be properly selected in the proximity of resources availability. In the study area most of the agro-based industries are concentrated in the irrigated tract.

The landuse of a region is always characterized by the spatial and temporal variations and is profoundly influenced by physio-socio-economic factors. As such some changes in general landuse have been observed during the period under investigation.

The landuse pattern of the study area is divided into five major categories such as forest, land not available for cultivation, other uncultivable land, fallow land and net area sown. Table 4.1 reveals the trends of these categories in the Kolhapur district.

4.4 LANDUSE PATTERN

The general landuse pattern of the Kolhapur district is differing from the state's general landuse because of the location and physical setting of the study area. The existing landuse pattern is as shown in map 4.1 and 4.2 has the result of the process of land exploitation within the frame of physical and socio- economic complex and modified because of the expansion of irrigation and growth of population.

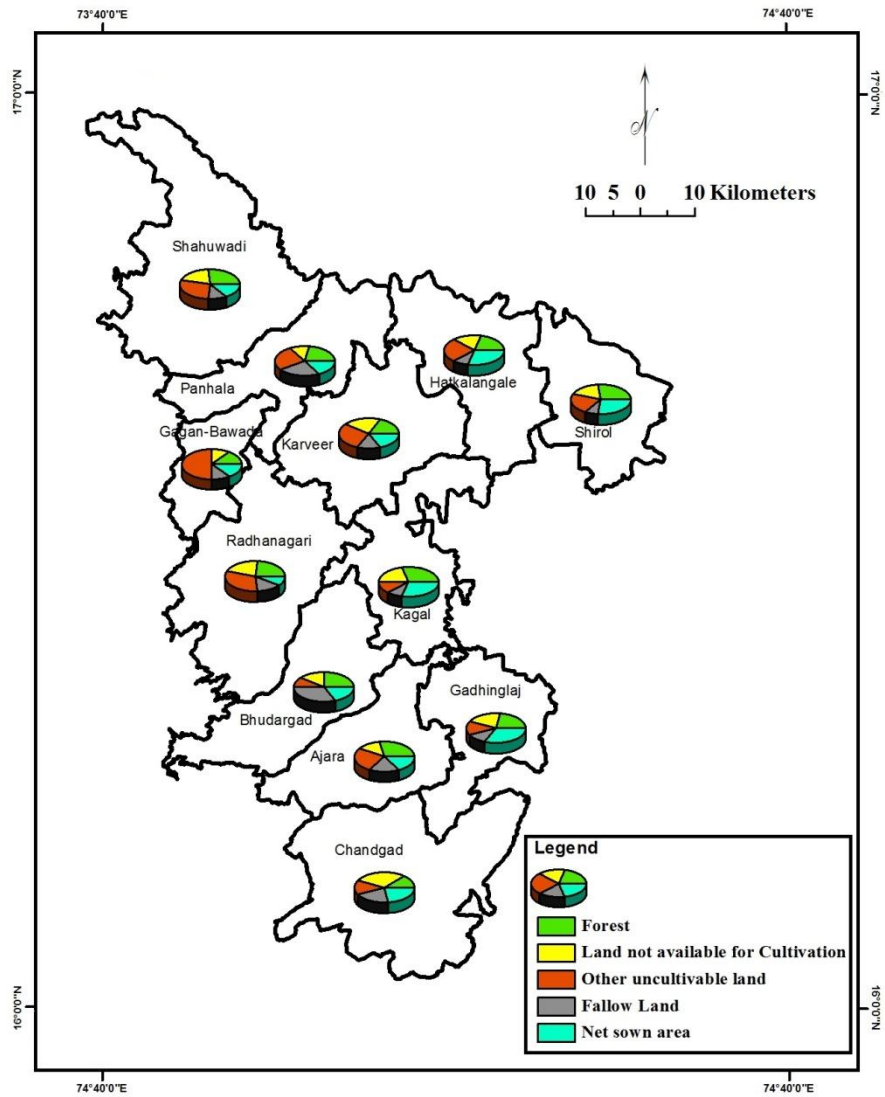
Nearly 35.77 per cent to 87.94 per cent to the geographical area is under cultivation because of the varied physical features. Gadhinglaj was the highest (89 %) in respect of agricultural land whereas Radhanagri (39 %) tahsils was lowest in agricultural land in Kolhapur district during 2002-2003. Table 4.1 indicates tahsilwise trends in general landuse in Kolhapur district during 1985-86 to 2002-2003, for this seventeen years period are consider to find out the spatio temporal changes there in.

4.4.1 AREA UNDER FOREST

This category includes all areas actually under forests whether state owned or private and classed or administered as forest under any legal enactment dealing with forests.

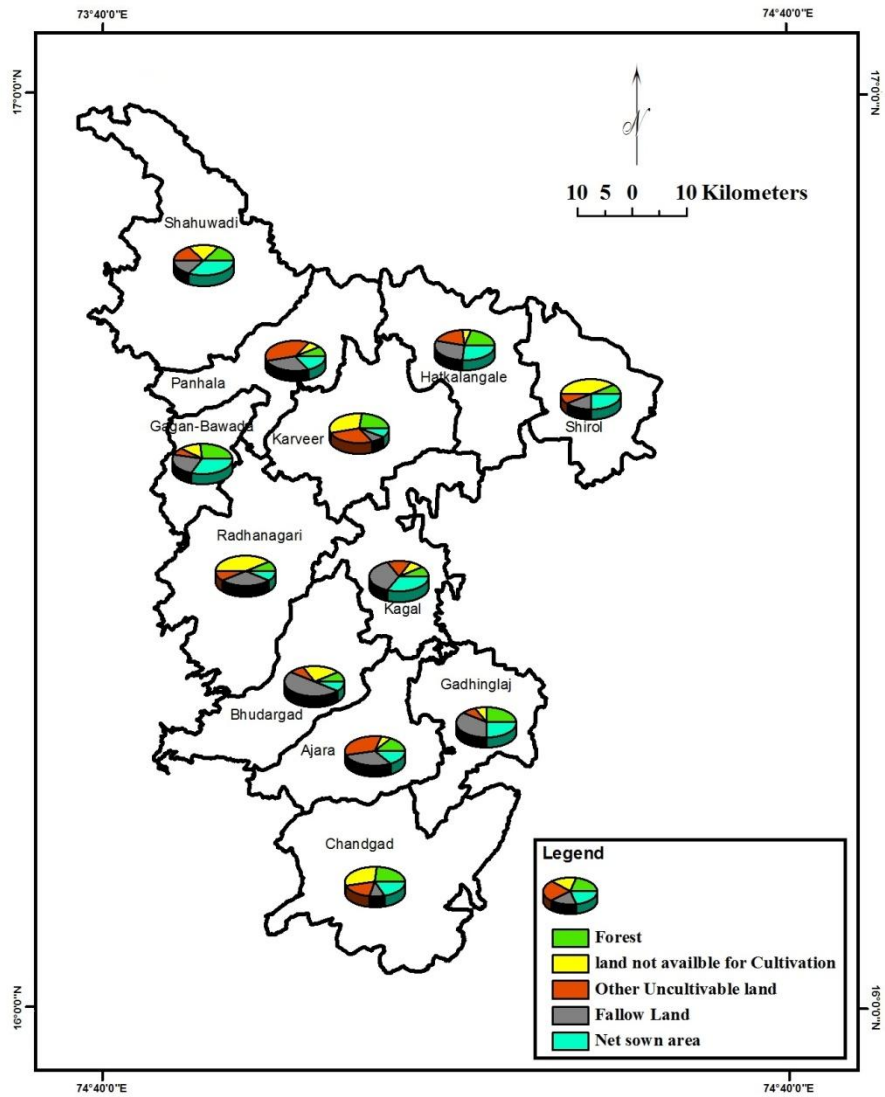
Forest occupies about 18.05 per cent of the total geographical area of the district; being higher than the average of Maharashtra which is 16.95 per cent. During 1985-86 nearly 1, 43,382 hectares of land was under forest I entire study region. It was decreased from 1, 43,382 hectares to 1, 40,100 hectares during the period of investigation. It means that the forest area has not shown very high decreases from 1985-86 to 2002-03. Table 4.1 clearly indicates that there is variation in forest area from tahsil to tahsil due to variation in rainfall distribution, soil and physiography. In the study area out of twelve tahsils of the district Gadhinglaj, Hatkanangale, Kagal, Shirol and Karveer were having 1.20 to 3.78 per cent of their geographical area under forest.

Kolhapur District Tahasilwise General Landuse 1985-86



Map. No. 4.1

Kolhapur District Tahasilwise General Landuse 2002-2003



Map.No. 4.2

Table No. 4.1

Kolhapur District: Tahsilwise Trends in General Landuse

(Area in hectares)

Sr.No.	Tahsils	Year and volume of change in %	Forest		Land not available for cultivation		Other uncultivable land(excluding fallow land)		Fallow land		Net sown area		Geographical area	
1	Shahu-wadi	1985-86	24399	23.38	13497	12.93	24490	23.47	5026	4.82	36940	35.40	104352	100
		2002-03	21912	21.00	13604	13.04	18507	17.73	2903	2.78	47426	45.45	104352	100
				-2.38		0.11		-5.74		-2.0		10.05		
2	Panhala	1985-86	11738	20.64	5093	8.96	4353	7.65	3482	6.12	32205	56.63	56871	100
		2002-03	11591	20.38	5023	8.83	7090	12.48	3787	6.66	29374	51.65	56871	100
				-0.26		-0.13		4.38		0.54		-4.98		
3	Hat-Kanangale	1985-86	13.58	2.23	5917	9.71	8090	13.29	705	1.16	44858	73.61	60937	100
		2002-03	1433	2.35	5906	9.69	35.88	5.89	1018	1.67	48992	80.40	60937	100
				0.12		-0.02		-7.40		0.51		6.79		
4	Shirol	1985-86	898	1.77	3731	7.34	2893	7.70	1663	3.27	41608	81.92	50793	100
		2002-03	864	1.70	4898	9.65	2742	5.40	612	1.20	41667	82.05	50783	100
				-0.07		2.31		-0.30		-2.07		0.13		
5	Karveer	1985-86	708	1.05	69.58	10.37	9213	13.73	2115	3.15	48119	71.70	67113	100
		2002-03	804	1.20	8025	11.96	9358	13.94	1774	2.64	47152	70.26	67113	100
				0.15		1.59		0.21		-0.51		-1.44		
6	Gaganbavada	1985-86	10238	36.28	2050	7.26	5553	19.68	3475	12.32	6902	24.46	28218	100
		2002-03	10626	37.64	1292	4.58	5462	19.35	377	1.33	10471	37.10	28228	100
				1.36		-2.68		-0.33		-10.99		12.64		

(Contd...)

(Table No: 4.1 contd...)

Sr.No	Tahsils	Year and volume of change in %	Forest		Land not available for cultivation		Other uncultivable land(excluding fallow land)		Fallow land		Net sown area		Geographical area	
7	Radhanagri	1985-86	26909	30.16	10899	12.21	15694	17.59	1763	1.98	33967	38.06	82232	100
		2002-03	26775	30.00	13016	14.59	14328	16.06	3192	3.58	31921	35.77	89232	100
				-0.16		2.38		-1.53		1.60		-2.29		
8	Kagal	1985-86	1473	2.69	4695	8.57	4751	8.68	370	0.68	43465	79.38	54754	100
		2002-03	1114	2.04	4513	8.24	1671	3.05	637	1.16	46819	85.52	54754	100
				-0.65		-0.33		-5.63		0.48		6.13		
9	Bhudargad	1985-86	24020	37.27	4448	6.90	4252	6.60	2530	3.93	29196	45.30	64446	100
		2002-03	23790	36.91	4601	7.14	3192	4.95	5951	9.24	26912	41.76	64446	100
				-0.36		0.24		-1.65		5.31		-3.54		
10	Ajara	1985-86	14997	27.32	3816	6.95	2359	4.30	741	1.35	31975	60.08	54888	100
		2002-03	12273	22.36	3360	6.12	5725	10.43	2822	5.14	30708	55.95	54888	100
				-4.96		-0.83		6.13		3.79		-4.13		
11	Gadhinglaj	1985-86	1746	3.63	2673	5.55	1301	2.70	237	0.50	42158	87.62	48115	100
		2002-03	1818	3.78	2481	5.15	898	1.87	606	1.26	42312	87.94	48115	100
				0.15		-0.14		-0.83		0.76		0.32		
12	Chandgad	1985-86	24898	25.79	4824	5.00	12986	13.45	6210	6.43	47625	49.33	96543	100
		2002-03	27100	28.07	11441	11.85	3414	3.54	3256	3.37	51331	53.17	96542	100
				2.28		6.85		-9.91		-3.06		3.84		
	District	1985-86	143382	18.47	68601	8.84	95944	12.36	28317	3.65	440018	56.68	776262	100
		2002-03	140100	18.05	78160	10.07	75981	9.79	26935	3.47	455085	58.62	776261	100
				-0.42		1.23		-2.57		0.18		1.94		

Source: Compiled by Author

Out of the total geographical area 15 to 30 per cent geographical area was found under forest in Panahala, Shahuwadi, Ajara, Chandgad and Radhanagri tahsils during 2002-2003. Above 30 per cent geographical area was noticed in Bhudargad and Gadahinglaj tahsils during 2002-2003 (Map 4.3 A).

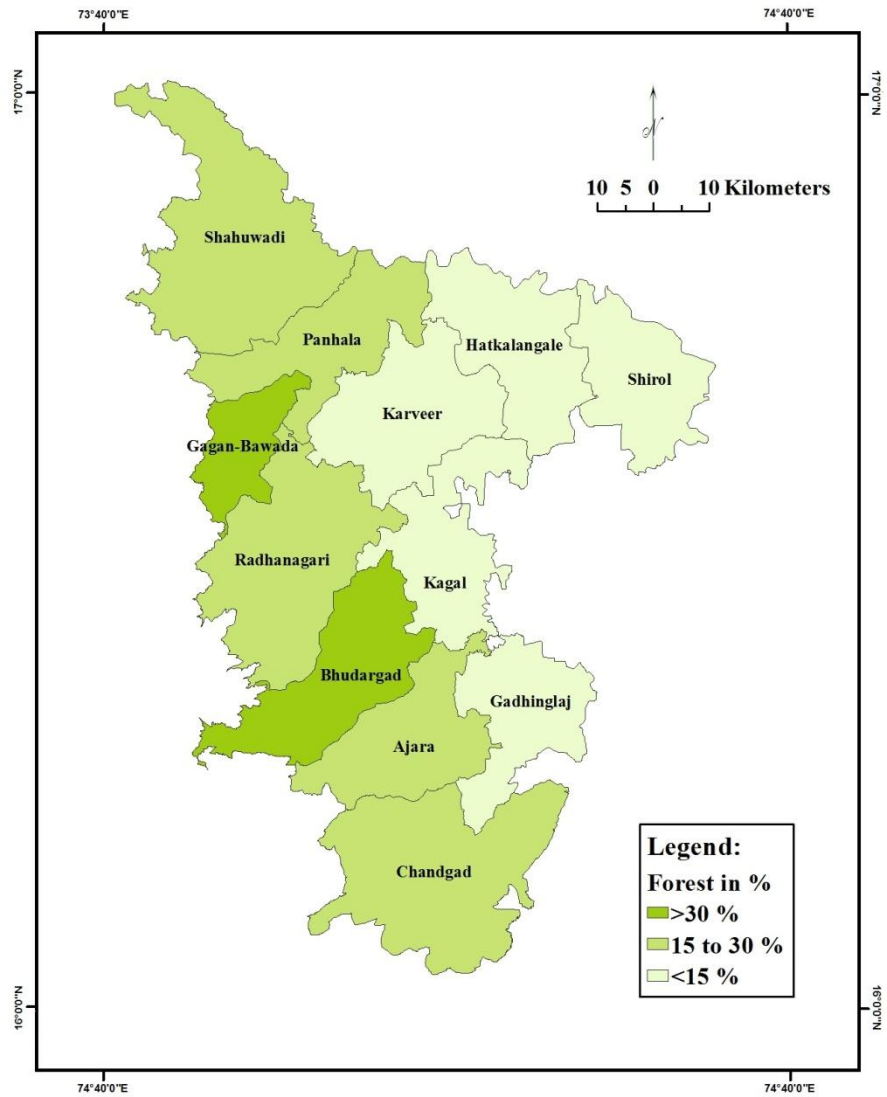
Below 1 per cent negative change in forest area was recorded in Kagal, Bhudargad, Panhala, Rahanagri and Shirol tahsils. Above 1 per cent negative change in forest area was recorded in Shahuwadi and Ajara tahsils. Below 1 per cent positive change in the forest area was recorded in Gadhinglaj, Karveer and Hatkangale tahsils during the period of investigation. Above 1 per cent positive change in forest area was recorded in Gaganbavda and Chandagad tahsils between 1985-86 to 2002-03 (Map 4.3 B).

4.4.2 AREA NOT AVAILABLE FOR CULTIVATION

This category include (a) The land put to non-agricultural uses and (b) Barren and uncultivable land. The western part of the district is a rugged tract of hills and valleys. These consist of the Sahyadri range and series of six valleys with lines of hills which runs north-east and east.

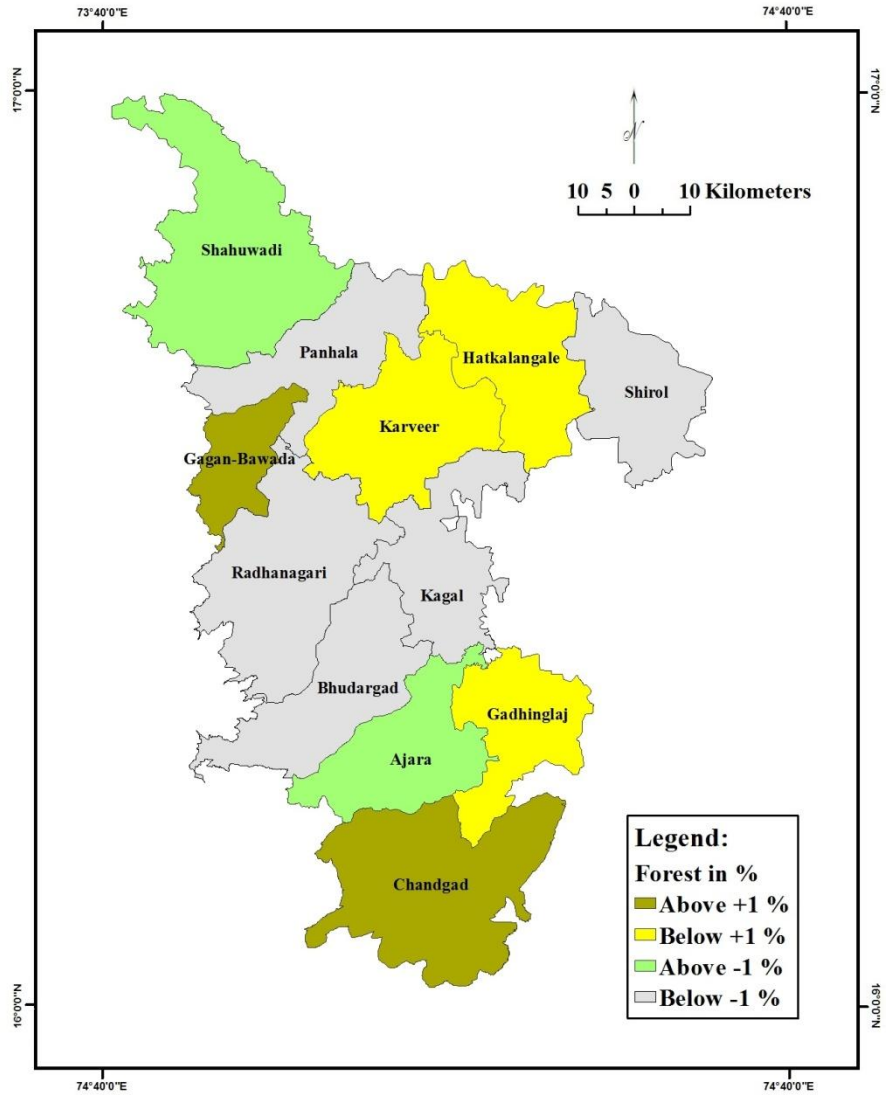
The sides of these hills are bare and ending in broad table lands. In the other hand the populations of the district were increased by the consequence 29.8 per cent populations lived in urban areas of the study area. Where need of infrastructural facilities were increased. For the fulfillment of these the area under this category especially area of the land put non-agricultural uses was increased by 0.38 per cent. This category shows close association with other uncultivable land. But which cannot be brought under cultivation unless at a very heavy cost. The distributional pattern under this category is exhibited in map 4.4 A. about 10.07 per cent of the district belongs to this category which is as equal as to Maharashtra whose average is about 10.08 per cent. The change in this category shown in Map 4.4 B exhibits the increase by 1.23 percent in the study region. The increase in this category is due to infrastructural development like roads, settlements, industries and reservoirs for irrigation purposes etc.

Kolhapur District area Under Forest 2002-03 (A)



Map. No. 4.3 (A)

Kolhapur District Volume of change in area Under Forest 1985-86 to 2002-03 (B)



Map. No. 4.3 (B)

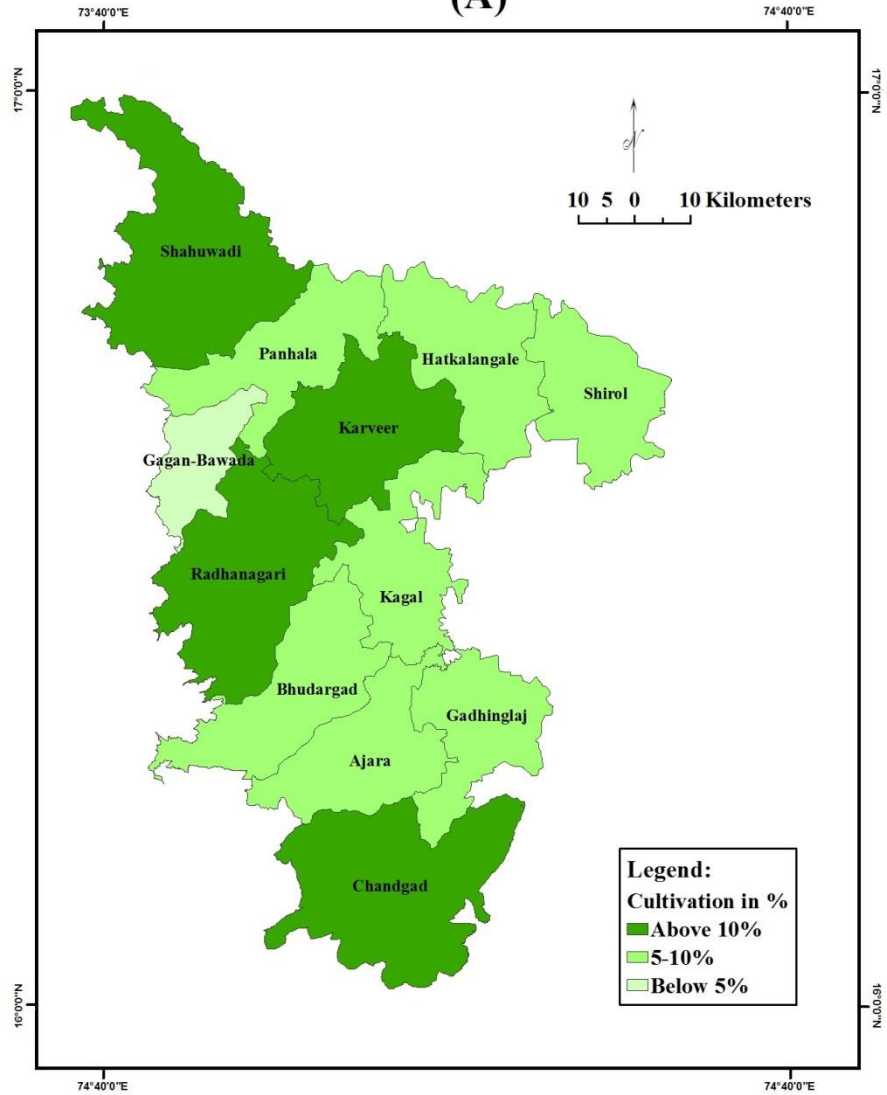
Out of the total geographical area below 5 per cent area was found under this category in Gaganbavada tahsil during 2002-2003. While 5 to 10 per cent geographical area was found under this category in Gadhinglaj, Ajara, Bhudargad, Kagal, Panhala, Shirol and Hatkanangale tahsil during 2002-2003. Above 10 per cent area was recorded under this category in Chandgad, Karveer, and Shahuwadi and Rahanagari during the period of investigation (Map 4.4 A).

Both positive and negative changes in land not available for cultivation took place in this group during the period of investigation. The decrease in this category is confined to the Middle Eastern tahsils of the district. Below 1 per cent negative change in this category was recorded in Hatkanangale, Panhala, Kagal, Gadhinglaj and Ajara. Whereas, above 1 per cent negative change in this category was recorded in the tahsil Gaganbavada during 1985-86 to 2002-03. Below 1 per cent positive change in land not available for cultivation was recorded in Shahuwadi and Bhudargad. 1 per cent to 2 per cent positive change was recorded in Karveer tahsil. Whereas, above 2 per cent positive change was recorded in Shirol, Radhanagari, Chandgad (6.85%) tahsil from 1985-86 to 2002-2003 (Map 4.4 B).

4.4.3 OTHER UNCULTIVATED LAND

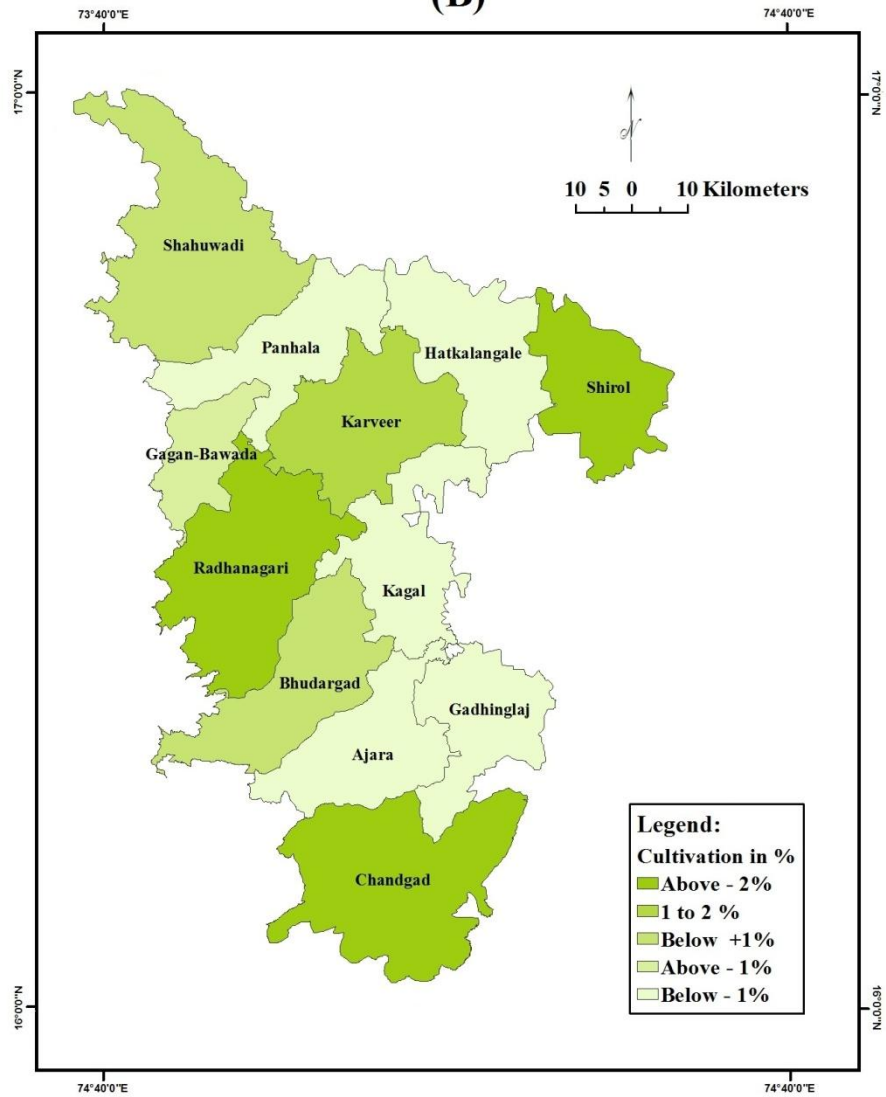
Other uncultivated land excluding fallow land consist three types of land viz. (a) cultivable waste (b) permanent pasture land and (c) land under miscellaneous tree, crops etc. of the three sub categories that constitute the uncultivated land, the parcel under three crops is rather negligible, though this could be treated as sown as much as the land carrying crops. The land permanent pastures are the ones marked grazing grounds owned in common by the village community or recorded as 'gairan' (literally meaning the land for the cow) which is also used for grazing cattle during the monsoons and because a desolate rock waste during the dry summer. Plateaus and hilly dissected areas with higher rainfall are the sites of such pastures. This potential land can brought under agriculture. About 9.79 per cent geographical area of the district belongs to this category which is little more of the Maharashtra state average of about 7.84 per cent.

**Kolhapur District
Land Not Available For Cultivation
2002-03
(A)**



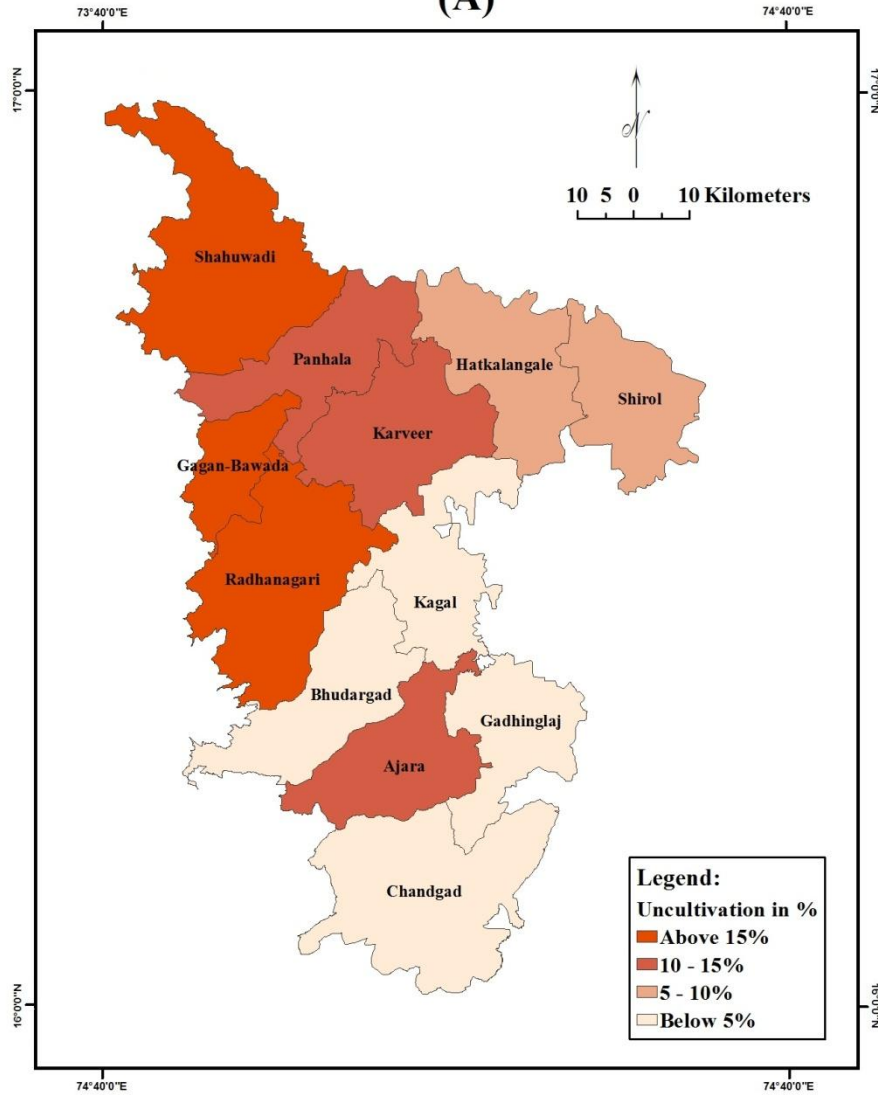
Map. No. 4.4 (A)

Kolhapur District Volume of Change in Land Not Available For Cultivation 1985-86 to 2002-03 (B)



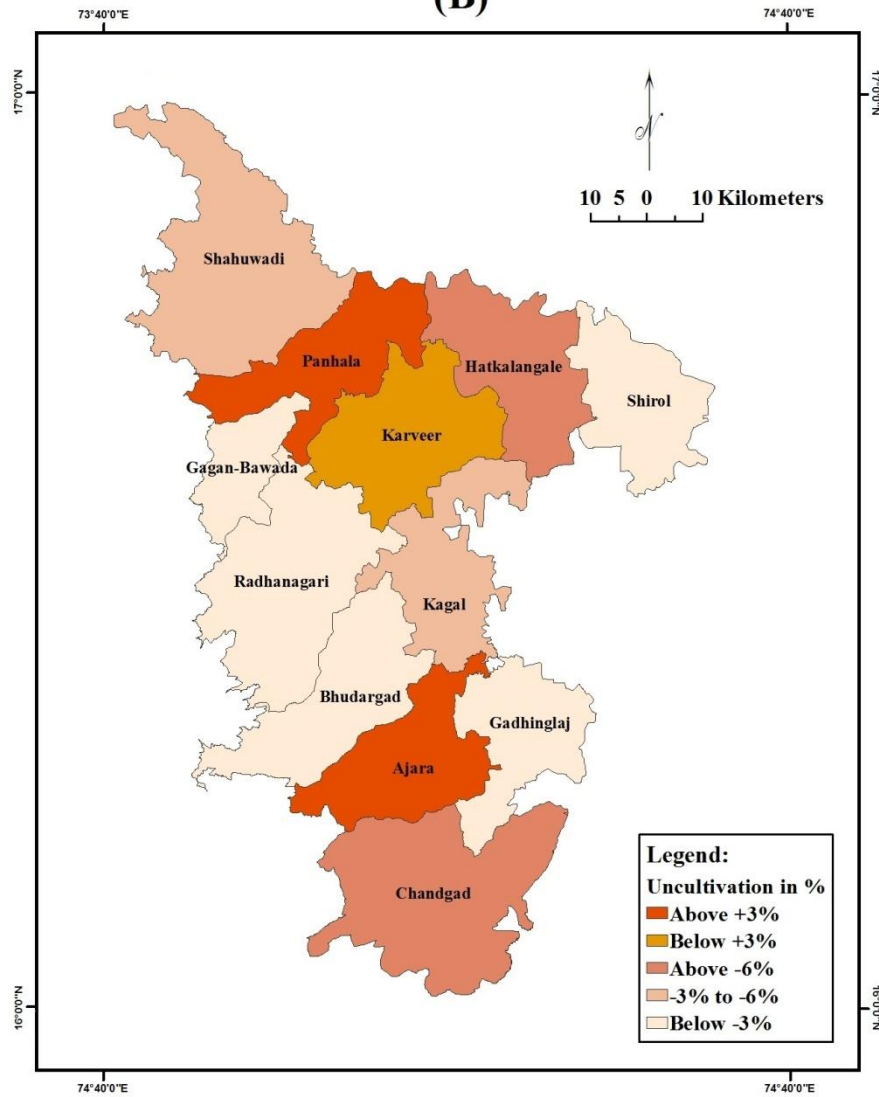
Map. No. 4.4 (B)

**Kolhapur District
Other Uncultivable Land
2002-03
(A)**



Map. No. 4.5 (A)

Kolhapur District Volume of Change in Other Uncultivable Land 1985-86 to 2002-03 (B)



Map. No. 4.5 (B)

During 2002-2003 out of the total geographical area below 5 per cent as found under this category in Bhudargad, Chandgad, Kagal and Gadhinglaj tahsil whereas 5 per cent to 10 percent area was recorded under this category in Shirol and Hatkanangale tahsils. While 10 per cent to 15 per cent area under this category was recorded in Ajara, Panhala and Karveer tahsils during 2002-2003 (Map 4.5 A).

Whereas above 15 per cent area under this category was found in the Radhanagari, Shahuwadi and Gaganbavada tahsils of the district during 2002-2003 (Map 4.5 A). Most of the tahsils in the district have recorded lot of volume of change in other uncultivated land from 1985-86 to 2002-2003.

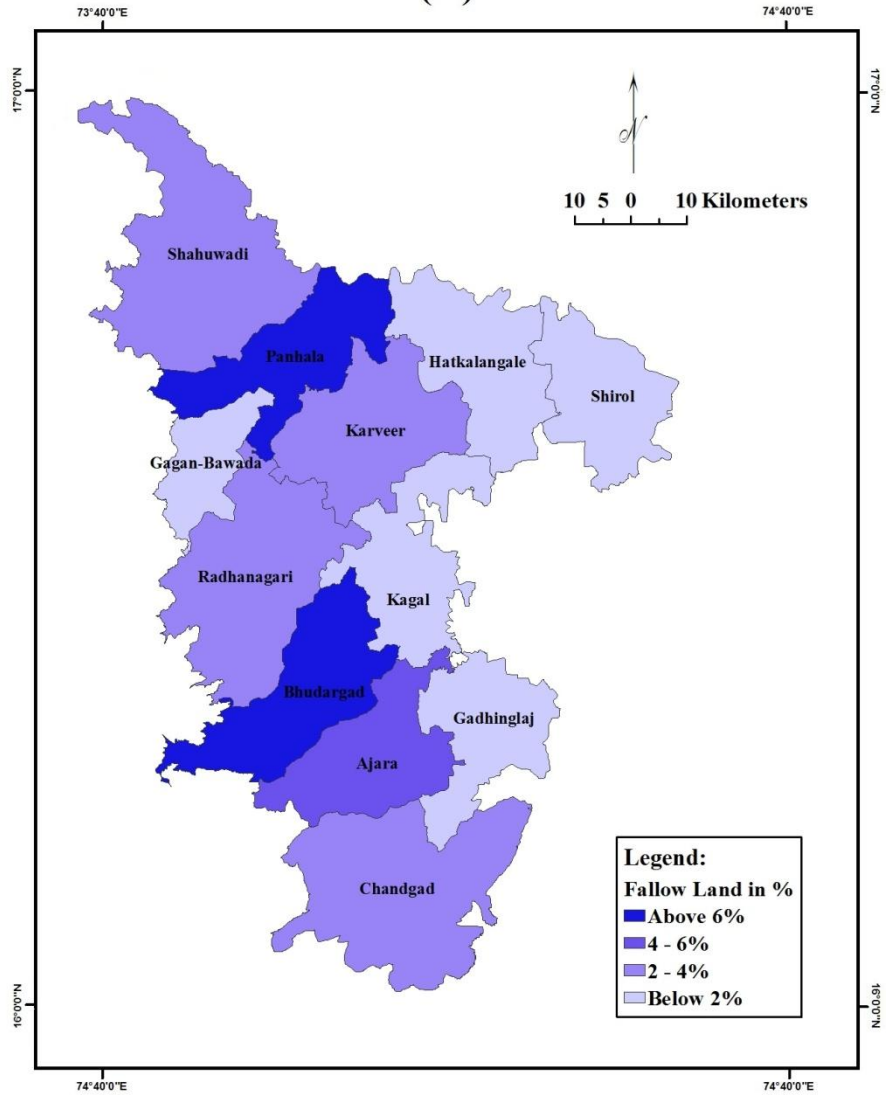
It is mainly due to the proportion of this category had gone to either non-agricultural land or agricultural land and particularly, permanent pastures and grazing lands could bring under cultivation or other uses.

Below 3 per cent negative change was recorded in this category in Shirol, Gaganbavda, Gadhinglaj, Radhanagari and Bhuargad tahsils. Whereas at 3 per cent to 6 per cent negative change was recorded in Kagal and Shahuwadi tahsils while more than 6 per cent negative change was recorded in Hatkanangale and Chandgad tahsils during the period of investigation. Below 3 per cent positive change was recorded by the Karveer tahsil whereas above 3 per cent positive change was recorded in Panhala and Ajara from the period 1985-86 to 2002-2003.(Map 4.5 B).

4.4.4 FALLOW LAND

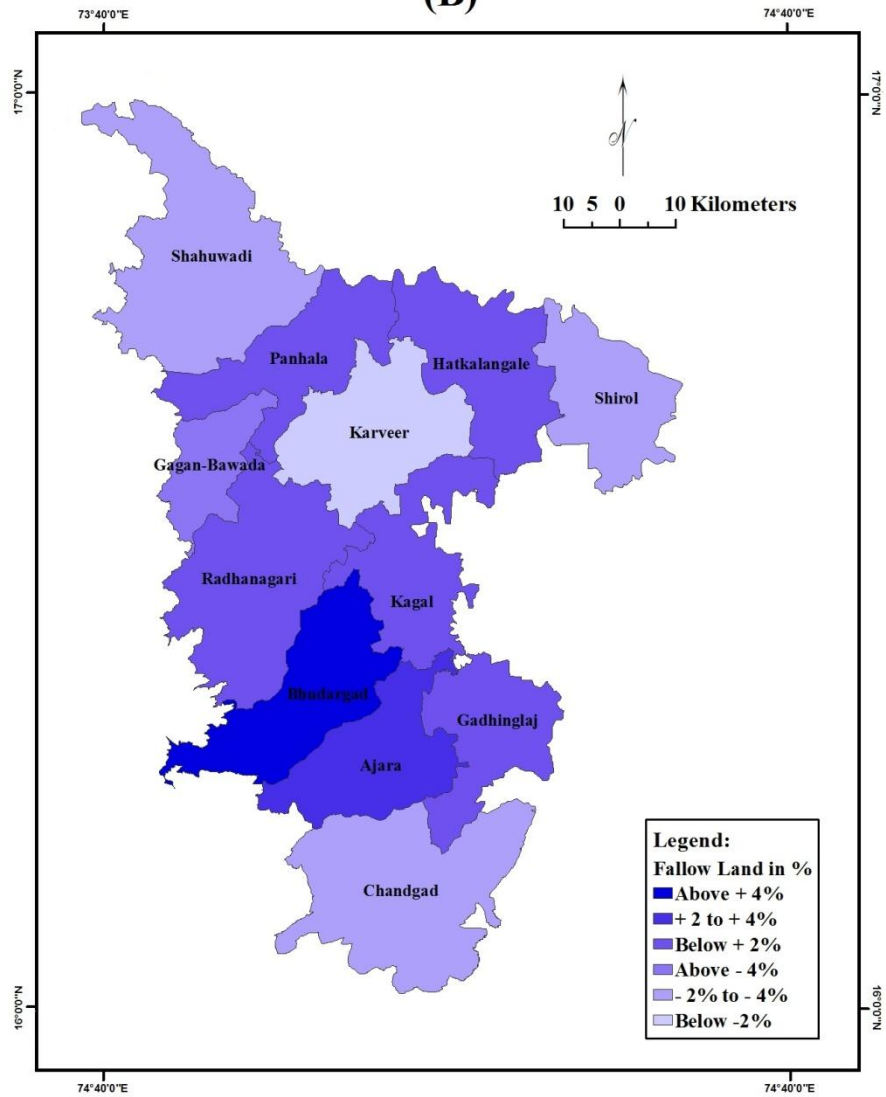
The fallow land should be a part of the land under cultivation. To distinguish the left fallow as a phase of crop rotation system, the term current fallow is used. Other fallow includes the land left idle for more than two years, temporarily given up because of depletion of its fertility. They largely found due to inadequate water supply or excess of moisture supply, extensive holdings and heavy clayey difficult for tilling at proper time. Sometime some land is kept behind to increase its fertility.

Kolhapur District Fallow Land 2002-03 (A)



Map. No. 4.6 (A)

Kolhapur District Volume of Change in Fallow Land 1985-86 to 2002-03 (B)



Map. No.4.6 (B)

The study region has 3.47 per cent land under fallow (26935 hectares.) of the total geographical area during 2002-2003. (Table No. 4.1). Maharashtra state has left 7.98 per cent (24, 55,000 hectares) geographical area under this category.

Out of the total geographical below 2 per cent area was recorded under fallow land in Kagal, Shirol, Gadhinglaj, Gaganbavada and Hatkanangale tahsils.

Whereas 2 per cent to 4 per cent fallow land was found in Karveer, Shahuwadi, Chandgad and Radhanagari tahsils. While 4 per cent to 6 per cent land was recorded under fallow land in Ajara tahsil more over above 6 per cent fallow land was recorded under this category in Panhala and Bhudargad tahsils during 2002-2003 (Map 4.6 A).

While studying the Table 4.1 and Map 4.6 B both negative and positive changes were recorded in the study area during the investigation. Below 2 per cent negative change has been noted in the Karveer tahsil, 2 to 4 per cent negative change in the fallow land was experienced in Shahuwadi, Shirol and Chandgad tahsils. Whereas above 4 per cent negative change in the fallow land was recorded in Gaganbavada (-10.99 %) tahsil.

On the other hand below 2 per cent positive change was recorded in the Kagal, Hatkanangale, Panhala, Gadhinglaj and Rahanagari tahsils. Ajara thasil was recorded volume of change between 2 to 4 per cent while Bhudargad tahsil was recorded above 4 per cent positive change during the period of investigation from 1985-86 to 2002-2003 in these tahsils (Map 4.6 B).

In Ajara tahsil the proportion of current fallow was increased by 0.50 per cent and 3.29 per cent of other fallow land during the period of investigation due to the hilly terrain and shifting of farming practices in the area, whereas in Bhudargad tahsil the proportion of current fallow was decreased by -3 per cent and increased the land of other fallow by + 8.30 per cent during the period of investigation. Once the area under cultivation was went temporarily out of cultivation since during the period of investigation from 1985-86 to 2002-2003.

4.4.5 NET SOWN AREA

This category consists of net area sown with crops and orchards, area sown more than once being counted only once. Table 3.1 indicates that net sown area occupies the largest share of the total geographical area of the region 58.62 percent and it is marginally more than the state average of net sown area which is about 57.15 percent during 2002-2003.

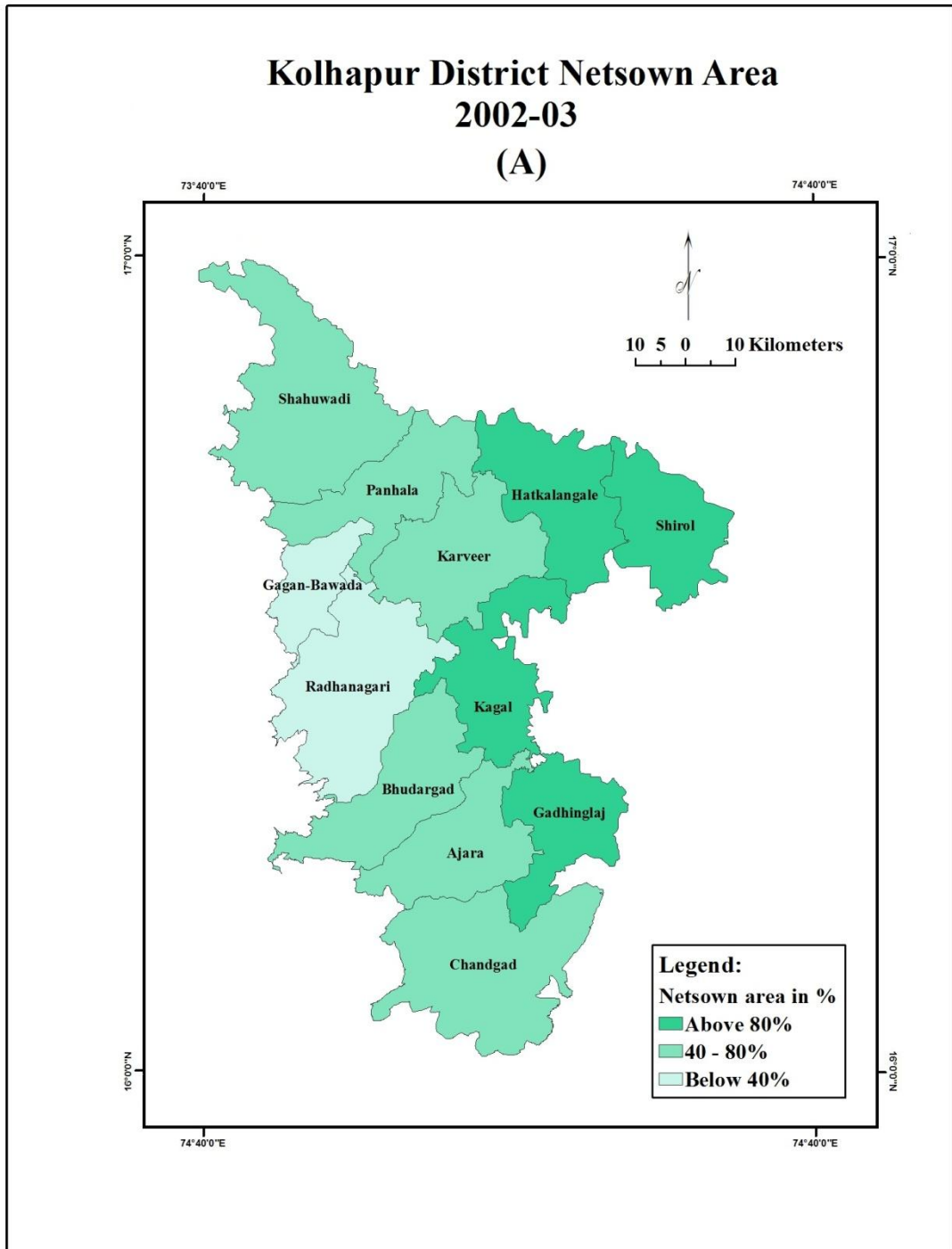
There is a significant contrast in the regional distribution of net sown area in the study region as shown in the Map 4.7 A. Some aspects play major role in the net sown area among them physical setting of study region, distribution of rainfall, soil types and socio-economic condition of the farmers and the new techniques adopted by them and its transformation.

Therefore the net sown area being different in tahsil to tahsil in the study region. Out of the geographical area below 40 per cent geographical area was found under net sown areas in Radhanagari and Gaganbavada tahsils on the other hand 40 per cent to 80 per cent geographical area was recorded as net sown area in Bhudargad, Shahuwadi, Panhala, Chandgad, Ajara and Karveer tahsils during 2002-2003. These tahsils have tremendous development and socio-economic transformation in agricultural practices since the beginning of industrial and development in corporate sector of the district.

There is the negative and positive changes in net sown area were recorded in the study region during the period of investigation. Below 4 percent negative change in this category was took place in Karveer (-4.44%), Radhanagari (-2.29%) and Bhudargad (-3.4%) tahsils. While above 4 percent negative changes were in net sown area was found in Ajara (-4.13%) and Panhala (-4.98%) during the period of investigation. Below 4 per cent positive change in net sown area was found in Shirol (0.13%), Gadhinglaj (0.32%), and Chandgad (3.84%) tahsils in the study region. While 4 per cent to 8 per cent positive change in the net sown area was recorded in Kagal (6.13%) and Hatkanangale (6.79%)

Kolhapur District Netsown Area 2002-03

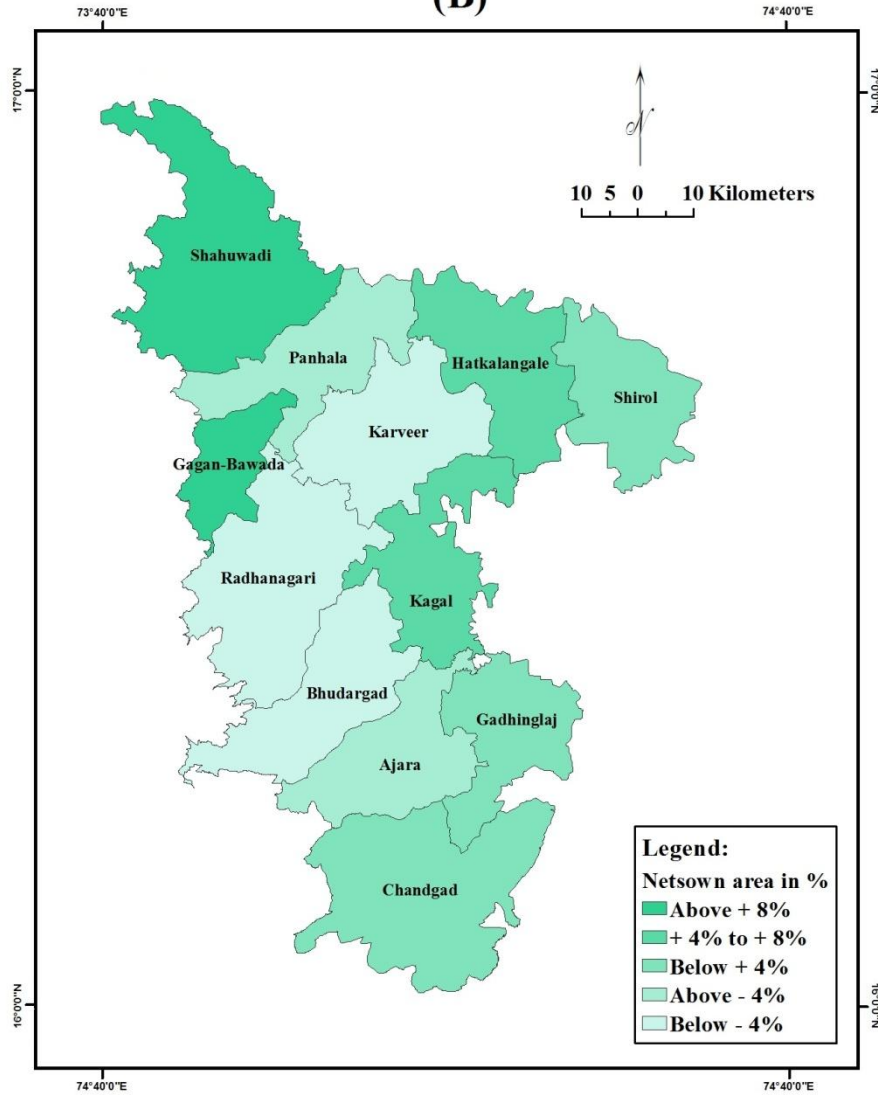
(A)



Map. No. 4.7 (A)

Kolhapur District Volume of Change in Netsown Area 1985-86 to 2002-03

(B)



Map. No.4.7 (B)

And above 8 per cent change in this category was recorded in Shahuwadi (10.05%) and Gaganbavada (12.64%) tahsils during the period of investigation (Map 4.7 B).

4.5 LANDUSE EFFICIENCY

The proportion of the potential land was decreased from 12.36 per cent to 9.79 per cent between 1985-1986 to 2002-2003. It means that there is scope for the extension of cultivable land, in the other hand the proportion of fallow land in the study area was decreased marginally from 3.65 percent to 3.47 per cent and the net area sown increased marginally from 56.68 per cent to 58.62 percent form 1985-86 to 2002-03. While observing these changes it would be said that there is scope for the extension of cultivable land or potential land.

On the other land there should be problem of overuse of net sown area; low productivity and damage of crops are taxing on rural population in the study region. Therefore it is fruitful to investigate the degree of intensity with which the net sown area is utilized. Landuse efficiency may be defined as the extent to which the net sown area is cropped or resown. The land use efficiency means the intensity of cropping. It is obtained from the gross cropped area. The index of landuse efficiency is obtained by the using the following formula.

$$\text{Index of land use} = \frac{\text{Gross cropped area}}{\text{Net sown area}} \times 100$$

The table 3.2 indicates that region's average gross cropped area and net sown area during 1985-86 to 2002-03. The index of land use efficiency is 126.48 during 2002-03. The index of land use efficiency is increased from 112.92 to 126.48 during 1985-86 to 2002-03. Below 120 per cent index of landuse efficiency was recorded in Gadhinglaj, Panhala, Chandgad, Kagal, Shirol and Shahuwadi tahsils. Whereas 120 per cent to 140 per cent index of landuse efficiency was recorded in Radhanagari, Hatkanangale, Bhudargad and Karveer tahsils. On the other hand 140 per cent to 180 per cent index of landuse efficiency was recorded in only one in Ajara tahsils and above 180

Table No. 4.2**KOLHAPUR DISTRICT: LANDUSE EFFICIENCY**

(Area in hectare)

Sr.No.	Tahsil	Gross cropped area	Net sown area	Index of landuse efficiency 1985-86	Gross cropped area	Net sown area	Index of land use efficiency 2002-2003	Volume of change in percent
1	Shahuwadi	39453	36940	106.80	56007	47426	118.09	+11.29
2	Panhala	34823	32205	108.13	33672	29374	114.63	+6.50
3	Hatkanangale	56155	44858	125.18	60005	48992	122.48	-2.70
4	Shirol	48338	41608	116.17	48631	41667	116.71	+0.54
5	Karveer	53544	48119	111.27	63369	47152	134.39	+23.12
6	Gaganbavada	6961	6902	100.85	31545	10471	301.26	+200.41
7	Radhanagari	35425	33967	104.29	38824	31921	121.62	+17.33
8	Kagal	51061	43465	117.48	54555	46819	116.52	-0.96
9	Bhudargad	32245	29196	110.44	35322	26912	131.25	+20.81
10	Ajara	36810	32975	111.63	46353	30708	150.95	+39.32
11	Gadhinglaj	54434	42158	129.12	47671	42312	112.66	-16.46
12	Chandgad	47646	47625	100.04	59622	51331	116.15	+16.11
	District	496895	440018	112.92	575576	455085	126.48	+13.56

Source: Computed by Author

per cent index of landuse efficiency was recorded in Gaganbavada tahsil (301.26%) during 2002-2003 (Table No.4.2).

Both negative and positive changes were recorded in landuse efficiency in the study region. Below 15 percent negative change in landuse efficiency was recorded in Kagal and Hatkanangale tahsils while above 15 per cent negative change in this category was recorded in Gadhinglaj tahsil during the period of investigation. Whereas below 15 per cent change in index of landuse efficiency was recorded in Shirol, Panhala and Shahuwadi tahsils. While 15 per cent to 30 per cent change in this category was noted in the Chandgad, Radhanagri, Bhudargad and Karveer tahsil of the study region. While 30 per cent to 60 per cent change in landuse efficiency was recorded in Ajara tahsil whereas above 60 per cent change was recorded in only one and it is noted 200.41 percent in the Gaganbavada tahsil of the study region during 1985-86 to 2002-03 (Table No.4.2).

SECTON-II AGRICULTURAL LANDUSE

4.6 CHANGEGING CROPPING PATTERN

Cropping pattern simply means the proportion of area under different crops at a point of time, whereas changes in cropping pattern refer to change in proportion of area under different crops at two different times. Such changes, though governed by ecological situation, socio-economic and technological factors also determine which of the feasible crops the farmers' will choose. In case of irrigated crops, the choices are directly governed by the specific purpose for which the irrigated crops are to be grown and these are also conditioned by the geographical factors and modified by the emergent, social and economic circumstances.

The choice for the growing a particular crop in a particular region is an outcome of these factors: i) the general agricultural conditions, particularly the soils, climate, water supply and sub-soil water table, etc. ii) aim of agricultural production, scale of production, size of holdings; techniques of agriculture and changes in market prices. In areas of scanty rainfall, where there is high uncertainty of monsoons, there is to be found a greater dependency on millets, jowar, bajara and ragi etc. on the other hand, areas with assured rainfall or those having irrigation facilities are devoted to rice,

Sugarcane and tobacco. A black soil favours the cultivation of cotton and wheat, while lateritic attracts plantation crops. The size of the farm also affects the cropping pattern. The Changes in the market prices, rent interests, wages, and availabilities or otherwise of means of transport and distance from the market also affects the cropping pattern.

Personal factors relating to the cultivators also influences cropping pattern. Under these are included the requirements for home and family consumption, meeting cash requirements of the family or for selling in the market, for meeting the feed and fodder needs of the years, for maintaining soil fertility by sowing crops that fallow in proper rotation or for green manuring; for seed purposes and outside stimuli etc.

The Government policy also affects the cropping pattern. Policies relating to priorities given to various crops, exports, taxes, supply of credits and the development of the backward regions determine the nature of the crops and the area under them. New technology has also affected the change in the cropping pattern.

Investigating belongs to study of changes in cropping assumes special importance in taking knowledge of soil-climatic factors and the crops that could be grown within a particular environment. Impact of changes in technological, economic and institutional factors can be felt only when the existing cropping pattern under goes a change. Generally the farmers have a tendency to stick to a stable cropping pattern under any given agro-climatic region and they do not shift much from this position except to dictate by price factors in adjusting hectorage allocation.

A review of changes in cropping pattern in Kolhapur district during the 1985-86 to 1997-2002 is briefly presented in table 4.3. The quinquennial average area under different industrial crops and the relative share of each crop in gross cropped area has been deployed for the study of cropping pattern.

4.6.1 CHANGES IN CROPPING PATTERN 1985-86 TO 1989-90

The position in 1985-86 to 1989-90 was that out of gross cropped area (4,63,290 hectares) 1,08,638 hectares (23.45%) were under rice, 45,495 hectares (9.82 %) under jowar, 20,539 hectares (4.43 %) were under other cereals, 12,493 hectares were under wheat (2.69 %) and 2,04,054 hectares were under total cereals (44.04 %) during

first quinquennium. Total oil seeds occupied 63,510 hectares (13.71 %), out of that ground

Table No. 4.3
KOLHAPUR DISTRICT: CHANGING CROPPING PATTERN

(Area in hectares)

Crops	1985-86 to 1989-90	1990-91 to 1994-95	1995-96 to 1999-2000	2000-2001 to 2001-2002
Rice	108638 (23.45)	106492 (22.12)	110679 (20.26)	106546 (18.53)
Wheat	12493 (2.69)	5265 (1.10)	7362 (1.35)	8510 (1.48)
Jowar	45495 (9.82)	38896 (8.08)	28956 (5.30)	22835 (4.00)
Bajara	502 (0.11)	350 (0.07)	161 (0.03)	76 (0.01)
Maize	1347 (0.29)	3488 (0.72)	5085 (0.93)	6181 (1.07)
Other Cereals	20539 (4.43)	1621 (0.34)	2887 (0.53)	1969 (0.34)
Total Cereals	204054 (44.04)	182381 (37.88)	182270 (33.37)	174375 (30.33)
Total Pulses	28088 (6.06)	20199 (4.20)	23815 (4.36)	29668 (5.16)
Sugarcane	51149 (11.04)	72290 (15.01)	95245 (17.44)	102734 (17.87)
Total Condiments and Spices	6424 (1.39)	5522 (1.15)	6174 (1.13)	5434 (0.95)
Fruits and Vegetables	4580 (1.00)	5118 (1.06)	11364 (2.10)	20898 (3.63)
Total Fibers	255 (0.05)	228 (0.05)	264 (0.04)	531 (0.09)
Groundnut	56761 (12.25)	55516 (11.53)	62329 (11.41)	68697 (11.95)
Total Oilseeds	63510 (13.71)	87571 (18.20)	121649 (22.27)	134097 (23.32)
Total Drugs and Narcotics	5571 (1.20)	5223 (1.08)	3402 (0.62)	5210 (0.91)
Fodder Crops	99659 (21.51)	102905 (21.37)	101854 (18.65)	101639 (17.68)
Miscellaneous Non-food Crops	-	5 (0.00)	108 (0.02)	348 (0.06)
Total Gross Cropped Area	463290 (100)	481442 (100)	546145 (100)	574934 (100)

Source: Kolhapur District-Socio-Eco.Review, 1991-92 to 2010-2011.

(Figures in the parenthesis are the percentages to the total Gross Cropped Area.)

Occupied 56,761 hectares (12.25%). Sugarcane has 51,149 hectares area (11.04%).

Nearly 28,088 hectares areas (6.06%) were occupied by total pulses. It means that rice,

groundnut, sugarcane, jowar and pulses are important crops of the study region. Below 4.83 % area were under bajara, maize and other cereals. Only 3.64 % areas were under total condiments and spices, fruits and vegetables, total fibers, total drugs and narcotics. Fodder crops were having 99,659 hectares (21.51%) area during this quinquennium.

4.6.2 CHANGES IN CROPPING PATTERN 1990-91 TO 1994-95 :

The gross cropped area increased from 4.63 lakh hectares to 5.46 lakh hectares during the first to second quinquennium. The area under rice decreased with 2146 hectares. Its share in gross cropped area also decreased by -1.33 %. The area under wheat decreased with 7228 hectares and its share in gross cropped area decreased - 1.59 %. The jowar registered the decreasing trend with 6599 hectares and its share of gross cropped area was decreased by -1.74 %. The minor millets like bajara, maize and other cereals have shown decreasing trend during these quinquenniums. The table 4.3 shows that the total cereals were decreased with 21,673 hectares and the share of gross cropped area has decreased by -6.16 %. It means that the decreasing trend has been registered by all cereals in the study region.

All the pulses have showed downward shift from 6.06 % to 4.20 %. The area under groundnut have showed decreasing trend with 1,245 hectares but total oil seeds shows increasing trend with 24,061 hectares and its share of gross cropped area was increased by 4.49 %. Sugarcane is the cash crop in the study region its cropped area was increased with 21,141 hectares and its share of gross cropped area was increased by 3.97 %.

The remaining crops like total condiments and spices, total fibers, total druges and narcotics were shown negative change in the share of gross cropped area in the study region. The positive change was recorded by the fruits and vegetables during the period of first and second quinquennium. The fodder crops have registered very marginal negative change with -0.14 % in its area.

4.6.3 CHANGES IN CROPPING PATTERN 1995-96 to 1999-2000

During this quinquennium the gross cropped area increased from 4.81 lakh hectares to 5.46 lakh hectares. The area under total cereals decreased from 37.88 per cent to 33.37 per cent, crops like rice, jowar, and bajara has shown decrease in their area

during this quinquennium. The area under wheat, maize and other cereals shows upward shifts during this quinquennium. The area under total pulses increased marginally.

The phenomenal growth in the area under sugarcane was recorded from 72,290 (15.01%) to 95245 hectares (17.44%). from second to third quinquennium. Nearly 1/5 area was under this cash crop in the study region. This is increased due to the availability of perennial source of irrigation, fertile soils and impetus provided by the sugar factories and co-operative credit societies.

In the case of oil seeds, groundnut has shown negative change in its area while the area under total oil seeds was increased from 87,571 hectares (18.20%) to 1,21,649 hectares (22.27%) during this quinquennium.

The proportion of area under total condiments and spices, total fibers, total drugs and narcotics was decreased during this quinquennium. The area under fruits and vegetables was doubled. The area under fodder crops decreased by 1051 hectares and its share to gross cropped area was 18.65%.

4.6.4 CHANGES IN CROPPING PATTERN 2000 TO 2001

The gross cropped area still increased from 5.46 lakh hectares to 5.74 lakh hectares from third quinquennium to the current year. Area under rice, jowar, bajara and other cereals showed decrease in their area in this period. Only wheat and maize crops has showed the marginal increase in its area. Whereas total area under cereals was decreased constantly from first quinquennium up to this year. It means say that the farmers were favors and taking cash crops in their fields. When the facilities are developed and provided to them by the agro-based industries like sugar factories and the co-operatives.

Therefore the area under sugarcane was increased from 95,245 hectares (17.44%) to 1,02,734 hectares (17.87%) and is constant to gross cropped area of the study region. The area under pulses has increased from 23,815 hectares (4.36%) to 29668 hectares (5.16%) over the third quinquennium to the year 2000-2002. The crops like total condiments and spices are negligible in the study region it shows the decreasing trend and very minute proportion of the area under this category. The fruits and vegetables have taking in the study region especially in the close vicinity of the city areas where there

assured and perennial irrigation facilities available. That's why the area under fruits and vegetables were increased over the third quinquennium. There is no remarkable area under fiber crops in the study region.

The position of the oilseeds is constant increasing but still it is marginal sign of increasing. The groundnut is the remarkable oilseed crop in the study region and it has keep constant position but very stagnant growth of its area from the beginning of the first quinquennium upto this year. Crops like total drugs and narcotics, fodder crops have showed decreasing trend in their area from the beginning of the investigating period.

The variety of crops was grown in the study region. The food grains constitute a major produce of agricultural land (35.49 %). The main foodgrains grown are rice (18.53 %), jowar (4.00%), and wheat (1.48 %) and pulses (5.16 %). When we include sugarcane, fruits and vegetables, condiments and spices, the total food crops has occupy about 57.94 % during the year 2000-2001 to 2001-2002 (Table No 4.3). Among the non-food crops groundnut shares (11.95 %) and total oilseeds having 23.32 percent share to total gross cropped area of the study region.

4.7 TAHSILWISE TRENDS IN AREA UNDER DIFFERENT INDUSTRIAL CROPS IN KOLHAPUR

Despite technological achievement and conquest over nature, the agricultural pattern is closely controlled by the physical factors. In fact, terrain, topography, slope, altitude, climate (temperature, rainfall, humidity, fog, forest, winds, and sunshine), soils, surface drainage and underground water table are quite vital determinants of agricultural activities and cropping patterns. Though there are numerous socio-cultural, economic, political, technological and infrastructural factors which also determines the agricultural land use, cropping pattern and agricultural process of those factors land tenancy, system of ownership, size of holdings, availability of labour, capital, religion, level of technological development, accessibility to the market, irrigation facilities, agricultural research and extension service, price incentives, government plans and international policies have a close impact on agricultural activities.

An attempt is made to study the existing overall cropping pattern of the region and changes there in during the period of 1985-86 to 2001-2002. Table No 4.4

shows that the region is a food grains oriented region, as they have occupied 36.44 per cent of the gross cropped area of the region during 1997-2002 and the share of food crops was 81.07 per cent. Among the rice is the important food grain that has exhibit 19.35 per cent of the gross cropped area of the region fallowed by total pulses (4.70 %) and jowar (4.64%). If the groundnut counted as a cash crop then the share of the sugarcane and groundnut together have 29.33 percent. Sugar cane alone occupied 17.80 percent to the gross cropped area of the study region it means that the rice, sugarcane and groundnut are the dominant crops in the study region.

Substantially changes have been occurred in the cropping pattern of the region due the physical and non-physical factors. These determinants were differs the cropping pattern of the study region. Therefore the detail analysis of each crop and its spatial analysis based on quinquennium averages from 1985-86 to 2001-2002 and changes there in are necessary to study and therefore it is as fallows.

RICE

Rice is the staple food crop of the region. It grows in every tahsils of the region. Being a tropical monsoon crop, rice requires temperature of 21⁰ Celsius during sowing and 37⁰ Celsius during its harvesting. It requires high rainfall or assured irrigation facilities. Rice occupys about 19.35 per cent of total cropped area and having more variations at tahsil level. The south-western hilly tract, particularly Bhudargad, Radhanagari and Karveer has high proportion of rice (above 25 %), the north-western and southern tahsils like Panhala, Shahuwadi, Ajara, Chandgad, Gaganbavada, Kagal and Gadhinglaj are having moderate (15 to 25 %) proportion. It is due to high rainfall and undulating topography, whereas very low share (below 15%) of rice crop is confined in Shirol and Hatkangale tahsil (Map 4.8 A).

Below 2 per cent negative change was recorded in its area in Shirol, Gadhingalaj and Bhudargad tahsil. Whereas 2 to 4 per cent negative change was recorded in Ajara, Hatkangale and Radhanagari tahsil. While 4 to 6 percent negative change was recorded in the area under rice cropping in tahsils like Gaganbavada and Panhala tahsil of the study region. The high negative change that is 6 to 8 percent in its area was recorded in tahsils like Kagal and Shahuwadi. Very high negative change that is more than 8 per cent was recorded in the tahsil Chandgad. Only one that is Karveer tahsil has showed

Table No. 4.4
KOLHAPUR DISTRICT: TRENDS IN AREA UNDER DIFFERENT CROPS
FROM 1985-86 TO 2001-2002

(Area in Hectares)

Sr.No	Name of the tahsil	Year and volume of change in %	Rice	Wheat	Jowar	Bajara	Maize	Other cereals	Total cereals	Total pulses
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Shahu-wadi	1985-1990	19762 (30.84)	781 (2.05)	873 (2.29)	-	625 (1.64)	2358 (6.18)	18632 (48.85)	704 (1.85)
		1997-2002	11684 (24.03)	1216 (2.50)	1264 (2.60)	-	1134 (2.33)	153 (0.31)	19414 (39.94)	1332 (2.74)
		Volume of change	-6.81	0.45	0.31	-	0.69	-5.87	-8.91	0.89
2	Panhala	1985-1990	10026 (30.33)	787 (2.38)	2967 (8.98)	2 (0.01)	48 (0.14)	1388 (4.21)	16016 (48.46)	1153 (3.49)
		1997-2002	8259 (24.46)	833 (2.47)	1836 (5.44)	-	405 (1.21)	357 (1.08)	13206 (39.12)	1985 (5.88)
		Volume of change	-5.87	0.09	-3.54	0.01	1.07	-3.13	-9.34	2.39
3	Hatkan-gale	1985-1990	3821 (7.64)	2472 (4.94)	12647 (25.28)	109 (0.22)	99 (0.20)	116 (0.23)	19317 (38.61)	4803 (9.60)
		1997-2002	2930 (4.38)	677 (1.01)	9165 (13.71)	23 (0.03)	527 (0.79)	38 (0.06)	13396 (20.05)	5115 (7.65)
		Volume of change	-3.26	-3.93	-11.57	-0.19	0.59	-0.17	-18.56	-1.95
4	Shirol	1985-1990	1222 (2.84)	1925 (4.47)	6175 (14.35)	268 (0.62)	270 (0.62)	29 (0.07)	9890 (22.98)	8819 (20.49)
		1997-2002	1161 (2.21)	1203 (2.29)	1959 (3.73)	40 (0.08)	356 (0.68)	150 (0.28)	4923 (9.37)	4011 (7.64)
		Volume of change	-0.63	-2.18	-10.62	-0.54	0.06	0.21	-13.61	-12.85
5	Karveer	1985-1990	12140 (25.14)	1671 (3.46)	4392 (9.10)	46 (0.10)	43 (0.09)	923 (1.91)	19465 (40.31)	1748 (3.62)
		1997-2002	16713 (28.12)	1067 (1.79)	2185 (3.67)	10 (0.02)	338 (0.57)	74 (0.12)	21106 (35.51)	2087 (3.51)
		Volume of change	2.98	-1.67	-5.43	-0.08	0.48	-1.79	-4.80	-0.11
6	Gagan-Bavada	1985-1990	1738 (24.13)	13 (0.18)	10 (0.14)	-	1 (0.01)	468 (6.51)	3073 (42.67)	-
		1997-2002	5161 (19.20)	96 (0.36)	9 (0.03)	-	251 (0.93)	92 (0.34)	7370 (27.41)	498 (0.74)
		Volume of change	-4.93	0.18	-0.11	-	0.92	-6.17	-15.26	0.74

(Contd...)

(Table No 4.4 Contd...)

Sr.No	Name of the tahsil	Year and volume of change in %	Sugar cane	Total Condi. And spices	Fruits and veg.	Ground nut	Total oil seeds	Total drugs and Narcotics	Total fibers	Misc. Non Food Crops	Fodder Crops	Gross Cropped Area
(1)	(2)	(3)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
1	Shahu-wadi	1985-1990	1494 (3.92)	81 (0.21)	86 (0.22)	1580 (4.14)	1974 (5.18)	-	-	-	15170 (39.77)	38141 (100)
		1997-2002	5941 (12.22)	114 (0.23)	444 (0.91)	4038 (8.31)	6809 (14.01)	8 (0.02)	18 (0.04)	11 (0.02)	14520 (29.87)	48611 (100)
		Volume of change	8.30	0.02	0.69	4.17	8.83	0.02	0.04	0.02	-9.9	-
2	Panhala	1985-1990	4126 (12.48)	354 (1.07)	14 (0.04)	2906 (8.79)	3032 (9.18)	-	3 (0.01)	-	8353 (25.27)	33051 (100)
		1997-2002	7852 (23.26)	338 (1.00)	498 (1.48)	2512 (7.44)	3768 (11.16)	7 (0.02)	2 (0.01)	14 (0.04)	6088 (18.03)	33758 (100)
		Volume of change	10.78	-0.07	1.44	-1.35	1.98	0.02	0.00	0.04	-7.24	-
3	Hatkan-gale	1985-1990	7076 (14.14)	721 (1.44)	343 (0.68)	11338 (22.66)	12054 (24.09)	899 (1.80)	88 (0.18)	-	4734 (9.46)	50035 (100)
		1997-2002	14309 (21.41)	292 (0.44)	1318 (1.97)	8984 (13.44)	25630 (38.35)	626 (0.94)	40 (0.06)	21 (0.03)	6079 (9.10)	66826 (100)
		Volume of change	7.27	-1.00	1.29	-9.22	14.26	-0.86	-0.12	0.03	-0.36	-
4	Shirol	1985-1990	9561 (22.21)	873 (2.03)	911 (2.12)	5712 (13.27)	9383 (21.80)	1069 (2.48)	46 (0.11)	-	2487 (5.78)	43039 (100)
		1997-2002	15560 (29.63)	443 (0.84)	1416 (2.70)	3022 (5.75)	20743 (39.49)	609 (1.16)	57 (0.11)	21 (0.04)	4740 (9.02)	52523 (100)
		Volume of change	7.42	-1.19	0.58	-7.52	17.69	-1.32	0.00	0.04	3.24	-
5	Karveer	1985-1990	12022 (24.91)	353 (0.73)	90 (0.19)	5013 (10.38)	5048 (10.45)	36 (0.07)	4 (0.01)	-	9516 (19.71)	48282 (100)
		1997-2002	15280 (25.71)	617 (1.04)	917 (1.54)	7250 (12.21)	11388 (19.16)	382 (0.64)	29 (0.05)	25 (0.04)	7611 (12.80)	59442 (100)
		Volume of change	0.80	0.31	1.35	1.83	8.71	0.57	0.04	0.04	-6.91	-
6	Gagan-Bavada	1985-1990	936 (13.00)	9 (0.12)	5 (0.07)	35 (0.50)	344 (4.78)	-	-	-	2834 (39.36)	7201 (100)
		1997-2002	7216 (26.84)	29 (0.11)	3393 (12.62)	1049 (3.90)	2100 (7.81)	128 (0.48)	-	8 (0.03)	6442 (23.96)	26884 (100)
		Volume of change	13.84	-0.01	12.55	3.40	3.03	0.48	-	0.03	-15.40	-

Table No. 4.4
KOLHAPUR DISTRICT: TRENDS IN AREA UNDER DIFFERENT CROPS
FROM 1985-86 TO 2001-2002

(Area in Hectares)

Sr.No	Name of the tahsil	Year and volume of change in %	Rice	Wheat	Jowar	Bajara	Maize	Other cereals	Total cereals	Total pulses
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
7	Radha-nagari	1985-1990	11411 (33.84)	103 (0.30)	985 (2.92)	1 (0.00)	7 (0.02)	1824 (5.41)	16581 (49.17)	1148 (3.40)
		1997-2002	11671(30.54)	319 (0.83)	243 (0.63)	2 (0.00)	855 (2.24)	95 (0.25)	17173 (44.94)	591 (1.55)
		Volume of change	-3.30	0.53	-2.29	-	2.22	-5.16	-4.23	-1.85
8	Kagal	1985-1990	11420 (24.33)	976 (2.08)	6555 (13.97)	21 (0.04)	2 (0.00)	972 (2.07)	20232 (43.11)	4517 (9.62)
		1997-2002	10368 (18.05)	646 (1.12)	4032 (7.02)	20 (0.03)	513 (0.89)	242 (0.42)	16445 (28.62)	3795 (6.61)
		Volume of change	-6.28	-0.96	-6.95	-0.01	0.89	-1.65	-14.49	-3.01
9	Bhudar-Gad	1985-1990	11911 (37.59)	1012 (3.19)	986 (3.11)	1 (0.00)	1 (0.00)	2485 (7.84)	18539 (58.52)	419 (1.32)
		1997-2002	12321 (35.66)	220 (0.64)	675 (1.95)	2 (0.00)	115 (0.33)	60 (0.17)	16236 (47.00)	900(2.61)
		Volume of change	-1.93	-2.55	-1.16	0.00	0.33	-7.67	-11.52	1.29
10	Ajara	1985-1990	8906 (25.52)	1300 (3.72)	2133 (6.11)	-	69 (0.20)	2993 (8.58)	17180 (49.24)	1998 (5.73)
		1997-2002	8680 (22.48)	743 (1.92)	1037 (2.68)	1 (0.00)	199 (0.51)	633 (1.64)	15432 (39.97)	2134 (5.53)
		Volume of change	-3.04	-1.80	-3.43	0.00	0.31	-6.94	-9.27	-0.20
11	Gad-hinglaj	1985-1990	8773 (18.37)	1452 (3.04)	6939 (14.53)	16 (0.03)	142 (0.30)	1916 (4.01)	19741 (41.34)	2541 (5.32)
		1997-2002	9660 (17.00)	541 (0.95)	3335 (5.87)	2 (0.00)	573 (1.01)	135 (0.24)	15446 (27.18)	3630 (6.39)
		Volume of change	-1.37	-2.09	-8.66	0.03	0.71	-3.77	-14.16	1.07
12	Chand-gad	1985-1990	15508 (31.94)	1 (0.00)	833 (1.71)	38 (0.08)	40 (0.08)	5067 (10.43)	25388 (52.29)	238 (0.50)
		1997-2002	10301 (21.01)	249 (0.51)	396 (0.81)	15 (0.03)	281 (0.57)	472 (0.96)	18452 (37.64)	596 (1.22)
		Volume of change	-10.93	0.51	-0.90	-0.05	0.49	-9.47	-14.65	0.72
	District	1985-1990	108638 (23.45)	12493 (2.70)	45495 (9.88)	502 (0.11)	1347 (0.29)	20539 (4.43)	204054 (44.04)	28088 (6.06)
		1997-2002	108909 (19.35)	7810 (1.39)	26136 (4.64)	115 (0.02)	5547 (1.00)	2501 (0.44)	178599 (31.74)	26374 (4.70)
		Volume of change	-4.10	-1.31	-5.24	-0.09	0.71	-3.99	-12.30	-1.36

(Contd...)

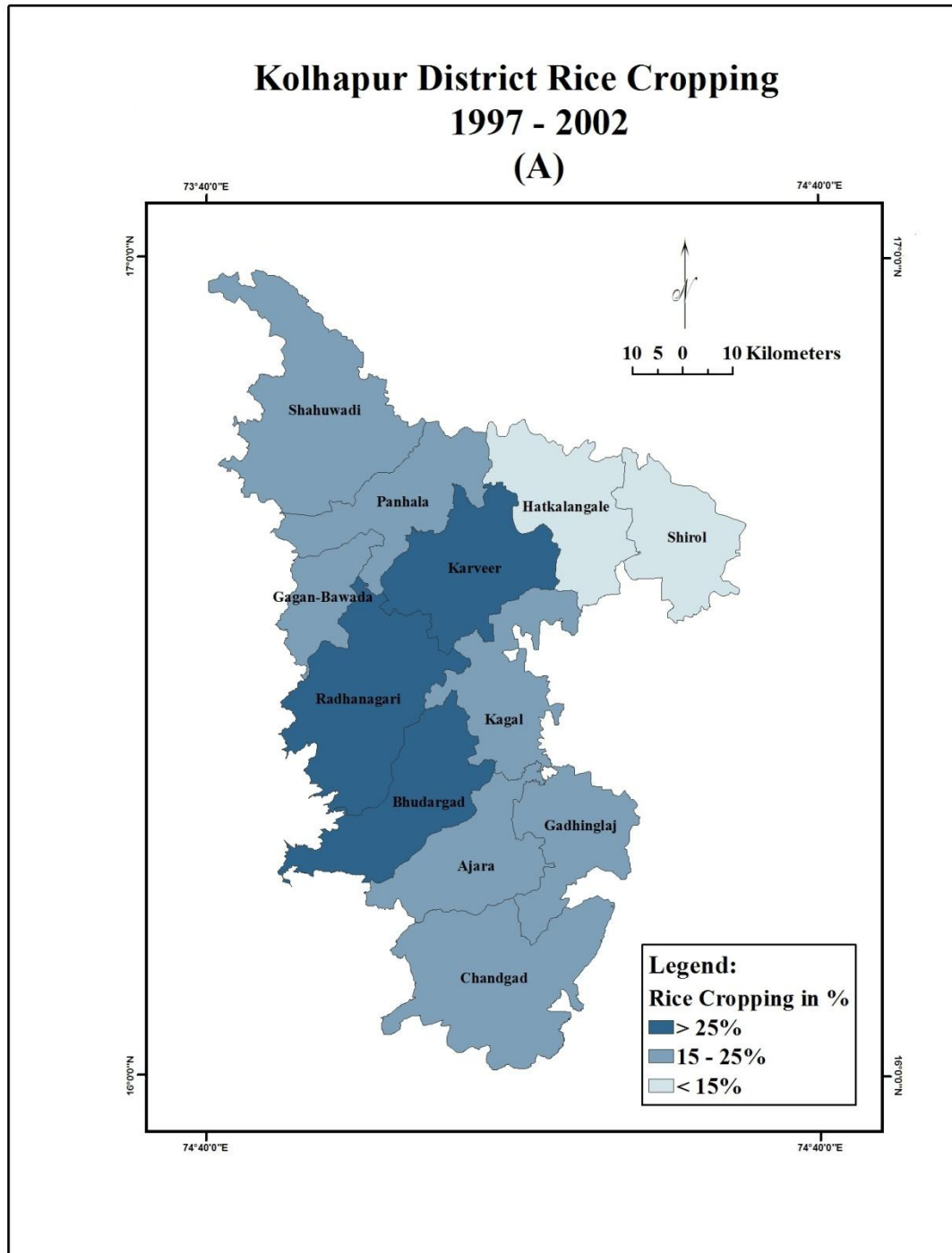
(Table No 4.4 Contd...)

Sr.No	Name of the tahsil	Year and volume of change in %	Sugar cane	Total Condi. And spices	Fruits and veg.	Ground nut	Total oil seeds	Total drugs and Narcotics	Total fibers	Misc. Non Food Crops	Fodder Crops	Gross Cropped Area
(1)	(2)	(3)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
7	Radha-nagari	1985-1990	4278 (12.68)	206 (0.61)	44 (0.13)	1881 (5.58)	2424 (7.19)	-	2 (0.01)	-	9041 (26.81)	33724 (100)
		1997-2002	7266 (19.02)	121 (0.32)	1233 (3.23)	1970 (5.15)	3139 (8.21)	3 (0.00)	3 (0.01)	19 (0.05)	8661 (22.67)	38209 (100)
		Volume of change	6.34	-0.29	3.10	-0.43	1.02	0.00	0.00	0.05	-4.14	-
8	Kagal	1985-1990	2176 (4.64)	1075 (2.29)	102 (0.22)	8358 (17.81)	8413 (17.92)	3206 (6.83)	13 (0.03)	-	7198 (15.34)	46932 (100)
		1997-2002	8658 (15.07)	769 (1.34)	965 (1.68)	9460 (16.47)	16047(27.93)	2297 (4.00)	29 (0.05)	25 (0.04)	8422 (14.66)	57452 (100)
		Volume of change	10.43	-0.95	1.46	-1.34	10.01	-2.83	0.02	0.04	-0.68	-
9	Bhudar-Gad	1985-1990	1319 (4.16)	200 (0.63)	47 (0.15)	2358 (7.44)	2881 (9.09)	1 (0.00)	-	-	8281 (26.13)	31687 (100)
		1997-2002	4503 (13.03)	145 (0.42)	822 (2.38)	3148 (9.11)	3816 (11.04)	5 (0.01)	2 (0.00)	4 (0.01)	8117 (23.50)	34550 (100)
		Volume of change	8.87	-0.21	2.23	1.67	1.95	0.01	0.00	0.01	-2.63	-
10	Ajara	1985-1990	1341 (3.85)	453 (1.30)	125 (0.36)	3588 (10.28)	3885 (11.13)	12 (0.03)	2 (0.00)	-	9896 (28.36)	34892 (100)
		1997-2002	3013 (7.81)	580 (1.50)	1546 (4.00)	4696 (12.16)	6113 (15.83)	13 (0.03)	4 (0.01)	5 (0.01)	9770 (25.31)	38610 (100)
		Volume of change	3.96	0.20	3.64	1.88	4.70	0.00	0.01	0.01	-3.05	-
11	Gad-hinglaj	1985-1990	3456 (7.24)	1520 (3.18)	304 (0.64)	11941 (25.01)	11961 (25.05)	348 (0.73)	97 (0.20)	-	7782 (16.30)	47750 (100)
		1997-2002	5529 (9.73)	1499 (2.64)	1534 (2.70)	12450 (21.91)	20217 (35.58)	100 (0.18)	127 (0.22)	20 (0.03)	8725 (15.35)	56827 (100)
		Volume of change	2.49	-0.54	2.06	-3.1	10.53	-0.55	0.02	0.03	-0.95	-
12	Chand-gad	1985-1990	3364 (6.92)	579 (1.19)	2509 (5.17)	2051 (4.22)	2111 (4.34)	-	-	-	14367 (29.59)	48556 (100)
		1997-2002	5064 (10.33)	1036 (2.11)	2479 (5.06)	6292 (12.83)	8687 (17.72)	69 (0.14)	26 (0.05)	10 (0.02)	12603 (25.71)	49022 (100)
		Volume of change	3.41	0.92	-0.11	8.61	13.38	0.14	0.05	0.02	-3.88	-
District	District	1985-1990	51149 (11.04)	6424 (1.39)	4580 (1.00)	56761 (12.25)	63510 (13.71)	5571 (1.20)	255 (0.05)	-	99659 (21.51)	463290 (100)
		1997-2002	100191 (17.80)	5983 (1.06)	16565 (2.94)	64871 (11.53)	128457 (22.83)	4247 (0.75)	337 (0.06)	183 (0.03)	101778 (18.09)	562714 (100)
		Volume of change	6.76	-0.33	1.94	-0.72	9.12	-0.45	0.01	0.03	-3.42	-

Source: computed by Author from Kolhapur District-Socio-Eco.Review, 1991-92 to 2010-2011.

Kolhapur District Rice Cropping 1997 - 2002

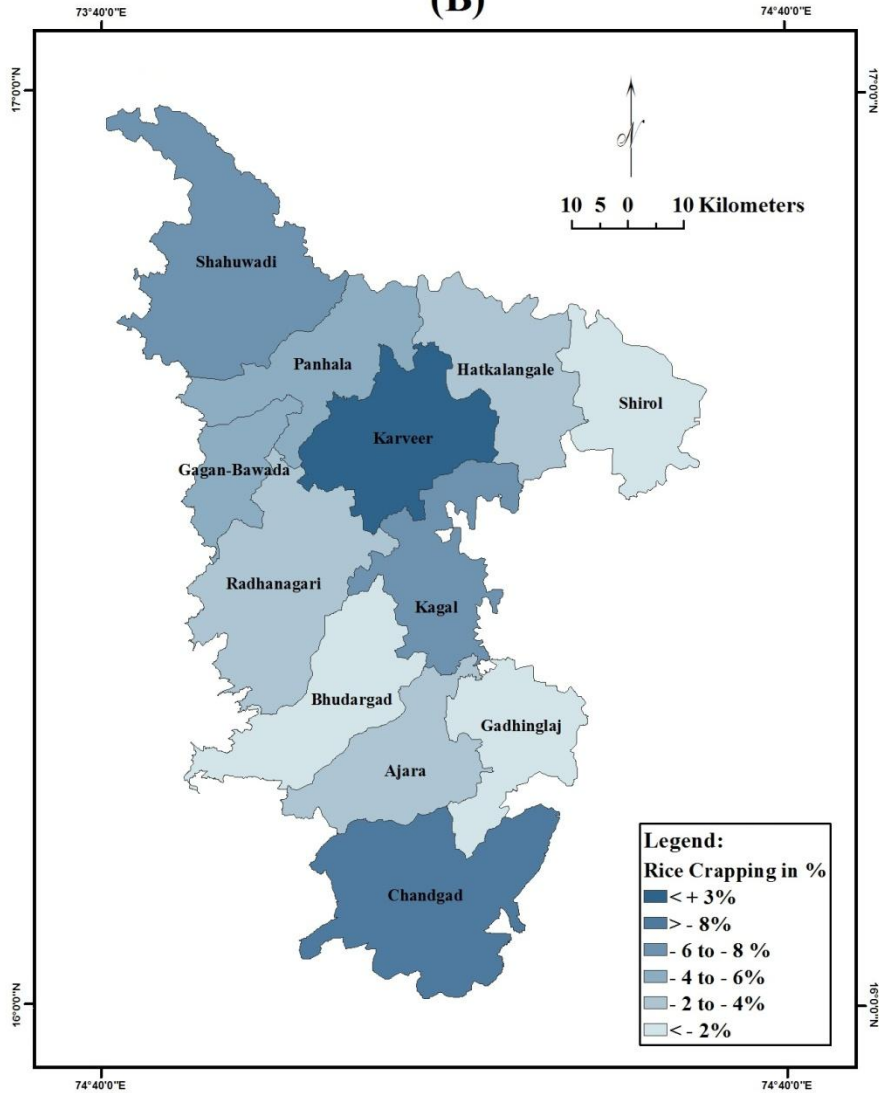
(A)



Map. No. 4.8 (A)

Kolhapur District Volume of Change in Rice Cropping 1985-90 to 1997-2002

(B)



Map. No. 4.8 (B)

Positive change and it is below 3 per cent in the area under rice cropping in 1985-90 to 1997-2002 (Map 4.8 B).

WHEAT

Wheat is a rabbi crop and it requires winter temperature between 10⁰ to 15⁰ Celsius. It can be grown in areas where rainfall is less than 500 mm. with the help of irrigation. As such, in the region the post monsoon rainfall is not sufficient for optimum production. Therefore it is extent to which irrigation can be provided to this crop which determines its areal extent and yield capacity.

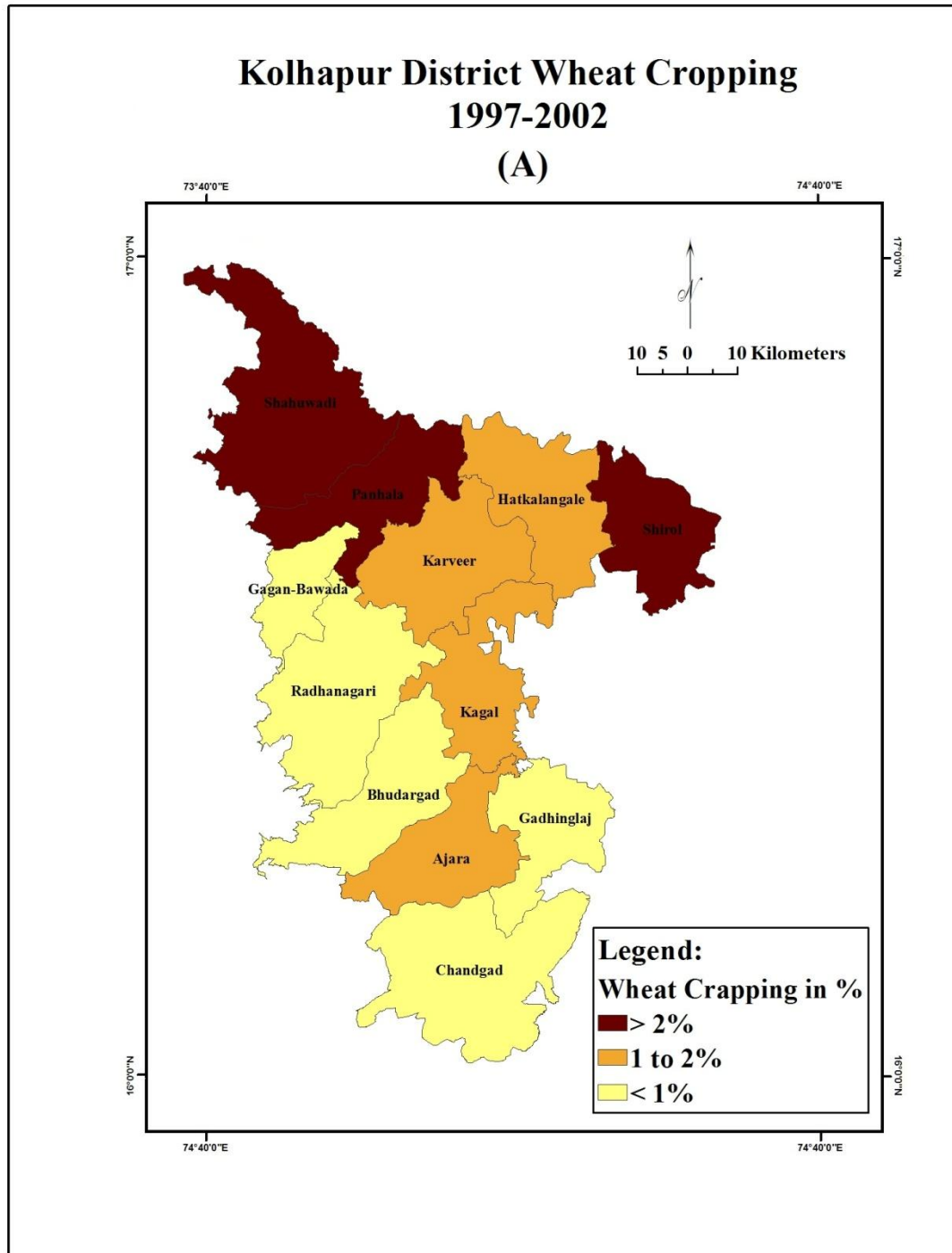
Wheat occupies only 4.64 per cent of the gross cropped area of the study region as against 3.69 per cent of the state level. Wheat is produced in every tahsil of the study region. But it is taken substantially in north-eastern, central and eastern tahsils of the study region. The central tahsils have moderate proportion of area under this crop. Owing to the less suitable ecological conditions, wheat cultivation is insignificant in south-western tahsils of the study region.

During 1997-2002 below 1 per cent cropped area was found under wheat in Gaganbavada, Chandgad, Bhudargad, Radhanagari and Gadhinglaj tahsil of the study region. About 1 to 2 per cent cropped areas was recorded under wheat in Hatkangale, Kagal, Karveer and Ajara tahsil. On the other hand above 2 per cent was experienced in Shirol, Panhala and Shahuwadi tahsil during 1997-2002 (Map 4.9 A).

Both negative and positive changes were recorded in the area under wheat cropping in study region during the period of investigation. Below 2 per cent negative change was recorded in Kagal, Karveer and Ajara tahsil in the study region. More than 2 per cent change was recorded in tahsils like Gadhinglaj, Shirol, Bhudargad, and Hatkangale tahsil of the study region. Below 0.50 per cent positive change was recorded in Panhala, Gadhinglaj and Shahuwadi tahsils. Whereas more than 0.50 per cent positive change was recorded by the Chandgad and Radhanagari tahsil during the period of investigation (Map 4.9 B).

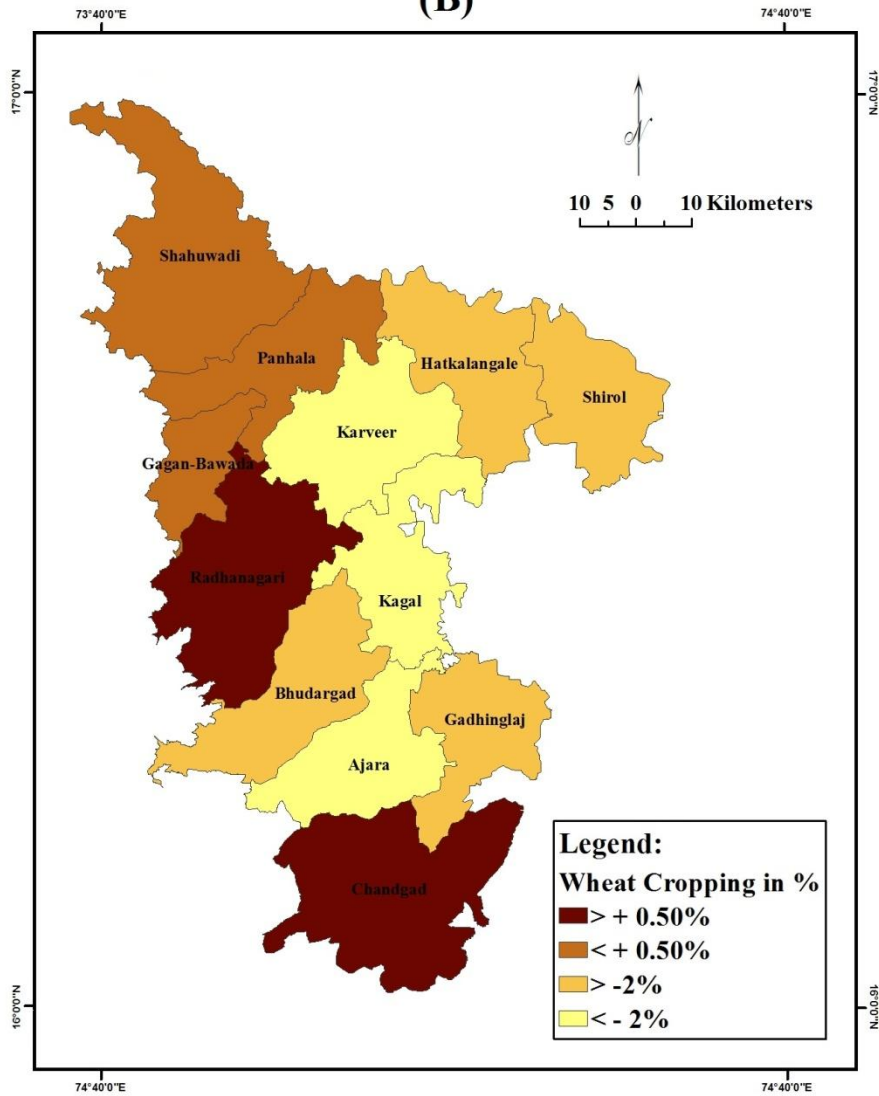
Kolhapur District Wheat Cropping 1997-2002

(A)



Map. No. 4.9 (A)

Kolhapur District Volume of Change in Wheat Cropping 1985-90 to 1997-2002 (B)



Map. No. 4.9 (B)

JOWAR

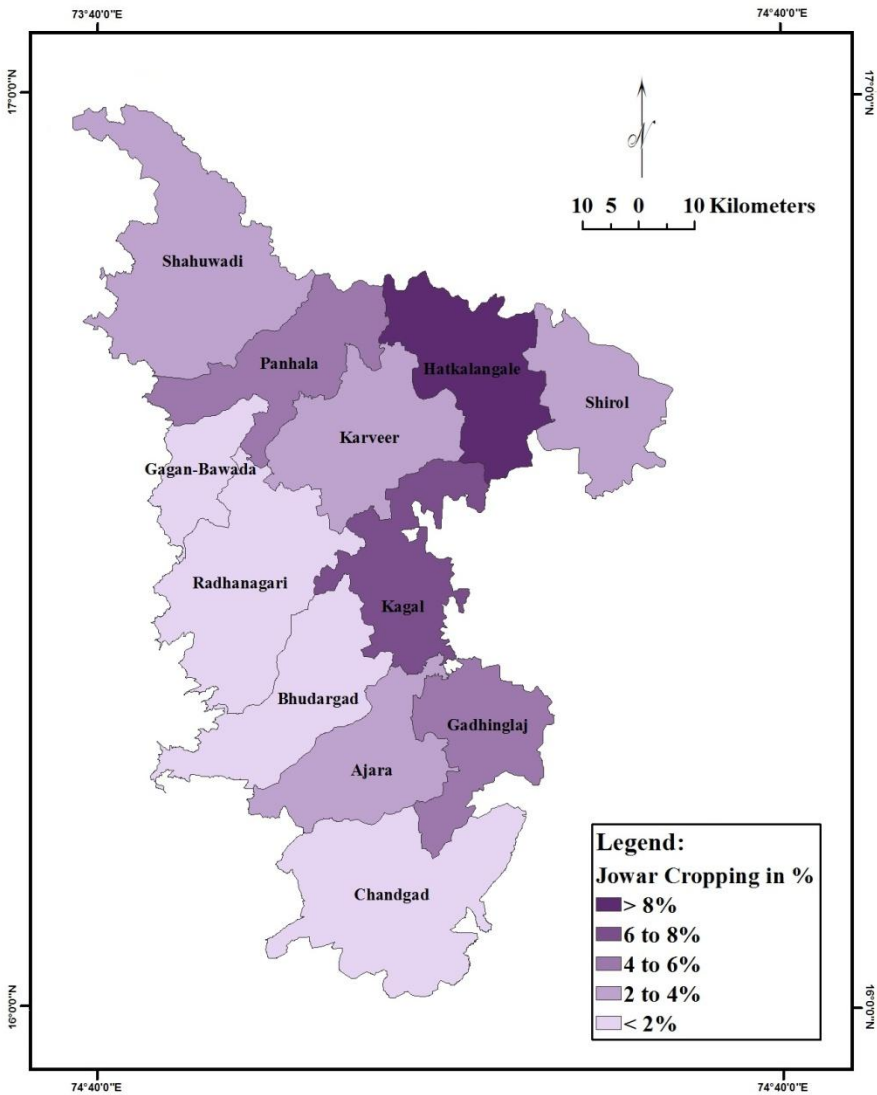
Jowar is the most largely grown cereal in the study region. It is grown both in kharif and rabbi season. It is staple food crop in the study region and also as a fodder. The spatial pattern of jowar is a reflection of topography, climate and irrigation facilities. Jowar shares about 4.64 per cent of the gross cropped area of the study region. During the study period it has lost 5.24 per cent of its area under cultivation.

During 1997-2002 out of the total gross cropped area below 2 per cent was found in Gaganbavada, Radhanagari Chandgad and Bhudargad tahsil in the study region. These tahsils have hilly tract and undulating topography and unfavorable condition of climate therefore the area under jowar is limited (Map 4.10 A). This is mainly due to adverse ecological condition prevailing in these tahsils.

There were 2 to 4 per cent area was under jowar in Shahuwadi, Ajara, Karveer and Shirol during the period of investigation. Whereas 4 to 6 per cent area was observed under jowar in Panhala and Gadhingalaj tahsil of the study region. Tahsil Kagal has between 6 to 8 per cent area under jowar. The Hatkangale is the only and one tahsil who have having above 8 per cent area under jowar cultivation in 1997-2002. The area under jowar is mainly lost in the Hatkangale, Shirol, and Gadhinglaj and Kagal tahsil in the study region during the period of investigation. The increasing irrigation facilities caused shifting the farmers from jowar cultivation to sugarcane cultivation.

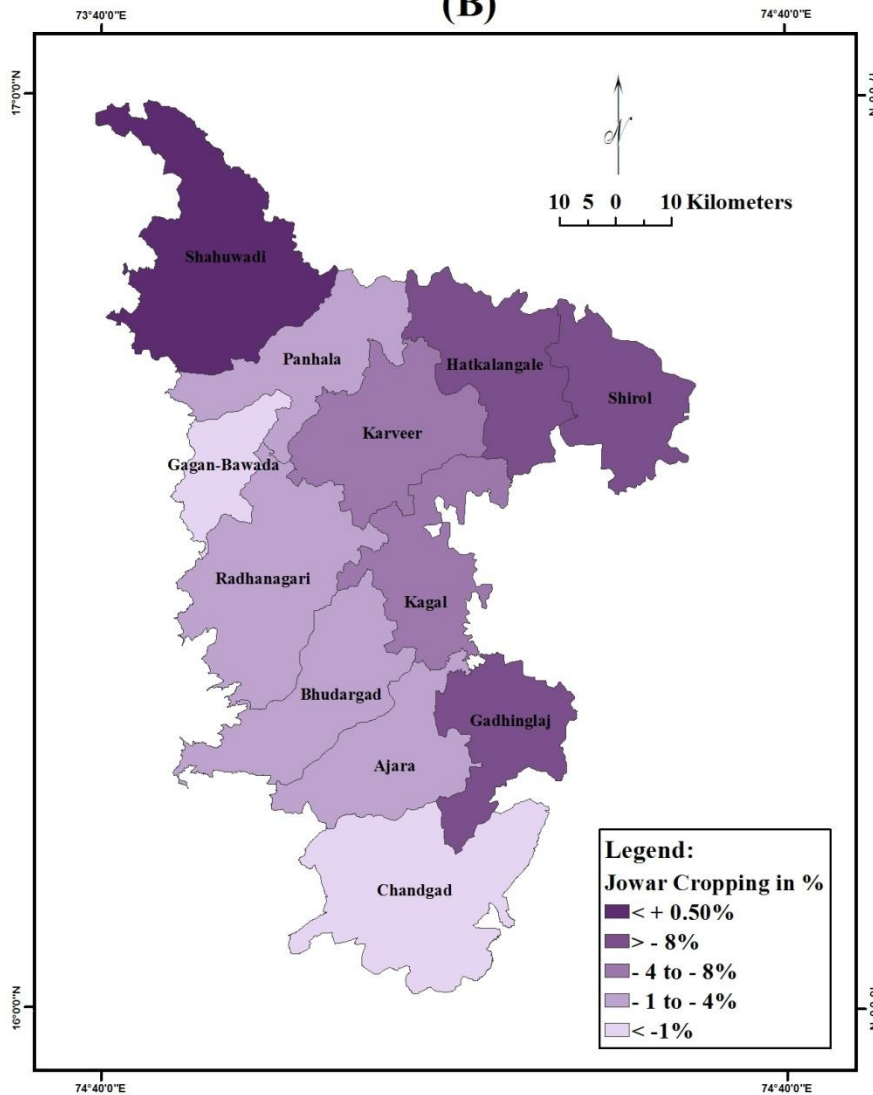
Both the negative and positive changes have been occurred in an area under jowar cultivation during the period of investigation in the study region. Below 1 per cent negative change was recorded in area under jowar in Gaganbavada and Chandgad tahsil in the study region. Whereas 1 to 4 per cent negative change in area under jowar was experienced in Bhudargad, Radhanagari, Ajara and Panhala tahsil of the study region. While 4 to 8 per cent negative change was noted in the Karveer and Kagal tahsil. Above 8 per cent negative change in area under jowar was found in Gadhinglaj, Shirol and Hatkangale tahsil of the study region (Map 4.10 B). Only one tahsil have recorded and is very little change in the area under jowar in Shahuwadi tahsil of the study region and it is noted bellow 0.50 per cent during 1997-2002 (Map 4.10 B).

Kolhapur District Jowar Cropping 1997-2002 (A)



Map. No. 4.10 (A)

Kolhapur District Volume of Change in Jowar Cropping 1985-90 to 1997-2002 (B)



Map. No. 4.10 (B)

OTHER CEREALS

Other cereals were not significant in the study region. This category has recorded only 0.44 per cent area of the gross cropped area in the study region. Nearly half of the tahsils of the study region has area under this category. Some of the tahsils situated in the hilly tract of the study region has taken very rare proportion of the hill millets and which were ripen in kharif season.

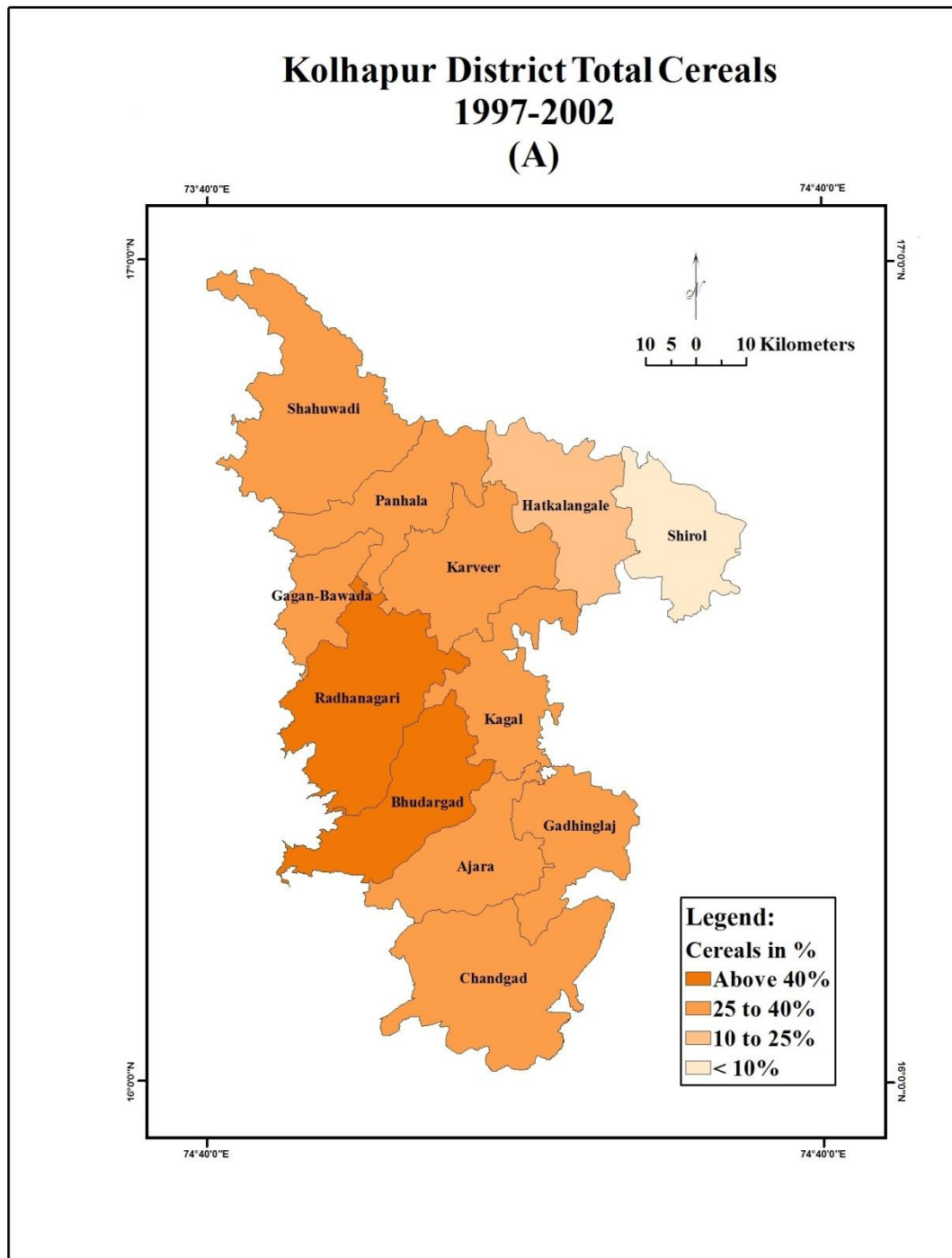
TOTAL CEREALS

Nearly 30 per cent of the gross cropped area was under total cereals in the study region. During the period of investigation table shows that the majority of the tahsils have lost their area under total cereals. More than half of the tahsils of the study region recorded a tremendous decrease in the area under total cereals. It is seen in Gaganbavada, Kagal, Chandgad, Gadhinglaj and Shirol tahsil of the study region. These tahsils were distinctly irrigated but now the farmers of these tahsils have shift cereals by cash crops like sugarcane in the study area.

Below 10 per cent change in the area under total cereals was recorded in Shirol tahsil. Whereas 10 to 25 per cent change was recorded in area under cereals in Hatkangale tahsil of the study region. While 25 to 40 per cent change was noted in the central zone of the study region among them Gadhinglaj, Gaganbavada, Kagal, Karveer, Chandgad, Panhala, Shahuwadi and Ajara are major tahsils. Above 40 per cent change in the area under total cereals was recorded in the Radhanagri and Bhudargad tahsils of the district (Map 4.11 A).

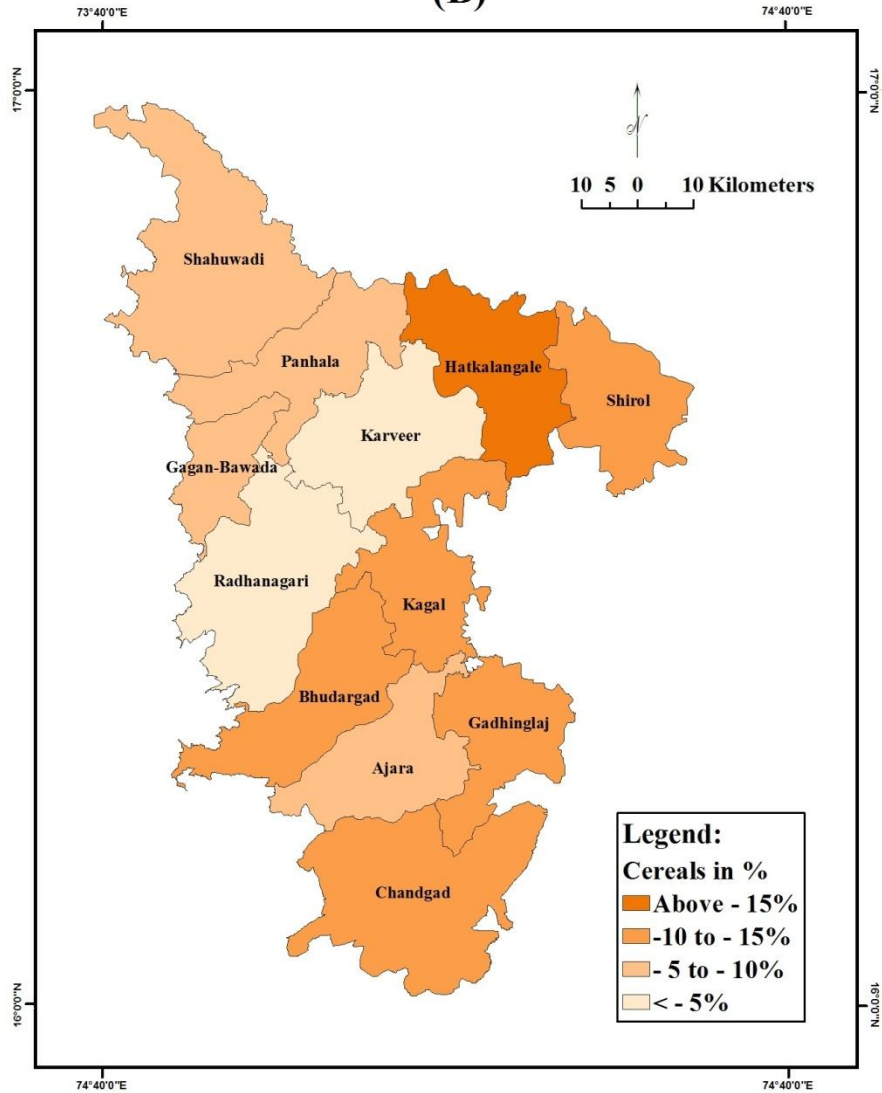
During 1985 to 2002 noon of the tahsil in the study region has recorded a positive change in the area under total cereals. Below 5 per cent negative change was recorded in the area under total cereals in Radhanagari and Karveer tahsil. Tahsils like Shahuwadi, Ajara and Panhala was recorded 5 to 10 per cent negative change in the area under total cereals. While 10 to 15 per cent change in the area under total cereals was recorded in Bhadargad, Shirol, Gadhinglaj, Kagal and Chandgad tahsil. Above 15 per cent negative change was noted in area under total cereals in Gaganbavada and Hatkangale tahsil of the study region during the period 1985to2002 (Map 4.11 B).

Kolhapur District Total Cereals 1997-2002 (A)



Map. No. 4.11 (A)

Kolhapur District Volume of Change in Total Cereals 1985-90 to 1997-2002 (B)



Map. No. 4.11 (B)

SUGARCANE

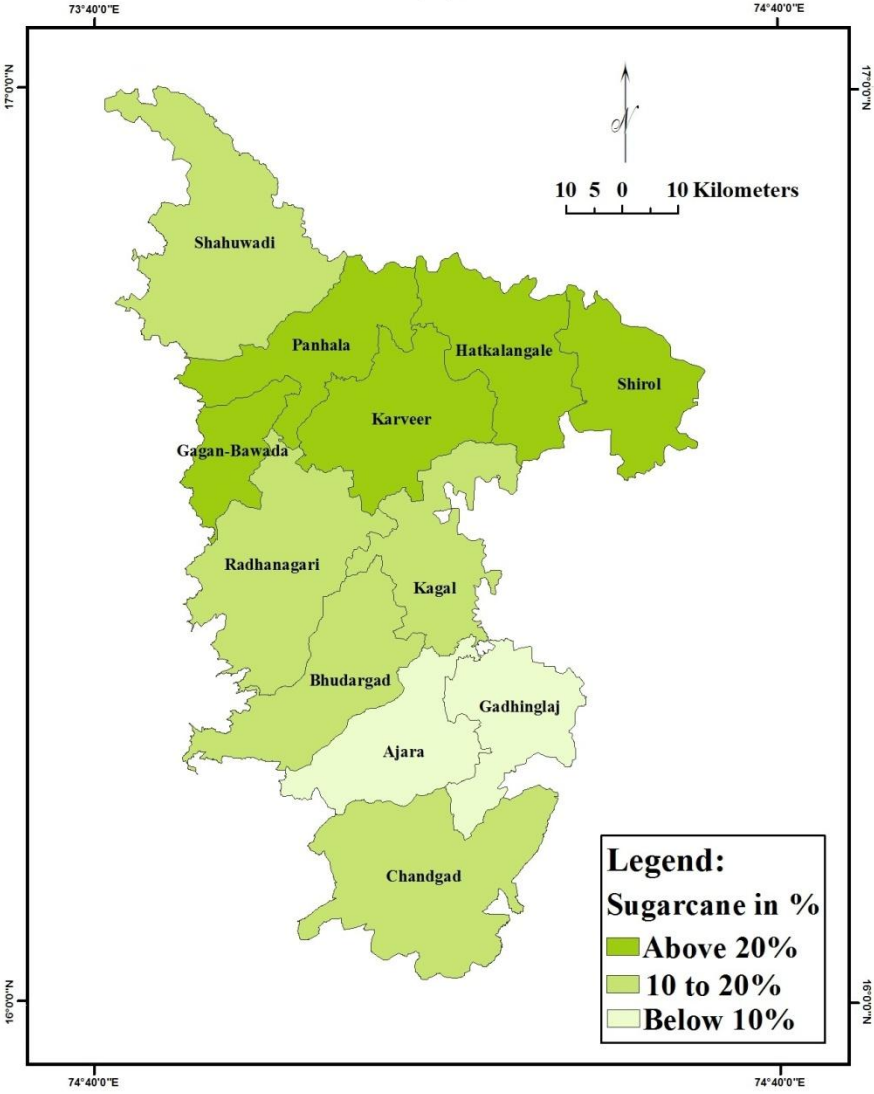
There has been a vast change in agricultural practices during the last twenty five years. Some of the changes have resulted from the innovations introduced in the field of agriculture. The upper Krishna basin is known as 'Sugar Bowl' of Maharashtra since long, wherein, Kolhapur, one of the leading and well known markets of jiggery in India is located. In an overview, increasing acreage under sugarcane and the springing up of sugar refineries. Sugarcane has not only changed the crop pattern, agricultural productivity and the landscape in western Maharashtra. It has introduced new dimensions in the politics of the state by creating a powerful pressure group of 'bagaitdars' the sugarcane planters and sugar co-operative societies. The entire economic and political structure of the Western Maharashtra revolves around these co-operatives.

Sugarcane, a premier cash crop of the study region occupied 17.80 per cent of the total cropped area (3.16 % state) and uses 78.18 per cent of gross cropped area irrigated, while ranking first among irrigated crops. However, its spatial distribution differs largely throughout the region. The area under sugarcane was increased in each tahsil during the period under investigation, but the remarkable increase in its area under cultivation where there is the irrigation facilities are comparatively more developed. Tahsils like Gaganbavda, Panhala, Kagal, Bhudargad and Shahuwadi have recorded tremendous increase in the area under sugarcane in the study region during the period of investigation (Table No. 4.3). It happens due to the alluvial tract, close vicinity of sugar factories and market, well developed network of transportation and other contributory factories which have stimulated the extension of cane cultivation in this part of the region.

During 1985 to 2002 below 10 per cent gross cropped area was found under sugarcane in Ajara and Gadhinglaj tahsils. Whereas 10 to 20 per cent gross cropped area was recorded under sugarcane Chandgad, Shahuwadi, Bhudargad, Kagal and Radhanagri tahsil. Above 20 per cent area was found in Hatkangale, Panhala, Karveer, Gaganbavada and Shirol tahsils during 1985-2002 (Map 4.12).

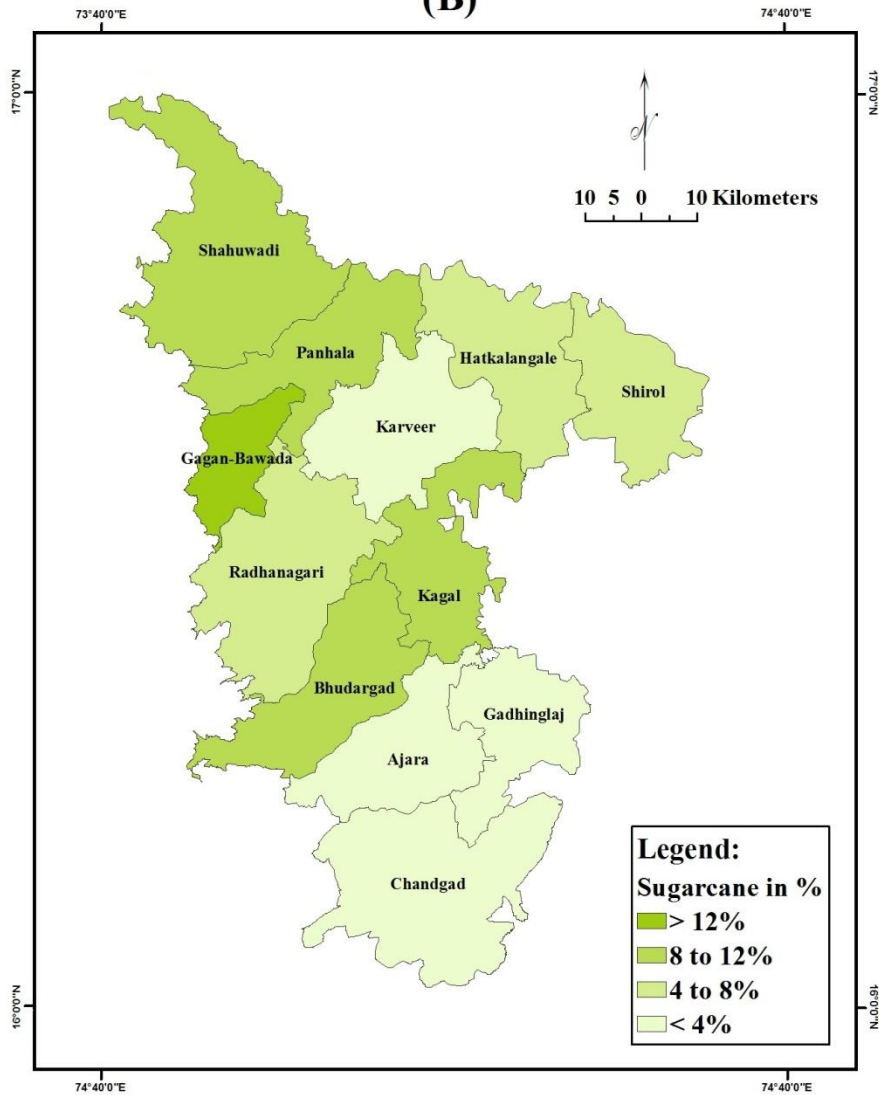
Kolhapur District Sugarcane Cropping 1997-2002

(A)



Map. No. 4.12 (A)

**Kolhapur District
Volume of Change in Sugarcane Cropping
1985-90 to 1997-2002
(B)**



Map. No. 4.12 (B)

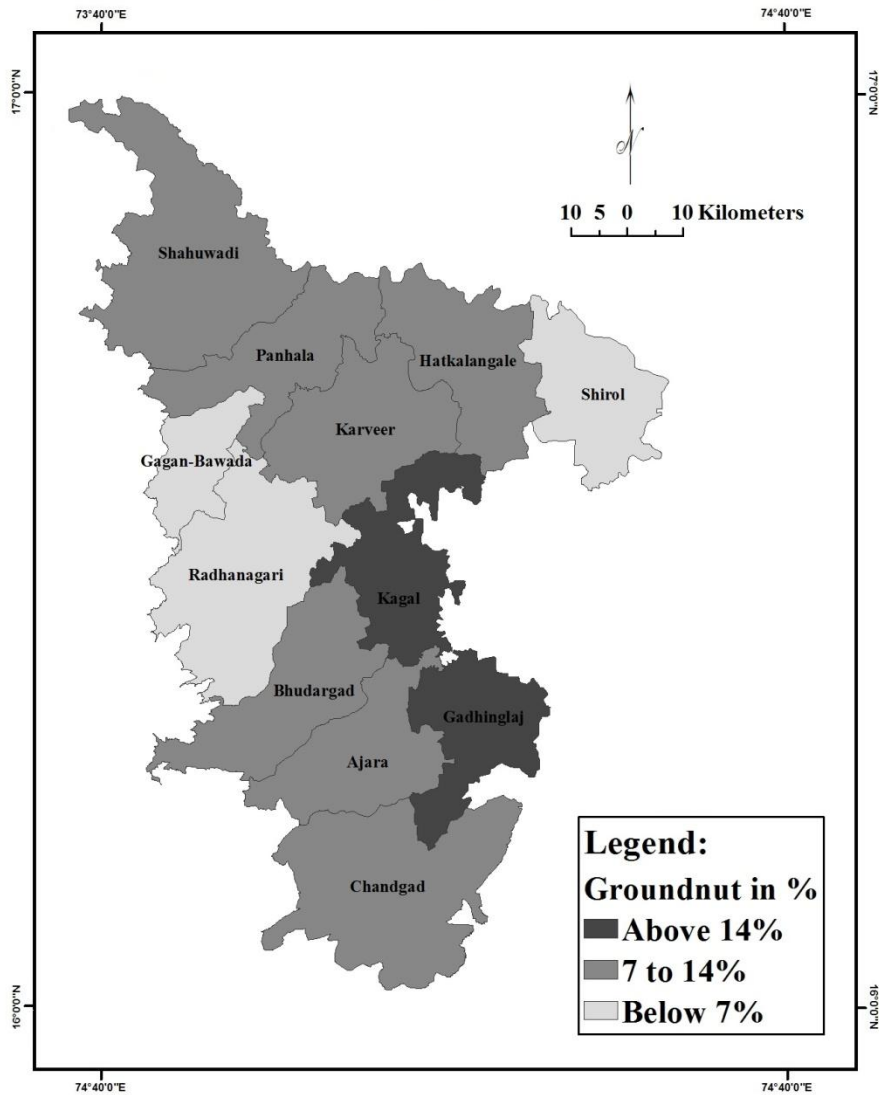
Only positive changes in area under sugarcane were recorded in study area. Below 4 per cent change in area under sugarcane was found in Karveer, Gadhinglaj, and Chandgad and Ajara tahsils in the study area. Whereas 4 to 8 per cent change in sugarcane area was took place in Radhanagri, Hatkanagle and Shirol tahsils. While 8 to 12 per cent change was recorded in area under sugarcane in Shahuwadi, Bhudargad, Kagal and Panhala tahsils of the study region. Above 12 per cent change in the area under sugarcane was found in Gaganbavada tahsil during 1985-2002 (Map 4.13). Area under irrigation was increased during the period of investigation, therefore sugarcane area showed positive change in all tahsils of the study region. Sugarcane alone share above 3/4th of the irrigated land in the study region. It ranks first among irrigated crops in all the tahsils.

GROUNDNUT

Groundnut (Bhuimug) requires temperature of 20 to 25⁰ c and 5 to 8 months to grow fully. About 750 to 850 mm of rainfall may be considered necessary, though it is grown in areas receiving rainfall below 500 mm. it thrives best in alluvial black soils and though it grows in other soils as 'Chunkhad', it then requires liberal manuring. It is sown in June and harvested in January. After the south-west monsoon has ceased in November and December, it requires four to five watering. Almost all classes eat it parched. Edible oil is pressed from the nuts which are first mixed with kerdai (Safflower).

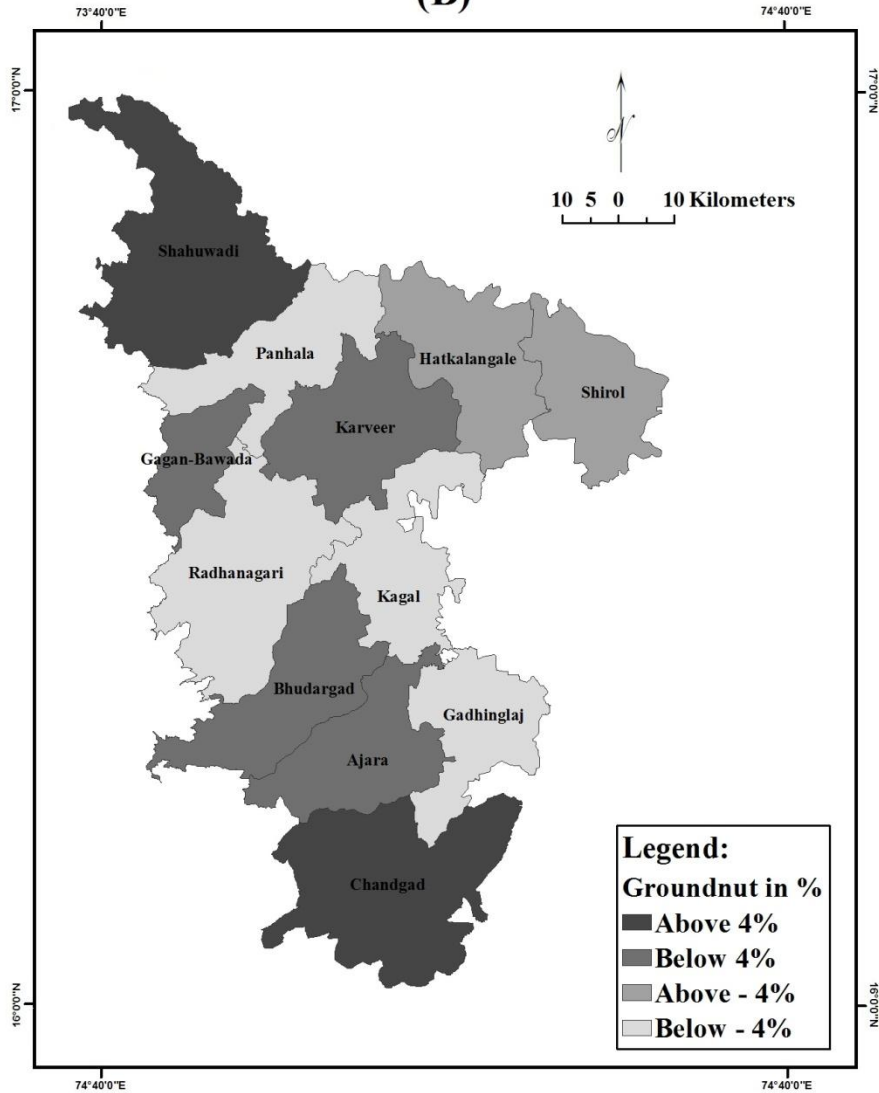
The area under groundnut is about 11.53 per cent of the gross cropped area of the study region during the period of investigation. But during the period of investigation its volume of change is about -0.72 per cent. The significant proportion of cultivated land under this crop is confined (7 to 14 %) to the central part of the region (Map 4.13 A). The spatial distribution of area under groundnut differs from tahsil to tahsils. Below 7 per cent gross cropped area under groundnut was noted in Gaganbavada, Radhanagri and Shirol tahsils of the study region. Whereas 7 to 14 per cent area under groundnut was recorded in Panhala, Shahuwadi, Bhudargad, Ajara, Karveer, Chandgad and Hatkangale tahsils of the study region during the period of investigation. Above 14 per cent area under groundnut was found in Kagal and Gadhingalaj tahsils of the study region.

Kolhapur District Groundnut Cropping 1997-2002 (A)



Map. No. 4.13 (A)

Kolhapur District
Volume of Change in Groundnut Cropping
1985-90 to 1997-2002
(B)



Map. No. 4.13 (B)

Both negative as well as positive changes were noted under gross cropped area of the groundnut. Below 4 per cent negative change was noted in area under groundnut in Radhanagri, Kagal, Panhala and Gadhinglaj. While above 4 per cent negative change was recorded in the area under groundnut in Shirol and Hatkangale tahsils of the study region. The edible oil seed like groundnut was replaced by the cash crops like sugarcane; wheat and fruits in the study region. Most of the tahsils in the study region has recorded positive change in the area under groundnut. The area under groundnut was increased during the period of investigation. Below 4 per cent positive change was recorded in Bhudargad, Karveer, Ajara and Gaganbavada. Whereas above 4 per cent positive change in the area under groundnut of gross cropped area was noted in Shahuwadi and Chandgad tahsils of the study region (Map 4.13 B). The area under groundnut has decreased particularly in Hatkangale, Shirol, Gadhinglaj, Panhala and Kagal tahsils very noteworthy in the study area.

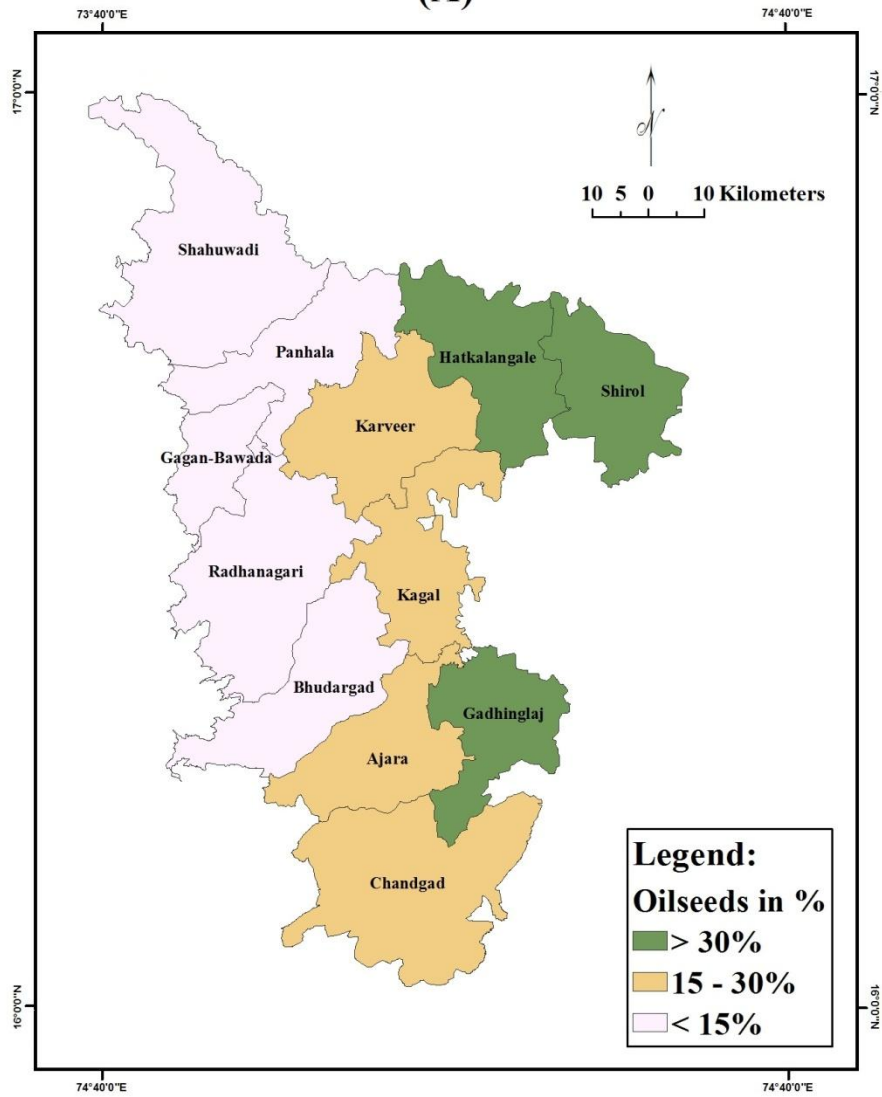
OIL SEEDS

Oil seeds grown in the region includes grounds, castor, sesamum, safflower seeds etc. which together constitute about 22.83 per cent of the gross cropped area of the district (11.27 % state). The area under oil seeds has increased 102 per cent during study period.

The area under oil seeds increased, below 15 per cent in Gaganbavada, Rahanagari, Bhudargad, Panala and Shahuwadi tahsils of the study region. While the moderate (15-30 %) change were recorded in the area under oil seeds in Ajara, Chandgad, Karveer and Kagal tahsil. Above 30 per cent area under total oil seeds was noted in Gadhingalaj, Hatkangale and Shirol tahsils of the study area. The regions average was noted 22.83 per cent under this edible oil seeds (Map 4.14 A).

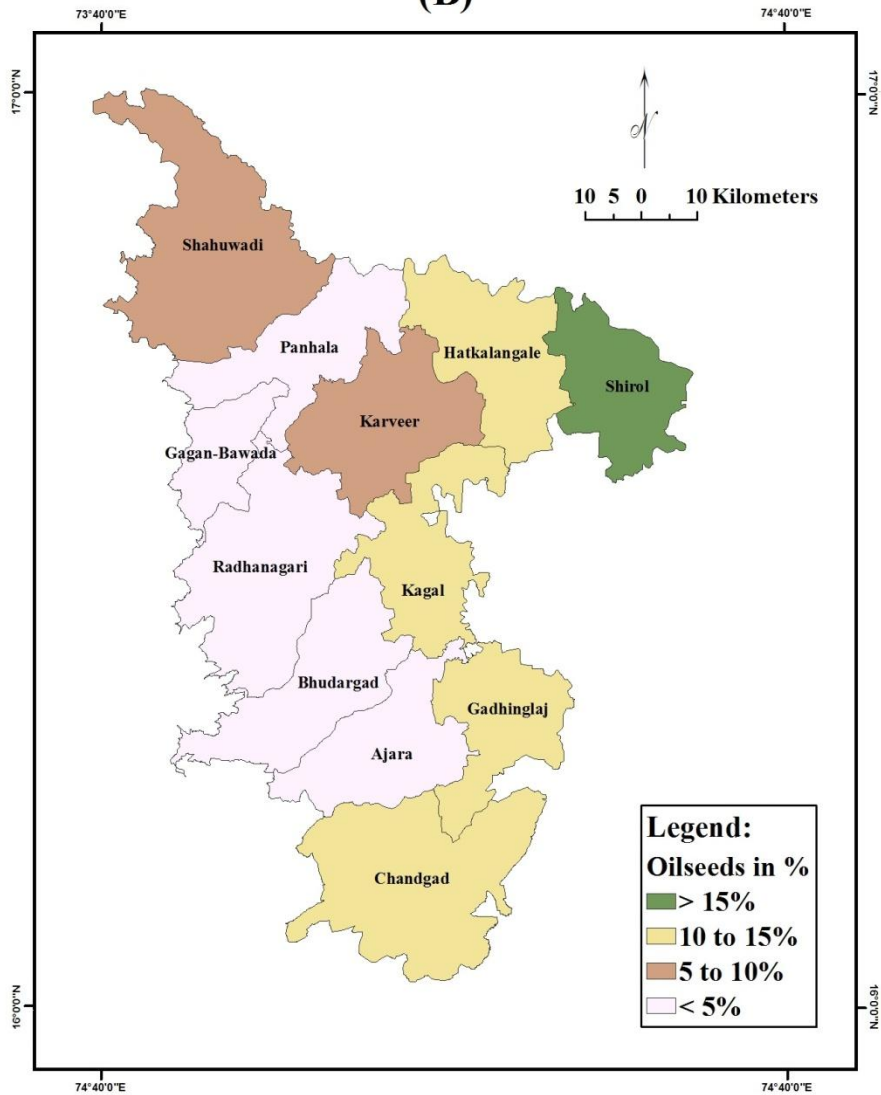
The regions as a whole have recorded only positive change under oil seeds. An increase below 5 per cent was noted in Radhanagri, Bavada, Bhudargad, Panhala and Ajara tahsils. While 5 to 10 per cent change in the area under oil seeds was recorded Karveer and Shahuwadi.

Kolhapur District Oilseeds Cropping 1997-2002 (A)



Map. No. 4.14 (A)

Kolhapur District Volume of Change in Oilseeds Cropping 1985-90 to 1997-2002 (B)



Map. No. 4.14 (B)

Above 15 per cent change in the area under oil seeds was recorded only in Shirol tahsil of the study region during the period of investigation (Map 4.14 B).

Pulses

Pulses are important in the cropping pattern of the study region. They are grown in both rabbi and kharif season occupying about 4.70 per cent of the gross cropped area (16.68 % state). The region produces varieties of pulses. However principal pulses are gram, mung, tur, udid, kulthi, wal, math, arhar and watana etc. they are mainly practiced as an intern cropping and are largely rain fed. The variation in cultivation of pulses is largely influenced by agro-climatic conditions. It varies from 0.75 per cent in western tahsils to 7.65 per cent in semi-arid eastern tahsils (Map 4.15 A).

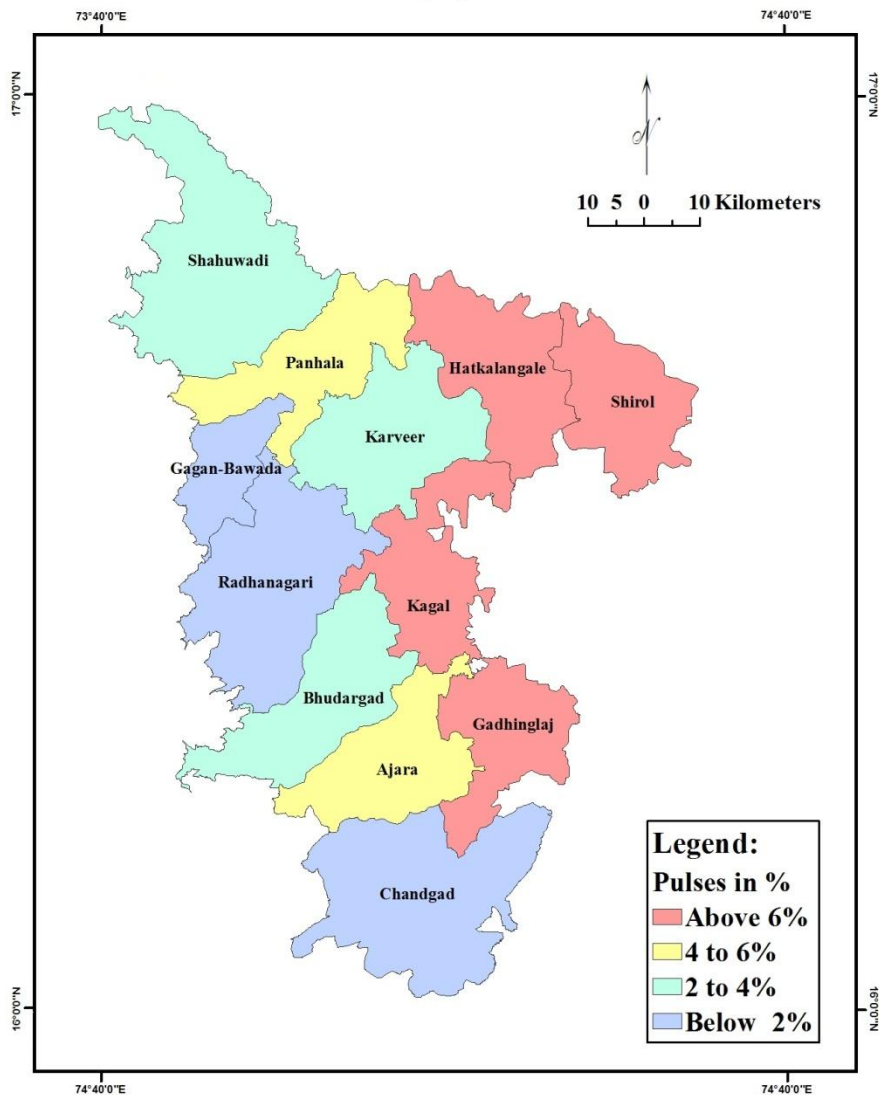
Below 2 per cent area was found under pulses in Gaganbavada, Chandgad and Radhanagari tahsils, while 2 to 4 per cent area was found under cultivation of pulses in Bhudargad, Shahuwadi and Karveer tahsils in the study region. There were 4 to 6 per cent area was registered under pulses in Ajara and Panhala tahsil. Above 6 per area under pulses was found in Gadhinglaj, Kagal, Shirol and Hatkangale tahsils of the study region during the period under investigation.

Both negative as well as positive changes have been found under the area of pulses in the study region (Map 4.15 B). Below 2 per cent negative change was recorded in the area under pulses in Karveer, Ajara, Radhanagari and Hatkanagale tahsils of the study region. Above 2 per cent negative change was registered in Kagal and Shirol tahsils of the study region. The positive change in the volume of cropping of pulses was recorded nearly half of the tahsils in the study region.

Below 1 per cent change in the volume of cropping under pulses was found in Chandgad, Bavada and Shahuwadi tahsils whereas 1 per cent positive change was recorded in Gadhinglaj, Bhudargad and Panhala tahsils during the period of investigation.

The area under pulses has decreased by 22.44 per cent during the period of investigation. Such decline is mostly related to the adoption of HYV of jowar, rice and

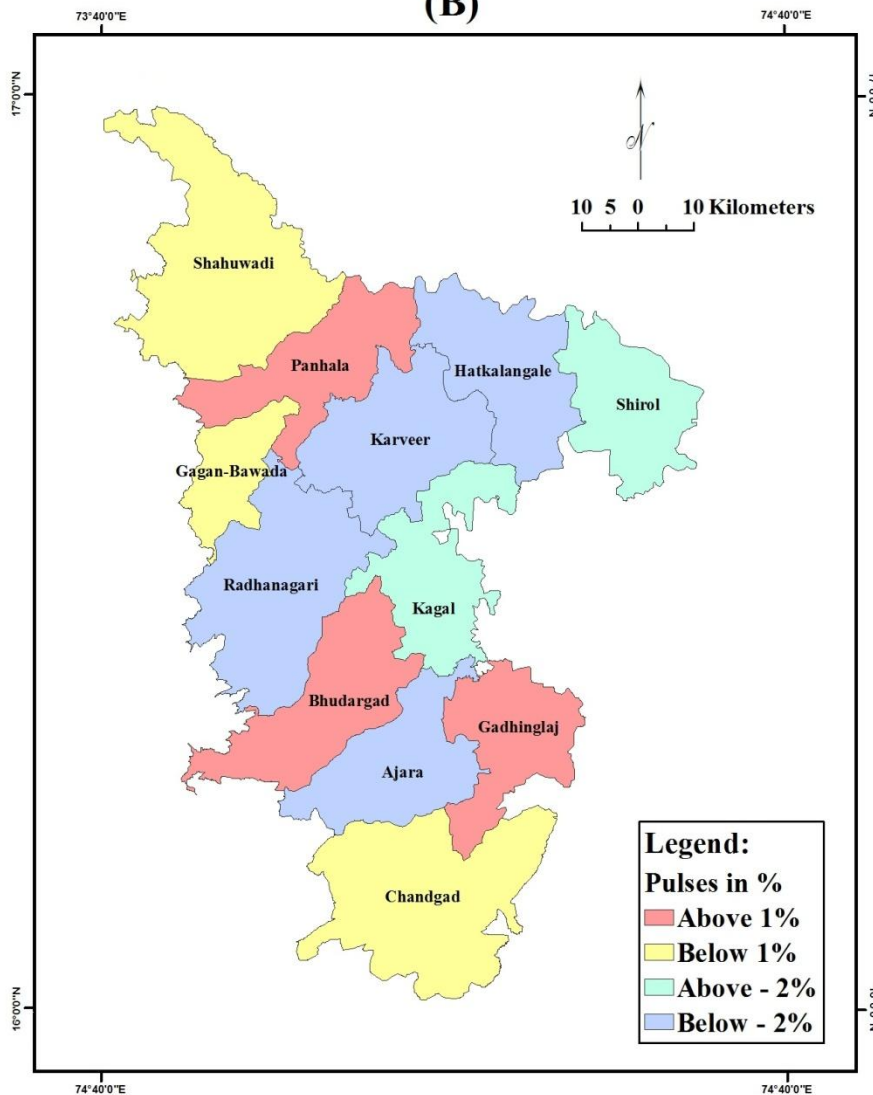
Kolhapur District Pulses Cropping 1997-2002 (A)



Map. No. 4.15 (A)

Kolhapur District Volume of Change in Total Pulses Cropping 1985-90 to 1997-2002

(B)



Map. No. 4.15 (B)

Wheat and sugarcane replacing pulses. Such decline is mostly notable in the eastern irrigated tahsils like Shirol (-12.85%), Kagal (-3.01) and Hatkangale (-1.95) and Radhanagari (-1.85 5%) in the study region during the period of investigation.

GRAM

Gram is important industrial crop which provides raw material to dal mills. It is eaten raw, but also made in dal and eaten boiled in a variety of ways, and its flour is used in many sweetmeats. It is an important crop for livestock. It also constitutes important chain in rotation system of crops from the point of view of soil management. Gram is a cold-weather crop. Gram a rabbi crop is generally a rain fed crop and rarely needs supplemental irrigation. It is generally sown in the end of September and in the beginning of October and takes about five months to harvest.

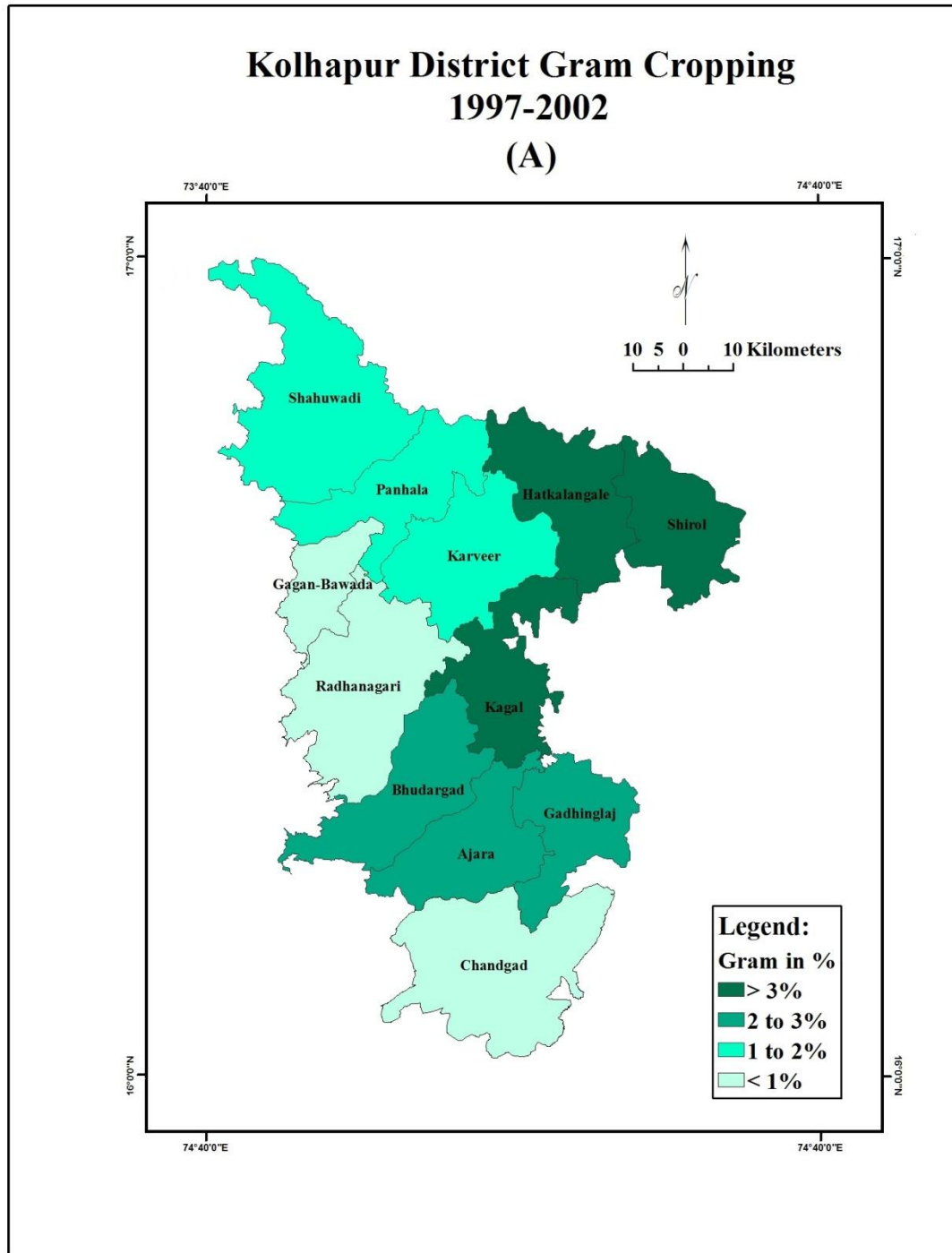
It shares about 2.28 per cent of gross cropped area of the study region (3.60 % state average). Generally it is taken in each tahsil of the study region as little as some proportion, though it is significant in Shirol, Hatkangale and Kagal tahsils of the study region. The area under gram is varies from tahsil to tahsils of the study region.

Out of the total gross cropped area below 1 per cent area was recorded in Chandgad, Gaganbavda and Radhanagari tahsils of the study region while 1 to 2 per cent area was found in Shahuwadi, Karveer, Bhudargad and Panhala tahsil. Whereas 2 to 3 per cent area was noted in Ajara and Gadhinglaj tahsils and above 3 per cent area under gram was recorded in Hatkangale, Kagal and Shirol tahsils during 1997-2002 (Map 4.16 A).

Both positive and negative changes in area under gram were recorded in the study region. Below 1 per cent negative change in area under gram was recorded in Shahuwadi, Panhala and Hatkangale. Above 1 per cent negative change in its area was recorded in Ajara and Radhanagri tahsils of the study region. Below 1 per cent positive change was confined in Chandgad, Gaganbavada and Karveer tahsil of the study region. Whereas 1 to 2 per cent change in its area notable in Bhudargad and Gadhinglaj tahsils. Above 2 per cent positive change in its area was recorded in Shirol and Kagal tahsils of the study region during 1985-90 to 1997-2002 (Map 4.16 B).

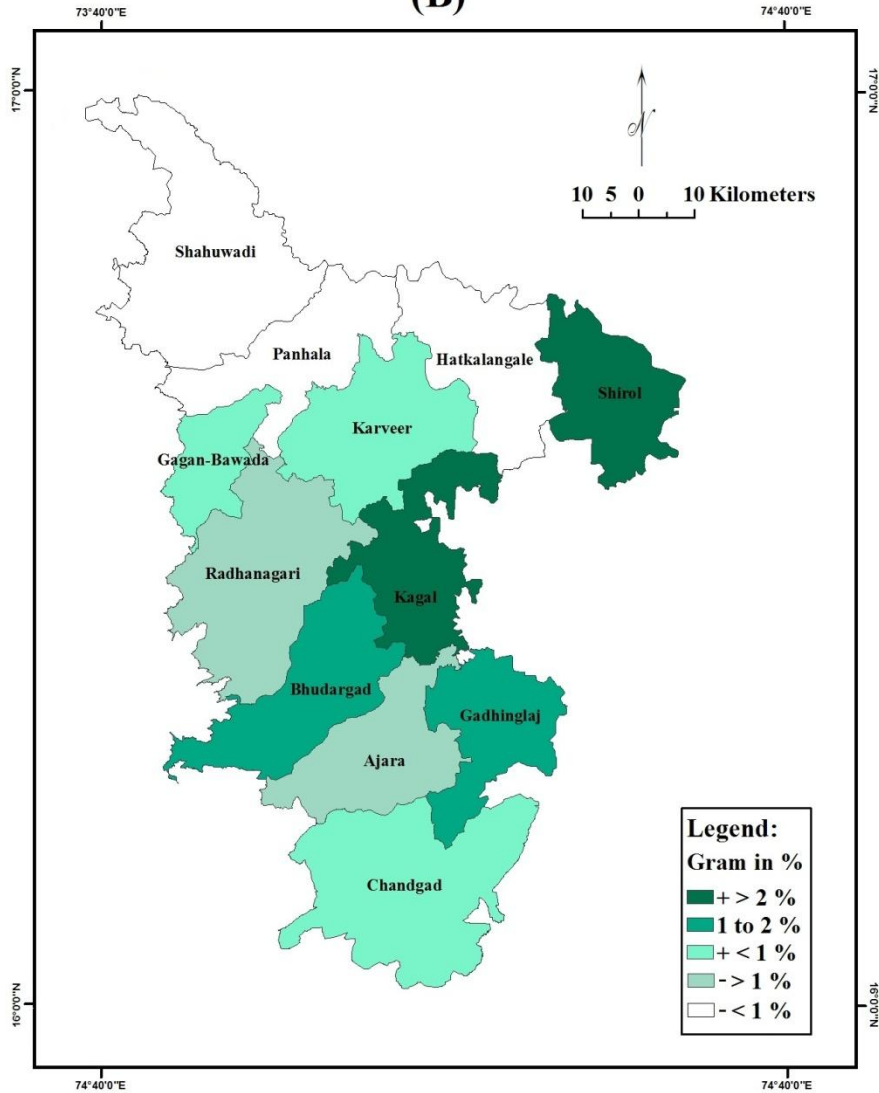
Kolhapur District Gram Cropping 1997-2002

(A)



Map. No. 4.16 (A)

Kolhapur District Volume of Change in Gram Cropping 1985-90 to 1997-2002 (B)



Map. No. 4.16 (B)

Though the insignificant proportion of area under gram was observed in western tahsils of the district where the tendency of the farmers to grow the other cash crops like sugarcane.

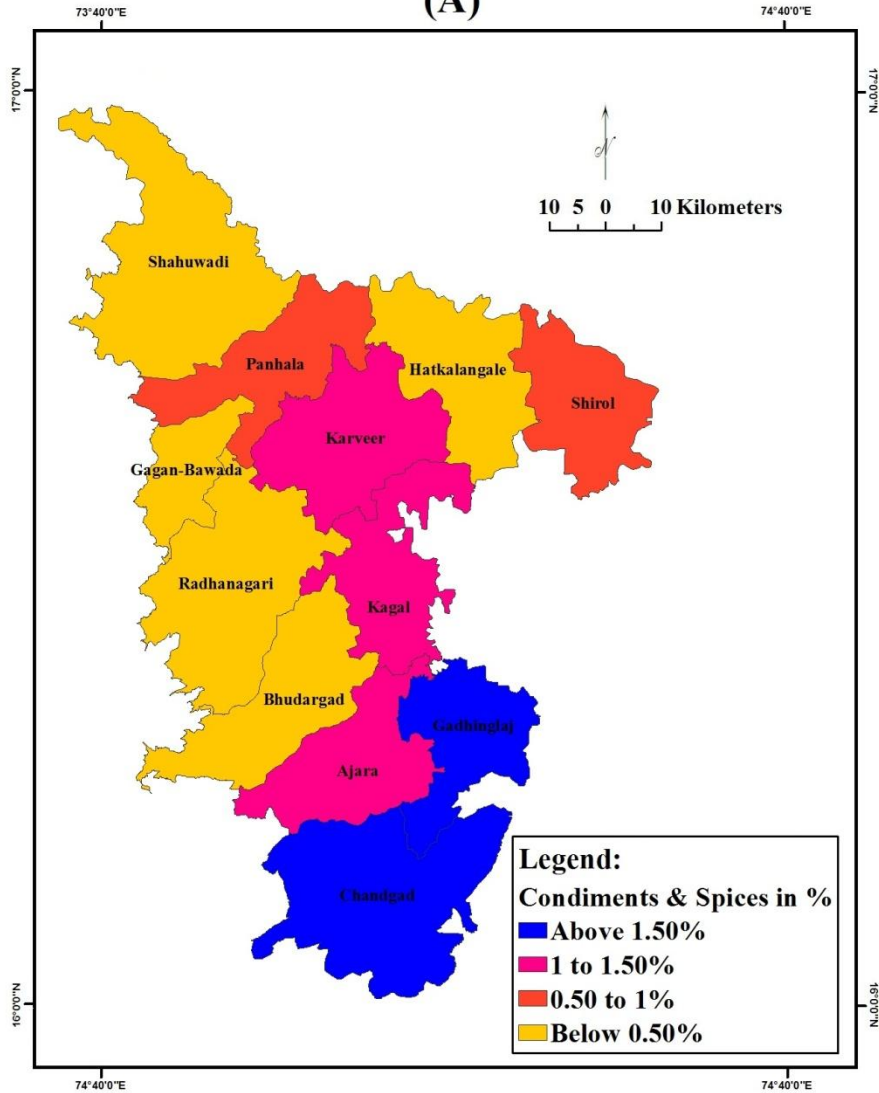
CONDIMENTS AND SPICES

This group of crops includes chillies, turmeric, ginger, onion, garlic, coriander and other spices. Its share is about 1.06 per cent of gross cropped area (0.68 % state) of the study region. However, they are important as they contribute to the economy of the peasantry. Chillies were taken in an area of 5122 hectares of the gross cropped area of the study region. It has taken leadly in Gadhinglaj, Chandgad, Kagal, Karveer and Ajara tahsils. 'Shankeswharee' chillies of Gadhinglaj are famous even outside the state.

Out of the gross cropped area, below 0.50 per cent area was found under total condiments and spices in Bavada, Shahuwadi, Radhanagri, Bhudargad, and Hatkanagle tahsils of the study region during 1997-2002. There were 0.50 to 1 per cent area was found under this category of crops in Shirol and Panala tahsils of the study region. It has 1 to 1.50 per cent area been found under this category of crops in Karveer, Kagal and Ajara tahsils of the study region. Above 1.50 per cent area was noted under this category in Chandgad and Gadhinglaj tahsils of the study region during the period of investigation (Map 4.17 A). Average area of the study region of this category is about 1.06 per cent.

Both, positive as well as negative changes of the area under this category were recorded during the period of investigation. Below 0.50 per cent negative change was recorded in Bavada, Panala, Bhudargad and Radhanagri tahsils of the study region. There was 0.50 to 1 per cent negative change was recorded in Gadhinglaj, Kagal and Hatkangale tahsils of the study region. Above 1 per cent negative change was recorded in Shirol tahsil of the study region. Below 0.50 percent positive change was noted in Shahuwadi, Ajara and Karveer tahsil. Above 0.50 per cent change was noted in Chandgad tahsil of the study region during 1997-2002 (Map 4.17 B). Average change of the study region was 0.33 per cent during the period of investigation.

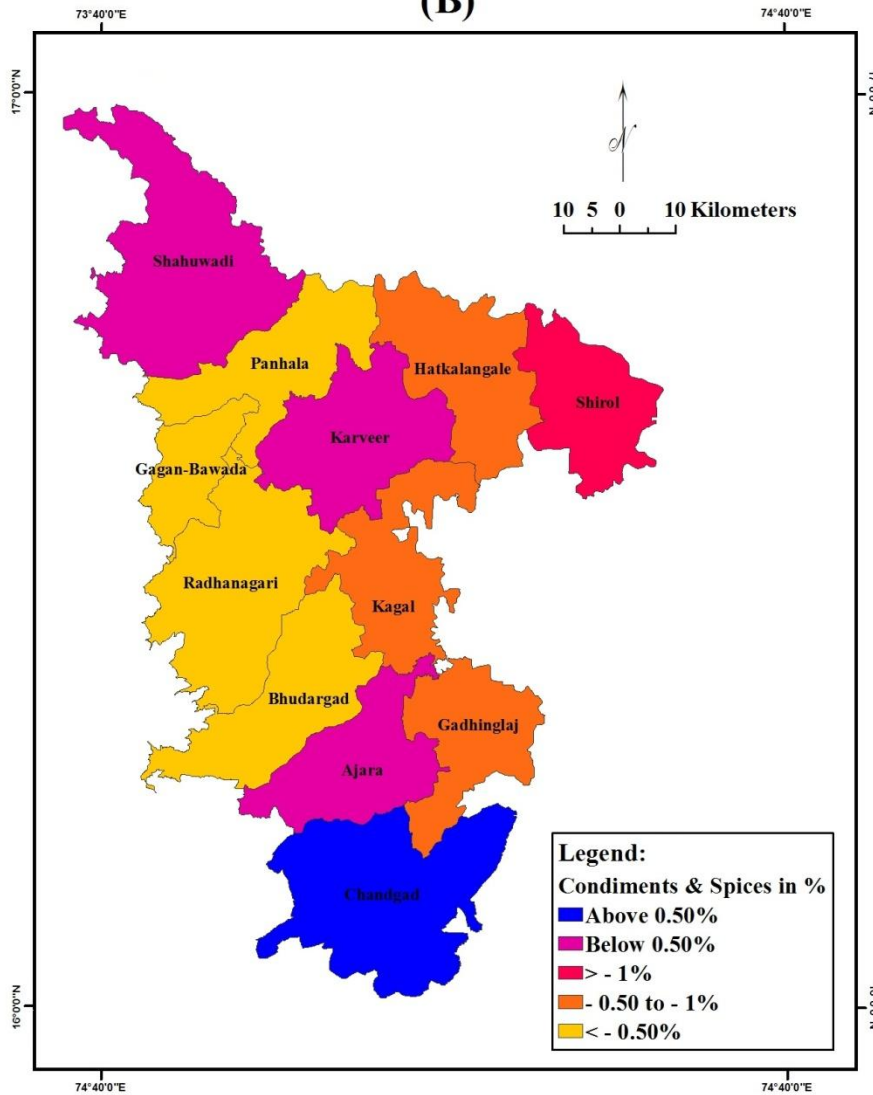
Kolhapur District Condiments & Spices Cropping 1997-2002 (A)



Map. No. 4.17 (A)

Kolhapur District Volume of Change in Condiments & Spices Cropping 1985-90 to 1997-2002

(B)



Map. No. 4.17 (B)

FRUITS AND VEGETABLES

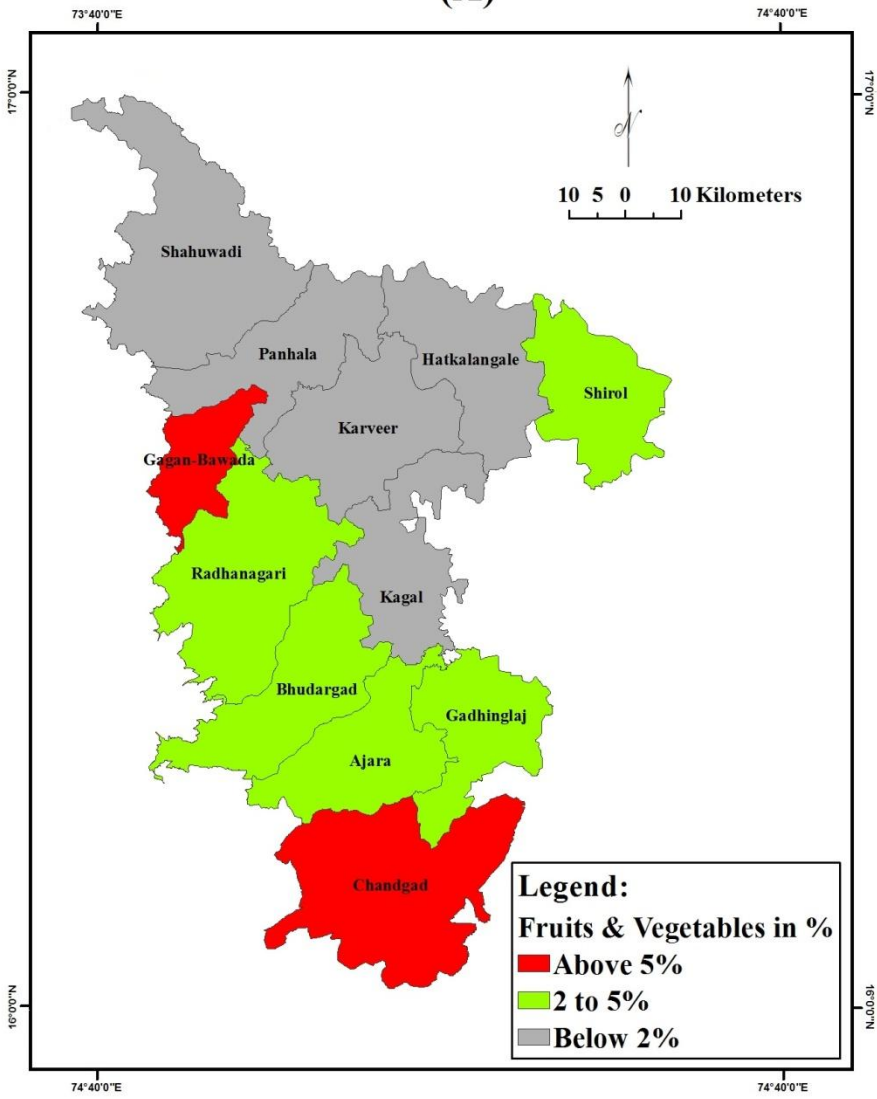
Varieties of fruits and vegetables are grown in the study region together sharing about 1.94 per cent of the gross cropped area (3.76 % state) during 1997-2002. There were bulbs vegetables are grown in the study region. However, they are known as root crops, among them potato, carrot, onion, garlic, radish, sweet potato are taken for the need of the peasantry. Some of them are eaten either raw or roasted chiefly on fast days.

There were thirteen fruit vegetables are grown in the study region. There were types of cucumbers, pumpkin (red), bottle gourd, snake gourd, brinjal, tomato etc. taken in the study region. The pod vegetables like okra, French bean, cluster bean, dubble bean, pavata, hudga, shevaga are grown in the study region. There were varieties of fruit trees are grown in the study region. However, mango, pineapple, jujube, tamarind, pomegranate, wood apple, bananas, lime, cocoanut, orange, guava, phanas, ramphal and sitaphal are important in the study region. Except there were many types of flowers are grown in the study region.

The area under vegetables and fruits varies from tahsil to tahsils in the study region. Out of the gross cropped area below 2 per cent area was recorded in Shahuwadi, Panala, Karveer, Kagal and Hatkanagale tahsils while 2 to 5 per cent area was found in Bhudargad, Shirol, Gadhinglaj, Radhanagri and Ajara tahsils. Above 5 per cent area was noted in Chandgad and Gaganbavada tahsils of the study region during 1997-2002 (Map 4.18 A).

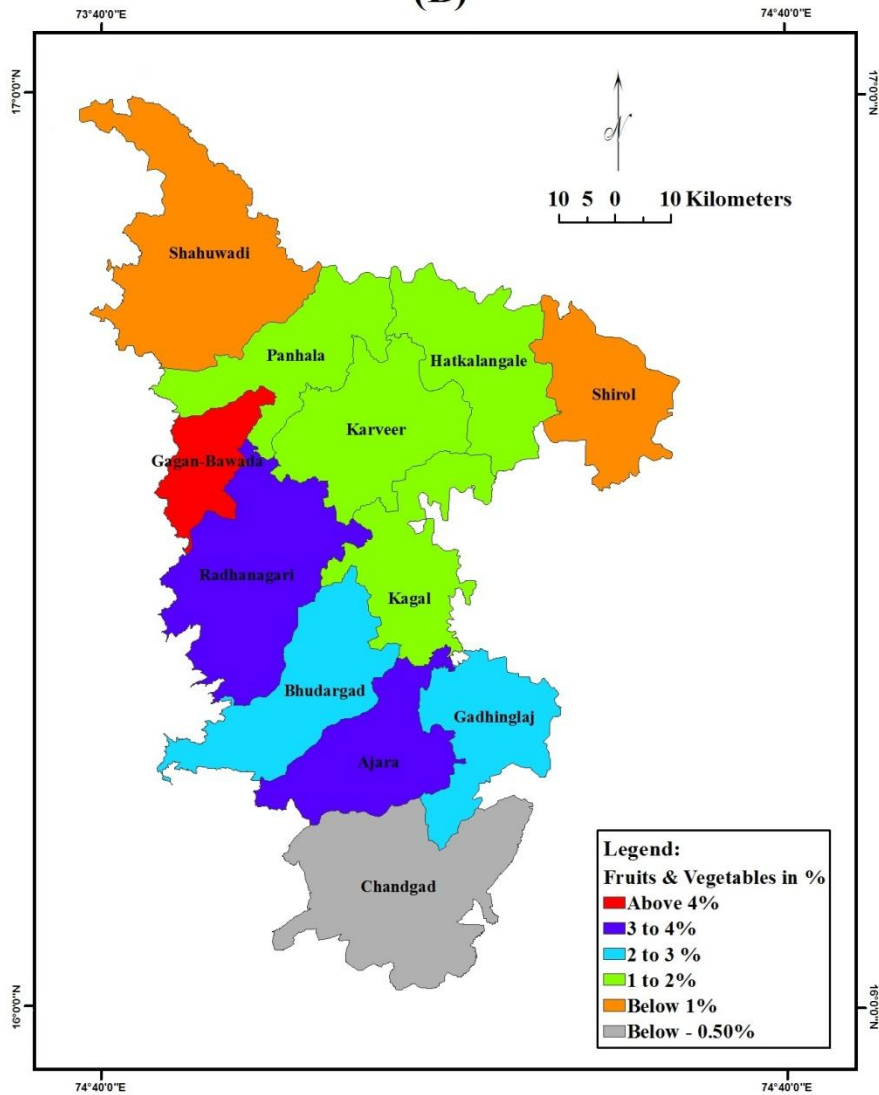
Only one tahsil has recorded negative change in the area under fruits and vegetables that is Chandgad and it is 0.11 per cent. The remaining tahsils have recorded positive change in its area under fruits and vegetables. Below 1 per cent change in the area under this category was recorded in Shirol and Shahuwadi tahsils. There were 1 to 2 per cent change in its area under fruits and vegetables was noted in Hatkanagale, Karveer, Panala and Kagal tahsil, whereas 2 to 3 per cent change was noted in Radhanagri and Ajara tahsils of the study region. Above 4 per cent change was recorded in the area under fruits and vegetables in Gaganbavada tahsils of the study region during 1997-2002 (Map 4.18 B).

**Kolhapur District
Fruits & Vegetables Cropping
1997-2002
(A)**



Map. No. 4.18 (A)

Kolhapur District Volume of Change in Fruits & Vegetables Cropping 1985-90 to 1997-2002 (B)



Map. No. 4.18 (B)

SUMMARY

There were many changes took place in the landuse pattern of the study region during the period of investigation. The net sown area of the district was increased from 440018 to 455085 hectares. Table 4.1 indicates tahsil wise trends in general landuse of the study region. Nearly 35.77 to 87.94 per cent of the total geographical area is under cultivation. It differs from tahsil to tahsils because of the varied factors affecting on them.

The area under forest was loosed by 2.28 per cent from 1985-86 to 2002-2003 in the study region. The tahsils situated in the western part of the study region have lost the area under forest. The proper area under forest was recorded in Bhudargad and Gadhinglaj tahsils of the study region.

The area of the land not available for cultivation in the study region is about 10.07 per cent. This is an equal to Maharashtra state. Land not available for cultivation was recorded in Radhanagri, Shahuwadi, Chandgad and Karveer tahsils in the study region.

The study region has 3.47 per cent land as fallow land. Bhudargad, Panala and Ajara tahsils have more than 5 per cent fallow land. Gaganbavada tahsils have only 1.33 per cent fallow land. Remaining tahsils have moderate proportion of fallow land.

There was 58.62 per cent area recorded as net area sown of the study region. Gadhinglaj tahsil has recorded highest net sown area (87.94 %) of its gross cropped area followed by Kagal, Shirol and Hatkangale tahsils of the study region. Radhanagri tahsil has recorded very least net sown of the study region.

The landuse efficiency of the district was increase from 112.92 to 126.48 times during 1985-86 to 2002-2003. Every tahsils has increased its landuse efficiency except Hatkangale and Kagal tahsil of the district.

Cropping pattern of the district has been changed during the period of the investigation. The dominance of the rice was seen followed by oilseeds particularly groundnut, sugarcane and jowar crops of the study region. The gross cropped area increased from the beginning of the 1st quinquennium upto 2000-2002. The decreasing

trend has been shown by all cereals in the study region. Sugarcane is the cash crop, it has shown increasing trend from Ist to IInd quinquennium. The remaining crops have shown negative change in its area except fruits and vegetables it has recorded positive change its area.

The area under total cereals decreased from 37.88 per cent 33.37 per cent IInd to IIIrd quinquennium. Share of the sugarcane to the gross cropped area was 17.44 per cent it has increased by 31.75 per cent during IInd to IIIrd quinquennium. The area under groundnut was decreased but area under total oil seeds increased by 138.31 per cent in this quinquennium. The area under fruits and vegetables are doubled. The share of the remaining crops was decreased among them total condiments and spices, total fibers, drugs and narcotics. Fodder crops had shown decreasing trend during this quinquennium.

The gross cropped area still increased from Ist quinquennium to 2001-2002. The decreasing trend has been shown by the cereals except wheat and maize during this period. Farmers in the study area were thinking about cultivation of the sugarcane. The area under sugarcane was increased followed by pulses, fruits and vegetables, oil seeds. The fiber crops in the study region are on its vanishing stage followed by total drugs and narcotics.

Now the increasing trend of sugarcane, groundnut, fruits and vegetables in the study region is favorable for the functioning of the agro-based industries.

From 1985-86 to 2001-2002 there is the decreasing trend in the area under total cereals. The total cereals have been shared by 31.74 per cent among them 19.35 per cent acquired by rice followed by jowar, wheat and maize of the gross cropped area.

Tahsils of the western hilly portion of the study region are having an area under rice. Rice being taken as a food crop in Bhudargad, Radhanagari, Karveer, Panala, Shahuwadi, Chandgad, Ajara and Gaganbavada tahsils of the study region. It has shown decreasing trend in every tahsil except Karveer tahsils.

Jowar has acquired 4.64 per cent area of the gross cropped area of the study region. Hatkangale (13.71%) is the leading tahsil who have an area under jowar

followed by Kagal, and Gadhinglaj, remaining tahsils have very little area under jowar. Jowar has shown that the decreasing trend in its area in the study region during 1985-86 to 2001-2002.

Wheat has taken on 1.39 per cent area gross cropped of the study region. Total pulses have 4.70 per cent area of the gross cropped area of the study region. Though the area under pulses was decreased by 1.36 per cent at the time of 1985-86 it has been taken on area about 6.06 per cent of gross cropped area. Gram has an area about 2.28 per cent of the gross cropped area during 2001-2002. The area under total pulses was constantly decreased in the study region.

Sugarcane is a cash crop; therefore farmers have taken it effectively on the area of about 17.80 per cent of gross cropped area in the study region. Sugar industries have given incentives to the farmers in the study region. Every tahsil has taken sugarcane as a cash crop therefore every tahsil has an area under sugarcane. However, it is leadely taken in Shirol, Karveer, Hatkangale, Kagal, Panala, Radhanagari and Gaganbavada tahsils of the study region.

Total oilseeds have an area about 22.83 per cent of the gross cropped area of the study region during 2002-2002. It has an area about 13.71 per cent in 1985-86. It has taken in Hatkangale, Shirol, Gadhinglaj, Kagal, Karveer and Chandgad tahsils.

The area under groundnut is about 11.53 per cent of the gross cropped area of the study region. It was 12.25 per cent in 1985-86. It has decreased by 0.72 per cent. It has taken in Gadhinglaj, Kagal, Hatkangale, Karveer, Chandgad and Ajara tahsils of the study region.

Fodders are taken over an area about 18.09 per cent of the gross cropped area of 1997-2002. It was decreases about 3.42 per cent from 21.51 per cent of 1985-90. It is largely taken in Shahuwadi, Chandgad, Ajara, Radhanagri, Gadhinglaj, Kagal, Bhudargad and Karveer tahsils of the study region.

The study region is agriculturally developed. Therefore overall situation is favorable for the setting of the agro-based industries in the study region.

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CHAPTER- V

AGRO-BASED INDUSTRIES

CHAPTER V

AGRO-BASED INDUSTRIES

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- 5.2 AGRO- BASED INDUSTRIES
- 5.3 ROLE OF AGRO-BASED INDUSTRIES
- 5.4 NATURE AND SCOPE OF AGRO-BASED INDUSTRIES
- 5.5 KINDS OF AGRO-BASED INDUSTRIES
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CHAPTER V

AGRO-BASED INDUSTRIES

5.1 INTRODUCTION

A very high proportion of India's working population is engaged in agriculture which contributes a very large share in the national income. In India about 70% of the working population is engaged in agriculture and its contribution in national income is 40 per cent. Mainly the rural economy depends on the production of agricultural commodities. Per capita income of rural people is low so it suffers from unemployment and under employment, it deficient in capital, its low level of technology and poor economic organization.

Therefore rural industrialization is the only key for the rural development. Agriculture and industrial linkages are the keys of the development of rural areas of the nation. Hence Agro-based industries play very important role in strengthening industrial and agricultural linkages. it provides an excellent nexus which provides integrated development of both sectors and rural prosperity.

5.2 AGRO-BASED INDUSTRIES

The agro based industries are broadly categorized in the following types.

- Large scale industries involving large investment and high level of automation. It includes sugar, jute, cotton industries etc.
- Small scale industries are those who have medium investment and semi-automation. It includes edible oil mills, rice mills etc.
- Village and cottage industries are found in villages and run by rural households with very little capital investment and a high level of manual labour for Gul (Jaggery) and khandsari, pickles, papad etc.

5.3 ROLE OF AGRO-BASED INDUSTRIES

For the balanced economic growth of agriculture and industry the proper emphasis should laid on both the sectors. Development of industries cannot progress beyond a certain stage without the assistance of agriculture likewise; agriculture development beyond a certain stage is subject to industrial development. Industries depend on the agriculture for labour force, raw material and foreign

exchange required to import industrial machinery through agricultural exports. A prosperous agricultural sector provides market for industrial products industry, in its turn, fosters agricultural growth by providing fertilizers, pesticides, various agricultural implements, tractors etc. Further it will siphon off excess labour force from overcrowded agricultural sector and thus help to increase agricultural productivity. This is to say, surplus population depending upon land for their livelihood will be absorbed by the industrial sector and thus facilitate increased yield from land.

Agriculture and industry are complementary to each other, industrial expansion depends on the increase in agricultural production and agricultural improvements depend on industrial development. In this context, agro-industries which support agriculture and its process also produce the manufacture for the other goods there form.

The concept of agro based industries signifies the proximity and affinity between agriculture and industry and highlights the interdependence of industry and agriculture. In other words agro-industries must pave the way for the centralization of industries, wealth and power etc. We can use agro-industries to utilize our own men and material.

5.4 NATURE AND SCOPE OF AGRO-BASED INDUSTRIES

Agro industries depend not only on the outputs of agricultural and allied activities but also on the inputs in agriculture, like agriculture equipment, fertilizers and pesticides, agro industries are industries which-

- 1) Encourage greater input into agriculture,
- 2) It leads to better processing and conversion of agricultural commodities,
- 3) Ensure with returns of processed goods,
- 4) Increase agricultural production.

5.5 KINDS OF AGRO-BASED INDUSTRIES

It can be divided into two categories:

- 1) Processing industries,

2) Non processing industries.

In the case of processing industries the capital involved will be larger than the non-processing industries. The processing industries that use agricultural products as raw material are sugar industries, oilseeds industries, cotton industries, rice mills and fruit industries etc. Non processing industries are the cottage industries which use agriculture products. They are Coir industries, Mat weaving. These industries do not require large capital and highly technical knowledge. In the other hand ordinary villages can organize and run these industries. These industries absorb a large number of workers than the processing industries.

Agro-industries cover a broad spectrum of the industrial scene and technically speaking can include a small artisan in a village as well as a big spinning mill in the large sector. However most of the agro-industries having a base in the rural economy have low capital investment and fall in the small scale sector.

A majority of the rural man power depends on agriculture which is already threatened which heavy pressure on the land and in the other factors. The surplus workers are withdrawn from agriculture and absorbed into other occupations, farm output would not be suffered while the whole new output would be a net addition to the communities' income. The economic case for industrialization of densely populated backward countries rests upon this mass phenomenon of disguised rural unemployment. Thus the agro industries can solve the twin problems connected with the surplus of rural manpower and relieving the pressure of population on land thereby it is increasing the productivity of agriculture.

5.6 AGRO-BASED INDUSTRY IS THE ONLY SOLUTION

While formulating arrangements for processing of agricultural produce and for that including agro-industries in the rural sector care should be taken to see that such arrangements not only offer processing making services but at the same time involve the farmers in these arrangements. In this context that the processing of agricultural commodities will have to be undertaken in the co-operative sector on an increasing scale is inescapable.

5.7 CO-OPERATIVE BASE OF AGRO-INDUSTRIES

Co-operative base of agro-industries will lead to the decentralization of economic power and will lead to the community ownership of wealth instead of individual ownership of wealth. The only solution to avert the threat of monopoly of industries is the co-operatives. It harms no one's property, it harms no one's right. Joint organization of agro-industries will help in mobilizing capital. In a country where poverty and paucity of resources are rampant, co-operatives can get turned and motivate the people to serve more, invest more and to get more benefits. Outside finance can also flow freely to the co-operatives. These societies can set financial and technical assistance from agencies like the Central co-operative Banks, Industrial co-operative Banks, Industrial development Bank of India and Industrial co-operatives.

The development of agro-industries in the co-operative sector is important from many angles. They help to strengthen other co-operative services such as supply of agricultural credit, marketing etc. In a subsistence economy like ours, integration of co-operative services with agro-industries is vitally important if the farmers have to grow vigorously and steadily.

When and as compare the study region in this respect it has spread its tentacles of agro based industries in urban, suburban and rural areas. Where there is a favorable situation readily available. Therefore study region has made in strident progress towards abundant production of industrial crops e.g. Sugarcane. The district has fertile soil in the close vicinity of the river tributaries of river Panchganga, favorable climate, hard working farmers and growing irrigation facilities there.

5.8 SPATIO-TEMPORAL GROWTH OF SUGARCANE AREA

The Table No 5.1 shows that the spatio-temporal growth of area under sugarcane in the district. From the year 1970-71 to 2000-2001 the index number worked out for the growth of sugarcane hectare for each tahsil of the district. The year 1970-71 was treated as the base year for the calculation of index number of the growth of the area under sugarcane. From the table it shows that the area was shot out by more than two to three times in each tahsil except Panala, Chandgad, Gadhinglaj, and Karveer.

Table No. 5. 1

Kolhapur District: Spatio- Temporal Growth of Sugarcane

(Area in hectare)

Sr. No.	Tahsil	1970-71	Index No	1980-81	Index No	1990-91	Index No	2000-01	Index No
1	S. wadi	1468	100	1482	100.95	1592	108.44	8966	610.76
2	Panla	4210	100	3853	91.52	4606	109.41	28.67	68.10
3	H.gale	5257	100	7391	140.60	7835	149.00	16577	315.33
4	Shirol	4962	100	8578	172.87	10434	210.28	13924	280.61
5	Karveer	9700	100	11323	116.73	11681	120.42	15424	159.00
6	G.bavda	782	100	786	100.51	1095	140.00	5513	704.98
7	R.nagri	3836	100	5656	147.44	4647	121.14	7932	206.72
8	Kagal	2586	100	2420	93.58	2469	95.47	9964	385.30
9	B.gad	1774	100	2113	119.11	1398	78.80	6548	369.11
10	Ajara	752	100	826	109.84	1615	214.76	2621	348.54
11	G.laj	2898	100	3424	118.15	3627	125.15	4207	145.17
12	C.gad	1670	100	2190	131.14	3629	217.30	2257	135.15
	Dist.	39895	100	50042	125.43	54628	136.92	96800	242.63

Source: Socio economic review and District Statistical Abstract.

A considerable growth was noted in the Gaganbavada (704.98), Shahuwadi (510.76), Kagal (385.30), Bhudargad (369.11) Ajara (348.54), Hatkanangale (315.33), and Shirol (280.610).

The index value of the district was increased by 242.63 from 1970-71. The tahsils like Hatkanangale, Kagal, Shirol and Karveer come under the riverine track of the district. These tahsils have availed with the facilities of ample water for irrigation, fertile soil and agricultural inputs. The sugar factories were implemented different schemes for the development of sugarcane cultivation and to fulfill the demand of the raw material. There has been a phenomenal increase in the area of the sugarcane from 39,895 hectares to 96,800 hectares of the district. The area under sugarcane almost doubled during the last 30 years from 1970-71.

5.9 PROGRESS OF THE HARVESTED AREA OF THE SUGARCANE

There were 21 sugar factories working in the district. The sugar factories were registered the area under sugarcane as well as harvested area in different crushing seasons. Table 5.2 shows that the registered and harvested area of the sugarcane by the factories in the district.

Table No. 5.2

Kolhapur District: Progress of the Registered and Harvested Area of the Sugarcane by the sugar factories

(Area inhectors)

Sr.No	Year	Registered area	Index number	Harvested area	Index area
1	2007-08	197185	100	144704	100
2	2008-09	120067	60.89	119453	82.55
3	2009-10	126752	64.28	138429	95.66
4	2010-11	220770	111.96	167342	115.64
5	2011-12	221186	112.17	150130	103.75

Source: Regional Joint-Director (sugar) Kolhapur Region Kolhapur.

The index number was worked out to understand the progress in the area registered and harvested by the sugar factories. For this the last five years have been taken into consideration. It is observed from the table that there was decrease in the registered area of sugarcane in the year 2008-2009 and 2009-2010. Afterwards the area again increased by the 112.17 in the 2011-2012. As compare to the base year 2007-08 the sugarcane area registered by the factories was increased by 12.17 percent.

The harvested area of the sugarcane was reduced as compare to the base year 2007-2008. It was reduced in the year 2008-09 and 2009-10 with 17.45 and 4.34 respectively. In the year 2010-11 again it was reduced by 11.89 per cent. There are some factories in the study region which have come down in the production of the sugar subsequently e. g. Ajara, Daulat, Dhudhaganga-Vedganga, Dr. D.Y.Patil SSK, Kumbhi-Kasari, Kasaba-Bavada etc. there is nothing to show the remarkable progress in its harvesting of sugarcane and production of sugar. It would not be beneficial to sugar industries.

5.10 SUGARCANE CRUSHING AND SUGAR PRODUCTION

The ever increasing demand of sugarcane from the sugar factories is most important. Sugarcane is the main raw material of the sugar factories and therefore the factories have come close vicinity of the sugarcane growing area. The following table shows that the year wise crushing of sugarcane and the sugar production, recovery of sugar and no of sugar factories in the district.

Table No 5.3

Kolhapur district: sugarcane crushing and sugar production

(Metric tons)

Sr.No	Year	S.cane Crush	Index Num.	Sug. Prod'n	Index. Num.	Sugar Rec	Sug. Fact.
1	2001-02	9869513	100	1144045	100	11.59	14
2	2002-03	9654147	97.82	1187591	103.80	12.30	17
3	2003-04	6019753	60.99	689668	60.28	11.46	19
4	2004-05	6373570	64.58	772301	67.51	12.11	19
5	2005-06	8767977	88.83	1094197	95.64	12.47	19
6	2006-07	10713372	108.55	1316250	115.05	12.28	19
7	2007-08	10369118	105.10	1331584	116.39	12.84	20
8	2008-09	8779528	88.95	1012529	88.50	12.37	20
9	2009-10	10897021	110.41	1337302	116.89	12.27	21
10	2010-11	12520159	126.86	1538103	134.44	12.28	21
11	2011-12	10649623	107.90	1349473	117.95	12.67	21
12	Total	104613781		12773043			

Source: Regional Joint-Director (sugar) Kolhapur Region Kolhapur.

Table 5.3 reveals the increasing trend in the sugarcane and production of the sugar. It is worked out by index number for the crushing and production of sugar from the year 2001-2002. The trend of sugarcane crush shows decrease from the year 2002-03 to the year 2005-06. After that it shows that the increased accept the year 2008-09. It again rest on 107.90 in the year 2011-12. It is true that the period crucial for the sugar factories especially in the co-operative sugar factories. At the time of begging of the crushing season the agitations from farmers are come out for the demand for the appropriate prices for the sugarcane. It is common at time of the crushing season. The

farmers' associations and their leader come on the road and commence the strikes severally against the crushing of the sugarcane. Now a day the prices of the sugar in the global markets come down so it is not affordable for the sugar factories to give the demanded prices for the sugarcane. It would not possible to give the ever increasing demand of farmers. In this situation the sugarcane crushing seasons were delayed for long period.

As compare to the sugarcane crushing the production of the sugar went up but sometimes it come down and expected production sugar production severely affected. In the year 2003-04 to 2005-06 the index number of production came down and it is rest on 95.64. There were some reasons behind them e.g. recovery of sugar, droughts, shortage of water for irrigation. In this situation the production of sugar comes down and sugar is affected. Form the table it assumes that the recovery of sugar in the district is more than 12 for this period. Kolhapur district is the leading in this respect as compare to the rest of Maharashtra.

There is a co-relation between the crushing of sugarcane and production of sugar produced. The purposefully the Karl Pearson method of co-relation co-efficient was used for the measurement of the intensity of the leaner relationship between the variable that is the crushing of sugarcane and production of sugar. The 'r' value was worked out by the formula accepted as under.

$$r = \frac{\frac{1}{n} \sum (a - \bar{a})(b - \bar{b})}{\sigma_a \cdot \sigma_b}$$

The calculated 'r' value is 0.97 and highly positive co-relation is between the variables. It would be proved from the calculated student's' test and it is 11.87, the calculated 't' value is greater than the critical table value at all level of knowledge. The formula for the student's' test was accepted and it is mentioned here for e.g.

$$t = r \times \sqrt{\frac{n-2}{1-r^2}}$$

5.11 SUGAR INDUSTRY IN KOLHAPUR DISTRICT

Kolhapur district is agriculturally developed district in Maharashtra with sugarcane and paddy. The endowment of nature is beneficial for the development of agriculture in the district. Geographically the district is divided into

two areas that are hilly and plain areas. There are seven tahsils are in the hilly area and remaining five tahsils come under the plain areas. The district has the wide network of the rivers on which different points Kolhapur type's water weirs become constricted. It is the ample source for irrigation of agriculture. The Radhanagri Dam was constructed for the irrigation by the Rajarshi Shahu Maharaj and it is the historic beginning of the agro-industries like sugar factories in the district.

The main thasils of sugarcane producing are Shirol, Hatkangale, Karveer, Kagal, Gadhinglaj, and some western tahsils e.g Chandgad, Ajara, Radhanagari, Shahuwadi and Panhala also produce the sugarcane. There is a way which goes through the development of agriculture and agro-based industry e.g. sugar industry. The sugar industry is raw material oriented agro-based industry therefore the sugar industries are located in the sugarcane producing areas. Kolhapur district is the leading district in the field of co-operative movement in the state. The development of co-operative societies in the district is not in the particular sector but in the every field of life.

The Kolhapur district has made a marked development in the field of sugar factories, spinning mills, credit co-operative, and urban co-operatives banks etc. The local leadership is important for the development of co-operatives sector. A large group of spiritual people is behind the development of the co-operative sector of the district. The spatial distribution of sugar industries is related to sugarcane cultivation, because sugarcane is the single most important source of raw material. There is an increasing demand of sugarcane from the sugar industries has increased the areal extent and demand from sugar factories since most of the sugar factories established and started their crushing of sugarcane.

Sugarcane is mainly used for the making of sugar. Therefore the development of sugarcane cultivation largely depends upon the sugar factories. There were 21 sugar factories producing the sugar from sugarcane in their command areas. The distribution of sugar factories is not even because sugar factories largely depend upon the raw material. Sugar industries are confined to cane growing areas. It is clearly seen that the areas of high intensity of cane have recorded large number of factories e.g. Karveer, Hatkangale, Kagal, Chandgad, each has three sugar factories. Shirol tahsil has two sugar factories. Most of the sugar factories are located in the

central sugarcane producing area of the district. The area has favorable condition for the cultivation of sugarcane which has give promotion for the growth of the sugar factories. Near about each tahsil there is a sugar factory.

The perishable nature of sugarcane and cost of transport are the important factors of the location of the sugar factories. Cane is the cumbersome raw material and costly to transport from its producing area to the site of the sugar factory. Therefore each factory has its particular command area (about 20 km radius from the factory site). Therefore it is more economical to the halt and short as possible. Therefore sugar industries have to be located at the centre of their assigned area of sugarcane.

The assigned area of the sugar factories is not homogeneous in regard to their topographical, pedagogical and hydrological conditions of the area. This area has ample facilities of irrigation and fertile soil of river valley tract and transportation facilities. The sugar industries have assured to supply of raw material e.g. sugarcane.

The first sugar factory in the district was established in the private sector in the year 1932. However in the recent years majority of the sugar factories came into existence in the field of co-operative sector. The numbers of sugar factories have been increased in the district. There are many factors are responsible and favorable for this e.g. geographical condition, co-operative movement, local leadership, social and political worker etc.

The following table 5.4 shows the number of sugar factories and how they are increased so far. After the year 1970 majority of the sugar factories were started in the middle portion of the district. There is a fertile tract where sugarcane is grown on large scale. The tahsils like Hatkanagale, Karveer, Shirol, Kagal and Shahuwadi are leading producers of sugarcane.

Table No. 5.4

Kolhapur District: No of Sugar Industry

Sr. No	Year	No of sugar industries
2	1985-86	9
3	1990-91	11
4	1995-96	13
5	2000-01	14
6	2005-06	19
7	2010-11	21

Source: Socio economic review and District Statistical Abstract.

There were only 9 sugar industries in the district in the year 1985-86 (Table 5.4). In the year 2010-11 there are 21 sugar factories in the district among them 18 are working in the co-operative sector and 3 in the private sector. Though, the situation of the some factories is not satisfactory due to the mismanagement in the factories. There were two factories who have stopped their production and closed down at this moment. The Daulat Shetkari SSK Ltd. Halkarni Taluka Chandgad was closed from the year 2011-12. Udaisinha Gaikwad SSK Ltd. Sonavade-Bambavde Taluka Shahuwadi was stopped its crushing from 2012-13. Shree Datta SSK Ltd. Asurle-Porle Taluka Panhala has been soldout to Dalmia Sugar Pvt. Ltd.

There are some sick factories in the district that has been run by another management of the factory or firm on the lease basis. The factories run on lease basis among them a well-known factory like Deshbhakata Ratanappana Kumbhar Panchganga SSK Ltd Ganganagar Taluka Hatkangale, Ajara SSK Ltd.Gavase Taluka Aajara and Indira Gandhi Bharatiya Mahila Vikas SSK Ltd. Tambale Taluka Bhudargad is run on the Collaboration basis.

5.11.1 CO-OPERATIVE SUGAR INDUSTRIES

There are eighteen co-operative sugar factories established in the district. There is a strong base for the development of sugar industries in the district. These industries are established in the different tahsils of the district is as follows.

1. Doulat Shetkari Sahakari Sakhar Karkhana Limited, Halkarni, Tal-Chandgad.

The Doulat Shetkari Sahakari Sakhar Karkhana is located at Halkarni village in Chandgad tahsil of the district on the Kolhapur-Belgaum road. This factory was registered on 30th January 1970 with daily crushing capacity of 1250 M.T. and it started its production from the year 1977-78. The factory has 231 villages under the operational area and 219 villages which are out of factory area. In the year 2002-03 factory was working with 3500 T.C.D. The factory had crushed 3, 17,942 metric tons of sugarcane and produced 3, 89,590 quintals of sugar in 2010-11 and it was the last sugarcane crushing season. After that the factory had closed and stopped its sugarcane crushing and production of sugar due to the mismanagement.

2. Appasaheb Nalwade Gadhinglaj Taluka Sahakari Sakhar Karkhana Ltd Harali, Gadhinglaj, Taluka-Gadhinglaj.

This factory is the outcome of the efforts made by the great co-operator Appasaheb Nalwade. Now it is known with his name. The factory is situated at Halkarni village on the Kolhapur-Belgaum road in Chandgad tahasil of the district. The factory was registered on 30th January 1970 and started the production in the year 1977-78 with the 1250 M.T.D. In 1985-86 the factory had crushed 1, 20,251 metric tons of sugarcane and produced 2, 03,901 of sugarcane.

The present crushing capacity of the factory is 2000 TCD. In the year 2011-12 the factory crushed 2, 30,580 metric tons of sugarcane and produced 2, 84,790 quintals of sugar (Table no. 5.5) with crushing capacity of 2000 T.C.D.

3. Shree Chh.Shahu Sahakari Sakhar Karkhana Ltd Kagal, Taluka-Kagal.

This sugar factory was established on 21 February 1977. The factory is located on the N.H. 4 near the Kolhapur. The factory had started its sugar production 1980 with the initial capacity of 1250 T.C.D. At the beginning of the first crushing season the factory had crushed 78,513 metric tons of sugarcane and in the year 2011-12. It crushed 6,63,416 metric tons and produced 8,51,730 quintals of sugar of 3500 T.C.D. The factory has own different types of awards. e. g. Best Economic Management Award from state level as well as award for sugarcane development programme at national level. The factory has successfully raised its crushing capacity

from 3500 to 5000 metric tons per day as well as co-generating power project with 21.5m watts. The sugar factory has its area of function in 182 villages. The factory has an ISO 9001 company. Economically the sugar factory is in better position.

4. Shree Datta Shetkari Sahakari Sakhar Karkhana Ltd Shirol, Taluka-Shirol.

The factory had been established on 9th June 1969. It is a multistate co-operative sugar factory. The factory has been working for the area of sugarcane 87 villages from its functional area and 28 villages from the out state Karnataka. The Krishna and Panchaganga River flows in its area of operation. It was started with the initial capacity of 1250 metric tonnes but further it was increased with 7000 metric tonnes. Today the factory is working with 7000 T.C.D.it is well managed sugar factory. It is a multistate sugar factory. The founder of the factory is late Shreemant Vishvasrao Santajirao Ghorpade. The factory having all types at time of trial the factory has crushed 7347 metric tonnes. In 2011-12 the factory crushed 12, 29,241 metric tonnes of sugarcane and produced about 15, 20,950 quintals of sugar (Table no. 5.5). It has prestigious award the certain field while working.

5. Bhogavati Sahakari Sakhar Karkhana Ltd Shahunagar Parite, Taluka-Karveer

The factory is located at Parite. The Bhogavati Sahakari Sakhar Karkhana was established on 18th Oct.1955 with entailed capacity of 2000 T.C.D. Now it has a crushing capacity of 4000 T.C.D. The factory has completed fifty years in 2007-08. In the year factory crushed 3, 96,989 metric tones of sugarcane and produced 5, 11,100 quintals of sugar. In 2011-12 the factory was working with 4000 crushing capacity and crushed 4, 59,989 sugarcane and produced 5, 81,510 quintals of sugar (Table no.5.5).

6. The Kumbhi-Kasari Sahakari Sahakari Sakhar Karkhana, Kuditre, Taluka-Karveer

The Kumbhi-Kasari Sahakari Sahakari Sakhar Karkhana,Kuditre was founded by the Late D.C. Narke. This is the primary reason of the employment of the people who live in the villages nearby ‘Kumbhi’ and ‘Kassari’ rivers. This is the reason of the development in the nearby places. This factory was started in 1960 with

initial capacity of 1250 metric tonnes per day. Now the factory has an increased capacity of 3000 metric tonnes (Table no: 5.5).

In 2011-12 the factory had crushed 4, 60,903 metric tonnes and produced 4, 71,780 quintals of sugar and factory soon started new co-generation plant at kumbhi kasari at kuditre.

7. Deshbhakat Ratnappanna Kumbhar Panchaganga Sahakari Sakhar Karkhana Ltd, Inchalkaranji. Taluka-Hatkanagale.

The factory was established on 27th August 1955 with able leadership of Deshbhakat Ratnappanna Kumbhar. The initial crushing capacity of the factory was 1016 T.C.D. Now it has 5000 T.C.D (2011-12). At the beginning the factory had crushed 66,843 metric tonnes of sugarcane and produced 4, 24,624 quintals of sugar. During the year 2011-12 the factory crushed 5, 34,935 metric tonnes of sugar cane and produced 6, 50,000 quintals of sugar. Although the factory was facing the slowdown or recession and is run by another management of sugar factory on the basis of fair paid. The initial stage and at forwards the factory implemented various schemes of development in its functional area. Now days each and every sugar industry has been suffering due to the due production of sugarcane and decrease in sugar prices. There are 103 villages come under command area of the factory. The factory has completed 50 years in 2008-09 from its inception.

Table No. 5.5

Kolhapur District: Tahsilwise General Profile of the Sugar Factories 2011-12

Sr. No	Tahsil	Sugar factory	Nature	Estd.	Cr. Cap. (M.t)		Cane crusd. (M.t)	Sugar Prdn. (qtls)	Sugar Reco.
					Init.	Prst.			
			1	2	3	4	5	6	7
1	Shahuwadi	1. Udaisinha Gaikwad SSK Ltd.Sonawde-Bambavade	Co-op.	2001	2500	2500	3,05,786	3,75,050	12.26
2	Panhala	1. Shree Datta SSK Ltd. Asurle-Porle. / Dalmiya Sugar	Co-op. / Pvt.	1969	2500	2500	2,95,271	3,80,430	12.90
		2. Shree Tatyah Kore Warana SSK Ltd. Warananagar	Co-op.	1955	1016	7500	13,90,123	17,96,851	12.65
3	Hatkanagale	1. Jawahar Shetkari SSK Ltd.Hupari-Yalgud.	Co-op.	1990	2500	7500	13,48,298	16,69,230	12.37
		2. Panchaganga SSK Ltd. Ganganagar-Ichalkarangi.	Co-op.	1955	1250	5000	5,34,935	6,50,000	12.17
		3. Sharad SSK Ltd. Narande	Co-op.	1996	2500	2500	5,37,650	6,93,675	12.90
4	Shirol	1. Shree Datta Shetkari SSK Ltd. Shirol	Co-op.	1970	1250	7000	12,29,241	15,20,950	12.37
		2. Shree Guru Datta SSK Ltd. Takaliwadi	Pvt.	2003	2500	4200	6,02,420	7,85,120	13.04

(Table No: 5.2 Continued)

Sr.no	Tahsil	Sugar factory	Nature	Estd.	Cr.cap.init	Cr.cap.prst.	Cane crsd.	Sugar. Prdn.	Sgr.rec.
5	Karveer	1. Bhogavati SSK Ltd. Parite	Co-op.	1955	2000	4000	4,59,989	5,81,510	12.70
		2. Kumbhi-Kasari SSK Ltd. Kuditre	Co-op.	1960	1250	3000	4,60,903	6,00,130	12.98
		3. Chh. Rajaram SSK Ltd. Kasba-Bavada	Co-op.	1984	1250	2200	3,81,959	4,71,780	12.35
6	G.bavada	1 Dr. D. Y.Patil SSK Ltd. Vesaraf.	Co-op.	1994	2500	2500	3,61,141	4,46,100	12.36
7	Kagal	1 Chh. Shahu SSK Ltd. Kagal	Co-op	1977	1250	3500	6,63,416	8,51,730	12.83
		2 Dudhaganga-Vedganga SSK Ltd. Bidri	Co-op	1956	1250	4500	4,21,882	5,66,700	13.45
		3 Sadashivrao Mandlik SSK Ltd. Hamidwada.	Co-op	2003	2500	2500	4,34,433	5,56,921	12.79
8	B.gad	1 Indira Gandhi Mahila SSK Ltd. Tamabale	Co-op/ pvt.	2002	2500	2500	1,89,082	2,28,150	12.07
9	Ajara	1 Ajara SSK Ltd. Gavase	Co-op	1990	2500	2500	350922	44,640	12.96
10	G.laj	1 Gadhinglaj taluka SSK Ltd. Harli	Co-op	1974	1250	2000	2,30,580	2,84,790	12.33
11	C. gad	1 Dault SSK Ltd Halkarni	Co-op	1970	1250	3500	N.A	N.A	N.A
		2 Nalawade Sugars Ltd. Mahalunge	Private	2007	2500	2500	1,30,108	1,71,150	13.01
		3 Hemrus Technology Rajagoli	Private	2007	3500	3500	3,21,484	4,09,826	12.75

Source: Annual Report of the Sugar Industries.

**8. Shree Dudhganga-Vedganga Co-op. Sugar Factory Ltd, Bidri (Mouninagar).
Taluka-Kagal.**

This factory is namely Shree Dudhganga Vedganga Co-Operative Sugar Factory Ltd. Bidri (Mouninagar) located in Kagal tahsil. The site of the factory is on the bank of river Dudhganga. It was a historical dream of Rajarshi Shahu Maharaj of Kolhapur dynasty. He had established this factory because of which economic condition will become good of that area. The factory was established on 10th October 1956 with 1250 metric tons per day crushing capacity. At the first phase, the factory crushed 1, 11,830 metric tons of sugarcane and produced 2, 15,514 metric tons in 1963. Today the factory has 4500 T.C.D. crushing capacity. In the year 2011-12 the factory has crushed 4, 21,882 metric tons of sugarcane and produced 5, 66, 00 quintals of sugar (Table No. 5.5).

**9. Shree Tatyasaheb Kore Warna Sahakari Sakhar Karkhana Ltd,
Warnanagar. Taluka-Panhala.**

It is the most renowned sugar factory not only in Maharashtra state but in India too. This factory was established in 1955 and got industrial license in 1969. The factory has all time number one in respect to sugarcane crushing as well as sugar production in Maharashtra. The factory has taken another two factories to run on the fair paid basis. The sugar factory has completed 50 years of his beginning and celebrated Golden Jubilee year with prestigious Hon. Bharatratana Dr. A.P.J. Abadulkalam. The factory is a forefront runner in every field of social, economical, educational and cultural. Now the factory has 8015 metric tonnes in 170 days during the year 2011-12. The factory has crushed 13, 90,123 metric tonnes of sugarcane and produced 17, 96,851 quintals of sugar with 12.65 sugar recovery. The factory has its operational area within the district as well as multidistrict and multistate too. There were 80 village in its operational area and 134 other than the area of operation.

10. Ajara Shetkari Sahakari Sakhar Karkhana Ltd, Gawase. Taluka-Ajara.

This factory came into existence in 1989 by the letter of consent of central Government of India. It has approved the operation area in the tahsil of Ajara, District Kolhapur, Sawantwadi and Kudal tahsil of Sindhudurga District. During 1997 the actual crushing season was commenced at the time of beginning the factory has

2500 metric tonnes of crushing capacity still with this the factory has crushed 3,50,922 metric tonnes of sugarcane and produced 4,54,640 quintals of sugar in 2011-12.(table no.5.2). From 1997-98 to 2003-04 the factory was run by its own management for seven years. There after due to low intensity of rainfall and sugarcane diseases the factory came in to trouble and handed over to Shree Renuka Sugar's Private Ltd for five years (2004-05 to 2008-09) on lease basis. There after the factory also runs for two years by the Warna sugar factory from 2009-10 to 2010-11. From 2011-12 again the factory management has decided to run the factory on its own powers.

11. Sharad Sahakari Sakhar Karkhana Ltd, Narande. Taluka-Hatkanagale.

This factory got industrial license in 1996 with capacity of 2500 metric tonnes per day during 2011-12. The factory has crushed 5, 37,650 metric tonnes of sugarcane and produced 6, 93,675 quintals of sugar with 12.90 sugar recovery. The factory is now in its eleventh crushing season. The factory has purchased sugarcane harvesting machine from Brazil. The factory has received an excellent prize for technical efficiency by two times from Vasantdada sugar institute Pune in the years 2005-06 and 2009-10.

12. Shree Chhatrapati Rajaram Sahakari Sakhar Karkhana Ltd Kasbabavada, Kolhapur. Taluka-Karveer.

This factory was established in 1984 at the bank of Panchaganga River. Its initial capacity was 1250 T.C.D. Now it has 3000 metric tonnes capacity. With this the factory has crushed 4, 60,903 metric tonnes of sugarcane and crushed 6, 00,130 quintals of sugar (table no. 5.5). The factory has completed the factory thirtieth crushing season in 2012-13.

13. Shree Datta Sahakari Sakhar Karkhana Ltd, Asurle-Porle. Taluka-Panhala.

This factory was located at Asurle. The factory came into existence in 1969 with initial capacity of sugarcane crushing 2500 T.C.D. the factory has completed 28th crushing season. During 2011-12 the factory has crushed 2, 95,271 metric tonnes and produced 3, 80,430 quintals of sugar (Table no. 5.5). During the 2007-08 and 2008-09 the factory was run by the Warna sugar factory Warnanagar on the fair paid basis. Now it has sold to the private enterprise Dalmia Bharat Sugar. This

is the example of the co-operative management was not working properly or faulty management. When it was sold to Dalmia Bharat Sugar Industries Ltd it had doubled its crushing capacity of 5,000 tonnes per day (T.C.D.) in the end of the year 2012. The company is also setting up a 23 mw bagasse and coal-based co-generation plant as part of the expansion plans. The company is investing about Rs 210 crore in expanding its operation.

Dalmia had acquired the stressed assets of a sugar co-operation in Kolhapur in an auction in 2012 for Rs 135 million and restarted the acquired plant in the current sugar season. The total expansion cost in Kolhapur is estimated at Rs. 345 million. The company expects its sugar output 2.4 to 3 lakhs per season.

14. Udaisinha Gaikwad Sahakari Sakhar Karkhana Ltd, Sonawade-Bambavade. Taluka-Shahuwadi.

This factory is the outcome of the efforts of Shree Udaisinha Gaikwad. The factory was established in 2001-2002. Its initial capacity of sugarcane was 2500 metric tonnes per day. It is located in the Shahuwadi tahsil of the district. The factory has purchased (gate cane) sugarcane from outside the operational areas with the trucks and trolis tractors etc. During 2011-12 the factory crushed 3, 05,786 metric tonnes of sugarcane and produced 3, 75,050 quintals of sugar with 2500 T.C.D. (table no: 5.5) it has 12.26 sugar recovery. The factory is located on the hill top area of the Shahuwadi tahsil.

15. Padmashree Dr. D.Y.Patil Sahakari Sakhar Karkhana Ltd, Vesarf. Taluka-Gaganbavada.

During 1994 the factory was established on co-operative basis. It is located at Vesraf in Gaganbawda tahsil of the study region, actually the area is being known as a crest of Sahyadri Mountain. Though the factory has its initial capacity of sugarcane crushing is 2500 T.C.D. With this the factory has crushed 3, 61,141 metric tonnes of sugarcane and produced 4, 46,100 quintals of sugar with 12.36 sugar recovery. The factory relies on the transport of sugarcane by trucks, trellis and tractors. Lot of the trucks and trolis stay in queue for the sugarcane crushing. The factory has its operational area in Gaganbavada, Panhala, Radhanagri in Kolhapur and Vaibhavwadi, Kankavali in Sindhudurg district of Konkan. Beyond its operation area

the factory has got sugarcane as gate cane remaining tahsil of Kolhapur, Sangali and Belgaon, district in Karnataka. Total 186 trucks were carrying sugarcane to the factory in 2007-08 and 136 trolleys / tractors towards the factory. From this we can think that how the factory is working because it was located far away from the sugarcane growing tract in the district.

**16. Sadashivrao Mandlik Kagal Taluka Sahakari Sakhar Karkhana Ltd.
Sadashivnagar, Hamidwada-Kaulage. Taluka-Kagal.**

The factory was established in 2003-04 with the initial capacity of 2500 metric tons per day. The factory is located at Hamidwada in the kagal tahsil. The Member of Parliament Mr. Sadashivrao Mandlik has made the efforts for the beginning for the factory in the Kagal tahsils which is the study region. It is the 3rd sugar factory in the Kagal tahsil. The factory has crushed 4, 34,433 metric tonnes of sugarcane in the crushing season and produced 5, 56,921 quintals of sugar with 12.79 sugar recovery during 2011-12.

17. Indira Gandhi Mahila Sahakari Sakhar Karkhana Ltd, Tomabale. Taluka-Bhudargad.

This factory is located at Tambale in the Bhudargad tahsil. It is established in 2002-2003 with a capacity of 2500 crushing capacity per day. The factory has its operational area in the Bhudargad, Radhanagri, Kagal, Ajara, Gadhinglaj, Chandgad, Karveer and Hatkanangle etc. The factory has crushed sugarcane beyond its operational area. The factory has crushed 1, 89,082 metric tonnes of sugar and produced 2, 28,150 quintals of sugar with 12.07 recovery of sugar during 2011-12. (Table no: 5.5).

5.11.2 PRIVATE SUGAR FACTORIES

1. Shree Gurudatta Sugars Ltd, Takliwadi. Taluka- Shirol.

This is the first sugar factory in the western Maharashtra in the private sector. It was located in the Shirol tahsil at Takliwadi. The factory had taken first trial crushing season in 2003-04 with its 2500 metric tons T.C.D. The factory has used latest techniques for the crushing of sugarcane and raised its crushing capacity up to

4200 T.C.D. The factory has highest sugar recovery 13.56% in the year 2007-08. The factory has paid highest rate for sugarcane of the sugarcane growers among its operational area. It has the international quality maintenance with ISO 9001-2008 grade.

The factory has given dividend to its share holder farmer's upto 257 which is the unique example among the private factories in the Maharashtra. The factory has implemented medical expenditure and accidental policy scheme for its sugarcane crusher cutters up to 50,000 Rs. The factory has got different awards for its meritorious work among them Bhartiya Vikas Ratan Award, Kohinoor Award, Indira Gandhi National Integration Award, Bharat Industrial Award, National Business Leadership Award with Gold medal etc.

The factory has multistate operational area; its operational area is in the Shirol, Hatkanangle tahsils (Kolhapur District) and Chhikodi, Athani tahsils (Karnataka state). During the year 2011-12 the factory crushed 6, 02,420 metric tonnes and produced 7, 85,120 quintals of sugar with 13.04 percent sugar recovery in the 2011-12. (Table no. 5.5).

2. Nalwade Sugars Ltd Mahalunge. Taluka-Chandgad.

The factory is located at Mahalunge in the Chandgad tahsil and working in the private sector. The factory was established in 2007 with an average capacity of 2500 metric tons T.C.D. During 2011-12 the factory crushed 3, 21,484 metric tonnes of sugarcane and produced 1, 71,150 quintals of sugar with 12.75 sugar recovery.

3. Hemrus Technology Rajgoli Ltd. Taluka-Chandgad.

The Hemrus Technology Rajgoli Company Ltd is located in the Chandgad tahsil of the district. It was started in 2007 with a capacity of 3500 metric tonnes T.C.D. This is the third sugar factory in the Chandgad tahsil. The factory comes in the multistate operational area. It has better position in the crushing and sugar recovery with 12.75 percent. During 2011-12 the factory has crushed 3, 21,484 metric tonnes of sugarcane and produced 4, 09,826 quintals of sugar.

5.12 SUGARCANE CRUSHING AND PRODUCTION OF SUGAR

There were 18 co-operative and 3 private sugar factories working in the district since 1970 with its initial crushing capacity. Particularly when the under sugarcane was broadened automatically the number of sugar factories were grown. The crushing capacity of the sugar factories also grown up generally those who were working in its own command area. The total life in the rural area has been changed. The sugar factories work as a growth pole of the development of the region. The following table shows that the sugarcane crushing and production of sugar in the district.

Table 5.6 reveals that the record of the sugarcane crushed and the sugar produced in the last five years in the district. The area under sugarcane increased substantially in the command areas of the factories. In the year 2007-08 the registered area under sugarcane was 1, 97,185 hector. It has been increased by 12.17 per cent and it is recorded 2, 21,186 hectors in the year 2011-12.

The harvested area of the sugarcane by the sugar factories has been increased considerably. It is increased by 57.24 per cent over the year 2007-08. In 2007-08 the harvested area of cane is 1, 44,704 hectors it rises up to 2, 27,536 hectors (Table no. 5.6). In the year 2008-09 it was decreased by -17.45 percent. There after again decreased by -4.33 percent as there was decrease in the area under sugarcane in the command area of factories. It is lost due to the lost of drought and deficit in the quantity of water as well as the low rate given by the factories to the farmers.

Table No: 5.6

Kolhapur District: performance of sugarcane crushing and production of sugar.

Sr. No	Year	Area of S. cane (in hectors)		Cane Crushed (Lakh m.t)	Prod. Of S.cane (in qtls)	Avg. Recr.	Crop Day's	Crug. Capacity (m.t/day)
		Regid.	Hartd.					
1	2007-08 (Base yr.)	197185 --	144704 --	10369118 --	13315846 --	12.37 --	146 --	71200
2	2008-09	120067 (-39.11)	119453 (-17.45)	8179528 (-21.12)	10125299 (-23.96)	12.12 (-2.02)	107 (-26.71)	72200
3	2009-10	126752 (-35.72)	138429 (-4.33)	10897021 (5.10)	13373026 (0.42)	12.27 (-0.81)	153 (4.79)	75200
4	2010-11	220770 (11.96)	167342 (15.64)	12520159 (20.74)	15381037 (15.50)	12.22 (-1.21)	162 (10.95)	75200
5	2011-12	221186 (12.17)	227536 (57.24)	10649623 (2.70)	13494733 (1.34)	12.66 (2.34)	133 (-8.90)	75200

Source: Annual Divisional Report of Joint Secretary (Sugar) Kolhapur Division.

The Share was of the crushed cane was decreased steadily, except the year 2010-11. In the year 2007-08 the quantity of crushed cane was 10369118 lakh metric tonnes as compare to this in the year 2011-12. It is slightly increased by 2.70 percent and the crushed cane is 10649623 lakh metric tonnes.

The production of the sugar was reduced by the sugar factories from 1, 33, 15,846 quintals in the year 2007-08 as compared to the year 2011-12 it is 1,06,49,623 quintals it is increased by only 2.70 per cent.

The recovery of the sugar is also decreased. It happened due the delay in the beginning of the crushing season sugarcane and quality of sugarcane. This is the worthwhile that the crushing season of the factories run minimum 180 days but in the district the factories runs bellow that. In the year 2011-12 the factories ran only for 133 days. The crushing capacity of the factories as well as well as the district has been raised time immemorial. It has been raised from 50700 metric tonnes per day to 75700 metric per day in the year 2011-12.

5.13 CASE STUDY

Jawahar Shetkari Sahakari Sakhar Karkhana Ltd, Shri Kallappa Anna Awade nagar, Hupari-yalgud.

After independence India accepted the democratic way of Government. In order to bring social and economic change in the life of people in the country through co-operative movement is the only way of self relief. The Government encouraged primary co-operative societies, banks, irrigation schemes, agro-industrial processing organization, so also spinning mills and sugar factories.

The co-operative sector has brought about foremost progress in the due course of the time. Initially the sugar industry was started in North India e.g. Uttar Pradesh, Bihar but at present Maharashtra occupies the unique place in the co-operative movement. Jawaharlal Nehru dreamt integrated development of the country through co-operative movement. This movement was further inspired by Dr. Dhananjairao Gadgil and Yeshwantrao Chavan, Dr. Vasantdada Patil and Vasantrao Naik. Because they gave this movement strong base by providing Government support in the state of Maharashtra sugar industry which is the large agro-based industry in the study region.

There were twenty one sugar industries in the district and much more going to be proposed in the irrigated central and south central portion of the study region. Co-operation is an indispensable part of rural Maharashtra and it has contributed in the social and economic upliftment of the rural community.

The Jawahar Shetkari Sahakari Sakhar Karkhana Ltd Hupari-Yalgud is selected for the case study. The researchers have visited and observed the factory and collected relevant data from the officers of the factory. Although the author was working as a lecturer in that region for more than one and half year when the beginning and establishment of the factory was started in 1992-93.

Establishment

Sugar production is the second largest business in India after spinning mills. Sugar industry plays a vital role in the growth and development of the rural economy. In the year 1990 the Government of Maharashtra proclaimed a pragmatic policy of rehabilitation of sugar factories in private sector closed down for want of sugarcane through co-operation. The Godavari sugar mills Ltd, Sakharwadi, District: Ahmadnagar (Maharashtra) was closed down due to the want of sugarcane since 1985-86. Therefore, it had been declared as a "SICK UNIT" by BIFR.

Accordingly, Jawahar SSK Ltd, Hupari sought permission of the Government of Maharashtra to purchase the plant and machinery, land and buildings together with its liabilities and also the industrial license of the Godavari Sugar Mills Ltd, Sakharwadi, District: Ahmadnagar, Maharashtra state along with its machinery of 1016 T.C.D. vide G.R.No.C.S.F./1089/433981/C.R.352,3-S dated 23rd January 1990.

In confrontation to the above decision with Government of Maharashtra, Director of sugar and additional Registrar of co-operative societies, Maharashtra, Jawahar S.S.S.K. Ltd, Hupari were registered on 29th January 1990 under Maharashtra co-operative societies Act, 1960. The Government of India transferred the industrial license of 1016 T.C.D. of Godavari Sugar Mills Ltd, Sakharwadi in the name of jawahar S.S.S.K Ltd, Hupari on 28th September 1990 and permitted to shift the machinery and the state Govt. provided Rs.1, 03,040 Lakh as share capitals assistance to Jawahar SSSK Ltd, to effect the co-operativisation of the sick unit.

As specified earlier, the Government of India in response to the proposal of Jawahar SSSK Ltd, according sanctioned to enhance the daily cane crushing capacity from 1016 T.C.D. to 2500 T.C.D. as "Restructured Unit" with NCDC's assistance under Minimum Economic scale of operation (MES) in order to enable the factory to impound the abundant production of cane in the area of operation of the factory.

Industrial License No and Registration

The factory has got industrial license is as follows.

L/8/30/54, Dtd. 28/09/1990.

11(13)/MES/90-LA II, Dtd. 18/09/1991.

425/SIA/IMO/99, Dtd. 26/02/1999.

- 1) Under Maharashtra Co-operative Societies Act, 1960 Dad. 29/01/1990. The number of farmer from Karnataka state has been supplying sugarcane since inception of the factory. Hence, in the year 1994, the Karnataka was converted in to Multistate Co-operative Society.
- 2) Under The Multi State Co-op. Societies Act, Dated 30/12/1994.

Member of the Sugar Factory

As per the office record the factory has offered the membership to whom the farmers and producer as well as non producers, co-operative societies and Government of Maharashtra too. Table 5.7 shows that the share holders and amount of share of the factory.

Table No. 5.7

Jawahar SSSK Ltd, Hupari: No. of Share Holders and Amount of Share.

(2011-12)

Sr. No.	Particulars	No. of Shares	Share Amount (Rs. lacks)
1	Producer Members	18028	1222.81
2	Non Producer Members	8395	439.81
3	Co-op. Societies	111	10.21
4	Government	1	679.30
5	Share Amount	----	117.65
	Total	26535	2469.84

Source: Office record of the factory, 2010-11.

Members have a good faith in the management and hence the mill never faced shortage of raw material i.e. sugarcane. Thus the members of the society patronize the mill. So, credit for the outstanding success of the sugar factory goes to the members, who have supported the management and adopted new varieties, advanced cultivation practices in order to grow sugarcane for feeding the factory regularly.

Cane Development Activities.

Karkhana has opened up a separate cane development to look after scientific production, soil testing advising farmers to utilize HYV sees, fertilizer, irrigation facilities regularly. Karkhana has carried various cane development activities such as supply of sugarcane seeds, fertilizers, pesticides and press-mud, varmi-compost etc. on interest free credit at reasonable price along with subsidy. Table 5.8 shows that the implementation of Cane Development Scheme.

From the Table No. 5 we can analyze the performance of the Cane Development Programmed of the factory. The number of beneficiaries was increased by 174.93 per cent as compare to the base year 2001-02. During the year 2010-11 there were 13271 member farmers who had taken benefit of the cane development program. The cane development scheme was implemented over 7838.82 hectare in their area of operation of the factory. It is increased by 144.05 per cent as compared to the year 2001-02. The factory has spent Rs. 238.74 lacks on fertilizers, seeds and insecticides etc.

Table No: 5.8

Jawahar SSSK Ltd, Hupari: Implementation of Cane Development Scheme

Sr. No.	Planting Season.	No. Of Beneficiaries	Area (Hect.)	Total Expenditure (Fert./Seeds/Insect.) (Rs. In Lacks)	Subsidy (Rs. In Lacks)
1	2001-02	4827	3211.66	170.13	114.08
2	2002-03	5431 (12.51)	3119.57 (-2.86)	73.04 (57.05)	-16.14
3	2003-04	5925 (22.74)	3130.26 (-2.55)	64.43 (-62.35)	11.53
4	2004-05	8146 (68.75)	5061.98 (57.59)	212.83 (25.29)	3.88
5	2005-06	9353 (93.76)	7422.62 (131.10)	177.18 (4.12)	7.48
6	2006-07	10191 (111.12)	5215.22 (62.35)	166.93 (-1.80)	11.52
7	2007-08	7926 (64.20)	4565.00 (42.12)	129.34 (-24.11)	13.74
8	2008-09	11125 (130.47)	6626.00 (106.28)	310.53 (82.66)	14.90
9	2009-10	12605 (161.13)	8528.00 (165.50)	281.83 (65.88)	14.32
10	2010-11	13271 (174.93)	7838.82 (144.05)	238.74 (40.59)	29.10
	Total	88800	54719.13	1824.98	236.95

Source: Office record of the Factory 2010-11.

Area under sugarcane of the factory.

Table 5.9 reveals that the area under sugarcane as per the members, non member in the operational area as well as non-operational area of the factory. It indicates that average production of sugarcane per hectars of members and non member farmers in the factory areas.

Table No. 5.9

Jawahar SSSK Ltd, Hupari-Yelgud: Area and Production of Sugarcane.

2006-07 to 2010-11

(In
hectars)

Sr. No	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	Area under S.cane Member's	7565	7698	6667	8115	9437
2	Non members	4833	5219	3559	5441	6275
3	Beyond operational area in Maharashtra.	28	307	201	239	1025
4	In Karanataka	1506	07	06	25	26
5	Net Harvested area	13932	13231	10433	13820	16763
6	Harvested area in its operational area.	12398	12917	10226	13556	15712
7	Avg. Prod. (per hect / m.tonns) Members	84.51	90.20	88.67	102.39	95.80
8	Non members	83.91	79.19	77.47	91.16	86.73
9	Average	84.21	84.69	83.07	96.77	91.26

Source: Office record of the Factory 2010-11.

From the table no: 5 it is observed that the gradual increase in the area under sugarcane of member farmers of the operational area of the factory. During 2006-07

area under sugarcane is 7565 hectare it rise up to 9437 hectares up to 2010-11 and the growth was recorded at 24.75 percent during five years.

During the period 2006-07 to 2010-11 it is also seen that again non-member farmers in operational area the area under sugarcane was increased from 4833 hectors to 6275 hectors and its increase was recorded 29.83 percent.

The net harvested area of sugarcane was increased. During 2006-07 the net harvested area was 13932 and it rises up to 16763 hectors and its percentage was 20.32 %. In the operational area of the factory there is the net increase in the harvested area up to 26.73 percent. During 2006-07 to 2010-11 it may said that the overall performance of sugarcane growth and its production is well.

The average production per hectare was swept from 84.51 to 95.80 of the member farmers in the operational area of the factory. The supporting non members of the operational area of the factory was raised per hectors production of sugarcane from 83.91 to 86.73 metric tonnes and average production of sugarcane per hector is about 91.26 metric tonnes.

Sugarcane Crushing of the Factory.

Jawahar SSSK Ltd, Hupari-Yelgud is one of the leading and well management sugar factories in the study area because it has got best award for management and technology because today it has 7500 T.C.D. capacity with this the factory has crushed very huge production of sugarcane. The following table 5.10 shows the performance of crushing during the last five years.

Table No: 5.10

Jawahar SSSK Ltd, Hupari-Yelgud: Performance of sugarcane crushed

2006-07 to 2010-11

(Metric tonnes)

Sr. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	A)Members(within operational area)	639351	694382 (8.60)	591152 (-7.53)	830901 (29.84)	904069 (41.40)
2	B)Non-member (within operational area)	383914	414712 (8.02)	279323 (-27.24)	496447 (29.31)	559143 (45.64)
3	C)Beyond operational area (In Maharashtra)	2681	22918	12036	21692	73634
4	D)Beyond operational (In Karnataka)	147730	573	466	1959	2646
5	E) Total	1173677	1132586	882978	1351000	1539492
6	F) (A+B) and its % with (E)	87.18	97.92	98.56	98.25	95.05

Source: Factory annual report 2010-11.

Table 5.10 reveals the overall crushing of sugarcane during last five crushing season of the Jawahar Sugar Factory. It also depicts that except the season 2008-09 remaining season the factory has raised its crushing from 11.74 lakh metric tonnes to 15.39 lakh metric tonnes during 2006-07 to 2010-11 with 31.20 percent increase in its crushing. In the year 2006-07 the factory crushed 87.18 percent sugarcane in its operational area of member as well as non-member farmer and its rate become increased up to 95.05 during 2010-11 (Table no.5.10). The crushing of member farmers of the factory has risen up to 41.40 percent as compare to 2006-07. It is also seen that the percentage of crushing of sugarcane of non-member farmer in its operational area was 45.62 percent during 2006-07 to 2010-11.

Performance of the factory

Table 5.11 indicates that the overall performance of the factory during 2001-02 to 2010-11 was satisfied. When we say about its capacity of sugarcane crushing it may rise from 2500 (1992-93) up to 7500 metric tonnes per day. From this we can analyse that how is the huge capacity of the crushing of sugarcane its quantity of crushed of sugarcane was swept from 10.60 lakh metric tonnes up to 15.39 lakh metric tonnes in 2010-2011. It happens when the bumper crop remains in its operational area.

Table No. 5.11

Jawahar SSSK Ltd, Hupari-Yalgud: Performance during last ten seasons from 2001-02 to 2010-11

(M.tonnes)

Sr.No	Particulars	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
1	Crush capa.	5000	5000	5000	6500	6500	6500	7500	7500	7500	7500
2	Crop days	156	142	91	105	133	156	160	108	170	182
3	C. Crush. (lakh m.t)	10.60	9.49	6.99	8.29	10.12	11.73	11.32	8.83	13.51	15.39
4	Avg. Sugar Rec'ry (%)	12.04	12.22	11.59	12.44	11.42	12.93	12.58	12.22	12.02	12.01
5	Sugar. Prod. ('00'Qt.)	12770	11620	8100	10330	12590	14060	14260	10800	16250	18500
6	Cap'ty utilz'n (%)	136.23	134.69	154.62	122.76	117.58	116.34	94.93	109.81	106.14	113.40
7	Cane price (Rs. / M.t)	801	840	885	1225	1451	925	1000	1825	2311	2200

Source: Factory annual report 2010-11.

The factory has succeeded in keeping a constant sugar recovery beyond 12 except some exceptions. The production of sugar is also increased. Now it has produced 18.50 lakh quintals during 2010-11. The factory has been working with

full capacity and its percentage is above 100 percent in each crushing season except 2007-08. The factory has paid a better price for sugarcane of the farmers some time more than F.R.P.

During 2010-11 the factory has paid Rs. 2200 advanced amount per metric tonnes of sugarcane. Jawahar sugar factory has been developed quickly within a short period of time as compared to other sugar factories e.g. Daulat sugar factory has now completely stopped its crushing of sugarcane and production so there is a competition in the crushing and production of sugar too. Hatkanangle tahsil has three sugar factories however they run very well.

During 2010-11 the factory produced 18.50 quintals of sugar and it is more than 2001-02 by 44.87 percents. The factory has used its full capacity of utilization and stayed over 100 percents except few years of crushing season.

Scheme of the Sugar factory.

The sugar factory has implemented some schemes for the upliftment of people or it may be said that its operational area is getting some beneficial schemes.

Employees Facilities.

About 1375 employees are working in the karkhana out of which 200 employees have been living in the residential quarters of the mill campus. Besides that radius welfare services such as Dispensary, Montessori and Canteen are available in the premises. Every month 2kg and additional Ten kg for Diwali sugar is sold to employees in concessional rate. The excellent relationship among the management and employees is maintained.

Ecological Balance

A massive plantation has been done at the factory site to minimize the frequency of air pollution. There was 40% area of the karkhana covered by the different types of plantation of trees e.g. 15054 Nos. of trees among them silver Oak, Australian Babul, Cassia, Rein tree, Bottle palm etc. Moreover the factory has fruit trees and therefore industrial area has become a charming one and a natural spot. The factory has maintained the rightfully environmental healthy environment.

Co-Generation.

The management of the factory has decided to go for modernization cum-expansion by augmenting the crushing capacity from 5000 T.C.D. to 5000 T.C.D. along with co-generation for exportable surplus power of about 12 Mw. The karkhana was started with expanded capacity from 2500 T.C.D. to 5000 T.C.D. along with co-generation for exportable surplus power of about 12 Mw. Table 5.12 indicates that the profit from the co-generation project. The factory was started with expanded capacity from the crushing season 2000-2001 successfully and surplus electricity is being exported continuously from 22nd November 2001 to the MSEB grid. Further, optimization, balancing of equipments cum modernization from 5000 T.C.D. to 7500 T.C.D. Have been implemented in the list of IEM bearing No. 236/SIA/IMO/2001 dated 29/01/2001 issued by the government of India for 7500 T.C.D. and also additional co-generation of 3 Mw capacity based on biogas and electricity its exported to MSEDCL.

Table No. 5.12

Jawahar SSSK Ltd, Hupari-Yalgud: Profit from cogeneration project.

Season	1.5 Mw. Amount(Rs. Lack)	3Mw. Amount(Rs. Lack)	12 Mw. Amount(Rs. Lack)
2001-02	78.72	----	778.76
2002-03	52.89	----	939.61
2003-04	36.18	----	709.80
2004-05	47.99	----	806.56
2005-06	67.40	----	1049.11
2006-07	71.95	----	1229.53
2007-08	----	84.67	1254.05
2008-09	----	75.25	----
2009-10	----	157.52	1705.65

Source: Office Record of the Factory.

Environmental Pollution Management

Karkhana has adopted advanced technology which is an aerobic digestion followed by aerobic treatment and finally adopted a tertiary system for recycle the water for industrial use. This treatment not only results but also reduces 40% power consumption compared to conventional system. For air pollution control karkhana has established, a venture wet scrubber for all boilers for achieving pollution control norms.

Water treatment

Karkhana has completed the total water management system i.e. segregate of machinery cooling water, evaporated water and excess condensates from main effluent channel and recycling after primary treatment. About 5000 to 6000 m³ / day water is recycled. For this system karkhana has saved 90% of fresh water consumption and reduced the effluent generation up to 850 to 950 m³ /day. This water is given to the gardening, seed farm and sugarcane farmers.

Jawahar Sakhar Shala

The various schemes like the order of commissioner of sugar and the guideline of Dnyan Prabodhini, Pune, and the Govt. Resolution NO.PRE 2001(2902) / prashi-1, dated. 23/04/2004 regarding Mahatma Phule Hangami shikshan Hami Yojana for the children's of cane harvester and transporter workers were implemented. Karkhana has started the school affiliated to Kallappa Anna Awade charitable Trust in 1995 since the beginning of 3rd season regularly.

The rcc building has been built with all amenities necessary for all round development of students. The qualified, experienced and caring faculty and staff, hygienic and nutritious meal is provided in free of cost everyday to ensure the good health of children.

Temple and garden

An attractive shrine of Rajrajeshwari temple is surrounded by beautiful garden which has been constructed at the factory site. This temple has become a holy place and a good picnic spot for the people from nearby villages. Children are seen playing and old people take regular stroll on the green grass.

Other schemes of the factory

Jawahar sugar factory has implemented various schemes in the operational area for their member farmers as well as employees. Among them labour welfare programme, Mediclaim scheme, economic assistance, accidental help, scholarship for the students, training programmes honorarium to the players and wrestlers water supply schemes are implemented. From the above table we can imagine the performance of the factory in some aspects related to them.

Table 5.13 indicates that the number of farmer's members was declined by 1.10 percent as compare to pervious 2008-09 year. The sugarcane was crushed during 2010-11 which is slightly increased over last year upto 13.95 % as well as sugar production was also increased very slightly from previous crushing season. Though the recovery of sugar was decline in last season. The number of crushing days were increased.

The production cost of sugar does also increase. The rate of harvesting and transportation cost of raw material was also increased therefore the cost of production of sugar become increased. Number of workers in the factory may reduce very slightly. It is constant in their number. The rate of optional deposit was seen declined. The rate paid by the factory to the cane growers shows decline at the last but when it is compared to the past in 2008-09 it shows increased. However the demand of rate per tones from sugarcane growers increase every crushing season. The factory has tried to remove the burden of loans in the last season which it shows decreasing trend in its removal as compared to past crushing season 2009-10.

Table No 5.13

Jawahar SSK Ltd Hupari-Yalgud: Performance of last five years.

Sr. No.	Particulars	2006-07	2007-08	2008-09	2009-10	2010-11
1	No. of Mbr's	24910	24945	26374	26535	26828
	Gr. rate		0.14	5.72	0.61	1.10
2	Canecrushed(M.t) Gr. rate	1173676	1132586	882978	1351000	1539491
			-3.50	-22.04	53.00	13.95
3	Sugar prod'n (quintals ³)	1406043	1425645	1080090	1625580	1850040
	Gr. rate		1.39	-24.23	50.50	13.81
4	Sugar re'ry (%)	11.93	12.58	12.22	12.02	12.01
	Gr. rate		5.44	-2.86	-1.63	-0.10
5	Crop days	156	160	108	170	182
	Gr. rate		2.56	-32.5	57.40	7.05
6	Avg. Expd're on sugar prod'n (Rs. per Qutls ³)	1398				
	Gr. rate.		1467	2189	3283	2608
7	Har & trans't Exp (Rs./ t)	245				
	Gr. rate		238	244	311	353
8	No. of workers	1423	1412	1384	1358	1360
	Gr. rate.		-0.77	-1.98	-1.88	0.15
9	Optional Deposit (Rs. In lack)	1313				
	Gr rate.		660	929	908	817
10	Final Rate (Rs. Per M.tonnes)	925				
	Gr. rate.		1000	1825	2311	2200
11	Removal of loans Gr. rate.	1596	553	1879	3950	2446
			-65.35	239.78	26.28	-38.07

Source: Factory annual report 2010-11.

5.14 COTTON SPINNING (YARN / SOOT GIRNI) MILLS

Cotton is a soft, staple fiber that grows in a form known as a ball around. The seeds of the cotton plant are a shrub native to tropical and sub-tropical regions around the world, including the America, India and Africa. The fiber most often is spun into yarn or thread and used to make a soft, breathable textile which is widely used-fiber cloth in clothing today.

History

Cotton was cultivated by the inhabitant of the Indus valley civilization by the 5th millennium BCE-4th millennium BCE. The Indus cotton industry was well developed and some method used in cotton spinning and fabrication continued to be used until the modern industrialization of India. Well before era the use of cotton textile had spread from India to the Mediterranean and beyond.

According to the Colombia encyclopedia, sixth edition “cotton has been spun, woven and dyed since prehistoric times; it clothed the people of ancient India, Egypt and China”. Hundreds of years before the christen era cotton textile were woven in India with matchless skill and their use spread to the Mediterranean countries.

Agriculture of Cotton

Successful cultivation of cotton requires a long frost-free period, plenty of sunshine, and a moderate rainfall, usually from 600 to 1200 mm, soil usually to be fairly heavy, although the level of nutrients does not need to be exceptional. In general, these conditions are met within the seasonally dry tropics and sub-tropics in the northern and southern hemispheres, but a large proportion of the cotton grown today is cultivated in areas with less rainfall that obtain the water from irrigation. Production of the crop for a given year usually starts soon after harvesting the preceding the autumn. Planting time in spring in the northern hemisphere varies from the beginning of February to the beginning of June.

Cotton in Textile

Cotton is used to make a number of textile products. These include terrycloth, used to make highly absorbent bath towels and robes; denim, used to make blue jeans; chambray, popularly used in the manufacturing of blue work shirts, and corduroy, seersucker and cotton twill. Socks, underwear, and most T-shirts are made from cotton. Bed sheets often are made from cotton. Cotton also is used to make yarn used for crochet and knitting. Fabric also can be made from recycled or recovered cotton that otherwise would be thrown away during the spinning, weaving, or cutting process. While many fabrics are made completely of cotton, some materials blend cotton with other fibers, including rayon and synthetic fibers such as polyester. It can either be used in knitted or woven fabrics, as it can be blended with elastane to make stretch threads for knitting fabrics, and things such as stretch jeans.

In addition to this textile industry, cotton is used in fishnets, coffee filters, tents, gunpowder, and cotton paper and in bookbinding. The cotton seed which remains after the cotton is ginned is used to produce cottonseed oil, which, after refining, can be consumed by humans like any other vegetable oil. The cottonseed meal that is left generally is fed to ruminant livestock. Cottonseed hulls can be added to dairy cattle rations for roughage, cotton linters are fine, silky fibers which adhere to the seeds of the cotton plant after ginning. Linters are traditionally used in the manufacture of paper and as a raw material in the manufacture of cellulose.

Leading Cotton Producing Countries

The cotton is produced in the tropical and sub-tropical countries. There are five leading exporters of cotton: 1) the United States 2) Uzbekistan 3) India 4) Brazil and 5) Burkina Faso. The largest non-producing importers are Bangladesh, Indonesia, Thailand, Russia and Taiwan.

In India, the states of Maharashtra (33.42 %), Gujarat (25.78 %), and Andhra Pradesh (14.34 %) are the leading cotton producing states; these states have a predominantly tropical wet and dry climate.

Table No: 5.14

State wise Area, Production and Productivity of cotton

(Area in million hectores, production in million bales of 170 kg. yield per hector)

Sr. No.	State	2006-07			2007-08			2008-09		
		A	P	Y	A	P	Y	A	P	Y
1	Punj	0.607	2.4	672	0.604	2.2	619	0.537	1.75	607
2	Har.	0.53	1.5	481	0.483	1.6	563	0.455	1.4	610
3	Raj.	0.35	0.9	437	0.339	0.9	451	0.223	0.75	627
4	Guj.	2.39	10.3	733	2.422	11.2	786	2.417	9	774
5	Mah.	3.107	5	274	3.194	6.2	330	3.133	6.2	336
6	M.P.	0.639	1.9	505	0.63	2.1	567	0.655	1.8	529
7	A.P.	0.972	3.6	630	1.138	4.6	687	1.345	5.3	748
8	Krnt.	0.378	0.6	270	0.403	0.8	338	0.39	0.9	507
9	Tn.	0.1	0.5	850	0.119	0.5	714	0.12	0.5	708
10	Odis.	-	-	-	0.05	0.15	-	0.058	0.15	-
11	Othrs	0.071	0.1	239	0.058	0.05	425	0.04	0.05	347
12	Total	9.144	26.8	521	9.439	30.2	560	9.373	27.8	591

Source: [Www.texcofed.com](http://www.texcofed.com) (A: area; P: prod; Y: yield)

Table 5.14 shows that the state wise area, production and yield of cotton in India. In 2008-2009 Gujrat (9 m.bales) ranks first in the production of cotton followed by Maharashtra (6.2 m. bales) and Andhrapredesh(5.3 m. bales). Per hector yield of cotton is higher in Gujrat (774 kg.) followed by Andharpredesh (748 kg.) and Maharashtra (336 k.g.).

5.15 COTTON TEXTILE INDUSTRY IN INDIA

Textile industry constitutes an important sector in India's industrial economy. These are not only the harbinger of modern industrial development in the country but still contribute 33 percent of export earnings. The cotton and synthetic textile industry in India is the largest industry in the country, account for about 20 per cent of the industrial output, providing employment to over 20 million persons and contributing around 33 per cent of the total exporting earnings. The textile industry is one in which India has an opportunity for success on a global scale, given the cost of labour.

India is one of the leading producers of cotton textile in the world. The Indian textile industry is the predominantly cotton based with 65 per cent of the cloth production in the country being accounted for by cotton. Production of raw cotton varies from year to year depending upon the rainfall and weather conditions and price fluctuations in raw cotton affected the industry.

The cotton textile industry still occupies an outstanding position both in terms of output and employment among the industries of the country. India is not only self sufficient in its textile requirements but exports textile fabrics and ready-made garments to valuable foreign exchange.

In India, the cotton mill industry consists of two sections: a) spinning mills and b) composite (spinning and weaving) mills. There were 846 spinning mills and 271 composite mills in the country on March 31, 1992. Table 5.15 reveals that gradual increase in the number of cotton mills, spindles and looms.

Table No 5.15

India: Growth of Cotton Textile Industry

Sr. No.	Year	No. of mills	Index No.	No. of spindles ('000')	Index No.	No. of rotors ('000')	Index No	No .of looms ('000')	Index No
1	1951	383	100	11250	100	---	---	196	100
2	1961	481	125.59	13830	122.93	---	---	199	101.53
3	1971	670	174.93	17980	159.82	---	---	206	105.10
4	1981	693	180.94	21225	188.66	---	---	208	106.12
5	1991	1062	277.28	26670	237.06	67	100	178	90.82
6	2001	1846	481.98	35530	315.82	394	588.10	123	62.75

Source: Indian economic survey, 2002-03.

Table 5.15 indicates that the number of cotton textile mills and it was increased gradually after 1951. There were 383 cotton textile mills in 1951. After wards it grows considerably up to 1846 in 2001 and the index number of growth is 481.98.

The number of spindles was increased with 315.82 indexes over the year 1951, at that time the spindles were 1, 12, 50, 000 and it was increased 3.55 in the year 2001. The index number of rotors was increased by 394 and over the base year 1991. The growth

of looms was recording satisfactorily upto the year 1981 after that its growth was decreased by the index of 62.75. In the year 1951 the number of looms was 1.96 lakhs it is decreased upto 1.23 lakh upto the year 2001.

The localization of the cotton textile industry is largely affected by the availability of raw material, proximity of the market, capital facility, port facility and the skilled labour. In the early days the cotton growing tracts of the peninsula and great plains together with capital and port facilities helped in the concentration of cotton mills in Mumabai,Ahmadbad, Coimbatore, Solapur, Nagpur and Indore. But with development of modern means of communication an apparent shift was noticed towards centers of consumption (market), capital and cheap skilled labour. Hence the industry spread into the cotton growing areas.

5.16 COTTON TEXTILE INDUSTRIES IN MAHARASHTRA

Maharashtra state is an agro-based state where cotton is one of the major cash crops. Due to abundant availability of cotton, the cotton spinning mills were developed and still going to be developed in the state. The decentralized handlooms and power looms are widely spread over the entire state of Maharashtra.

Therefore with advent of co-operative movement in the state, the cotton spinning industry has been encouraged. At present 71 Co-op. spinning mills have the capacity of 12.79 lakh spindles and 9752 rotors. There were 106 cotton textile mills, equipped with 23.4 per cent of total spindles and 37 per cent of total looms of the country, countries 12 per cent of mill-made cotton yarns and 46.2 per cent of mill-made cotton cloths in India. The city of Mumbai is the largest centre of cotton textile.

Table 5.16 indicates that number of spinning mills, scomposite and exclusive weaving mills in Maharashtra from 2007-08 to 2011-12. There were 1940 spinning and composite mills existed in Maharashtra in 2010-11. The index of growth is 1.10 from the base year 2007-08. The same rate of growth was recorded in the spinning mill sector (Non-SSI) from 2007-08.

Table No: 5.16

Maharashtra: Textile Industry Overview

Item	Unit	2007-08	2008-09	2009-10	2010-11	2011-12 (Prov)
Textile mills (Non-SSI)						
Sping. Mills (Non-SSI)	No.	1597	1653	1673	1757	1761
Compt. Mills (Non-SSI)	No.	176	177	180	183	196
Total	No.	1773	1830	1853	1940	1957
Exclusive weaving mills (Non- SSI)	No.	179	184	183	174	173

Source: [Www.texcofed.com](http://www.texcofed.com)

Solapur is located in the cotton growing centre of south Maharashtra and it is the second largest centre. Pune, Nagpur, Jalgaon and Ichalkaranji are another important centres of the cotton textile industry. It is another well known cotton textile centre of the south Maharashtra. Ichalkaranji is located near the Kolhapur and having all essential facilities to cotton textiles industry. It is well accessible to the remaining area of the country, cheap labour, capital form the entrepreneurs and corporate sector and clustering of this industry etc. are favorable factors for the location cotton textiles.

5.17 SPINNING MILLS IN THE KOLHAPUR DISTRICT

Look at a piece of cloth under a magnifying glass and you will notice that it is made with threads weaved together. Before the introduction of machines in the early 1800s, all cloths were handmade: weavers were sitting before a loom made cloth one thread at a time. With the introduction of machines, all that changed. Machines wave cloth quickly by taking raw material and spinning it into thread. Afterwards, the thread is waved into cloth. Manufacturing plants that converted raw material into cloth were originally called spinning mills. Today, spinning mills are large factories that daily produce daily thousands of square yards of cloth.

Spinning mills are divided into sections. The receiving block takes the raw material, which goes into a spinning area, where raw cotton is converted into thread or yarn. These products go to weaving machines to make cloth and other process.

The availability of yarn at right quantity, at right time and right price play an important role for the growth of power looms in and around Ichalkaranji in the Kolhapur district. Kolhapur is known for the co-operative movement in every field of the industrial development. Ichalkaranji is known for the development of cotton textile industry. For the growth of spinning mills some eminent leaders came forward and established the spinning mills.

There are 19 co-operative and 10 private spinning mills in the Kolhapur district. Textile is the main enterprise of Ichalkaranji. A notable person Shrimant Narayan Ghorapde helped the industry to grow in and around the Ichalkaranji. There is no of power looms, number of auto looms, spinning mills and other ancillary units are established at Ichalkaranji.

The number of spinning mills have been established in co-operative sector in the district. The idea behind the inception of spinning mills came in reality due to the local leaders and Ex. Member of Parliament late shri. Dattajirao Kadam and A.G. Kulkarni. Both have made efforts for the beginning of the spinning mills at Ichalkaranji and around it. Dattajirao Kadam established the Deccan Co-operative Spinning Mill which is the first co-operative spinning mill of the country and latter on Nava Maharashtra Sahakari Soot Girni Limited Sajni, Ichalkaranji. The Kallapana Awade has established the Indira Gandhi Mahila Sahakari Soot Girni Limited Ichalkaranji. It is run and managed by the women. All the share holders, board of directors and most of the workers of the mill are women only.

The following cotton spinning mills were established in the district in the co-operative as well as private sector:

- Actif Corporation Pvt. Ltd., Ichalkaranji, Taluka-Hatkanangale.
- Ajara Taluka Shetkari Sahakari Soot Girni Ltd., Khede, Post-Madelage Taluka-Ajara.
- Arvind Cotsyn (India) Pvt. Ltd., Laxmi Co.op.Ind.Estate, Hatkanangale Taluka-Hatkanangale.
- Choundeswari Sahakari Soot Girni Ltd., Kolhapur-Sangli Road, Post: Dharangutti, Taluka-Shirol.

- Datta Shetkari Vinkari Sahakari Soot Girni, Ltd., Sangli-Kolhapur Road, Taluka-Hatkanangale.
- Deshbhakta Ratnappanna Kumbhar Shirol Magaswargiya Sahakari Soot Girni Ltd., Kolhapur-Sangli State Highway, Post: Tamdalge-Jaysingpur, Taluka-Shirol.
- F.M. Hamrle Oswal Textiles Pvt. Ltd., 5 Star MIDC Talndage Taluka-Hatkanangale
- Gangotri Textiles Pvt. Ltd., Kumbhojgiri Road, Post:Alate, Taluka-Hatkanangale.
- Ganesh Co. op. Spg .Mills Ltd. Sector-B, Plot No. 1 to 7, Shri. Laxmi Co. op. Ind. Estae, Hatkanangale, Taluka-Hatkanangale.
- Hatkanangale Taluka Sahakari Soot Girni Ltd., Post: Vadgaon, Taluka-Hatkanangale.
- Hutatma Swami Warake Co. op. Spg. Mills Ltd., Gargoti, At Post: Mudhal Taluka-Bhudargad.
- Ichalkaranji Co-op. Spinning Mills Ltd., Shivanakwadi, Taluka-Shirol.
- Indira Gandhi Mahila Sahakari Soot Girini Ltd., Shivanakwadi, Taluka- Shirol.
- Indiana Cotspin Pvt. Ltd., Tamdalge. Taluka- Shirol.
- Indo-count Industries Pvt. Ltd., 5 Star MIDC Kagal, Taluka-Hatkanangale.
- Janta Shetkari Vinkari Sahakari Soot Girani, Maryadit, Hegadewar Nagar, Ichalkaranji Taluka-Hatkanangale.
- Jawahar Sahakari Soot Girani, Ltd., Hupari. Taluka-Hatkanangale.
- Kolhapur Zilla Shetkari Vinkari Sahakari Soot Girani, Ltd., Yadrav, Ichalkaranji, Taluka- Shirol.
- Mahatma Phule Magasvargiya Sahakari Soot Girni Ltd., Peth Vadgaon, Taluka-Hatkanangale.
- Nagarika Exports Pvt. Ltd., Yavluj, Taluka-Pnahala.
- Nav-Maharashtra Sahakari Soot Girani, Ltd., Sajani, Ichalkaranji Taluka-Hatkanangale.
- Parvati Sahakari Soot Girni Ltd.,Terwad. Taluka- Shirol.
- Pranavaditya Spinning Mills Pvt. Ltd., Alate, Taluka-Hatkanangale.
- R.M.Mohite Textiles Pvt. Ltd., Ambapwadi Phata off. N.H.No.4, Vadgaon, Taluka-Hatkanangale.
- Rajivji Sahakari Soot Girni Maryadit, Dindnerli, Taluka-Karveer.
- Sahakar Maharshi Dattajirao Kadam Sahakari Soot Girni Ltd., Kaulage, Taluka-Gadhingalaj.

- Shri. Siddhivinayak Cotspin Pvt. Ltd., Sangli-Kolhapur Highway No.3, Village Chipri, Taluka-Shirol.
- The Deccan Co-operative Spinning Mill, Ltd., Ichalkaranji, Taluka-Hatkanangale.
- Venkatesh Shetkari Vinkari Sahakari Soot Girmi, Ltd., Hupari-Yelgud. Taluka-Hatkanangale.

5.18 CASE STUDY

5.18.1 R. M. Mohite Textiles limited

M/S R. M. Mohite and company found its roots in the year 1966. This company is the creation of a dedicated man fighting and defeating all odds and bringing into reality his dreams.

Location

The R. M. Mohite industries limited was started in year 1995. The industry is located at Ambapwadi, Tahsil: Hatkanagale Distirct: Kolhapur. There were all favorable factors to existence of this spinning mill. The unit has got benefit place for location at low cost along the NH-4 near Kolhapur. There is the easy availability of labour at local level. The company has got benift of hydro electricity power from its own generated hydro power project built at Fejiwade, Tahsil: Radhanagari District: Kolhapur.

Capital

The company has invested Rs. 150 crore. It is taken from the financing group of banks like bank of india, IDBI and State Bank of India etc. The share capital was collected through the finance as well as the share capital from the local people.

Raw Material

The existing capacity of the company is about 35000 spindles. The cotton has been used as a raw material. It got from other palaces of cotton growing areas. It is easily available nothing is the shortage of raw material. The private traders have been supplying the raw material and it is available from Marathawada and Vidarbha. . There is 15 tons of raw material have been processed daily. In the whole year the company processed 5400 tones of raw material.

Labour

Table 5.17 reveals the number of labours employed in the company. The existence of the company has felt its impact on the surrounded area and near peoples has got an opportunity of the employment.

Table No.5.17

R. M. Mohite Industries: Labour Chart.

Sr. No.	Nature of labour		Male		Femal		Total		
			Skill	Unskill	Skill	Unskill	Skilled	unskilled	Gr. Total
1	Technl.	a)Permanent	50	---	---	---	50	---	
		b)Temporary	10	---	---	---	10	---	
		Total	60	---	---	---	60	---	60
2	Non-Technl.	a)Permanent	200	70	15	5	215	75	290
		b)Temporary	80	50	10	10	90	60	150
	Total		340	120	25	15	365	135	500

Source: 21st Annual Report 2011-12 of the company.

The management of the company is satisfied about the work of labours. There are 340 permanent labours out of them 20 are female labours and 365 are skilled labours out of them 25 female labours. There are 135 labours working as unskilled labours out of them 15 are female labours. Every labour has got on an average Rs. 200 as a payment for per day. The work of labour was done in different shifts. The monthly payments is given to the worker by the company is about Rs. 6000.

Turnover of the company

Table 5.18 reveals the turnover of the company form the year 2001-2010. The turnover of the company is growing in all the aspects e.g. production, expenditure, sale of finished goods and benefits of the different years.

Table no: 5.18

R. M. Mohite Company: Turn over

(In Rs.)

Sr.No.	Year	Expdr. Of prod.	Index number	Sale of finshed goods	Index number	Benefit	Index number
1	2001	1119477906	100	1144157532	100	2444679626	100
2	2002	949675607	84.83	963356243	84.20	13680636	55.43
3	2003	771123530	68.88	789934805	69.04	18811275	76.22
4	2004	638140000	57.00	643045000	56.20	4905000	19.87
5	2005	763542000	68.20	778120000	68.01	14578000	59.07
6	2006	896821000	80.11	949980000	83.03	53159000	215.40
7	2007	951431000	84.98	1004897000	87.83	53466000	216.64
8	2008	1821875000	162.74	1878200000	164.15	56325000	288.22
9	2009	1834966000	163.91	1868770000	163.33	33804000	136.97
10	2010	1057679000	94.48	1098130000	95.98	40451000	163.90

Source: 21st Annual Report 2011-12 of the company.

Year 2001 is treated as the base year for all aspects of the expenditure of the company. The production expenditure is came down from the base year to the year 2007. It is increased afterwards and reached up to 163.91 on the year 2009. After this year it showd decreased by 95.98.

The sale of the finished goods of the company as compared to the base year, it shows decreasing in the sale value. It shows that the steadily increase in its sale. In the year 2008 and 2009 the index number was increased by 164.15 and 163.33 respectively but after 2009 again the index of was come down and set on the 95.98.

The benefit of the company become decline after the base year 2001. The most declines were noted in the year 2004 and it was 19.87, afterwards the rate of benefit was increased by striking. In the year 2006 to 2008 it was decline. In the year 2010 it was recorded with 163.90.

Problem and Expectations of the Company

Though the company is in benefit now days, it faced some problems for e.g. labour problems, increasing power bills and ever increasing fuel rates. So the management demands liberal polices form the side of government and at low cost of

appropriate electric charges, stability in prices of the raw material. There is need to stable the labour and its wages.

5.18.2 Mahatama Phule Magaswargiya Sahakari Soot Girni Ltd., Pethwadgaon Taluka- Hatkanagale

The mill was started on the 15th October 2002. It is located near the Mumbai-Bangalore NH-4 at Pethwadgaon in Hatkanangale taluka. It is started in the close vicinity of Ichalkaranji and Kolhapur. The majority of the shares are taken by the farmers and weavers who have 653 shares, the 12 share are taken by other institutes and one share was taken by the state government. The mill was started with the capacity of 25,200 spindles and it would be expanded up to 26,208 spindles. The mill was working with its full capacity nearly 97.50 per cent.

Capital

The capital was available in the form of shares collected through the members shareholders and the state government of the Maharashtra. There is the term loan taken by the mill from the Samaj Kalayan Department of the government of Maharashtra. The share was collected 5 per cent from the members of the mills (share holders), 45 per cent from the government and 50 per cent in the form of term loans. The mill has Rs. 70 crores of invested capital.

Raw material

The raw material is available to the mill from the Vidarbha, Marathwada and khandesh region of the Maharashtra. The daily capacity of processing of raw material is about 84 bales (170 K.g. per bales). The raw material is available throughout the year. It is supplied through the traders of raw cotton. The rate of raw material is about Rs, 37000 per khandi (one khandi of two bales). The yarn is the main production and waste material is the secondary production of the spinning mills. The yarn is exported at local market and the waste material is used for the making of the towels, carpets, gins and tarpaulins etc.

Labours

There were 547 labours working in the mill which is available from the local level. The Rs. 300/- is given to labour as daily wages. All types of facilities are

given to the labours in form of casual leaves, medical leaves, govern holidays and insurance etc. some labours went on strike for their efficient wages. There is not a competition between them and other mills.

Government Assistance

The management had made the efforts for the post development of the mill. The government has given encourage to the business and given benefit in the form of economic assistance e.g. loans, arability of land for mill, there is nothing any problem faced by the mill still today. The mill has got different awards for best management and progress of the mill from state government and federation of spinning mills.

Production and sale of the finished goods (yarn)

The table 5.19 reveals THE expenditure and sale of the yarn of the spinning mill.

Table No. 5.19

Mahatma Phule Magaswargiya Sahakari Soot Girmi: Expenditure and sale of Yarn.

Sr.No.	Year	Exp. of Prod.	Index number	Sale of Yarn	Index number
1	2005	2000.30	100	2089.08	100
2	2006	1907.91	95.38	1909.95	91.42
3	2007	2263.60	113.16	2270.00	108.66
4	2008	2518.43	125.90	2354.82	112.72
5	2009	2810.51	140.50	2976.57	142.48
6	2010	4582.21	229.10	4578.46	219.16
7	2011	6867.00	343.30	6652.05	318.42
8	2012	5308.64	265.40	5507.99	263.65

Source: From the questionnaire filled by the officers of the mill.

5.19 EDIBLE OIL MILLS

The vegetable oil industry is one of the important ago-based industries in the country. Vegetable oil is an important item of Indian food as it the major source

of fat. Extracting oil from oil seeds is an age old village industry in India. India is the largest oilseeds and vegetable oil producing country in the world. It is also the biggest consumer of vegetable oil as it is the most common source of oil are groundnut, sunflower seed, cotton seed, soybean, mustered and rapeseed and coconut etc.

The vegetable oil industry in India can be divided in three groups depending upon the technology used for e.g.

- i. Ghani is the main technology for expelling oil in the villages. Different oil seeds are used in the oil expellers.
- ii. Factories using intermediate level of technology are located in towns. Oil seeds used are region specific.
- iii. Large scale sophisticated mills are located in big cities and oriented towards bigger markets.

The vegetable oil is hydrogenated oil. The first vanaspati oil factory was established in 1930. The World War Second and the levy of import duty on vanaspati gave a fillip to this industry in 1951; There were 48 factories with a capacity of 3.3 lakh tones and a production of 105 thousand tones.

In India the major oil producing states are Utter Pradesh, Punjab, Hariyana, Delhi, Madhya Pradesh, Maharashtra, Gujarat and West Bengal. These states have share about 70 percent of the total production of the country. Gujarat is the leading state in vegetable oil production, particularly the groundnut oil production. The industry spread owing to the universal nature of market and availability of various kinds of the oil seeds in different parts of the country.

Maharashtra has the largest number of vanaspati producing units in the oilseeds producing areas of the state. As a part of liberalization the industry has been allowed to use expeller groundnut, sesame and mustered / rape seed oils up to a level of 30 percent since 1993.

Crushing of major oil seeds like groundnut, mustered and sesame is reserved for small scale oil seeds growers' co-operative section and state agro industries. In terms of liberalized policy of the government, no licensed is required for an activity relating to processing of vegetable oils, provided that the proposed units do not come under the location policies.

5.20 EDIBLE OIL MILLS IN KOLHAPUR DISTRICT

Oil-pressing is an age old and important industry of the district. Oilmen or Telis were extracted edible oil from local grown oil seeds. The chief oilseeds locally grown are safflower (Kardai), Niger-seed (Karla), earth nut (Bhuimug) brown hemp (Ambadi). The oil pressed from these oilseeds mainly used both for purpose of burning and cooking. The mustered oil (Mohri) is mainly used for the preserving pickles and as medicine. The linseed oil is locally used by the painters.

Most of the work in the traditional oil mill was done by the bullock. As on Mondays and holidays the mills remain closed at all and on the market day it is operated only for the half day. The oilman works in the on an average for twenty four days in a month. Most of the mills work for eight months in the year. During rainy days the mills would not be in operation. Only those oilmen who have capital enough to lay in a stock of oilseeds press oil. The oilman works the mill for eight hours a day. The oilman generally extracts in one day twenty six pounds of oil form most oilseeds. This oil is chiefly exported by local dealers, who by it from oilmen. To the people it would be sold by the oilman's wife from house to house.

The first oil mill was established in the district in 1912. In 1939 there were three oil mills were in operation. In the year 1948 the number of oil mill was five. It was increased and stood at seven in 1951. In the year again the number of oil mills was increased and it reached up to ten. There were thirteen oil mills were in operation in the year 1970. These majorities of the oil mills were concentrated at Kolhapur, Ichalkaranji, Jaisingpur and Nandgaon. The edible oil was extracted mainly from the groundnut and other oil seeds minor in quantity. The produced oil was sold mainly at local markets as well as export to Sangli, Ratanagiri and pune. In those days raw material was easily available at local level.

In the year 2011-12, there were twenty six oil mills existed in the district. These oil mills mainly uses groundnut purchased from the neighboring states, very little quantity of raw material was available at local level because of the low production oil seeds e.g. groundnut. Some of the oil mills in the district were stood sick or on the way closing destination. Due to the acute shortage of raw material, working capital, fluctuation in the prices of raw material as well as in the finished goods etc.

- Shivganga oil mill, Vadgaon. Taluka-Hatkanangale.
- M/s Malakar Brothers oil mill, Bhadole road, Pethvadgaon. Taluka-Hatkanangale.
- M/s Shri. Ganesh oil mills A/P 9/162, new industrial estate, Icalkaranji. Taluka-Hatkanangale.
- M/s Sai oil mill Plot no 21/2, Yashwant Uodyogik Vasahat, Yashwant nagar, Hupari. Taluka-Hatkanangale.
- M/s Shree. Maheshvar oil mills, 25/2/1A, Uchagaon, Market Yard, Kolhapur. Taluka-Karveer.
- M/s Kaveri oil mills, 25 12/1 Market Yard, Kolhapur. Taluka-Karveer.
- M/s Ashvini oil mill 1063, E, Warad, Bgal chowk, Shahupuari, Kolhapur. Taluka-Karveer.
- M/s Patel oil mill 2094, E' wards, near Shahu market yard, Kolhapur. Taluka-Karveer.
- M/s Shree Jalaram oil mill plot no. 6 market yard road, Kolhapur. Taluka-Karveer.
- M/s Tushar oil packing company A/p 44, Daphale Mala Uchgaon. Taluka-Karveer.
- M/s Vaishnavi oil mill rail way goods road, near Lonar vasahat, Kolhapur. Taluka-Karveer.
- M/s Jai Bharat oil mill 2094, E' wards, near Shahu market yard, Kolhapur. Taluka-Karveer.
- Patco Pvt. Ltd. Old Pune Road, opp. market Yard Kolhapur. Taluka-Karveer.
- Datt oil mill 231/ 3 /2 A, Jadhavwadi, opp. Market yard, Kolhapur. Taluka-Karveer.
- M/s. Patil oil industries H 26, MIDC, Gokulshirgaon. Taluka-Karveer.
- Jagdesh oil mill market yard, Vikram nagar, Kolhapur. Taluka-Karveer
- Korgaonkar oil mill, Shahupuri, Kolhapur, Taluka-Karveer.
- M/s Ramesh Mahadev Banchoda, 25 /12 / 4 A 2, Rail Goods Road, Market Yarad Uchagaon, Kolahapur, Taluka-Karveer.
- Maharashtra oil mill market yard Kolhapur, Taluka-Karveer.
- Kisan oil mills D-8, MIDC Shirol, Kolhapur. Taluka-Karveer.
- M/s. Vivek oil mill A/P Gogave, Taluka-Shahuwadi.
- M/s. Santaji oil mill 791/A, Ajara Rd. Gadhinglaj. Taluka-Gadhinglaj.
- M/s. Nandkumar Pattanshetti oil Mill, Gadhinglaj. Taluka-Gadhinglaj.
- M/s. Vinayak Agro Industries, Mutnal, Taluka-Gadhinglaj

- M/s. R.B.Kitturkar oil mill A/P 1672, Hanabarwada, Gadhinglaj, Taluka-Gadhinglaj
- M/s. Agro Fresh industries M. No. 1248 Adkur. Taluka-Chandgad.

5.21 CASE STUDY

Shree Ganesh Oil Mill

Shree Ganesh oil mill was established in 1989. The oil mill is located at A/P 9/162, new industrial estate, Ichalkaranji. Taluka-Hatkanangale. It is private company and the traditional business of the enterprise. Mr. Vilas Ganpati Gatade is the proprietor of the mill. He had made efforts for the establishment of this oil mill. The edible oil is extracting from the groundnut and repacking of another type of cotton seeds oil and sunflower oil too. All the location aspects are favorable for the existence of the factory e.g land, labour, capital, raw material, electricity, transport and market.

Capital

The enterprise has invested Rs. 20 lakh as a capital. The finance for the oil mill was taken by the entrepreneur form the Ichalkaranji Janta co-op. bank ltd. Ichalkaranji.

Raw material

The mill extracts the oil from peanuts by the processing of the groundnut with capacity of ten tones per day. The raw material is available from local areas as it would be imported from the state of Gujrat Sourashtra and karanataka. It is available in a specific season. The raw material was purchased from the Brokers. The mill has operated through the year. The raw material was processed form the species of groundnut e.g. G10, G20, Jada, Phulepargatti and Ghungaru. The rate of ground nut per tone is about Rs. 4800-5000. It is purchased from the Gadhingalaj, Uttur, Ajara.

Labour

There were only 6 labours working in the oil mill on the daily wages. The wages given to the labourers as per their nature of work is generally Rs. 200 the men and Rs.180 to the women labours.

Production

The processed raw material that is peanuts degummed and oil was extracted from that. The produced oil was packed in the polythene bags of different weights and branded by the enterprise. The finished goods (edible oil) sold at local market of Ichalkaraji and exported in the other cities like Sangli, Kolhapur and Gadhinglaj. The oil was sold at factory site on loosely and purchased by the local consumers.

The packages of the tines were stored in the store rooms of the factory. The groundnut oil was sold at the rate of Rs.130 per kilograms and Rs. 2020/- per 15 Kg. packed tine. The secondary product e.g. oil cakes were sold at the local level and is used as an animal feeds. The mill has repackages the edible cotton seed oil and sunflower oil.

Problem faced by the oil mill

There are some problems faced today by the oil mills. There is the acute problem of raw material because of the low production of groundnut at local level. The prices of raw material are unstable. The peanuts are used by the consumers in their daily cooking and therefore the demand was increased from the domestic users. Though there is the competition between oil making enterprises. The users or the consumers are nowadays conscious about the use of the oil and want low fats of oil. They follow the rule of the philological existence on medical ground. The rate of the oil is no affordable to the consumers, at that they want to purchase at low cost or find another alternatives. The enterprise has faced high cost of processing of raw material. In this situation, very low margin stay behind to the enterprise. The fluctuated rates in the markets are the main problem. The mentality of the farmers has been changed and they do not take more production crops on their farms e.g. groundnut. The LBT is another problem faced by the enterprise. They do not get appropriate value for their products in the market.

5.22 RICE MILLS IN KOLHAPUR DISTRICT

The agricultural base of the district is favorable for the establishment of different types of agro-based industries in the district. The infrastructural facilities are available for the establishment of the rice mills. The establishment of the rice mills is done due to the enthusiastic interest of the entrepreneur and due to easy available land, easy accessible point of location, provision of capital, raw material, labor, transport, industrial setup and assured market at local level and nearby places. The required raw material came from Ajara, Radhanagari, Gadhinglaj, and Chandgad tahsils, though the local area is not fulfilling the required demand of raw material, then there is a need of imported raw material and it would be fulfilled from the raw material demanded from the states of the Vidarbha, Hariyana, Karnataka, West Bengal and Zarkhand. The majority of the rice mills were located at the close vicinity of the urban areas of the district e.g. Ichalkaranji, Rukadi-Mangaon and Kolhapur. Total 17 rice mills are producing the rice from the paddy. The following rice mills were working in the district:

- Shree. Vishvaprabha Foods Product Pvt. Ltd., Rukadi. Talauka-Hatkanangale.
- M/s Birla Rice Mills Pvt. Ltd. Mangaon. Talauka-Hatkanangale.
- Ganesh Rice Mills Pvt. Ltd. Rukadi. Taluka-Hatkanangale.
- Mahashakati co-op Rice Mill Mangaon. Taluka- Hatkanangale.
- Gomtesh Rice Mills Pvt.Ltd. Mangaon. Taluka-Hatkanangale.
- M/s. Shivganga Rice Mill A/P Donavade, Taluka-Karveer.
- M/s. Bhivate Rice Mills Pvt. Ltd., A/P C-1, MIDC Gokul Shirgaon. Taluka-Karveer.
- M/s. Kubera Rice Mills Pvt. Ltd. A/P B-8, Plot No.-78, MIDC, Gokul Shirgaon. Taluka-Karveer.
- M/s. Alankar Rice Mills H-12, MIDC, Gokul Shirgaon, Taluka-Karveer.
- M/s. Bhivate Rice and Poha Mills A/P Kalamba Tarf Thane. Taluka- Karveer.
- Khandoba Rice Mills, Pvt. Ltd., Starde Taluka-Pnhala.
- M/s. Shree Krushan Rice Mill, Shivaji Peth, Radhanagari.Taluka-Radhanagari.
- M/s. Radhai Rice Mill Get No. 711, Indira Ganaddhi Vasahat, Radhanagari. Taluka-Radhanagari.
- Shri. Shivling Dhanlaxmi Rice Mill, Shengaon. Taluka-Bhudargad.

- M/s. Devesh Rice Mill, Pvt. Ltd., A/P Plot No. N.C-7, 5 Star MIDC Kagal Taluka-Kagal.
- Annapurna Rice Mills Ltd., MIDC Ajara. Taluka-Ajara.
- Kalbhairav Modern Rice Mills, Ltd., Ajara MIDC Ajara. Taluka-Ajara.

5.23 CASE STUDY

Shree. Vishvaprabha Foods Products Pvt. Ltd., Rukadi. Taluka-Hatkanangale.

This unit has been started in 2007. It is started due to the own interest of the owner of the rice mills. The mill is located at Rukadi-Mangaon near Ialkaranji in Hatkanangale taluka. It has all infrastructural facilities at the factory site.

Capital

The capital has risen by the proprietor from the local people. The amount Rs. 7 crore was invested in mill as a capital, among them proprietor had invested Rs.3 crore and Rs. 4 crore were collected from the local share holders.

labour

The labours were available from the local near by the areas. There were 26 laborers working in the mill on daily wages among them 6 were skilled and remaining 20 were unskilled labours. There are 3 persons working as an official of the mill. The manager get payment between the slabs of payment Rs.7000-12000. The labours get facilities like insurance, govt. holidays and weekly holidays and all types of leaves. The mill has taken a responsibility of primary education of the children's of the laborer working in the mill.

Raw Material

The mill has processed raw material (paddy) and made the fine product of rice. The raw material was available from the nearby areas of the district, but bulk of the raw material used to come from the state of Karnataka, W.Bengal, Zarkhand and Bihar. The processing capacity of the mill is 3 tonnes paddy per hour. Still only 50 percent work would be done by the mill from its established and existing capacity. It has processed 50 metric tonnes of paddy per day. It is processed during the seasons

e.g. from December to May. The different types of varieties of paddy was processed in the mill e.g. Sona masuri, HMT, Indrayani, Sujata, Ratanagiri-24 and Ghansal. In the year 2011-12 the mill has processed 4400 metric tonnes of the paddy worth Rs. 7 crore and 50 lakhs.

Production

The main production of the mill was rice as well as broken rice. Nearly 650 Kg. rice was produced when one tones of paddy was processed. At the time of process of paddy, the 75 per cent of rice was made available as a final product and 15 percent of husk and 10 percent was the waste material. The processed material was sold at the local level as well as sent to the nearby region of the district.

The finished product was sold under the brand of the mills at Ratanagiri, Khankhajana, Gai-vasaru and Bansidhar etc. it was sold in the market of Pune, Mumbai and Karnataka. There was 25 percent of finished product sold at local level and 75 percent in the national level. There is the competition in the quality and product. There is the fluctuations in the prices of the products depend upon the quantity and quality sold in the markets.

The table 5.20 reveals that the cost benefits of the mill. It is analyzed form the table that the cost of production and sale of production and benefit of the mill was increased.

Table No 5.20

Expenditure and benefit of the mill on processed material

(Rs.Lakh)

Sr.no	Year	Exp. of prod.	Index value	Sale of prod.	Index value	Benefit	Index value
1	2010	114.89	100.00	206.60	100.00	91.71	100.00
2	2011	120.12	104.55	220.14	106.55	100.02	109.06
3	2012	144.11	125.43	251.27	121.61	107.16	116.85

Source: From the questionnaire filled by the officials of the mill.

From the last three years the expenditure of production was increased by 125.43. The sale of the mill was also grown by 121.61 over the year 2010. The enterprise is in benefit shown from the table and the index of the benefit was grown by 116.85 points.

Problems faced by the mill

The mill has faced some of the problems. The problems which are noticed by the proprietor, there is a shortage of the paddy at local level. Therefore nothing is alternative except the purchasing from other states. There is not any assistance from the side of the govt. The rate of electric bills increases day today and it is not affordable in these days. There is burden of sale tax on the mill. There is another problem of unstable prices in the market both for the raw martial as well as the finished goods. There is nothing any policies and planning from the side of the govt. in connection with production and sale of the material of this enterprise among in the industries in the state of Maharashtra.

5.24 SUMMARY

Agriculture is the prime base of agro-based industries in India. It contributes a large share in the national income upto 40 percent. Though, the rural scene was not satisfactory due to the low per capita income of the people and unemployment of them.

Rural industrialization is the only solution on it. In this connection the agro-based industries are the best measures for the rural development: After that the future scene will be clear.

Agro based industries were categorized as large, medium, rural and cottage industries. Agro-based industries clearly linked with agriculture or both the sectors are related to each other. None of the enterprise is self reliance.

There is a linkage between agriculture and industry. Both agriculture and industry are complementary to each other. Industrial expansion highly depends upon agricultural production. Agro-based industries supports agricultural and processed agricultural produced. It supports agriculture; processed goods came from agriculture, ensured good returns from finished products. Agro-based industries merely not only process only goods but include the farmers too.

The development of agro-based industries in the co-operative sectors is the vital importance for the prosperity and it supports the economic status of the peasants particularly.

The sugar industry is the backbone of the development of rural area and prosperity of the peoples surrounded along the units. The Kolhapur is sugar bowl of the western Maharashtra. Therefore the area under sugarcane rises tremendously in the study area. In the year 1970-71 the area under sugarcane was 39,895 hectares it raised up to 96,800 hectares in the 2000-01. There is a considerable growth in the area under sugarcane particularly in Gaganbavada, Shahuwadi, Kagal, Bhudargad, Ajara, Hatkanangale and Shirol tahsils. There tremendous growth of area registered and harvested area of sugarcane in the district. The sugar factories have crushed a huge quantity of cane e.g, 12.5 million metric tonnes and produced 15.38 lakh of sugar in the year 2010-11.

The Kolhapur district has a marked development in the field of sugar industries. There were only 9 sugar factories in 1985-86 but it is grown with considerable number 21 upto 2010-11. There are 18 co-operative and 3 private sugar factories working in the district. Two factories were stopped their production of sugar and one sugar factory was sold out to Dalmiya sugar. There are three factories run on lease basis. The quantity of cane crushed and sugarcane produced both are increased from the time immemorial.

Jawahar sssk ltd. Hupari takuka- Hatkanangale is accepted for case study because the factory has got pride in the field of sugarcane crushing, production and sugar recovery. It is a multistate co-operative sugar factory. The factory has implemented different area for the development programmes in its command areas.

The cotton textile industries occupy an outstanding position in its output as well as employment in the country. There are 19 co-operative and 10 private spinning mills in the district. The co-operative nature among the peoples in the rural areas being existed naturally therefore the local leaders and social workers make a pride of the co-operative spinning mills in the district.

R. M. Mohite Textiles Ltd. Ambapwadi, Taluka-Hatkanagale is selected for the case study. It is one of the best examples in the field of spinning mills in the private sectors. The spinning mill is well in its administration and its total entrepreneurship.

Mahatma Phule Magaswargiya sahakari Soot Girni Ltd., Peth wadgaon Tal-Hatkanagale is the best example in the field of co-operative spinning mills in the district.

The edible oil industry is one of the important agro-based industries in the rural-urban areas of the district. It is an age old and important agro-based industry. In 2011-12, there were 26 oil making industries existed in the district. Though it has faces some problems in these days. The Genesh oil mill has one of the traditional and ancestral enterprises of the proprietor. It also faces some of the problems today.

The Kolhapur has 17 rice mills in the close vicinity of the urbanized areas of the district. There were different infrastructural facilities were available in the district for the establishment of the rice mills. Majority of the rice mills were existed in the private sectors. Shree. Vishvaprabha Foods Products Pvt. Ltd., Rukadi. Taluka-Hatkanangale is pvt Ltd., company and still working in well manner and it is taken as case study of the rice mills in the district. There are some problems told by the administrative units of the mills and today these types of entrepreneurs have faced some problems in these days.

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CHAPTER- VI

**CONCENTRATION AND DIVERSIFICATION OF
AGRO-BASED INDUSTRIES**

CHAPTER-VI
CONCENTRATION AND DIVERSIFICATION OF
AGRO-BASED INDUSTRIES

- 6.1 INTRODUCTION
- 6.2 SPATIO-TEMPORAL GROWTH OF SUGAR INDUSTRIES
 - 6.2.1 SPATIO-TEMPORAL GROWTH OF SPINNING MILLS
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CHAPTER-VI

CONCENTRATION AND DIVERSIFICATION OF AGRO-BASED INDUSTRIES

6.1 INTRODUCTION

Agriculturally Kolhapur district is one of the leading districts in the state of Maharashtra. There were number of crops has been grown in the district. Majority of the agro-based industries in the district were relied on raw material come from agriculture. Therefore a sound position was found in the district from time immemorial. The number of considerable agro-based industries was established in the district. From the year 2001-2002 to 2011-2012 there was a considerable change in the growth agro-based industries in the district was noted by 1.32 times. A considerable growth was recorded in the rice mills with 1.70 times within the period of ten years from 2001-02 to 2011-12 fallowed by sugar industries (1.31times), spinning mills(1.26 times) and oil mills (1.23) in the district. The table no 5.1 Shows that the spatial-temporal changes in the growth of the agro-based industries in the Kolhapur district from the period 2001-02 to 2011-12.

6.2 SPATIO-TEMPORAL GROWTH OF SUGAR INDUSTRIES

Sugar industry is one of the most important agro based industry in the district. There were 16 sugar factories existed in the district in 2001-2002. This was possible due to the sugarcane cultivation. Sugarcane was grown in good quantities since old day in Kolhapur district. Well irrigation facilities are developed in the district; well drained soils of Kolhapur district are best suited to this tropical crop. Farmers of the district taking efforts to provide high yielding varieties of sugarcane therefore the raw material was available for the sugar factories in the district. The Hatkangale and Shirol tahsils have three sugar factories. Kagal and Phanala tahsils have two sugar factories. The Shahuwadi, Shirol, Gagenbavada, Ajara, Gadhinglaj and Changad tahsils of the district has one sugar in 2001-2002 (Table No 6.1).

There were 21 sugar factories came into existence in the year 2011-2012 in the district. Hatkangale, Kagal and Changad are the leading tahsil of the district and each has three sugar factories. The marked growth in the sugar factories

noted in the Changanad and Kagal tahsils of the district. These tahsils have enough raw materials for the existence of sugar factories in the district. All the infrastructural facilities were available in these tahsils. Gagenbavada tahsil has started new sugar factory in the recent year. Shirol district has two sugar factories. The increase in the sugarcane cultivation has motivated to the development of sugar factories in the district. Sugar industries are the main important agro-based industry in the study region. Sugar factories are offer good employment opportunities in the rural areas. In the year 2001-2002 there 17,389 workers engaged in the sugar factories. The number of workers grown and it has provides employment to 20,313 workers in the year 2011-2012 in the district.

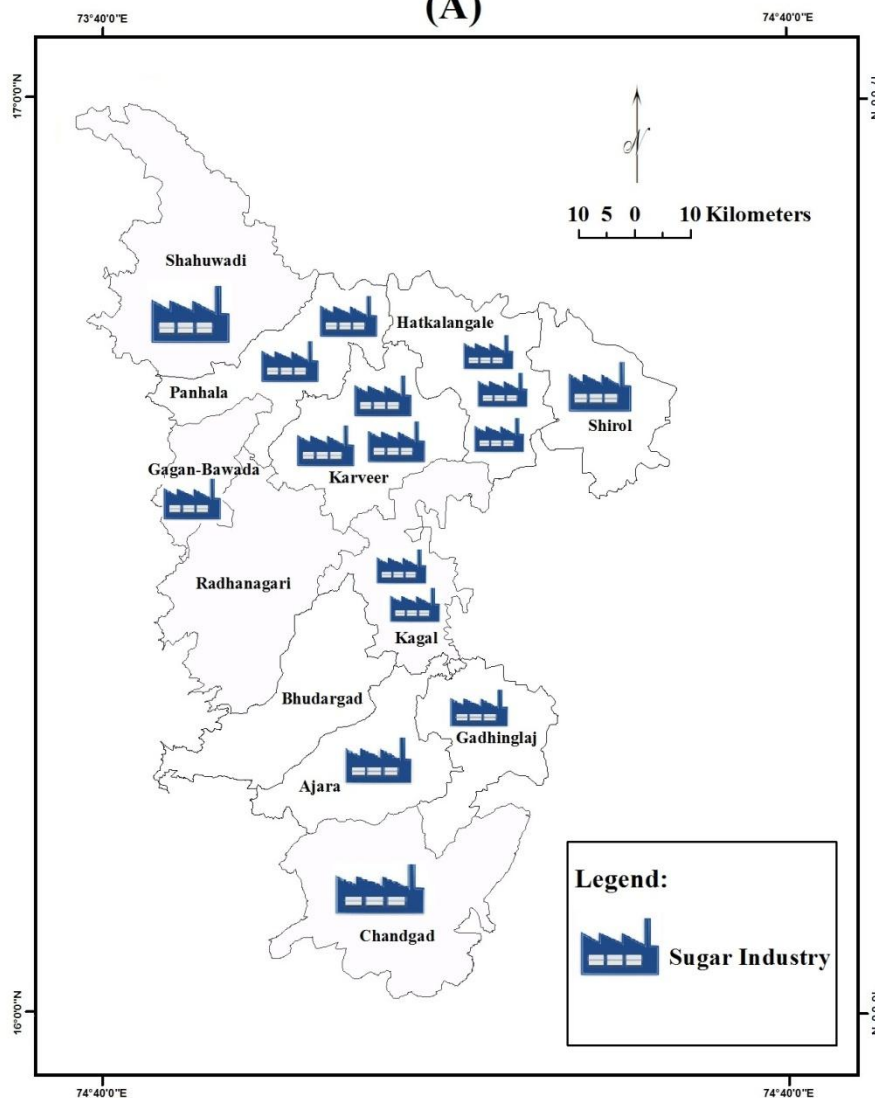
Table No. 6.1

Kolhapur District: No of Agro-based Industries.

Sr. No	Tahsil	2001-2002					2011-2012				
		Sug ind	Spin. mills	Oil mills	Rice mill	Tot.	Sug ind.	Spin. mills	Oil mill	Rice mill	Tot.
1	S.wadi	1	----	1	----	2	1	----	1	----	2
2	Panhala	2	1	----	----	3	2	1	----	1	4
3	H. gale	3	14	3	2	22	3	16	4	5	28
4	Shirol	1	6	----	----	7	2	8	----	----	10
5	Karveer	3	----	14	4	21	3	1	16	5	25
6	G.bavda	1	----	----	----	1	1	----	----	----	1
7	R.gari	----	----	----	1	1	----	----	----	2	2
8	Kagal	2	----	----	1	3	3	----	----	1	4
9	B.gad	----	1	----	1	2	1	1	----	1	3
10	Ajara	1	----	----	1	2	1	1	----	2	4
11	G.laj	1	1	3	----	5	1	1	4	----	6
12	C.gad	1	----	----	----	1	3	----	1	----	4
13	District	16	23	21	10	70	21	29	26	17	93

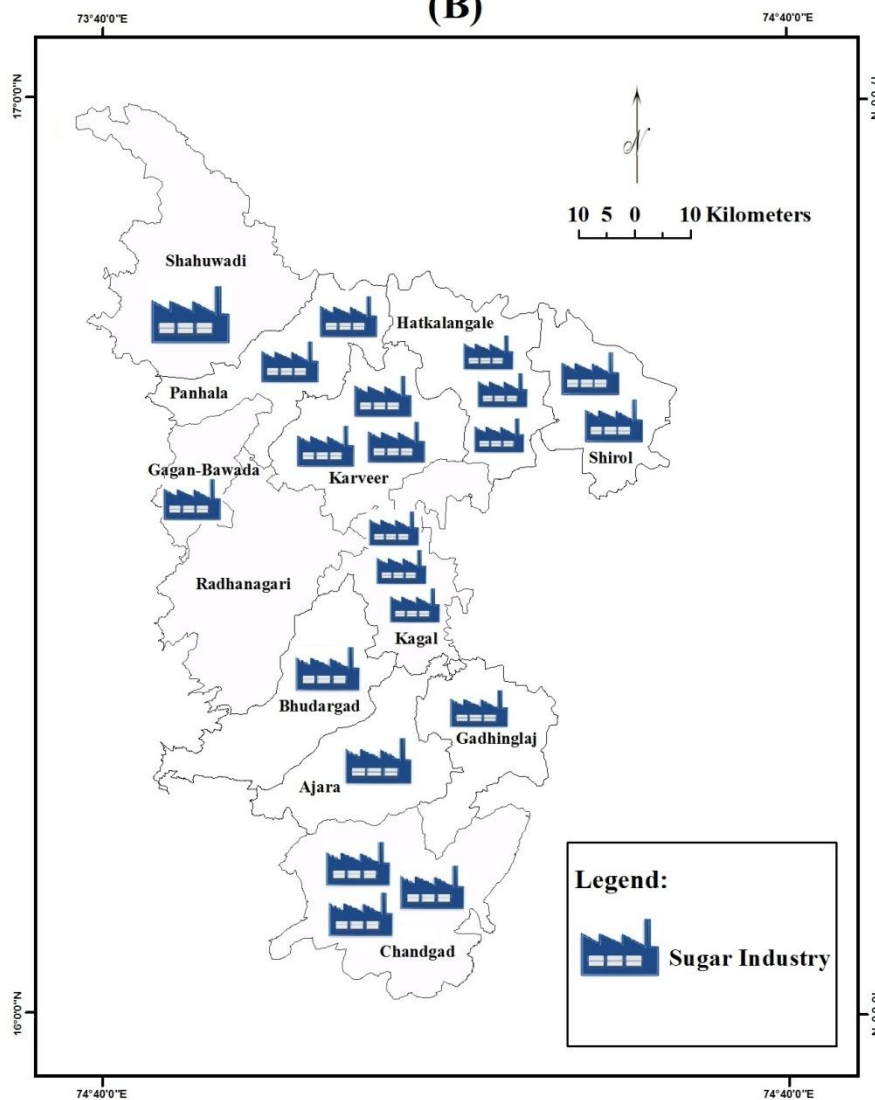
Source: Socio-economic abstract of the Kolhapur district 2001-02 to 2011-12.

Kolhapur District Tahsilwise Distribution of Sugar Industries 2001-2002 (A)



Map No.6.1 (A)

Kolhapur District Tahsilwise Distribution of Sugar Industries 2011-2012 (B)



Map No.6.1 (B)

6.2.1 SPATIO-TEMPORAL GROWTH OF SPINNING MILLS

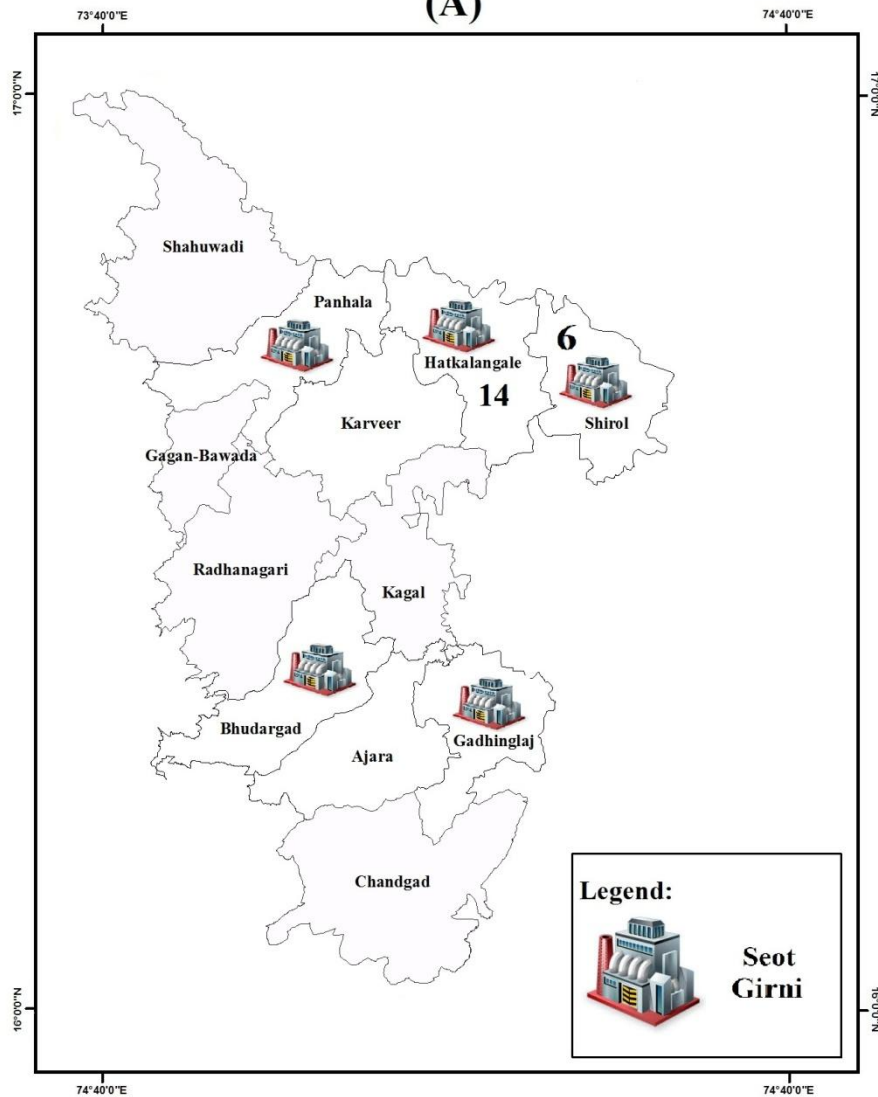
Cotton spinning mills is one of the main agro-based industries in the district. It plays important role in the cotton textile industry in the district. It provides yarn (soot) for the weaving mills in the district. Ichalkaranji is the known as the Manchester's of cotton textile of the Maharashtra. Cotton textile industry is mainly concentrated in and around the Ichalkaranji town. All the required infrastructural facilities are well developed in this area of the district. The textile clusters is particularly made at Ichalkarnaji. Though, the locational aspects play an important role in the development of cotton textile industry.

In the year 2001-2002, there were 23 spinning mills are existed in the district. The spinning mills were mainly concentrated in the Hatkanangale tahsil particularly at Ichalkaranji, followed by Shirol tahsil of the district. There are 14 spinning mills were existed in Hatkangale tahsil. Six spinning mills were found in Shirol tahsil. The remaining tahsils e.g. Panhala, Bhandarged and Gadhinglaj has one spinning mill respectively (Map No. 6.2 A). There were 60.87 percent spinning mills were concentrated in Hatkangale tahsil followed by Shirol 26.08 percent and 4.35 percent in each in the Panhala, Baudargad and Gadhinglaj tahsils of the district.

There is a notable increase in the number of spinning mills in the district from 2001-2002 to 2011-2012. There were 29 spinning mills were existed in the year 2011-2012 (Map No.6.2 B). The growth index of spinning was 126.08 percent as compare to 2001-2002. Particularly the growth in the number spinning was recorded in the Hatkangale and Shirol tahsils of the district. In the year 2011-2012 there were 16 spinning mills were found in Hatkangale tahsils the district. Shirol tahsil has 8 spinning mills in the year 2011-2012. The Pahnala, Ajara, Karveer, Budhargad, Gadhinglaj tahsils have one spinning mills respectively in 2011-2012(Table No.6.1 B).

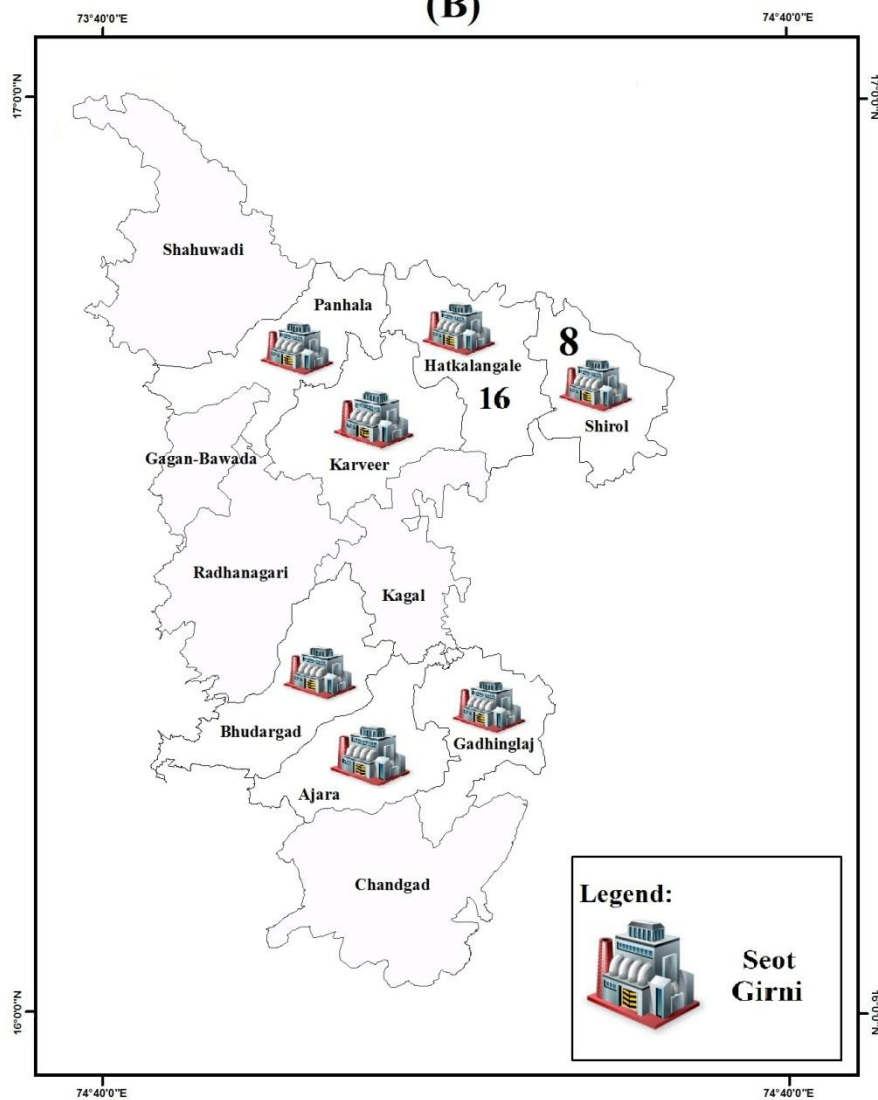
The notable change in the growth of the spinning mills were observed in the Hatkangale and Shirol tahsils of the district from 2001-2002 to 2011-2012. There were 55.17 percent spinning mills were located in the Hatkangale and 27.58 percent in the Shirol. The Panhala, Karveer, Budargad, Ajara, and Gadhinglaj tahsils has 3.45 percent share in the spinning mills respectively in the Kolhapur district.

Kolhapur District Tahsilwise Distribution of Soot (Yarn) Girni 2001-2002 (A)



Map No.6.2 (A)

Kolhapur District Tahsilwise Distribution of Soot (Yarn) Girni 2011-2012 (B)



Map No.6.2 (B)

6.2.2 SPATIO-TEMPORAL GROWTH OF EDIBLE OIL MILLS

The edible oil is one of the important small scale agro-based industries in the district. It is mainly concentrated at Karveer, Gadhinglaj, Htkangale tahsils of the district. The entrepreneurial efforts are being important for the beginning of the oil mills at Kolhapur. The availability of raw material, transportation and market facilities are also play an important role in the beginning of the oil mills at Kolhapur and Gadhinglaj cities in the Kolhapur. A considerable increase in the number of oil mills was notable in the Karveer tahsils of the district.

In 2001-2002 there were 21 oil mills were existed in the district. The oil mills increases up to 26 in 2011-2012. The index of growth is 123.81 in the period of investigation. There were (66.66 percent) 14 oil mills were concentrated in Karveer tahsil of the district in 2001-2002 (Map No.6.3 A). There are three (14.28 percent) oil mills were existed in each in the Hatkangale and Gadhinglaj tahsils during 2001-2002 (Table no.6.1). The Shahuwadi tahsil has one unit (4.76 percent) of oil mills in 2001-2002.

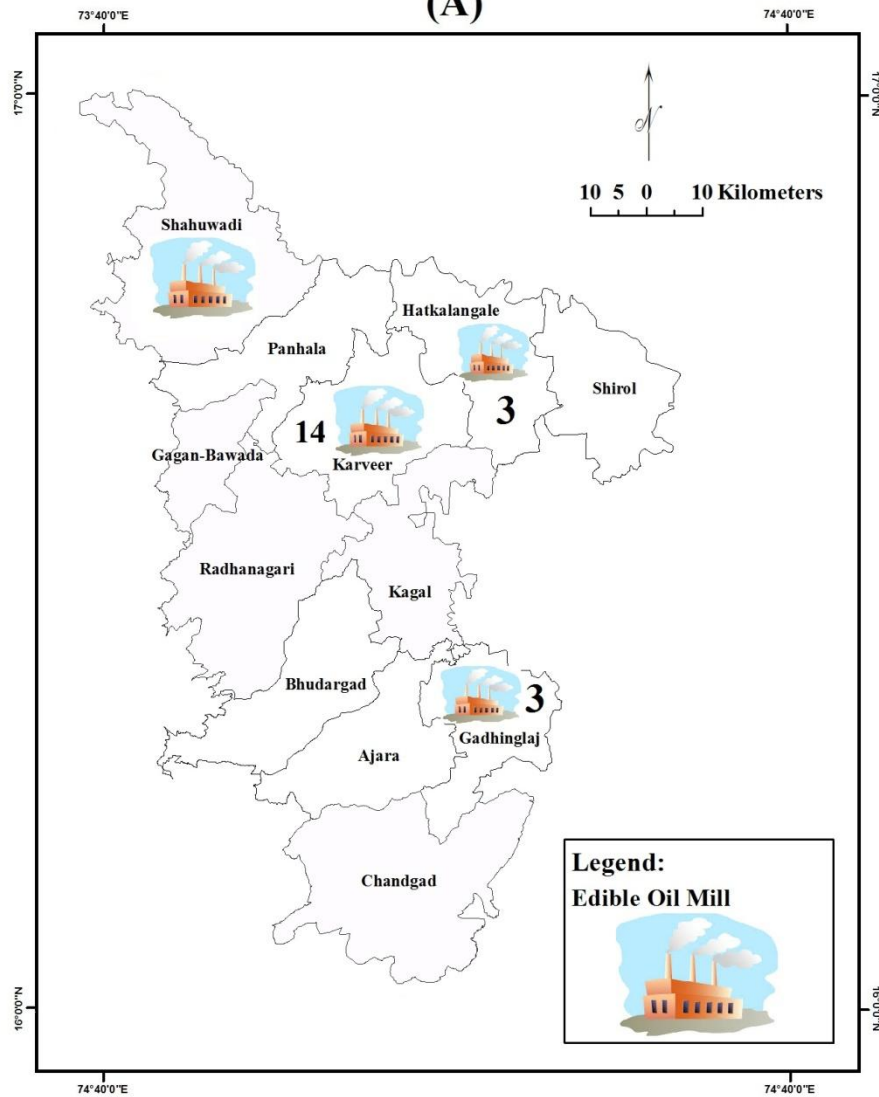
The number of oil mills increases in the Karveer, Hatkangale, Gadhinglaj and Changad tahsils of the district in 2011-2012. The Karveer (16), Hatkangale (4), Gadhinglaj (4), Changad (1), Shahuwadi (1) are the main tahsils having oil mills in the year 2011-2012. (Map No.6.3B) The share of the oil mills in Karveer tahsil (61.53 percent) was shown decreases as compare to year 2001-2002.

There is increase in the share of oil mills (15.38 percent) in the Hatkangale and Gadhinglaj tahsils of the district respectively. Changad tahsil has one oil mill in 2011-2012. The Shahuwadi and Changad has 3.85 percent share in the oil mills respectively during the year 2011-2012. (Map No. 6.3 B)

There is a considerable change was observed in the increase of oil mills particularly in the Karveer, Hatkangale, and Gadhinglaj tahsils of the district (Map No.6.3 B).

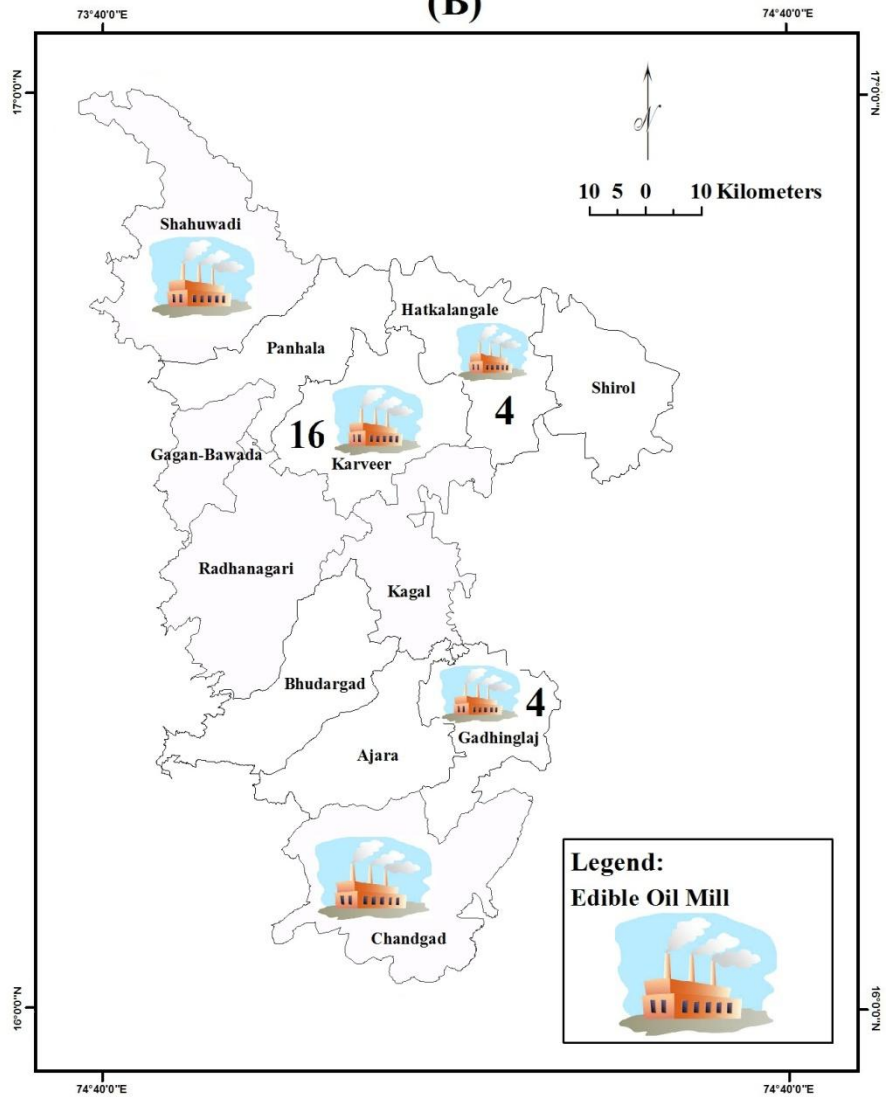
The oil seeds made available in the district was inadequate because the farmers become replace the ground by the sugarcane. Therefore the mills have facing acute shortage of groundnut.

Kolhapur District Tahsilwise Distribution of Edible Oil Mills 2001-2002 (A)



Map No.6.3 (A)

Kolhapur District Tahsilwise Distribution of Edible Oil Mills 2011-2012 (B)



Map No.6.3 (B)

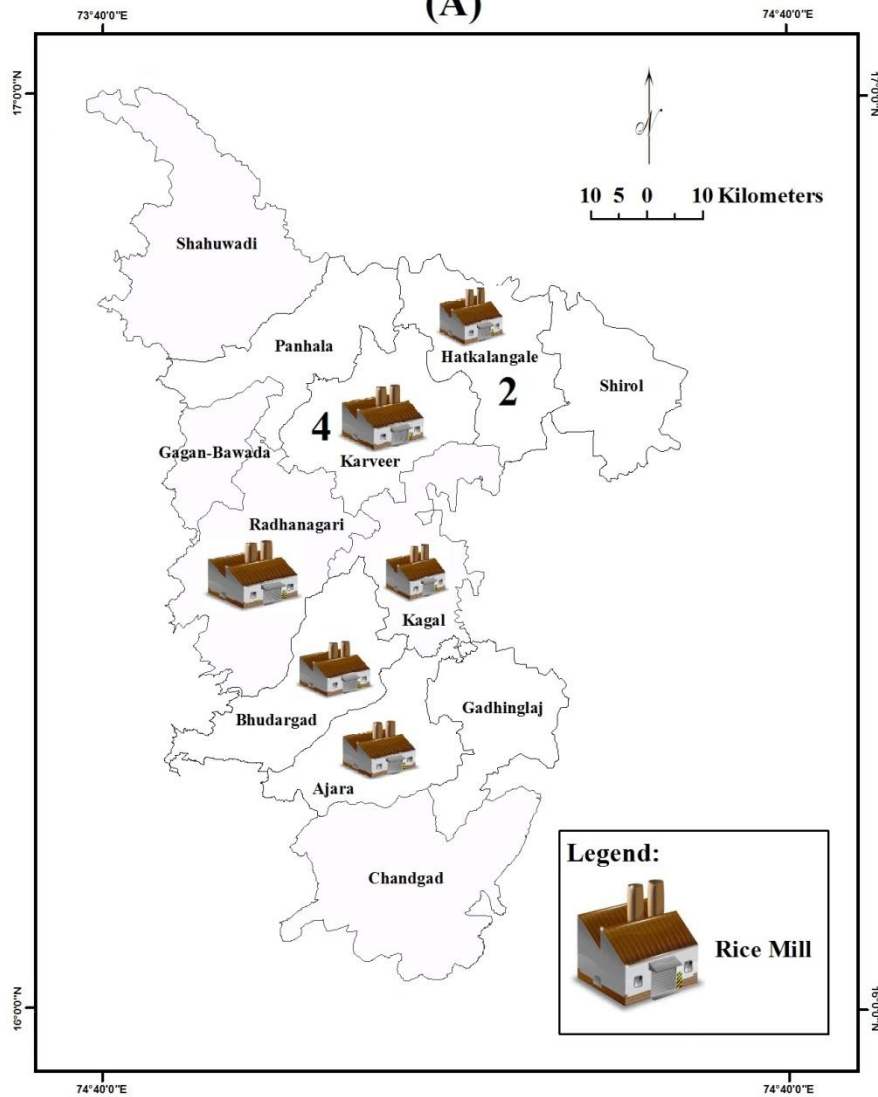
6.2.3 SPATIO-TEMPORAL GROWTH OF RICE MILLS

There were 10 rice mills existed in the year 2001-2002 in the district. (Map No.6.4 A) out of ten rice mills 4 rice mills were found in Karveer, 2 in Hatkangale and one each in Radhanagari, Kagal, Bhudargad and Ajara tahsils in the district in 2001-2002(Map No.6.4 A).

Rice mills are increased by 1.7 times from 2001-2002 to 2011-2012. During 2011-2012 there 17 rice mills were existed in the district out of them 5 each in Hatkangale and Karveer, 2 each in Ajara and Radhanagari, 1 each in Panhala, Kagal, Bhudargad tahsils of the district. (Map No. 6.4 B)

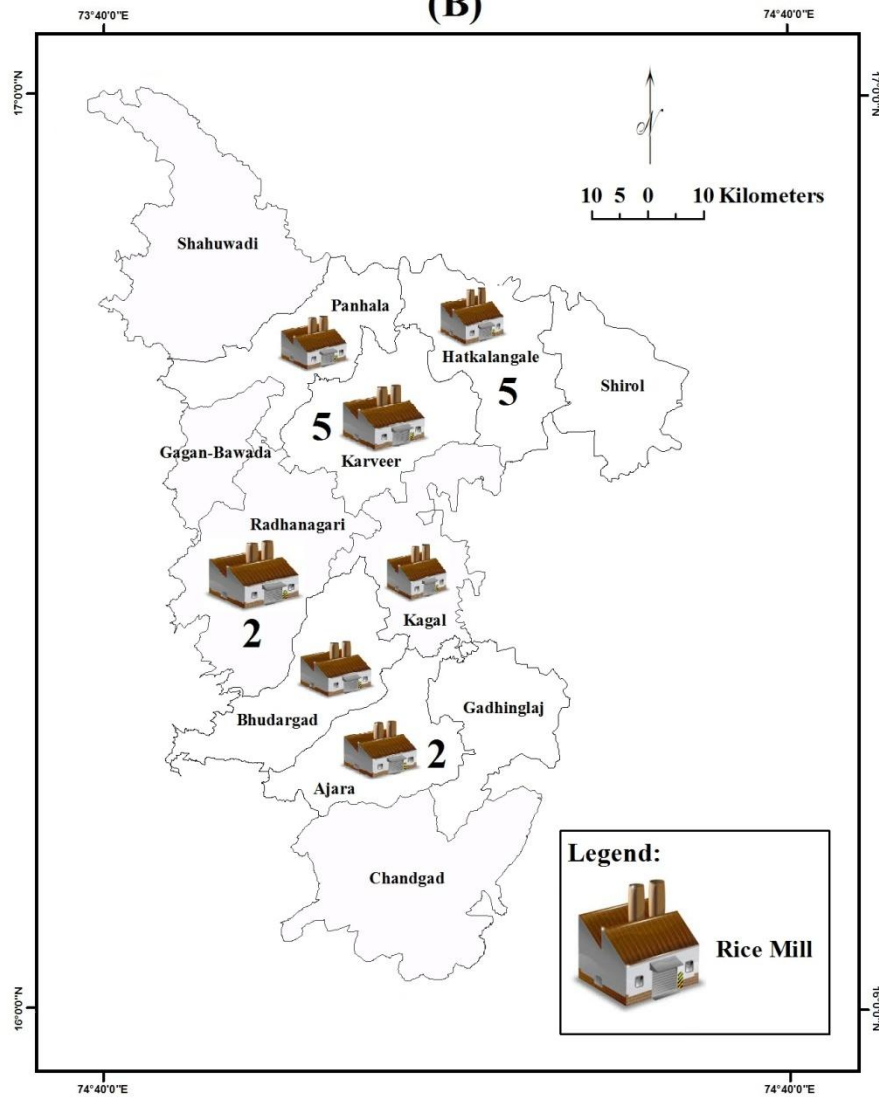
There is a considerable increase in the number of rice mills in the Hatkangale, Karveer, Radhanagari and Ajara tahsils of the district from 2001-2002 to 2011-2012.(Map No. 6. 4 B). Still there is a potential for the new begins of rice mills in the tahsils of the western part of the district.

**Kolhapur District
Tahsilwise Distribution of Rice Mills
2001-2002
(A)**



Map No.6.4 (A)

Kolhapur District Tahsilwise Distribution of Rice Mills 2011-2012 (B)



Map No.6.4 (B)

6.2.4 EMPLOYMENT IN AGRO-BASED INDUSTRIES

Agro-based industries play an important role in the generation of employment in the rural areas of any region. Thus the labour or worker is one of the major location factors of the agro-based industries. Majority of the peoples in the Kolhapur district are cultivators, agricultural labourers and other workers. But the different types of agro-based industries in the district provide a huge opportunity of employment to the rural peoples. The workers are available at comparatively much cheaper rates in this region. Many large and small scale agro based industries provided employment to the local labours. There were 46.92 percent peoples are engaged as labourers to the total population of the district in different category of the economic activities in the year 2001. Thus the skilled and unskilled, both types of workers are easily available in this region.

During 2001-2002 there were 24,209 workers working in the different types of agro-based industries in the district. The growth index of industrial workers was increased by 1.24 times during 2001-2002 to 2011-2012 in the study region. There were 30,114 workers working in the different types of agro-based industries e.g. Sugar factory, spinning mills, Edible oil mills and Rice mills in the year 2010-2011 (Table No.6.2).

Table No. 6.2

Kolhapur District: Employment in Agro-based Industries.

Sr.No.	Tahsil	2001-2002					2010-2011				
		Sug. ind.	Spin. mills	Oil mills	Rice mill	Tot.	Sug. ind.	Spin. mills	Oil mills	Rice mill	Tot.
1	S.wadi	788	----	----	----	788	876	----	4	----	880
2	Panhala	2100	630	----	----	2730	2340	700	----	20	3060
3	H. gale	3087	3065	06	25	6183	3430	4275	19	31	7755
4	Shirol	2114	2898	----	----	5012	2374	3570	----	----	5944
5	Karveer	2743	----	18	18	2779	3048	435	70	24	3577
6	G.bavda	660	----	----	----	660	737	----	----	----	737
7	R.gari	----	----	----	09	09	----	----	----	11	11
8	Kagal	2471	----	----	----	2471	3349	----	----	06	3355
9	B.gad	404	135	----	----	539	449	149	----	05	603
10	Ajara	692	----	----	10	702	769	330	----	13	1112
11	G.laj	790	----	06	----	796	878	120	19	----	1017
12	C.gad	1540	----	----	----	1540	2063	----	----	----	2063
13	District	17389	6728	30	62	24209	20313	9579	112	110	30114

Source: Socio-economic abstract of the Kolhapur district 2001-02 to 2011-12.

During 2010-2011 there were 20,313 workers working in the sugar industry. It is increased by 1.16 times in the study region during the period 2001-2002 to 2010-2012. Sugar factory is one of the important agro-based industries of the study region which one provides a huge quantity of employment to the local level labourers in the study region.

The leading tahsils in the field of cooperative sugar factories has made an important role in the generation of employment to the local peoples. The Hatkanangale, Kagal, Karveer, Shirol and Changad are the main tahsils where the sugar industries being existed and provides employment to workers of the study region.

There were 9579 workers working in the spinning (yarn) mills during 2010-2011 in the study region. It increased by 1.42 times over the year of 2001-2002. There 4275 workers out of 9579 workers working in the spinning mills in the Hatkanangale tahsil of the district and the percentage 44.62 followed by Shirol (37.26 percent) 3570 workers out of total workers engaged in spinning mills in the district. The spinning mills a sector has provide a large quantity of employment to the workers in the study region. All the spinning mills are concentrated in the Hatkanangale and Shirol tahsils of the district during the period 2001-2002 to 2010-2011 (Table No.6.2).

During 2010-2011 there were 112 workers working in the edible oil mills in the study region. A very small quantity of labour engaged in this agro-based industry as compare to the other agro-industries E.g. Sugar and Spinning mills. Majority of the edible oil mills are concentrated in Karveer and Hatkanangale tahsils of the district. The workers are available at local level in the district. The Kolhapur is the main centre of this enterprise. Where the oil mills particularly located near the market place at Kolhapur.

Rice mills are another agro-based industry which provides a little quantity of employment to the workers. Though, it requires trained workers. There were 110 workers working in the rice mills of the district. The extent of its growth is 1.77 times from the year 2001-2002. It is clear from the table no.6.2 that there is 28.18 percent workers (31 workers) were engaged in this enterprise in the Hatkanangale tahsil. Shirol tahsil has five rice mills and ranks second (21.81 percent)

in employment. Radhanagari and Ajara tahsils which have two rice mills were existed in the study region. The Panhala and Radhanagari tahsils has well suitable for the rice mills where 18.18 percent workers working in the rice mills.

As compare to other agro-based industry of the district, there were majority labour force was working in the sugar industry, spinning mills, edible oil mills and rice mills they may become the potential source of labour in the rural sector of the study region.

During the period of investigation from 2001-2002 to 2010-2011 a remarkable growth was noted in number of the employment in the study region. A remarkable growth was recorded in the large scale agro-based industry e.g. Sugar and Spinning mills both the co-operative and private sector of the Kolhapur district.

6.3 CONCENTRATION AND DIVERSIFICATION OF AGRO-BASED INDUSTRIES

Kolhapur district lies in the extreme south of the state of Maharashtra. It is fortune that the district has been availed with the all the natural elements to its all round development. Geographically district has different characteristics. It influences on the socio economic development of the district. The farmers of the district grow different types of crops relied on the extremely geographical condition. There were different types of crops grown in the district e.g. cereals, fruits and vegetables and cash crops. It is the base of the development of agro-based industries. Different types agro-based industries exist in the district from long time.

The Kolhapur district is famous for the sugar industries, Cotton textile industries and different types of food processing industries. Particularly sugar industries are flourished in the middle and eastern part of the district. Cotton textile industry is the eastern part of the district. The region is having good fertile soil, sufficient drainage net work, irrigation facilities and other infrastructural facilities so it is all favorable for the existences and development of the different food processing industries in the district.

There is potential for new coming agro-based industries in the district. Still the district is enjoying the development of such types of agro-based industries

thoroughly. The development of these industries maintains adequate growth and creates ample opportunities of employment in the district.

6.3.1 CONCENTRATION OF AGRO-BASED INDUSTRIES

Industrial concentration means the variation in the density of any industrial area at a given point of time. The concentration of these agro-based industries depends on terrain, agricultural production, availability raw material, water, transportation system, market place and pedological conditions. It is a tendency to have high concentration in area of ideal infrastructure condition place, perfect knowledge of industrial concentration and diversification pattern in a region which has been considered to be most useful in the judicious industrial planning. The general concentration of an enterprise can be quantified with help of location quotient or by co-efficient of localization.

In order to determine the regional concentration of selected agro-based industries Bhatia's method of crop concentration (1965) is used with modification for calculation quotients. The following formula is used for the concentrations of selected agro-based industries:

$$\text{Indx. of Concent.} = \frac{\text{No. of ind. 'a' in the comp. areal unit}}{\text{No. of all sectd. agro ind. in the comp areal unit.}} \div \frac{\text{No. of agro. ind. 'a' in the entr. area}}{\text{No. of all seltd. agro ind. unit in the entr. study region}}$$

Table no. 6.3 reveals that the index values of concentration of agro-based industries for the year 2001-02 and 2011-12.

6.3.1.1 CONCENTRATION OF SUGAR INDUSTRY

From the table 6.3 it is noted that the low concentration of sugar industries was recorded in Gadhinglaj, Karveer, Hatkanangle and Shirol tahsils of the Kolhapur district in the year 2001-2002. Whereas moderate concentration of sugar industries was recorded in Ajra, Kagal, Panhala and Shahuwadi tahsils in 2001-2002. High concentration was recorded in Chandgud, Gaganbavada tahsils in 2001-2002. None of

the industrial concentration of agro-based industries was recorded in the tahsils of Radhanagari and Bhudarged in the year 2001-2002 (Map 6.5 A).

Table no. 6.3

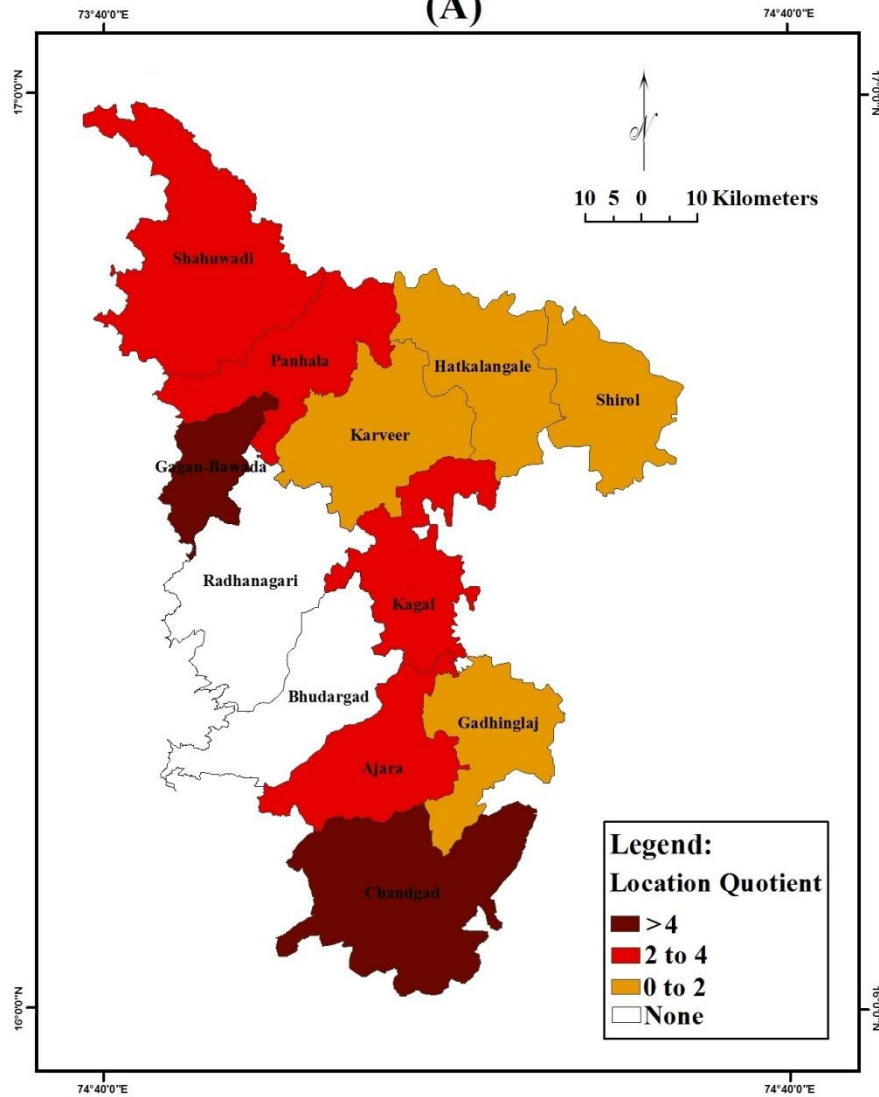
Kolhapur District: location quotient of industrial concentration

Sr. No.	Tahsil	2001-2002				2011-2012			
		Sugar ind.	Spin mills	Edi.oil mills	Rice mills	Sugar ind.	Spin. Mills	Edi.oil mills	Rice mills
1	Shahuwadi	2.27	0.00	1.67	0.00	2.27	0.00	1.85	0.00
2	Panala	3.00	1.00	0.00	0.00	2.27	0.81	0.00	1.38
3	Hatkangale	0.62	1.97	0.45	0.64	0.50	1.84	0.52	1.00
4	Shirol	0.64	2.66	0.00	0.00	0.91	2.58	0.00	0.00
5	Karveer	0.64	0.00	2.20	1.36	0.54	0.13	2.37	1.11
6	G.bavada	4.54	0.00	0.00	0.00	4.54	0.00	0.00	0.00
7	R.nagari	0.00	0.00	0.00	7.14	0.00	0.00	0.00	5.55
8	Kagal	3.00	0.00	0.00	2.36	3.40	0.00	0.00	1.38
9	B.gad	0.00	1.57	0.00	3.57	1.50	1.06	0.00	1.83
10	Ajara	2.27	0.00	0.00	3.57	1.14	0.81	0.00	2.77
11	G.laj	0.91	0.62	2.00	0.00	0.73	0.52	2.44	0.00
12	Cha.gad	4.54	0.00	0.00	0.00	3.40	0.00	0.93	00.00

Source: Computed by Author.

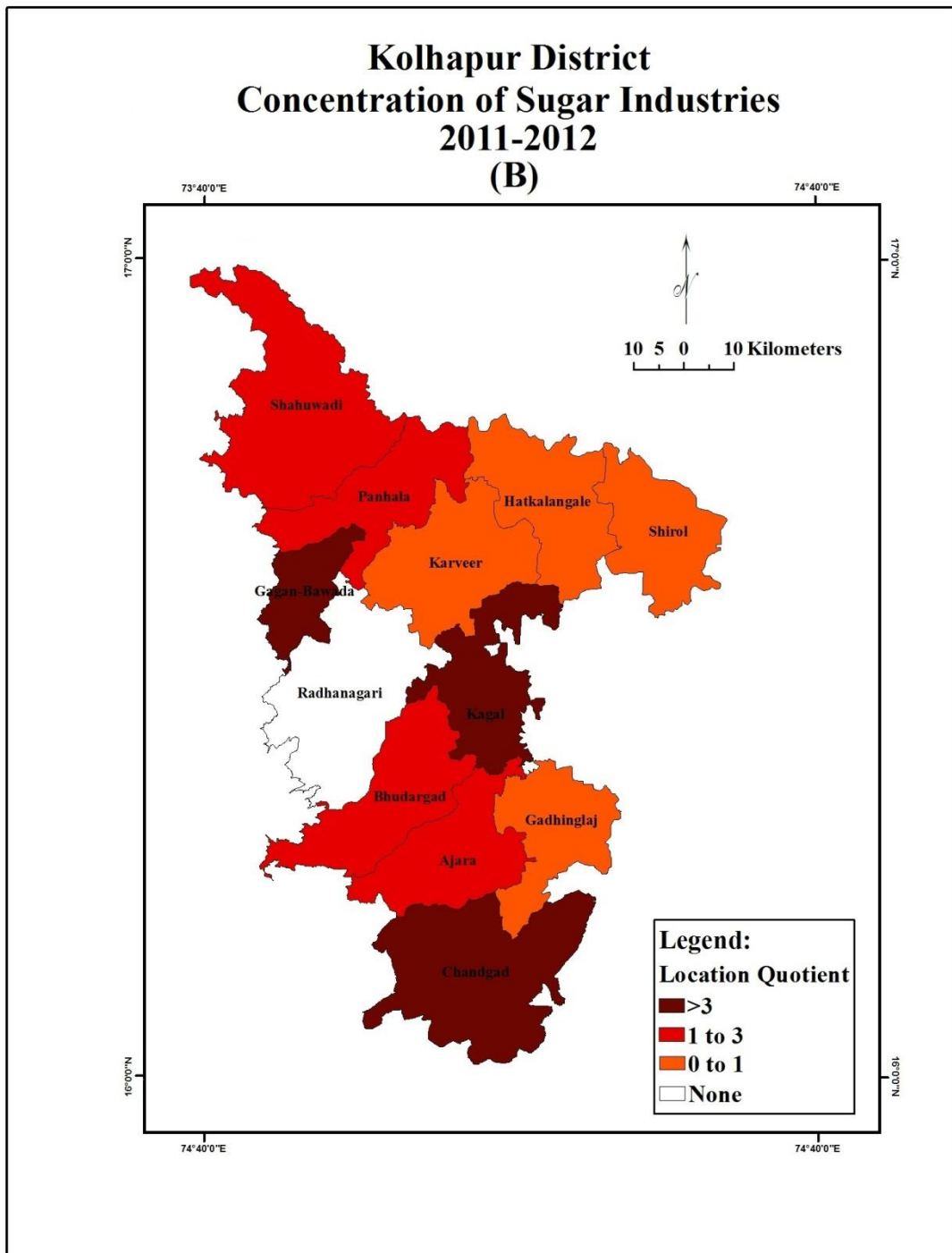
The notable changes in the concentration of sugar industry in the year 2011-2012 were shown in Table No. 6.3 in the study region. There is low concentration of sugar industries was recorded in the tahsils of Gadhinglaj, Karveer, Hatkanagle, Shirol. The moderate concentration of sugar industry was recorded in the tahsils of Shahuwadi, Panhala, Bhudarged, Ajara tahsils of the district in the year 2011-2012. The high concentration of sugar industries was recorded in the Chandgad, Gaganbavada tahsils of the district in 2011-2012. None of sugar industry was concentrated in the Radhanagri tahsils of the district (Map 6.5 B). Notable change was observed in the concentration of sugar industries in the Kagal and Bhudarged tahsils of the study region.

Kolhapur District Concentration of Sugar Industries 2001-2002 (A)



Map No.6.5 (A)

Kolhapur District Concentration of Sugar Industries 2011-2012 (B)



Map No.6.5 (B)

6.3.1.2 CONCENTRATION OF SPINNING MILLS

Low concentration of spinning mills (0 to 1) was recorded in Gadhinglaj and Panhala tahsils and moderate concentration (1 to 2) of cotton spinning was observed in Bhudargad and Hatkangale tahsils of the district in 2001-2002. (Map 6.2 A) High concentration (> 2) of spinning mills was recorded in Shirol tahsils. None of the concentration of spinning mills was recorded in the Radhanagari, Gaganbavada, Kagal, Karveer and Shahuwadi tahsils of the district in 2001-2002 (Map 6.6 A).

Low concentration was observed in spinning mills (0 to 1) in Ajara, Gadhinglaj and Karveer and Panhala in 2011-2012 (Map 6.6 B). Moderate concentration was recorded in (1 to 2) the Bhudargad and Hatkanangale in 2011-2012. The high (> 2) concentration was observed in the Shirol tahsils in the year 2011-2012. There is none of concentration is observed in the Chandgad, Radhanagari and Shahuwadi tahsils of the Kolhapur district (Map 6.6.B). There is change in the concentration of spinning mills was noticed from 2001-2002 in the tahsils Ajara and Karveer tahsils of the Kolhapur district. (Map.no.6.6 A and B)

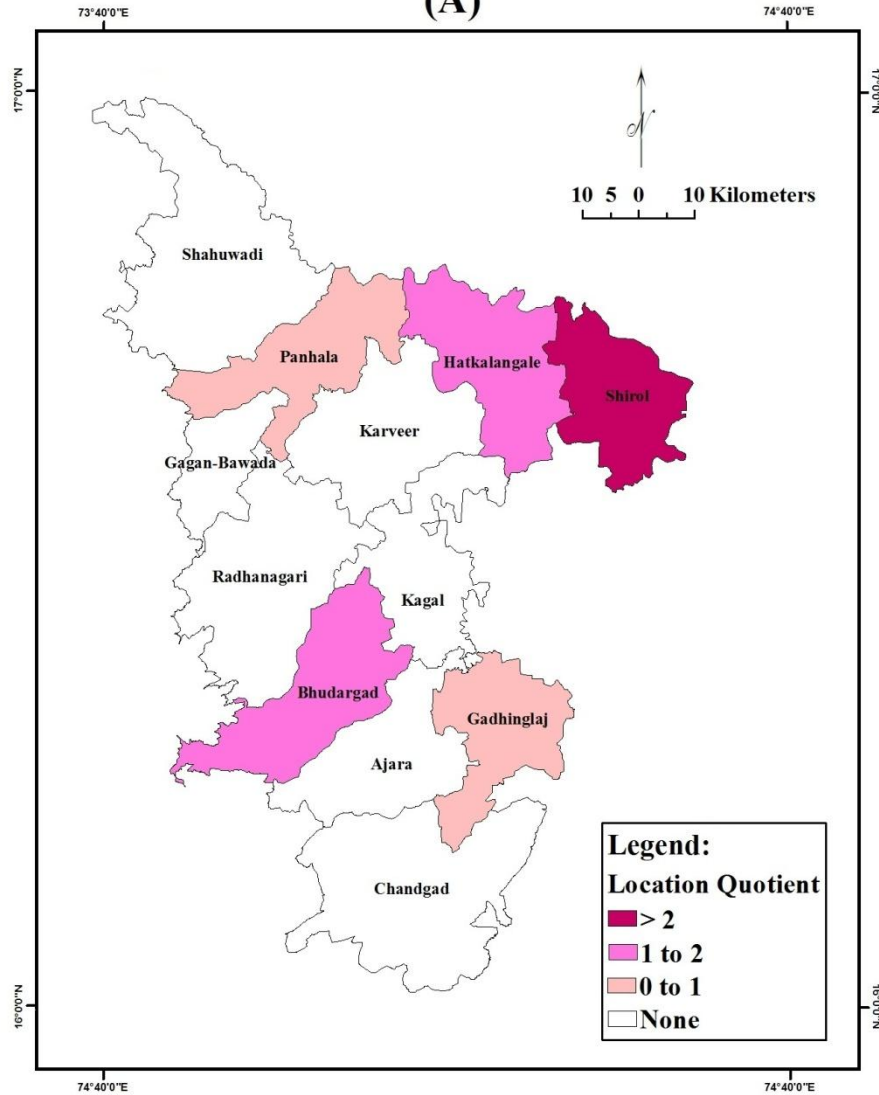
6.3.1.3 CONCENTRATION OF OIL MILLS

Low concentration (0 to 1) of oil mills was found in the Karveer tahsils and moderate concentration (1 to 2) was recorded in Gadhinglaj and Shahuwadi tahsils in the district in 2001-2002 (Map 6.7 A). High concentration (>2) of oil mills was observed in Karveer tahsils of the district in 2001-2002. None of the concentration in oil mills was observed in the Chandgad, Ajara, Bhudarged, Radhanagari, Gaganbavad, Panhala and Shirol tahsils of the district in 2001-2002 (Map 6.7 A).

The low concentration (0 to 1) of oil mills was noted in the year 2011-2012 in Chandgad and Hatkananagale tahsils of the district (Map 6.7 B). The moderate concentration (1 to 2) was observed in the tahsil Shahuwadi in the Kolhapur district. The high concentration of oil mills in 2011-2012 was observed in the Gadhinglaj and Karveer tahsils of the district. None of the concentration in 2011-2012 was recorded in the Ajara, Bhudargad, Radhanagari, Gaganbavada, Panhala and Shirol tahsils of the district (Map no.6.7 B).

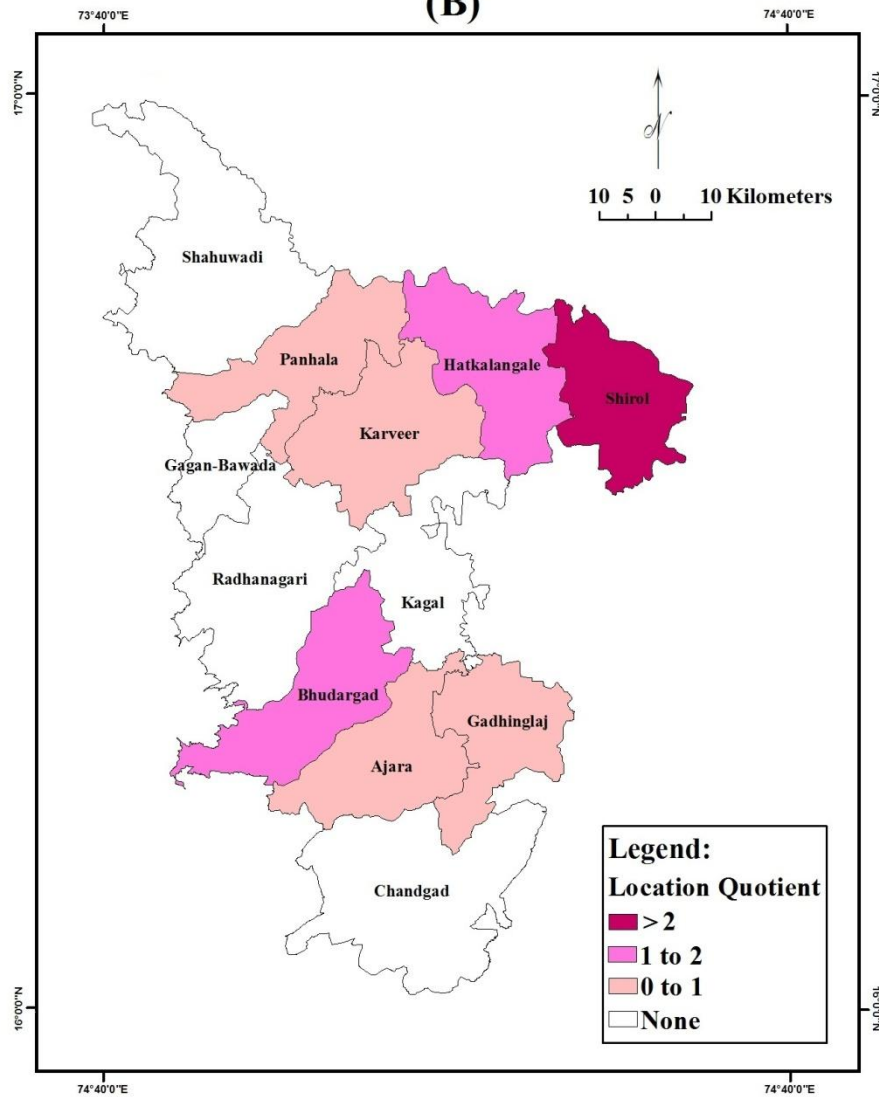
The change in the concentration of oil mills was recorded in the tahsils of Chandgad and Gadhinglaj in the Kolhapur district (Map 6.7 A and B).

Kolhapur District Concentration of Soot (Yarn) Girni 2001-2002 (A)



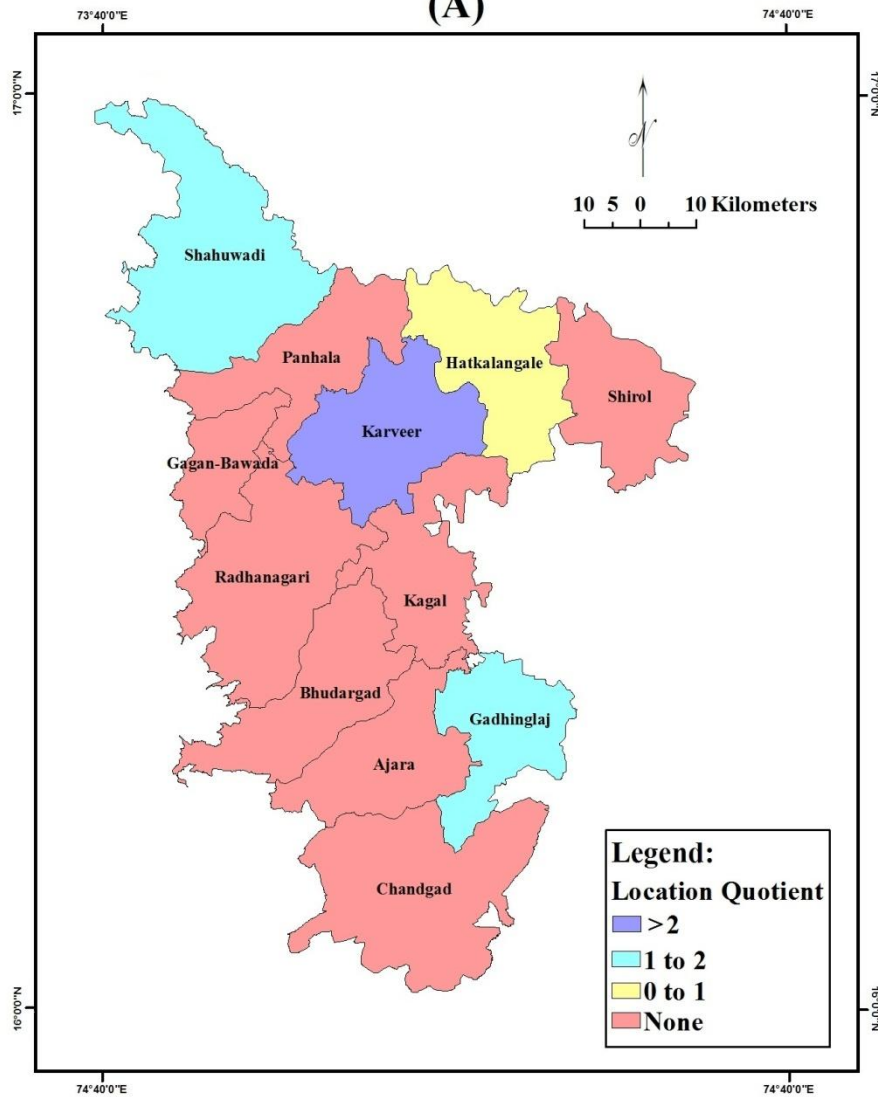
Map No.6.6 (A)

**Kolhapur District
Concentration of Soot (Yarn) Girni
2011-2012
(B)**



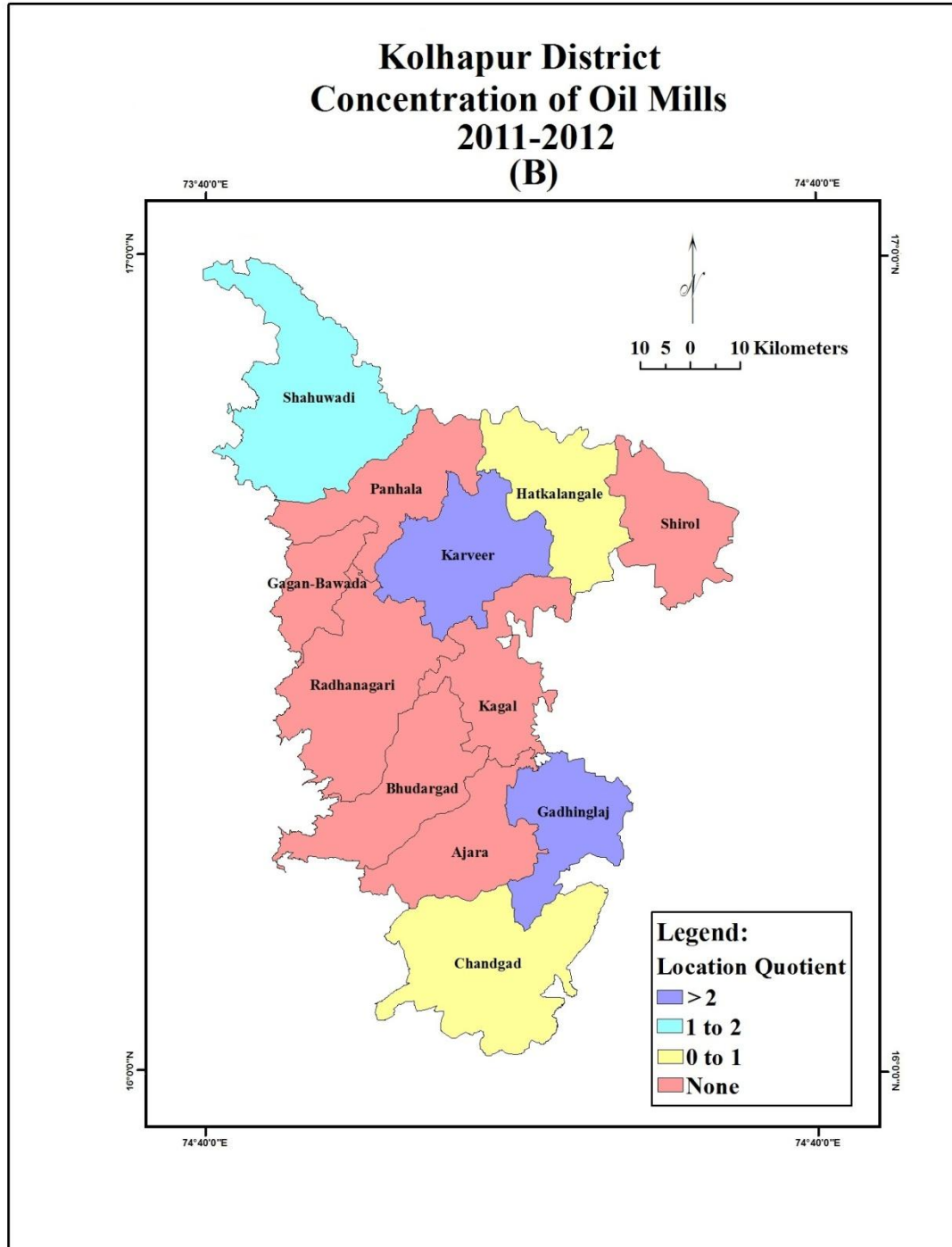
Map No.6.6 (B)

Kolhapur District Concentration of Oil Mills 2001-2002 (A)



Map No.6.7 (A)

Kolhapur District Concentration of Oil Mills 2011-2012 (B)



Map No.6.7 (B)

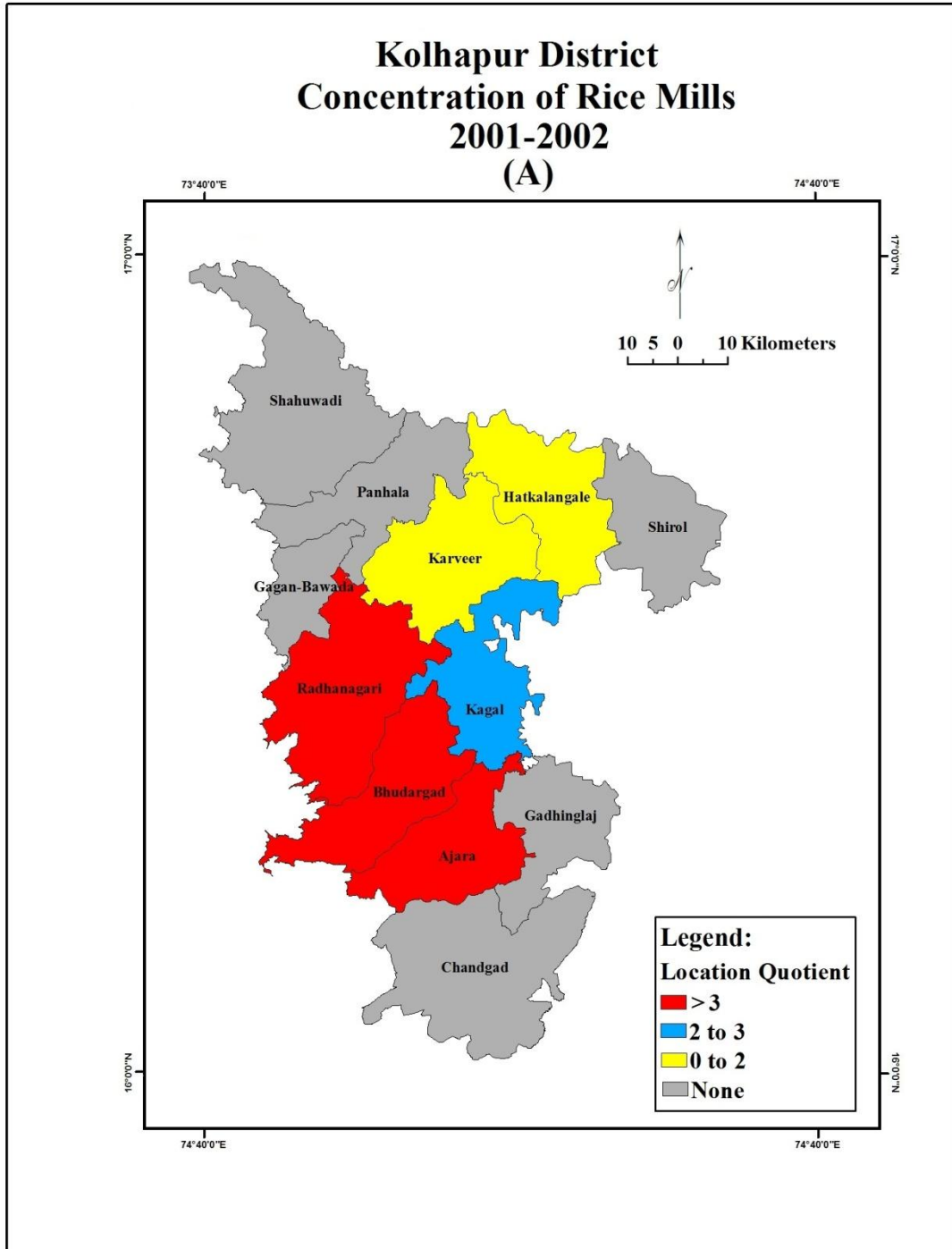
6.3.1.4 CONCENTRATION OF RICE MILLS

Low concentration of rice mills (0 to 1) was noticed in Karveer and Hatkanagale tahsils of the district in 2001-2002 (Map 6.8 A). The moderate concentration of rice mills was (2 to 3) recorded in Kagal tahsils of the district in 2001-2002 and high concentration of rice mills (> 3) was observed in Ajara, Bhudargad and Radhanagari tahsils of the district in 2001-2002. (Map no.6.8 A). No concentration in rice mills was recorded in the Chandgad, Gaganbavada, Panhala and Shahuwadi tahsils in the Kolhapur district in 2001-2002 (Map no. 6.8 A)

The low concentration in rice mills ($2 <$) was recorded in the Bhudargad, Kagal, Karveer, Panhala and Hatkanagale tahsils of the district in 2011-2012. (Map no.6.8 B) The moderate concentration in rice mills (2 to 3) was observed in the tahsils of Ajara and high concentration was noted in the tahsils (> 3) of Radhanagari in the district. (Map no. 6.8 B) None of the concentration of rice mills was noted in the tahsils of Chandgad, Gudhinglaj, Gaganbavada, Shahuwadi and Shirol tahsils of the district in 2011-2012. (Map no.6.8 B)

The change in rice mills was recorded in the tahsils of Bhudargad, Ajara, Kagal, Panhala tahsils in the district during 2001-2002 to 2011-2012 (Map no. 6.8 A B).

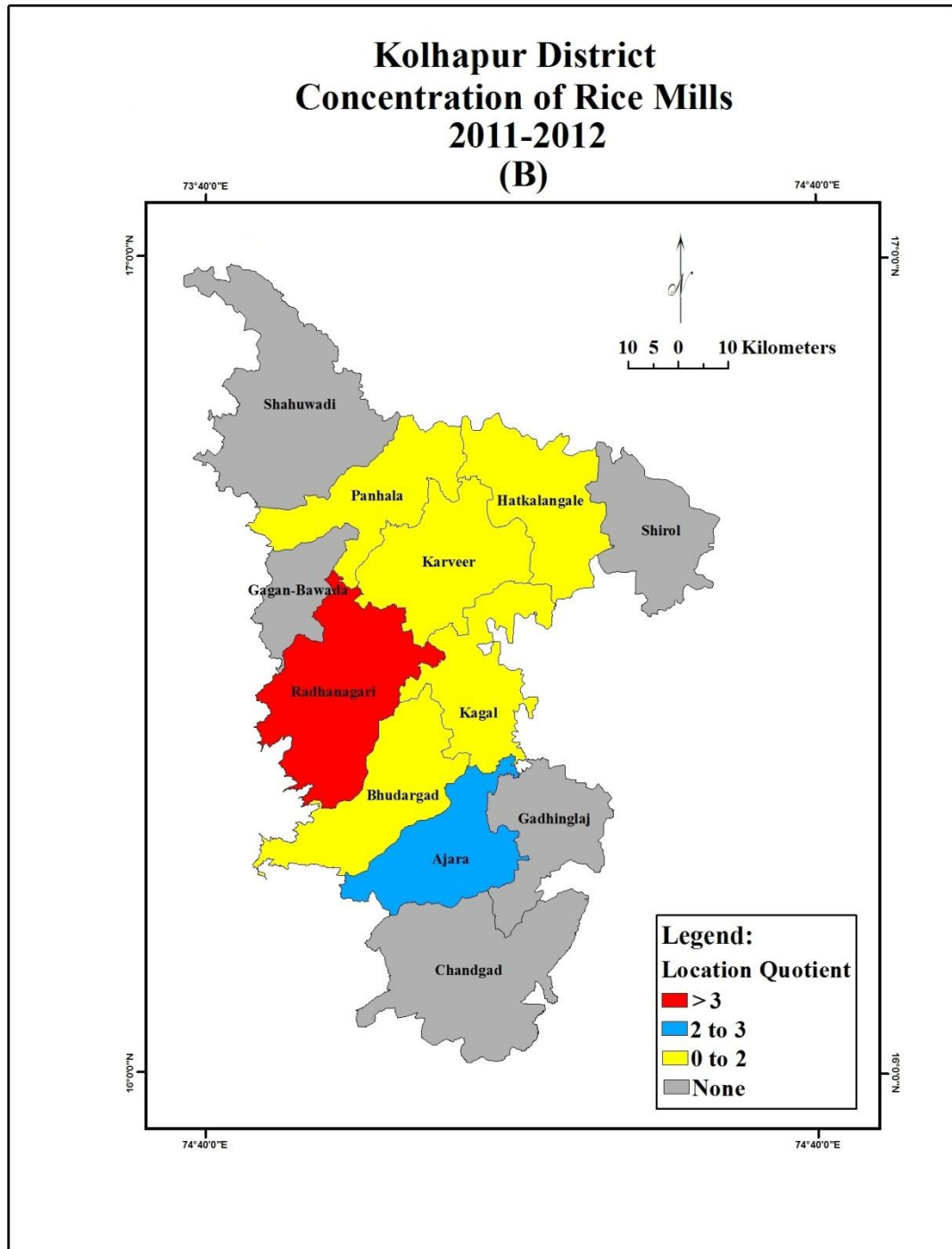
**Kolhapur District
Concentration of Rice Mills
2001-2002
(A)**



Map No.6.8 (A)

Kolhapur District Concentration of Rice Mills 2011-2012

(B)



Map No.6.8 (B)

6.4 INDUSTRIAL DIVERSIFICATION

Industrial diversification is a concept which is opposite to industrial specialization. Diversification in industrial pattern means a variety of industries involving intensity of competition amongst a regional industry for arable land. The diversification in structural forms of industry such as industrial pattern, cropping pattern explain why it is possible or necessary to start a variety of agro-based industries which possess nearly an even proportion. Industrial activities which have obviously involve intense competition among various activities for space. The keener the competition the higher the magnitude of diversification and lesser the competition greater will be the trend towards specialization or monoculture, where emphasis is on one or two industries.

The Gibbs-Martin index of Diversification is a useful alternative index for testing the diversification of employment in industry. It was developed by Gibbs and Martin in 1962. If the labour force in a region is concentrated wholly in one industry, the index is zero; if it is distributed throughout every industry (i.e. Maximum diversification) the index approaches 1. For computing index of diversification the following formula was accepted and used for the calculation of index of diversification. The formula is employed in the form of following formula.

$$\text{Index of diversification} = 1 - \frac{\sum x^2}{(\sum x)^2}$$

Where, x is the number of employees in each industrial category. The range of the Gibbs-Martin index of diversification run from 0 (absolute concentration) to 0.9 (completely diversification) Gibbs-Martin index is called as an index of diversification.

The indices of industrial diversification are calculated for the period i.e. 2001-2002 and 2010-2011 (Table No. 6.4) and shown in (Map 6.9 A and 6.9 B) respectively. It shows the regional distribution of pattern of Agro-based industrial diversification grouped in to four categories viz:

- 1 Perfect concentration (0.00)
- 2 Areas of low diversification (0.20 <)
- 3 Areas of moderate diversification (0.21 to 0.40)
- 4 Areas of high diversification (> 0.40)

Table No. 6.4

Kolhapur District: Index of Diversification of Agro-based Industries

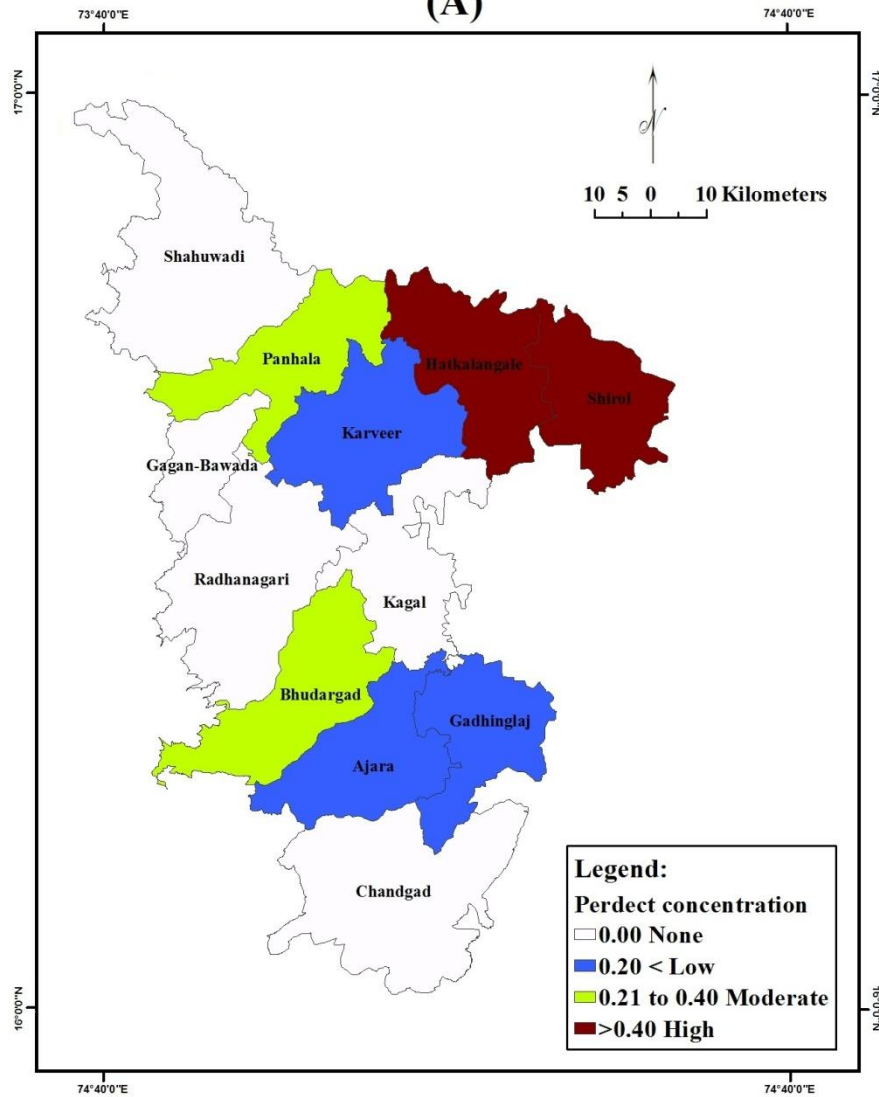
Sr. No.	Tahsils	Index of Diversification	
		2001-2002	2010-2011
1	Shahuwadi	0.00	0.01
2	Panhala	0.35	0.36
3	Hatkananagle	0.49	0.51
4	Shirol	0.49	0.48
5	Karveer	0.03	0.26
6	Gaganbavada	0.00	0.00
7	Radhanagari	0.00	0.00
8	Kagal	0.00	0.01
9	Bhudargad	0.37	0.38
10	Ajara	0.03	0.43
11	Gadhingalaj	0.02	0.24
12	Chandged	0.00	0.00

Source: Computed by Author.

The perfect concentration (0.00 indices) of agro-based industries was found in Shahuwadi, Gaganbavada, Radhanagari, Kagal and Chandgad tahsils of the district in 2001-2002 (Map No.6.9 A). Low diversification of agro-based industries (below 0.20) was found in Karveer, Ajara and Gadhingalaj tahsils of Kolhapur district. Moderate concentration (0.21 to 0.40) of agro-based industries was found in the Bhudargad and Panhala tahsils of the district in year 2001-2002 (Map No.6.9 A). High industrial diversification (more than 0.40) was recorded in the Hatkanagale and Shirol tahsils of the district in 2010-2011 (Map No.6.9 A and Table No. 6.4).

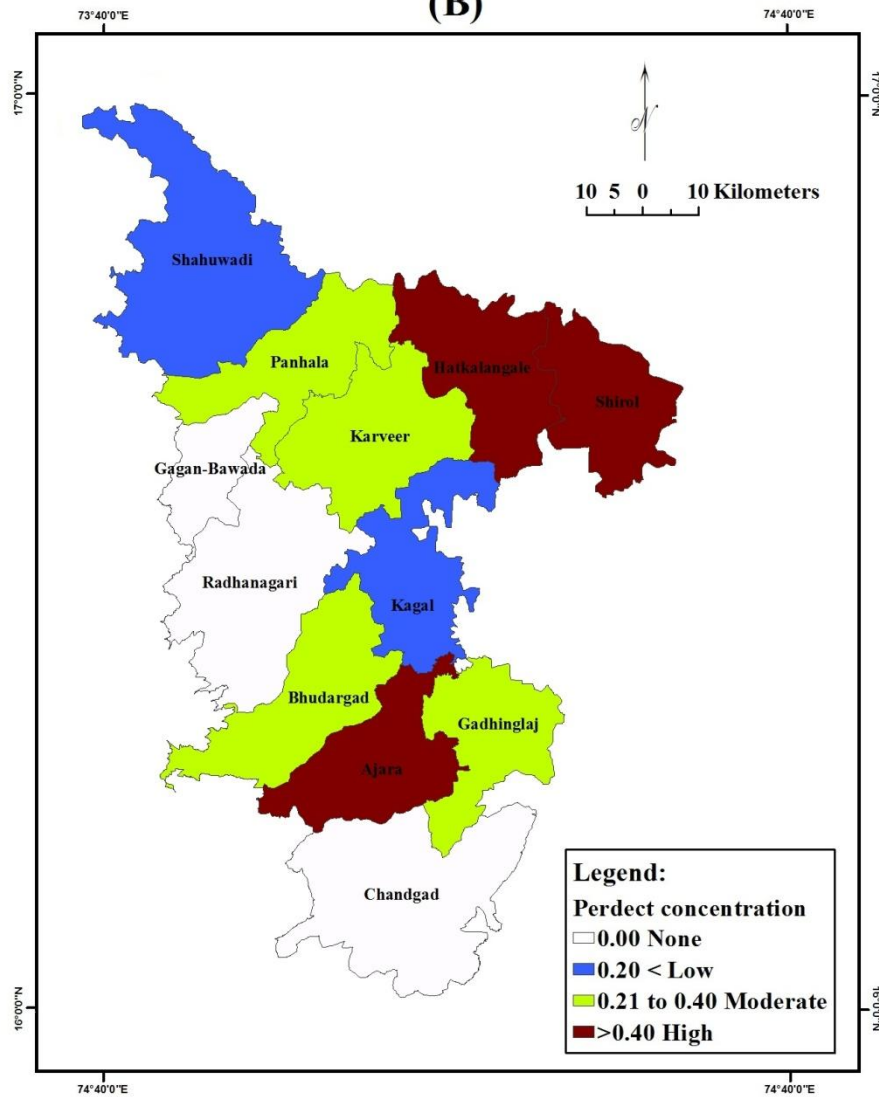
In the year 2010-2011 the perfect concentration of agro-based industries was observed in the Gaganbavada, Radhanagari and Chandgad tahsils of the district (Map No.6.9 B and Table No.6.4). Low industrial diversification (below 0.20) of agro-based industries was noted in the Shahuwadi and Kagal tahsils of the district. Moderate diversification (0.21 to 0.40) of agro-based industries was observed in the Gadhingalaj, Karveer, Panhala and Bhudargad tahsils of the district in the year

Kolhapur District Diversification of Agro-based Industries 2001-2002 (A)



Map No.6.9 (A)

Kolhapur District Diversification of Agro-based Industries 2010-2011 (B)



Map No.6.9 (B)

2010-2011 (Map No.6.9 B and Table No.6.4). High diversification (more than 0.40) was recorded in the Ajara, Shirol and Hatkangale tahsils of the district in during the year 2010-2011 (Map No.6.9 B).

Some changes have been noted in the diversification of agro-based industries from 2001-2002 to 2010-2011 in the district. The major changes in the diversification of agro-based industries were noted in the Kagal and Shahuwadi tahsils from perfect concentration to low concentration. Low to high diversification is noted in the tahsil Ajara. The Shirol and Hatkanangale tahsils has remained highly diversified in the agro-based industries during this period.

The Kagal tahsil had only two sugar industries in 2001-2002 now it has three sugar industries, Shahuwadi tahsils has one sugar industry in 2001 to 2012 prior to this period there was nothing any industry in the tahsil. The Gadhinglaj tahsils had five agro-based industries in 2001-2002 now in 2010-2012 it has six agro-based industries. Therefore changes have been noted from 2001-2012. Kareer tahsil has recorded low to moderate diversification due to the increase of agro-based industries from number 21 to 25 and particularly the no. of industries grown e.g. oil mills, rice mills and spinning mills.

There Shirol and Hatkangale tahsils have remain diversified in agro-based industries during the period 2001-2012. Particularly the change has been noted in sugar industries, spinning mills, oil mills and rice mills. Karveer tahsil has noted changes in the number of sugar industries and spinning mills in the district.

The number of employment has grown from 24204 to 30114 from 2001 to 2011 in the district.

6.5 SUMMARY

The number of considerable agro-based industries was established in the district from the year 2001-2002 to 2011-2012. Sugar industry, spinning mills, oil mills, rice mills and other food processing units are the most important agro based industry in the district.

Sugar industries were increased by 1.31 times in the study region during 2001-02 to 2011-12. Hatkanangale, Kagal and Chandgad are the leading tahsils of the district in

the number of sugar factory. All essential factors are available for sugar industry in these tahsils. Except the Radhanagri each tahsil has a sugar factory. The Gaganbavada tahsil has newly emerged tahsil in this field of sugar factorirs.

Cotton textile industry of the district is particularly concentrated at Ichalkaranji. The spinning mills were increased by 1.26 times during 2001-02 to 2011-12. The numbers of spinning mills were increased from 23 to 29 during the period of investigation. A notable increase in the number of spinning was recorded in the Hatkanangale and Shirol tahsils of the district.

Edible oil industry of the district is mainly located in Karveer, Gadhingalaj and Hatkanangale tahsils of the district. The index of growth of edible oil is 1.23 times from 2001-02 to 2011-12. The share of oil mills was decreased in the Karveer tahsil as compare to total number of oil mills in the district during this period. The notable increase in numbers of oil mills was recorded in the karveer, Hatkanangale and Gadhingalaj tahsils.

The rice milling was one of the important agro-based industries in the district. The growth index of the rice mill was 1.7. Majority of the rice mills were located at Kolahapur, Ichalkaranji. Particularly, the rice mills closely located to the industrial estates of the district. A considerable increase in the number of rice mills was noted in the Hatkaangale, Karveer, Radhanagari and Ajara tahsils of the district.

The different type of agro-based industries provides employment opportunity to the people of the study region. The employment in agro-based industries of the district is increased by 1.24 times from 2001-02 to 2011-12. There were 67.45 per cent of employment was provided by the sugar factories. Spinning mills have next to provide the employment to the peoples of the region it would provide 31.81 per cent employment to the peoples as compare to total employment of the Agro-based industries in the district. Very little opportunity was made by the oil and rice mills in this connection.

The table 6.3 reveals that the concentration of the agro-based industries in the study region. Low concentration of sugar industries was recorded in the Gadhinglaj, Karveer, Hatkanangale and Shirol tahsils of the study region. The moderate concentration was noted in the Shahuwadi, Panahala, Bhudargasd and Ajara

were as high concentration of sugar industries was recorded in the Chandgad and Gaganbavada tahsils of the district during 2011-2012.

From the analysis of the table 6.3 it is said that, the low concentration of spinning mills recorded in the Ajara, Gadhinglaj and Karveer and Panhala. Moderate concentration was observed in the Bhudargad and Hatkanangale where as high concentration of spinning mills were observed in the Shirol tahsils of the district during 2011-12.

Table 6.3 reveals that the concentration index of agro-based industries in the study region. The low concentration of oil mills was noted in the Chandgad and Hatkanangale where as moderate concentration of oil mills were noted in the Shahuwadi. High concentration of oil mills was observed in the Gadhinglaj and Karveer tahsils of the district in 2011-12.

There were 17 rice mills was recorded in the district during 2011-12. The low concentration of the rice mills was recorded in the Bhudarga, Kagal, Karveer, Pqanhala and Hatkanangale. Moderate concentration of rice mills was observed in Ajara whereas high concentration of rice mills was observed in the Radhanagari tahsils of the district in 2011-12.

Perfect concentration of agro-based industries was observed in the Gaganbavada, Radhanagari and Chandgad tahsis of the district. Low diversification of agro-based industries was recorded in the Shahuwadi and Kagal tahsils of the study region. Moderate diversification of agro-based industries was observed in the Gadhinglaj, Panhala and Bhudargad. High diversification was recorded in the Ajara, Shirol and Hatkanangale tahsils of the district 2011-2012.

The major changes in the diversification of the agro-based industries were noted in the Kagal and Shahuwadi tahsils from perfect concentration to low diversification, low to high diversification is noted in the Ajara. Shirol and Hatkanangale tahsils has remain highly diversification from 2001-02 to 2010-11.

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CHAPTER- VII

CONCLUSION, CONSTRAINTS AND DEVELOPMENT PLANS

CHAPTER VII

CONCLUSION CONSTRAINTS' AND SUGGESTIONS

- 7.1 CONCLUSIONS
- 7.2 PROBLEMS OF SUGAR INDUSTRIES
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INDUSTRY
- 7.4 PROBLEMS OF SPINNING MILLS
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COTTON SPINNING MILL
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CHAPTER VII

CONCLUSION CONSTRAINTS' AND SUGGESTIONS

7.1 CONCLUSIONS

It is evident from the preceding chapters that the Kolhapur district has a large potential for the agro-based industries. The purpose of this chapter is to sum up main conclusions of the study to get comprehensive view on the basis of the conclusion. An attempt is also made to discuss the agro-based industrial problems and prospects of them. The suitable suggestions are also made in this chapter, to change the existing situations and thereby to change and achieve the appropriate development of agro-based industries in the study region.

The following conclusion are drawn from the past successive chapters.

As per the census 2001 there were twelve tahsils, twelve towns and 1203 villages existed in the district.

There is a variation in the topography of the district. It is a part of Deccan table land and slopes towards south-east. Physiographical the district is divided into three parts e.g. Sahyadri hills (45.64), Plateau (30.53) and low lands (23.83).

The region has the different river valleys and grids of tributaries. Geologically the Sahyadri hills are mainly consist of Deccan trap with inter trepan beds; some patches of Dharwar system and Penganga beds are found.

The district has deposit of bauxite ore and building stones and some capping of laterite stones in the west part of the district.

There were many irrigating dams and Kolhapur type of weirs were constructed for the irrigating the land livelihood of the district.

The climate of the district is generally temperate. The district has got rainfall mainly from monsoon. The amount of rainfall decreases towards the east. The average rainfall of the district is almost between 600 mm to 6000 mm.

The soils of the district is divided into the three categories e.g. Laterite in the western part, shallow and medium black in the middle part and black soils in the eastern parts.

The district has 21.85 percent area under forest. The thick forests are found in the western hilly parts of the district. There are sub-tropical moist deciduous and semi-evergreen and the dry deciduous and semi-evergreen forest are found in the district.

The population of the district is 35.23 lakh as per 2001 census with density of 455 persons per km². The district has 29.8 per cent urban population. The Karveer, Hatkanangale tahsils are highly urbanized tahsils. As per the 2001 census the literacy of the district is 76.93 percent.

As per 2001 census the district has 1196 inhabited villages, particularly rural settlements were found in the district. There were 18 towns found in the district ranging from I to class VI categories. Kolhapur and Ichalkaranji are the class one towns.

The Karveer and Hatkanangale tahsils are industrialized and urbanized tahsils.

The largest use of water is in the agriculture for irrigating of the land. The important sources of irrigation are wells, canals and lift irrigation. There were 36.27 percent is the surface irrigation, 58.87 percent of well and 4.86 percent other sources of irrigation. The highest percentage of irrigation is observed in Shirol, Hatkanangale and Karveer tahsils having 30 percent and above of gross area irrigated. The western hilly region has not enough irrigation facilities. Total 4 major, 2 medium and 47 minor irrigation projects are constructed in the district.

The geographical area of the district is 7,76,261 hectares. The net sown area is 4,47,764 hectares. It means the 57.68 percent to geographical area of the region. The 78.05 percent area come under forest, 10.04 percent area was not available for cultivation, other uncultivated area 9.79 percent and fallow land is 4.44 percent. The tahsils situated in the western hilly zones have less percentage of cultivable land as compare to the regions average.

The cattle are the main pillars of the farm life; it provides subsidiary occupation for the peoples living in hilly and drought prone areas where farming may not sustain the family of the farmer. Out of the total livestock there were 72.82 percent bovine animals out of them 52.11 percent buffaloes and 20.71 percent cattle. The role of cows and buffaloes is important in the dairy development in the district.

The considerable strength of buffaloes lies in the Shirol, Ajara and Panhala tahsils of the district.

The Kolhapur district has been using farm tools since time immemorial. The wooden, iron plough, bullock carts, oil engines, electrical pumps, threshers, harrows are operated in the district. The western hilly tahsils have considerable proportion of wooden ploughs. The density of iron plough is very high in the Chandgad, Gadhinglaj, Panhala, Ajara and Bhudargad tahsils of the district. The highest density of electric pumps per thousand hectors was recorded in Gadhinglaj tahsil. Majority of tahsils have highest density of oil engines as compare to the district density (14.19%). The highest density of tractors was found in the Karveer (25.39%) followed by Panhala (25.12%), Kagal (16.31%) and Shirol (11.74%). The lowest density was found in the western hilly tahsils of the district.

The modern input e.g. irrigation, farm implements, mechanical power, use of fertilizers and high yield varieties seeds were used in the district to meet the requirements of increasing population and demand from agro-based industries.

The batter financial base was observed in the district. The district has 207 branches of district central co-operative banks. Among them 16 state agricultural and rural development banks fulfill the requirement of the finance for the agricultural development in the district. The Karveer, Kagal, Shirol and Hatknangale got benefit of loans from these institutes.

The electricity grid was well developed in the district. The rural electrification was done very well in the district, there was 98 percent electrification done in the district.

There were 59.89 percent electricity was used in various industrial areas. Whereas 19.64 percent electricity was consumed for domestic purpose and 20.47 percent was used for agricultural sector during 2008.

There is the structural development of markets observed in the district. There are 4 regulated, 21 sub markets, 218 district primary markets societies were developed in the district.

The district has well developed transportation and communication system. The district has enjoyed a good transportation and communication systems e.g. road, rail and village roads are well developed.

Majority of the farmers are conversant with recent development in agricultural which has been adopted by them. All these intensified particularly in the sugarcane zone of the district.

Industrial development in the district has been done in the 20th century. The great historical monarch king Chhatrapati Shahu Maharaj was the pioneer of the industrial development of the Kolhapur dynasty.

The district has been endowed with natural resources. It has got benefit in field of agriculture. The eastern tahsils of the district are well developed in the field of both in agriculture as well as industry particularly in the co-operative sector.

For the efficient development of the industries in the district the different sectors have made effective efforts by the individual personalities and government agency. It is possible due to the dream and foresight of the eminent personalities in the district including Tatyasaheb Mohite, Dattajirao Kadam, Tatayasaheb Kore, Deshbhakatt Rattanappanaa Kumbhar and Sare Patil.

Chhatrapati Shahu Maharaj had made continuous efforts for the development of industries. He would give all types of help to the entrepreneurs in his historical dynasty. He started spinning mill at Kolhapur in 1906 and sugar mill in 1934 at Kolhapur on the cooperative basis. Specifically he made efforts to emphasize on agro-based industries. He was the strong supporter of the indigenous entrepreneurs.

In 1941 Shivaji Udyamnagar co-operative society was established where 185 plots were developed. J. P. Naik was the pioneer of the establishment of this industrial estate he made efforts with the valuable help of Late Shree Rajaram Maharaj of Kolhapur dynasty.

Late Mahadaba Mistri the mile stone in the field of making of oil engines which he made 'Vishvas Engines'

Deshbhakatta Ratanappaanna Kumbhar worked in the field of co-operative sector like Sugar factories and the spinning mills.

Tatayasaheb Kore was another stalwart in the field of co-operation; he made the efforts to start the Warana sugar factory at Warananagar.

Late Shree Dattajirao Kadam was the real corporator who has spent his life for the development and spread of the co-operative sector.

In the eastern part of the district late Shree Shamrao Patil Yadravkar made an effort for the development co-operative factories.

Shree Sadashivrao Mandlik still is working in the field of corporate sector.

The co-operative movement is the backbone of the economic development of the district. The standard of living of the people of the district has been raised due to the co-operative development.

Chhatrapati Shahu Maharaj has laid foundation stone of co-operative movement 1912. The textile industry concentrated at Ichalkaranji its future known cluster has been sanctioned in and around the textile centre Ichalkaranji.

There were 21 sugar factories in the district. The number of co-operative institutions has been engaged to distribute the loans and credit to the farmers in the district. As per the direction and decision of the Government of the Maharashtra industries were dispersed from heavily congested areas of Bombay, Thane and Pune. Its impact has been seen in the field of all spheres of industries of the district.

Kolhapur district is well known as an industrially developed district in the Maharashtra. The recent developments were made by the efforts of able leadership of Y. P. Powar.

In the sixties the majority of the foundries and engineering estates were established. However the demand was rightly increased from the agricultural sectors because various tools and techniques were demanded from this sector.

For the industrial development of the district MIDC was established in 1962 in the district. It is a nodal agency established for the provision of industrial infrastructure for systematic development. In the district there were industrial estates

developed at Kagal (5 star), Gokul-Shirgaon, Shivaji Udayamnagar, Gadhingalaj, Yashwantnagar, Hatkanangale and Ajara. Maharashtra State Khadi and Village Industries Commission has been started to promote and develop the khadi and village industries at different places in the district. Unemployed would get an opportunity of village through cottage industries with the help of the Maharashtra State khadi and village industries Commission.

The District Industrial Central was started in 1979 at Kolhapur. It is an important centre for the development of industries because it provides some margin money for the new entrepreneur, for the establishment of industrial units apart from that it provides infrastructural facilities to them. It has worked and given training to the entrepreneurs and encourage to them.

The land use pattern of the district was changed in time immemorial. The net sown area of the district was by 103.42 times. The area under forest of the district has been diminished by 2.28 percent. The 10.07 per cent was treated as land not available for the cultivation generally in westerns tahsils Radhanagar, Shahuwadi, Chandgad and Karveer of the study region. Very little that 3.47 percent of land is treated as fallow land in the district. More than 5 per cent area is known as fallow in the Ajara, Bhudargad and Panhala tahsils of the study region. There was 58.62 percent area of the district known as net area sown. The tahsil Gadhingalaj have noted highest proportion of this net sown area to gross cropped area fallowed by Kagal, Shirol and Hatkanangale. Radhanagri tahsil has recorded very least net sown area of the district.

The land use efficiency of the district was increased from 112.92 to 126.48 times during the 1985-86 to 2002-2003.

The cropping pattern of the district has been changed. The dominance was seen first with the crops like rice fallowed by groundnut sugarcane and jawar. The gross cropped area of the district was increased considerably. The sugarcane is cash crops increasing trend and so the area under cereals shows decreasing trend.

The share of the sugarcane to the gross cropped was increased from 17.44 per cent and reached up to 131.75 percent from 1990-95 to 1995-2000. The area underground nut was decreased but the area under total oil seeds was increased

138.31 per cent. The area under fruits and vegetables are doubled. The remaining crops among them are spices, total fibers, drugs and narcotics shows decreasing trend. The gross cropped area of the district is still increasing. Farmers of the study area were thinking about cultivation of the sugarcane. A considerable thing is that the fiber crops in the study region stands on its vanishing stage.

The increasing trend of cash crops like sugarcane and ground fruits and vegetables in the study region is favorable for the functioning of the agro-based industries.

The western tahsils having hilly terrain has a considerable area under rice among the Radhanagri, Bhudargad, Karveer and Ajara tahsils of the district. These tahsils have an area under rice more than 30 percent to its gross cropped area.

Among cereals the jawar has acquired only 4.64 per cent of the gross cropped area of the district. Hatkanangale tahsil is the only leading tahsil having 13.71 per cent area under jawar to its gross cropped area. It shows decreasing trend in the study region.

Only 1.39 per cent area came under the wheat of the total gross cropped area. There is only 4.70 per cent area out of the gross cropped area of the district came under pulses and it would shows continuous decreasing trend.

Every tahsil has area under sugarcane and now the district have 17.80 per cent area under sugarcane to gross cropped area in the district. The sugarcane is leadingly taken in Shirol, Karveer, Hatkanangale, Kagal, Panala, Radhanagri and Gaganbavada tahsils of the study region.

Total oilseeds have an area about 22.83 per cent of the gross cropped area of the study region. It is taken in Hatkanangale, Shirol, Gadhinglaj, Kagal, Karveer and Chandgad tahsils very leadingly.

The area under groundnut was decreased slightly with 0.72 percent. It is mainly taken in Gadhinglaj, Kagal, Hatkanangale, Karveer, Chandgad and Ajara tahsils of the the study region.

The fodders are taken largely in tahsils in Shahuwadi, Chandgad, Ajara, Radhanagasri, Gadhinglaj, Kagal, Bhudargad and Karveer tahsils of the study area.

Agriculturally the study region is developed in well manner. It would favorable for the development of agro industries the district.

The agriculture is the prime base of the agro-based industries of the district. It is one of the alternatives that over comes the unemployment in the rural areas.

Agro-based industries clearly depend upon the agricultural produce e.g. sugarcane, cotton, oil seeds and fruits and vegetables etc. The development of agro-based industries in the co-operative sector is most important because it supports economic state of the farmers and other peoples of any region.

Sugar industry is one the major agro-based industries after the cotton textile industry in the country. It supports the development economic state of the rural areas of the country.

Kolhapur district is one the leading district in co-operative sugar industries. The tremendous growth was noted in the area under sugarcane. The area under sugarcane was doubled from 1970-71 to 2000-01. The index number of the growth is 242.63.

There is considerable growth in the area under sugarcane was recorded in the Gaganbavada, Panala, Kagal, Bhudargad and Shahuwadi tahsils. A huge quantity of sugarcane e.g. 104.6 million metric tonnes were crushed and 1.27 million metric tonnes of sugar were produced by the factories in the district in 2011.12.

The district has made a marked progress in the field of co-operative sugar factories. There were only 9 sugar factories in 1985-86. There were 21 sugar factories in the year 2011-12, out of them 19 sugar factories come in the co-operative field and 3 in private sector. Though, there were two sugar factories which have stopped its crushing and become known as sick units and one sugar factories has sold out to a private enterprise to Dalmiya Sugars.

The district has great pride of cotton textile industry. Ichalkaranji is the main cotton textile centre very well known in the Maharashtra. As per the approval of Govt. of India, Ministry of Commerce and Industries, Department of Industrial Policy and Promotion, Udyog Bhawan, New Delhi. M/s Ichalkaranji Textile Development

Cluster Ltd., got sanction of Rs. 65.07 crores under the scheme of (IIUS) Industrial Infrastructural Up gradation Scheme 2003. At present there are 19 co-operative and 10 private spinning mills are in the district.

M/s R. M. Mohite Textiles Ltd., Ambapwadi is the renowned private unit in the spinning mill sector. Another, example in the co-operative sector of spinning mills e.g. Mahatma Phule Magaswargiya Sahakari Soot Girmi Ltd., Peth Wadgaon Taluka-Hatakanagale.

The edible oil industry is the most important agro-based industry in the district. Due to the inadequate availability of raw material and other dearth factors many of the units have been closed down. At present there are 26 oil mills found in the district. M/s Ganesh oil mill is one of the traditional edible oil making factories, but still it has faces some of the problems e.g. shortage of raw material other unexpected problems told by the time of interview.

There is still potential for the establishment of rice mills in the district, because the western part of the district has preferential geographical condition for the rice production. As in 2011-12 there total 17 rice mills were present in the district. Majority of the private entrepreneur were interested in the rice milling. There is the infrastructural facilities available in the district for the establishment of the of rice mills.

Shree Vishvaprabha Foods Products Pvt. Ltd., Rukadi. Taluka-Hatkanangale is the private Ltd., company and still it works in better position. Though, he has told some problems at the time of the interview. It is faced by the each and every units of the rice making unit in the district. However there is a large potential for the establishment of the agro-based industries in the district

There were 16 sugar factories in the district during 2001 to 2002. It grows up to 21 in during 2011. Hatkanangale, Kagal and Chandgad are the leading tahsils each have three sugar factories. Panhala and Shirol tahsils have two sugar factories each. Except Radhanagari the remaining tahsila e.g. Shahuwadi, Gaganbavada, Bhudargad, Ajara, and Gadhinglaj each have one sugar industries.

There were 23 spinning mills are existed in the district. Now the district has 29 spinning particularly in co-operative as well as private sector. Still

there is a beginning of spinning mills in both fields e.g. co-operative and private sector. The spinning mills were mainly concentrated in the Hatkanangale tahsil particularly at Ichalkaranji, followed by Shirol tahsil of the district. Hatkanangale tahsil have 14 spinning mills in were found in 2001 there is increase in the number of spinning mills up to 16 as per 2011-12.

There were 21 oil mills was existed in 2001-2002. It has increased up to 26 in 2010-2012. The number of oil mills increases in the Karveer, Hatkanangale, Gadhinglaj and Changad tahsils of the district in 2011-2012. There is a considerable change was recorded in the increase of oil mills particularly in the Karveer, Hatkanangale, and Gadhinglaj tahsils. Due to inadequate availability of raw material the regions mills have facing dearth problems. The mills have facing acute shortage of groundnut.

There are 10 rice mills was existed in 2001-2002 in district. It increased by 1.7 times during 2001 to 2012. The district has 17 rice mills at present. A considerable increase in the number of rice mills was observed in the Hatkanangale, Karveer, Radhanagari and Ajara tahsils of the district during the this period.

Agro-based industries are labour oriented. It provides employment to the peoples at local level. There were 24,209 workers working in the different types of agro-based industries in 2001-2002. It increased by 1.24 times during 2001-2002 to 2011-2012. It grows with 30,114 during 2011-2012 in the district. Still there is huge potential of employment in the agro-based industries because agro-industries going to established in the district e.g. sugar industries, cotton spinning mills and food processing industries.

Low concentration of sugar industries was recorded in the Gadhinglaj, Karveer, Hatkanangale and Shirol tahsils of the study region. The moderate concentration was noted in the Shahuwadi, Panahala, Bhudargasd and Ajara were as high concentration of sugar industries was recorded in the Chandgad and Gaganbavada tahsils of the district during 2011-2012.

Low concentration of spinning mills recorded in the Ajara, Gadhinglaj and Karveer and Panhala. Moderate concentration was observed in the

Bhudargad and Hatkanangale were as high concentration of spinning mills were observed in the Shirol tahsils of the district during 2011-12.

The low concentration of oil mills was noted in the Chandgad and Hatkanangale where as moderate concentration of oil mills were noted in the Shahuwadi. High concentration of oil mills was observed in the Gadhingalaj and Karveer tahsils of the district in 2011-12.

Low concentration of the rice mills was recorded in the Bhudarga, Kagal, Karveer, Pqanhala and Hatkanangale. Moderate concentration of rice mills was observed in Ajara whereas high concentration of rice mills was observed in the Radhanagari tahsils of the district in 2011-12.

Perfect concentration of agro-based industries was observed in the Gaganbavada, Radhanagari and Chandgad tahsils of the district. Low diversification of agro-based industries was recorded in the Shahuwadi and Kagal tahsils of the study region. Moderate diversification of agro-based industries was observed in the Gadhinglaj, Panhala and Bhudargad. High diversification was recorded in the Ajara, Shirol and Hatkanagale tahsils of the district 2011-2012.

The changes in diversification of the agro-based industries were noted in the Kagal and Shahuwadi tahsils from perfect concentration to low diversification, low to high diversification is noted in the Ajara and Shirol tahsils of the district. Hatkanangale tahsils has remain highly diversification from 2001-02 to 2010-11.

7.2 PROBLEMS OF SUGAR INDUSTRIES

- Problems of sugarcane cutters, lack of sugarcane cutters due to the availability of alternative business at their native place like dairying and plantation agriculture. Therefore they can't accept the advance from the sugar factory.
- Over burdens of loans, due to this problem the factories came into economic crises. Though factories can't pay the bills of payments of the labourers, farmers, overdue of loans, other payments are going to pending at that time the management to decide to give the factory on rental charges to the another management.
- Fluctuations in the rate of sugar in the world market, it is going to slowdowns. It happened due to excess production of sugarcane in the state. Hence factories had

faced the problems of the payment of sugarcane and giving the amount of instalments of the payments to the sugarcane growers.

- Sometimes the area under sugarcane is increased due to the best rate given to sugarcane in the previous season. Therefore the farmers thought that the next year also we shall get satisfied rate to the sugarcane. When they plant sugarcane more than the expected capacity at the same time they can't get expected rate for sugarcane and therefore the problem of excess production would face by the sugar factories and hence many problems would going to face by the factories viz. excess production of sugarcane, over load of sugarcane crushing, delay in crushing season, loss in the weight of sugarcane, sugarcane recovery, loss in tonnages all these things were came as an economic obstacles in the path of sugar factory as well as sugarcane growers.
- If delay in the crushing season automatically delay in the kharif season of the peasant's.
- Sometimes sugar factories give more rates for sugarcane growers over FRP, and then the factories must pay income tax to the government.
- When the clumsy management is working as administration then time factory will not run properly at that time viz. priorities would be given to the crushing sugarcane of their close relatives and friends, get cane out of the existing area of the factory, delay in crushing of sugarcane in their functioning area.
- Long lasting crushing season of the factories. As compare to the last crushing season the excess area under sugarcane was experienced to this crushing season.
- Protection would not be providing by the factory to the workers working in the factory. Therefore sometimes accidents might happen at working sights hence workers have lost their life.

7.3 REMEDIAL MEASURES OVERCOME TO THE PROBLEMS OF SUGAR INDUSTRY

Sugar industry is the second largest agro-based industry in the country. India was the fourth major sugar producing country in the world. It has now emerged as the largest sugar producing country with the share of 22 percent of sugar production in the world. It ranks third largest industry in terms of its contribution to the net value added by manufacturing and employs number of workers besides it creates extensive indirect employment for farmers of sugarcane. It is one of the important sources of the excise duty for the Central Government. Though, the

industry is going to suffer from the above problem. For overcome these problems some suggestion are given:

A) Making available enough sugarcane

Non-availability of sugarcane may be due to the absence of the infrastructural facilities. Problem of shortage of sugarcane was faced by the majority the sugar factories in the district. It happened due to the 40 to 50 per cent sugarcane was used as fodder for the cattle in the drought affected district in western Maharashtra. Though, the south-western tahsils of the district have very little area under sugarcane as compared to the remaining tahsils of the district. So there is a scope to lay the more area under sugarcane efficiently. The average crushing season of the sugar factories in the district shows the declining trend and it rests on 133 days in 2011-12. It would be necessary as per the norms minimum 180 days sugar factories must be run. But in the past five years only average 140 day factories had run. So there is need to supply of adequate sugarcane to the factories for efficient crushing. Therefore it is necessary to take some measures to overcome the shortage of material. In this connection some steps should be taken. This would be possible when the following measures shall be implemented in the study region.

- 1) Improving infrastructural facilities like irrigation, roads, harvest labour, transport vehicle supply of inputs like seed material, fertilisers and farm credit etc.
- 2) Determining optimum period and duration of crushing.
- 3) Quantum of cane to be crushed annually.
- 4) Varietal composition for the overall crushing hr each month.
- 5) Nursery program.
- 6) Varietal trial in the factory farm.
- 7) Improved cultural practices to be adopted for sugarcane.
- 8) Rationalized harvesting schedule base on maturity.
- 9) Surveillance of pests and diseases and taking appropriate control measures in time.
- 10) Demonstration plots to carry communication to the growers.

- 11) Necessary field training to the cane staff.
- 12) A proper incentive scheme for the ryots to take up the improved agricultural methods.
- 13) Providing adequate staff for carrying out the above programme.

In short a package program must be drawn in respect of the sick factory for implementing the cane development programme in a phased manner. It may not be enough at a higher cane price alone is announced. The needs of the growers have to be properly assessed by the cane development staff and it has to meet at the proper time. Many factories have become sick not merely because cane is not available in the factory area but because there has been a lot of diversion of sugarcane for Jaggery making. A balance between the prices offered by the two categories of producers is essential to ensure equitable distribution of all available cane supplies because the fortunes of the sugar industry are tied to the fluctuations in the market price of sugar and Jaggery. It becomes the responsibility of the factories to the growers by way of higher price, higher incentive and prompt service to make them factory minded and supply sugarcane even if there is any marginal difference in the price obtained by Jaggery making.

B) Modernization of technology and machinery

Sugar industry has made wide strides in the matter of improvement in the technology and innovation. A technical team should study the existing performance of the factory at various stations. A highly trained technical team should carefully study the performance of the factory and identify the areas of weakness and suggest a most economical and effective scheme of modernization to improve the working efficiency, so that there is not only optimum crushing but also optimum result. Therefore, it is imperative to make a scientific study of the existing functioning and suggest improvement for installing additional equipment of the factory to a comparable status.

C) Reduction in overhead and labour cost and improving managerial capability

The management has got a dual responsibility. Sometimes the defective management might itself be the cause for the sickness. In those causes, the existing managerial practices must be studied properly. Disputes between partners or

shareholder groups can be a very disruptive force. Expansion of manufacturing company with high capital investment and recruitment of senior technical and administrative personal without reference to the availability of raw material etc. has lead to sickness in several cases.

As far as the managerial aspects are concerned, a proper and scientific study of the organizational structure has to be under taken so that expert could suggest ways and means to revitalize the company to meet the challenges of the future. The important aspects would consider in the matter of personnel administration.

- 1) There should be a comprehensive staffing pattern and management policy by making an independent and scientific assessment of personal requirement for individual departments and the company as a whole.
- 2) The existing executive personal in the technical, financial, purchasing marketing and administrative departments should be given appropriate educational trainings as well as senior supervisory staff should be given the re-orientation training for efficient performance of their appointed task. Personal found inefficient and unsuitable for technique responsibility should be weeded out.
- 3) Co-operation and co-ordination between departments to work jointly to fulfil company objective. It should be ensured by establishing sound lines of communication system.

D) Government policies

The responsible causes are extraordinary such as due to government policies etc., the remedies lie mainly with the government. The administration of the pricing policy for both raw material and the finished product has to be streamlined with a view to flatten the ups and downs in the production. The long term policy of the government should aim at maintaining relative equilibrium among the three sweetening agent wise, sugar, Jaggery and Kandsari. The policy should also be formed in such a way that the sugarcane growers are offered reasonable prices to enable them to make available sugarcane to the factories at reasonable economical prices. The location of industry should be properly planed with a view to gate adequate sugarcane. It should not be based nearly on political consideration as some factories required to have fallen sick due to faulty location. The industry requires operating under on entirely different free sugar price which may be less in the interest of the

consumer disregarding the working cost of the industry. When the industry is called upon to subsidize the levy sugar to the extent of 65 percent then adequate safeguards must be taken to regulate the releases in such a way that the factories rely on reasonable free market price to compensate the loss incurred in subsidizing the levy sugar. So long as this release mechanism is not operated pragmatically taking into account the overall realization of the overall cost, the industry is bound to become sick one day or other. One view is that subsidized distribution of levy sugar would hamper further investment in sugar industry often all-India sugar policy is characterized by ad-hocism. Hence this is the most vital aspect which has to be taken care of a present sickness in sugar industry.

E) Need to generate by-product

For minimization of the expenditure and uneconomic state of the factories it would be necessary to take another by-product e.g. molasses. It is therefore suggested that each sugar factory should be permitted to install either distillery or acetone plant to get additional revenue and generate more employments in the rural areas. There is not any factory which generates ethanol and paper product. Some of the factories have generated power on their site.

F) Creation of task force

A task force must be created to implement the rehabilitation programme of sick units with fullest commitment. The constitution of a taskforce will be consisting of multidisciplinary group of experts within the organization to implement the programmes, to iron out the difficulties and to monitor the progress. The task force is purpose to be oriented and it is an effective forum to continuously implement the policies of rehabilitation. The taskforce can serve as an effective instrument of revival of the sick unit.

7.4 PROBLEMS OF SPINNING MILLS

Cotton spinning mills are obsessed with many problems. Some of the cotton spinning mills became sick and were closed down. Three spinning mills were temporarily closed down and became known as sick unit because they have faced some acute problems. The spinning mills in the district are facing both the short term as well as long term problems. Former includes problem of high prices, shortage of

raw material, liquidity problems due to poor state of the spinning mills. The long term of this industry includes the slow pace of modernization, outdated technology resulting in the low productivity and high cost of production. The common problems are faced by the mills are as follows.

- There is a shortage of capital. There is nothing any provision of financial assistance from the government.
- There is the shortage in the raw material particularly long stapled cotton. There is nothing availability of the raw material at local level. Because this farmers would not produce cotton in the district.
- Transportation cost of the raw material is high.
- There is the copulation of different taxes to be paid to the government. The rates of these taxes are high e.g. VAT, Sale tax and LBT. etc.
- The rates of electricity are unaffordable and there is nothing any source of energy and provision of power except electricity. The load shading problem arose in the pick hours and affects industry badly. This leads to loss of man hours and low production and loss of the mills. As compared to other states the rates of electricity were very high.
- Low productivity is another problem. The labour oriented problems become severe, some times strikes, lay offs are the common features found in this sector. There is a problem of instability of labour and their availability at low cost. There was ever increasing demand of high wages and therefore they hinder from this enterprise.
- Today the high inflation in the industrial sector in the world.
- The enterprise has been running with obsolete old machinery. The obsolete machinery leads to low output and poor quality of goods. Its impact was seen on the production capacity and performance of the unit. In this situation these units are not able to face the competition in the market.

7.5 REMEDIAL MEASURES TO OVERCOME THE PROBLEMS OF COTTON SPINNING MILL

To solve the problems of spinning mills the following measures should be suggested for the better and smooth functioning:

- I. The government of Maharashtra should give sufficient loans to the entrepreneurs through the various banks with reasonable rate of interest. The working capital should play a vital role in the spinning mills.
- II. Cotton spinning mills should be provided sufficient and in time raw material throughout the year as the mills were functioning smoothly. Prices of raw material should be fixed by the Government.
- III. There is a need to make raw material available at local level. It is also needed to motivate the farmers by the department of agricultural of Maharashtra. Otherwise it may provide through the arrangement of raw material depot at appropriate place where it would be easily access.
- IV. The electricity board should provide regular supply of electricity throughout the year with appropriate rates for the smooth functioning of the mills.
- V. There is need to replace the old age machinery to efficient working with full capacity. Otherwise the enterprises thought that why the enterprise should not be shifted to other neighbouring state.
- VI. Workers should be given chances of training by the enterprises. There is a need to organise training programmes by the departments of the industries through the district industrial centre at district level.
- VII. To make the efficient and strict as well as prompt management. There is need of co-ordination among various governmental agencies, department and financial organization etc. It is essential to avoid the delay of sanction of the enterprises. There is needed to make improvements in liberal policies to obtain easy approvals.
- VIII. The financial agencies may convert the overdue of such sick units into medium or long term loans and fix a schedule as medium to long term loans.

7.6 PROBLEMS OF EDIBLE OIL MILLS

Oil Mill entrepreneurs told the fallowing problems at the time of field survey.

- Shortage of raw material in rainy season.
- Only 25 % oil extraction being done as compare to the initial capacity of extraction of the oil mills.
- All the mills have been facing the fluctuations in the prices of raw material.
- The rates of raw materials (groundnut) was raised up when the shortage of raw material.

- The raw material produced at local level, generally sold at local markets for domestic purpose and exported too. The oil mills doesn't get quality raw material.
- Seeking food licence is strictly compulsory to every enterprise.
- Every oil mill is facing the problem the burden of local body tax (L.B.T.)
- Shortage of labour because of the low wages each and every labour demands high wages in the time of crushing season.
- People become health conscious so they thought the physical well being of the family.
- Completion in the market from other types and quality brands of the oil and they sold their commodity at any cost or sell very cheaply.
- Unstable prices of raw material and the finished product in the market. The commission of brokers and agents are very high.

7.7 REMEDIAL MEASURES TO OVERCOME THE PROBLEMS OF OIL MILLS

- 1) The government of Maharashtra should provide adequate financial assistance and may provide loan facilities through banks with appropriate rate of interest to the entrepreneurs. So, that the problem of working capital will be solved easily.
- 2) Electricity board should supply regular electricity to the oil mills so that the unit can be run throughout the year with full capacity.
- 3) The government should start supply depot of raw material at tahsil level or in the area of oil mills. So, that the oil mills will get at ease raw material to process with full capacity especially in the off seasons (rainy seasons). The prices of raw material should be fixed and controlled by the government.
- 4) For the full capacity utilization eight hours shift should be enforced. so the problem of capacity utilization shall be solved. There is a need to change the traditional oil extraction technique and modernization machinery is required and by annual overhauling is necessary.
- 5) There is a need of hour to increase the rates of wages of the labours so that they do their works enthusiastically on their work sites. There is the necessity to organise the industrial training to the workers by the district industrial centres. At the time of training the stipend should be given to the workers.
- 6) There is need to examine the market system thoroughly. There is a need to fix the rates of the finished products quality wise. Examine the trend of the consumer's

thoroughly because the consumers become health conscious. There are different alternatives available at market level.

7.8 PROBLEMS OF RICE MILLS

- There is shortage of raw material due to the drought in the region. The low rainfall causes the less production of raw material. Hence there is less production of paddy. Hence raw material is brought from other states. Purchasing prices of raw material goes high when shortage of it.
- Shortage of labours at local level therefore the labour is brought from other states e.g. West Bengal, Zarkhand and Karnataka.
- The skilled labours were not available at local level.
- At the time of processing many times the shortage of power supply is the main acute problem facing by the enterprises.
- There is the requirement or licence from Local Administration Body, Department of food and drugs and Department of pollution control Board.
- Compulsion of advertise or news in local daily news papers.
- The enterprise has faced competition in the market with other quality brands. When the demand from market decreases the production of commodity is stopped.
- The enterprises have faces acute problem of recession and trade.
- There is a difference between purchasing price and a market price of the commodity, therefore the rice mills are not run properly and stops its production.
- Competition in the selling price in the market when the production of commodity goes up.
- The process of sacking licence and permission to the enterprise is the tedious and time consuming.

7.9 REMEDIAL MEASURE OVERCOME TO THE PROBLEMS OF RICE MILLS

There were many problems faced by rice mil in the study region. To solve this problem some suggestion are as follow

- 1) It is necessary to start the raw material depot of paddy at local level or at tahsil level by the Government of Maharashtra. There is need to motivate the peasants to take the varieties in paddy production on their farms. For this government should provide

some assistance to them with new varieties of paddy seeds high yield production. It is necessary to give them the appropriate prices to produce the paddy in the market and fix the prices on the basis of varieties produced.

- 2) Workers should be given chances of training by the entrepreneurs. The local level workers must be given the efficient wages then they are attracted towards the enterprises. It is important to organise the necessary training programmes under the administration of district industrial centre at local level with stipend. Minimum basic training is necessary.
- 3) M.E.S.B. should supply regular power to the industrial units throughout the year with minimum rates.
- 4) Government should give sufficient loans to the entrepreneurs through the various banks of financial institutes for the smooth function of the units. The rate of interest of loan should minimize or give them the seed money to at the time of installation of the unit.
- 5) The installed machinery should be cleaned and repaired every three months so that the full capacity can be utilized.
- 6) Management should be strict and prompt in its administration.
- 7) There is need of market survey. There is the need to give the prices at market on the basis of quality product and demand from consumers.

7.10 SUGGESTIONS

Kolhapur district is agriculturally developed district in the Western Maharashtra. There is a sound base and infrastructural facilities were available for the development of agro-based industries. Still there is a huge potential for the new beginning of the agro-based industries e.g. sugar industries. Spinning mills, food processing industries etc. it is an empirical observation of the study area at the time of field visits in the study area. There is considerable change in the area under different crops in the district particularly cash crops e.g. sugarcane, oil seeds and fruits and vegetable. These are the basic raw material oriented industrial crops taken in the district. Here some suggestions have been made for the new beginning of agro-based industries in the district.

7.11 POTENTIAL FOR THE DEVELOPED OF SUGAR INDUSTRIES

There were 21 sugar industries in the district. Though, there is a strong infrastructural base for the new budding of the sugar industries. It observed from the table 4.4 that, that the considerable growth of area under sugarcane was recorded in the district. Particularly in the Gaganbavada, Panhala, Kagal, Sahhuwadi and Bhudargad tahsils of the district. District as a whole there is a notable growth recorded too. From 1997-2002 the area under sugarcane of the district was grown from 11.04 to 17.80 per cent to the gross cropped area of the district. A considerable change was observed in the area under sugarcane of the district. There is period of growing of private sugar factories. The private entrepreneurs were interested in the beginning of the sugar factories in the study region. There were well developed location aspects like availability of water, ample production of raw material, transportation facilities, electricity etc. available in the district.

7.12 POTENTIALS FOR THE EDIBLE OIL AGRO-BASED INDUSTRIES

There were 26 oil mills in the study region as per year 2011-12. The Karveer, Hatkanangale, and Gadhingalaj tahsils have a considerable number of oil mills. The area under groundnut is swept out in the Chandgad, Shahuwadi, Gaganbavada, Ajara, and Karveer tahsils in the district. There is an appropriate site for the location of the edible oil mills. Particularly groundnut was taken in the western part of the district. Therefore the location of oil mills would be suggested at Gadhingalaj and Ajra where there is all ready MIDC has developed required infrastructural facilities.

The areas under total oilseeds were swept out in the Shirol, Hatkanangale, Shahuwadi, Chandgad, Gadhighlaj, Kagal, tahsils of the district. It has recorded a considerable growth of area under total oil seeds. The farmers of that area have taken a large quantity of soyabean crops on their farms and it would be helpful for growth of nutrients in the farms. Apart from that the people have changed their attitude from the use of groundnut oil to soyabean oil. Therefore it would be necessary to start new soyabean oil mills in the District. Basically Kagal, Shirol and Hatkanangale tahsils have a strong industrial base to support these new coming agro-based industries. These places have well accessibility to the remaining parts of the district as well as other parts of the state through state highways and other routes. The market facilities are available at Kolhapur, Jaisingpur and Vadgaon. The entrepreneur mind was setup

in this area so there need to only assist to them with seed money and required capital through the banks.

7.13 POTENTIALS FOR THE DEVELOPMENT OF FOOD PROCESSING INDUSTRIES

The western part of the district has hilly terrain and geo-ecologically favourable for the growth of fruits and vegetable. Particularly Cashew nut, mango and other fruits were grown here. The considerable change was noted in the area under fruits and vegetables. Particularly it was noted in the Gaganbavada, Ajara, Radhanagari and Bhadargad tahsils. Geographically these tahsils have favourable conditions especially for the cashew nut, awala and mango etc. Basically these tahsils have cashewnut processing industries. Therefore these tahsils have a huge potential for the development of Cashew nut; Mango pulp pickles, candy, canning; extracting of awala juice, candy, pickles' and industry. So there is a strong base for the development of these industries in the area western part of the district.

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APPENDICES

Appendices

Appendix 1: Questionnaire for the Agro-Industries (Sugar Factories)

I. Introduction

- i. Year of establishment :
- ii. Name of the factory :
- iii. Site and situation :
- iv. Area occupied by the factory :
- v. Founder of the factory :
- vi. Historical background in brief, if any :

II. Management

- i. Type of registration :- Private / Public / Co-Op. / Government
- ii. Type of management :-----
- iii. Office bearers with their designation :-----

- iv. Number of the shareholders, if any :-----

III. Capital

- i. Initial capital: - shareholders / Government shares, funds, if any, bank loan. -----
- ii. Present capital :-----
- iii. Source of capital a)by Govt. b) by Bank c) by Share d) by Own

IV. Raw Material

- i. List of the different raw material required :-----

- ii. Whether Indian-make / foreign-make :-----
- iii. Sources of the machinery :-----
- iv. Modernization and increase in machinery
- v. Cost of machinery

- vi. Availability of spare-parts and repairing works problems if any
:-----

V. Machinery

- i. List of the various machines and their functions :-----

- ii. Whether Indian-make / foreign-make :-----
- iii. Sources of the machinery :-----
- iv. Modernization and increase in machinery :-----
- v. Cost of machinery :-----
- vi. Availability of spare-parts and repairing works. Problems, if any :

VI. Workers

- i. Total number o workers :-----male-----female-----
- ii. Skilled :-----,semiskilled-----,unskilled-----
- iii. Designation of the workers : -----

- iv. Appointment and wages
Daily-----, monthly-----, Annual-----,
Seasonal-----
- v. Number of the shifts and workers, if any :-----

- vi. Labour problems :-----Medical-----
Residential-----Recreational-----
Salaries-----Others-----

VII. Fuel

- i. Type of the fuel used : oil / electricity / coal / others
- ii. Source :-----
- iii. Annual consumption and cost :-----
- iv. Fuel problems, if any :-----

VIII. Water supply

- i. Source :-----
- ii. Quantity required :-----
- iii. Utilization :-----

IX. Production

Year	Area under Sugarcane in hectare (with No. Of villages	Cane production (in terms of raw sugar in 000,tones)	Yield recovery (per hectare in tones) percentage	Cane crushed By the factory

X. Cane requirement by the factory

Year	No. of units	Installed capacity (tones per day)	Cane requirements 150 days : 180 days	

XI. Cane production and cane crushed

Year	Present approx. production of cane in factory area	Present cane crushed by the sugar factory

- XII.** i. Process of sugar production :-----

- ii. Daily production in tones : -----
- iii. Different types of the finished production: -----

XIII. Measures taken by the factory to increase the productivity of sugarcane under the following heads :

- i. Land preparation and mechanization of farming :-----

- ii. Number of tractors : privately owned / factory owned :-----
- iii. Number of disc-harrows :-----
- iv. Facilities to supply good quality seeds :-----
- v. Irrigation (area under irrigation) :
Well: -----, canal-----, lift irrigation-----,
tank irrigation-----,
- vi. Drainage problem solved by the factory :-----

- vii. Manures and fertilizers :
a) Type of manures and fertilizers :-----
b) Quality used by the farmers :-----
c) Role of the factory in supplying manures and fertilizers
:-----
- viii. Plant protection measures. Insecticides and pesticides :-----

- ix. Credit facilities made available to the farmers :-----

- x. Research facilities : a) soil testing :-----
b) Varieties of cane (breeding and selection):-

- xi. Payment of cane price on quality basis :-----

xii. Transport and communication :

a) Number of vehicles used :

Trucks: -----, Tractors: -----, trolleys-----,
bullock-carts-----,

b) Number of vehicles in possession of the factory :-----

c) Nature of payment of transport charges :-----

d) Total expenditure (year-wise) :

Year	Expenditure	Year	Expenditure	Year	Expenditure
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

e) Delay in transporting cane to the factory and reasons for it
:-----

xiii. Market

a) Market for finished production :

Local / Regional / National / International

XIV. By-products

i. Alcohol : quantity-----,price-----,demand----

ii. Paper : quantity-----,price-----,quality----

iii. Liquors : quantity-----,quality-----,price----

XV. Current problems

i. Capital :-----

ii. Raw material :-----

iii. Competition :-----

iv. Transportation:-----

v. Marketing :-----

vi. Others :-----

XVI. Prospects :

i. Planed scheme, if any :-----

ii. Scheme under consideration :-----

XVII. Conclusion and remarks:-----

Appendix 2: Questionnaire to the industrial units

Name of the industrial Unit: _____

Place of location : _____

1. When was the unit started?

2. What are the factors that have influenced the selection of the location of the unit here?

3. What is the nature of the organization?

4. Who is the owner of the unit?

5. How many agriculturists are there as partners/shareholders of the unit?

6. a) What is the capacity of the plant? (physical units)

b) What is the percentage of capacity utilization at present?

c) If underutilized, what are the reasons?

d) Is the management taking any steps to increases the capacity utilization?

Please mention them.

7. What is the total investment in the unit?

8. What are the various sources of finance for the unit?

Amount

I. Own capital

a) Agriculturists

b) Non-agriculturists

- II. Commercial Banks _____
- III. Financial institutions _____
- IV. Indigenous Bankers _____
- V. Government subsidies _____
- VI. Any other sources _____
(Specify)

9. Are there any problems regarding finance? Yes / No

10. If yes, what are the reasons?

11. a) What is the main material in the production?

c) What are the subsidiary materials?

12. Where from these materials are procured?

	Main Materials	Subsidiary
Material		
I)	_____	_____
II)	_____	_____
III)	_____	_____
IV)	_____	_____
V)	_____	_____

13. How much quantity produced?

Per day: -----, Per Month: -----, Per Annum: -----

14. Is there any material shortage? Yes / No

15. If yes, what are the reasons?

16.

a) Are there any agencies to procure the material and to distribute the finished product outside the organization?

b) If yes, please give the particulars.

17. Raw material used

Per day: -----, Per Month: -----, Per Annum: -----

18. Area of availability of raw material :-----

19. Whether raw material is available through out the year or seasonal :-----

20. If seasonal, mention the names of the month in which raw material is available :-----

21. What price is paid for the raw materials

22. How many workers are employed in this unit:

I. Ministerial :

II. Others :

23. Where from the workers are attracted?

(Please give the particulars)

Name	Place	Distance from This unit	Tal.	Dist.	Earlier occupation
------	-------	----------------------------	------	-------	-----------------------

-----	-----	-----	-----	-----	-----
-----	-----	-----	-----	-----	-----

24. Please give the particulars of workers employed (category-wise)

<u>Type of workers</u>	Male	Female	Skilled/ unskilled
Permanent	-----	-----	-----
Temporary	-----	-----	-----
Seasonal	-----	-----	-----
Total	-----	-----	-----

25. Please give the wage-level and the structure of industrial workers per month:_____

26. Are the workers provided with leave benefits? (particulars)

27. What is your opinion about the performance of workers?

a) Excellent; b) Good; c)Satisfactory; d)Not satisfactory

28. Are there any industrial or other units which are started because of setting up of this unit here?

29. If yes, what are they?

30. If any such unit is within the organization, how many workers are employed in it?

31. What is the market place for this product? (percent of each to the total sales)

Market place		percent
a. State	:	-----
b. Zone	:	-----
c. National	:	-----
d. International	:	-----

32. Whether the factory is in profit : Yes / No

33. If not, what are the reasons :-----

34. Interlink ages between other factories / industries :-----

35. If yes, then what is its nature :-----

36. Is Government encouraging this unit? Yes / No

37. If yes, it is through

a. Finance	:	-----
b. Industrial estate	:	-----
c. Material supply	:	-----
d. Subsidy	:	-----
e. Tax incentives	:	-----
f. Market	:	-----
g. Any other (specify)	:	-----

38. Mention the existing problems faced by the factory.

- a. Transport : Rail-----, Road-----
- b. Labour problems :-----

- c. Problems of electricity shortage :-----
- d. Problem of demand and supply (able to meet or not) :-----

- e. Any other:-----

39. The impact of factory on its surrounding area.

- a. In terms of employment generation :-----
- b. In terms of education development :-----
- c. Creation of health care centre's :-----
- d. Market and urban development :-----
- e. Development of recreation and tourism. :-----

40. Details of area development programs

a. Infra structural development programme

- i. Seed money :-----
- ii. Loan for development :-----
- iii. Subsidy :-----
- iv. Farm inputs :-----
- v. Risk benefit cover :-----
- vi. Agri. research and development:-----

b. Rural development programme :

- i. Social :-----

- ii. cultural :-----

- iii. Educational :-----

- iv. For Poor sections in the society: -----

- c. Awards if any, in this regard :-----

41. What is your opinion about the Government policy towards this unit?

Please offer suggestions to streamline the government assistance towards the small and agro-based industries.

42. What is the turnover of the unit?

43. What is the profit of the unit?

Year	Turnover
-----	-----
-----	-----

Suggestions / opinions for the development of the surrounding area.

Appendix 3: A Schedule for Industrial Workers

Industrial location: -----

A. Personal information :

1. Name of respondent :-----
2. Type of occupation :-----
3. Educational qualification :-----
4. Age :-----
5. Family size :-----
6. Sex :-----
7. Male / female :-----
8. Children :-----
9. Male / female :-----
10. Name of industry in which working :-----

11. Designation at work :-----
12. Are you native of this village :-----
13. If no, where do you come from? :-----
14. How do you get here? :-----
Bus / train / private vehicle / cycle /by walk :-----
15. How far is your place (km) :-----
16. How long have you been working this unit? (year) :-----

B. Work and work related information:

17. Give a description of your work :-----
18. Employee : permanent / temporary / seasonal :-----
19. Length of service :-----
20. Salary /wages per month (Rs) :-----
21. Are working conditions conducive? :-----
22. Is working environment well? :-----
23. Are you satisfied with your salary? :-----
24. Does your employer treat you well? :-----
25. Is workload heavy? :-----
26. Do you get your allowances? Bonus / Medical Allowances / LIC /
Provident fund /Thrift Fund.:-----

27. What is the salary -----

28. Do you save money? Yes / No

29. Do you wish to change your job? _____

30. If yes, what is your other choice? -----

31. Do you have cultivable land? If yes who is cultivating? :-----

32. How many acres of land do you have? What are the main crops? :

1. -----, 2. -----, 3. -----, 4 -----

5. -----

33. Is agriculture profitable? Yes / No

C. Industry related information

34. Is your industry raw material based? Yes / No

35. What is the main raw material of your industry? :-----

36. Where do they come from? (name of places)

37. Means of transport : truck / carts / tractor / others

D. Quality of life.

Rate the quality of life a high (3), medium (2), low (1)

38. Have you improved your status after joining this firm 1 /2 /3

39. Social 1 /2 /3

40. Economic 1 /2 /3

41. Standard of living 1 /2 /3

42. Health 1 /2 /3

43. Education 1 /2 /3

44. Happiness 1 /2 /3

45. Your suggestion for

a. Improving the industrial production :-----

b. Improving regional prospects for development :-----

c. Improving quality of living further :-----

PHOTOGRAPHS

PHOTOGRAPHS



Photo Plate No. 1: Ploughing the field by traditional method.
(Village: Dewarde, Tal: Ajara.)



Photo Plate No. 2: Ploughing the field by modern method.
(Kurundwad, Tal: Shirol.)



Photo Plate No. 3: Farm of Sugarcane cultivation.

(Kodoli, Tal: Hatkanagale.)



Photo Plate No. 4: Temporary huts of Sugarcane cutters and their bullockrats laden with Sugarcane. (Chh. Shahu SSK Ltd., Tal: Hatkanagale.)



Photo Plate No. 5: Harvesting Sugarcane with Harvesters a new technique. (Shree. Tatyasaheb Kore Warana SSK Ltd., Warnanagar, Tal: Panhala.)



Photo Plate No.6: Transporting Sugarcane (raw material) towards the Sugar Factory by tradition. (Panchaganga SSK Ltd., Ganganager-Ichalkaranji, Tal: Hatkanangale.)



Photo Plate No.7: Transporting Sugarcane (raw material) towards the Sugar Factory by gate cane. (Udaisinha Gaikwad Sah.sakar,Karkhana Ltd.,Sonawde-Bambavade, Tal: Shahuwadi.)



Photo Plate No.8: Crushing of Sugarcane (raw material) at the factory site. (Shree.chh. Rajaram Sah. Sakhar Karkhana Ltd.,Kasba-Bavada, Kolhapur, Tal: Karveer.)



Photo Plate No.9: Exterior view of the Sugar factory. (Jawahar Shetkari SSK Ltd., Hupari-Yalgud, Tal: Hatkanagale.)



Photo Plate No.10: Interior view of warehouse of the Sugar factory. (Shree.chh. Rajaram Sah. Sakhar KarkhanaLtd., Kasba-Bavada, Kolhapur, Tal: Karveer.)



Photo Plate No.11: Exporting of Sugar (Finished product)
(Shree.chh. Rajaram Sah. Sakhar KarkhanaLtd.,Kasba-
Bavada, Kolhapur, Tal: Karveer.)



Photo Plate No.12: Raw material for Cotton Yarn Mills.
(Kapashi, Tal: Kagal.)



Photo Plate No.13: Opening ceremony of Sahakari Soot Girni.
(Nav Maharashtra Sahakari Soot Girani Ltd. Ichalkaraji
Tal: Hatkanagale.)



Photo Plate No.14: Interior view of the soot girni raw material
for weaving mills. (Mahatma Phule Magasvargiya SS Girani
Ltd., Peth Vadgaon, Tal: Hatkanagale.)



Photo Plate No.15: Harvesting of Paddy (raw material for the Rice Mills) (Village: Gavase, Tal: Ajara.)



Photo Plate No.16: Board of Agro-Based industry (Rice Mill) (MIDC Ajara.)



Photo Plate No.17: Warehousing of Paddy wait for processing in Rice Milling. (Vishvaprabha Foods Product Pvt. Ltd., Rukadi, Tal: Hatkanagale.)



Photo Plate No.18: exterior view of a Rice Mill. (Gomtesh Rice mills Pvt. Ltd., Mangaon, Tal: Hatkanangale.)



Photo Plate No.19: Exporting of Rice (finished product).
(Annapurna rice mills Pvt. Ltd., MIDE Ajara, Tal: Ajara.)



Photo Plate No.20: Ready bag of Rice for grain exhibition.
(Local Marketing System) (Kalbhairav rice mills Pvt. Ltd.,
MIDC Ajara, Tal: Ajara.)



Photo Plate No.21: warehousing of groundnut waiting for processing and Extracting Edible oil. (M/S Ganesh oil mills Ichalkaranji, Tal: Hatkanangale.)



Photo Plate No.22: a large heap of processed groundnut for domestic use. (M/S Vaishanvi oil mill, near lonar vasahat, Kolhapur, Tal: Karveer.)



Photo Plate No.23: Exterior view of Groundnut oil mill.
(M/S Jai Bharat oil near shahu market yard, Kolhapur, Tal:
Karveer.)



Photo Plate No.24: Local marketing of Groundnut oil at mill
site. (M/S Shri.Gnesh oil mills Ichalkaranji Tal: Hatkanangale.)



Photo Plate No.25: Stock of tins of Packed Groundnut oil at warehousing of oil mill. (Maheshwar oil mill near market yard, Kolhapur, Tal: Karveer.)



Photo Plate No.26: Export of Groundnut oil for marketing at local level. (Maheshwar oil mill near market yard, Kolhapur, Tal: Karveer.)