AGRICULTURAL DEVELOPMENT IN RATNAGIRI DISTRICT (MAHARASHTRA)

THESIS

Submitted in partial fulfilment of the requirements

for the Degree of

MASTER OF SCIENCE
IN
AGRICULTURE
(AGRICULTURAL ECONOMICS)

By
MS. KHABALE TRUPTI RAOSAHEB
(ADPM/20/2773)

DEPARTMENT OF AGRICULTURAL ECONOMICS
COLLEGE OF AGRICULTURE, DAPOLI

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NOVEMBER, 2022

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Under the Guidance of

DR. S. S. BHOSALE

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DECLARATION OF STUDENT

I hereby declare that the experimental work and its interpretation of the Thesis entitled **"AGRICULTURAL DEVELOPMENT IN RATNAGIRI DISTRICT" (MAHARASHTRA)** or part thereof has neither been submitted for any other degree or diploma of any University, nor the data have been derived from any thesis/publication of any University or scientific organization. The source of materials used and all assistance received during the course of investigation have been duly acknowledged and that no part of the thesis has been submitted for any other degree or diploma.

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CERTIFICATE

This is to certify that the thesis entitled, **"AGRICULTURAL DEVELOPMENT IN RATNAGIRI DISTRICT" (MAHARASHTRA)** submitted for the degree of M.Sc. (Agricultural Economics) of the College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, is a bonafide research work carried out by **Ms. Khabale Trupti Raosaheb (ADPM/20/2773)** under my supervision and that no part of this thesis has been submitted for any other degree. The student had completed all the Course and Research requirement as per the norms in regular mode and has published the one research paper from her M.Sc. work.

The assistance and help received during the course of investigation have been fully acknowledged.

Chairman
Student Advisory Committee

Place: Dapoli
Date: 23/ 01 / 2023

Countersigned

Head
Department of Agricultural Economics

THESIS APPROVAL BY THE STUDENT'S ADVISORY COMMITTEE INCLUDING EXTERNAL EXAMINER

This is to certify that the thesis entitled, **"AGRICULTURAL DEVELOPMENT IN RATNAGIRI DISTRICT" (MAHARASHTRA)** submitted by **Ms. Khabale Trupti Raosaheb (ADPM/20/2773)** to the College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, in partial fulfillment of the requirements for the degree of M.Sc. (Agricultural Economics) in the subject having Agriculture Extension as Minor subject of Department of Extension Education has been approved by Student's Advisory Committee, Board of Studies of the Department and Evaluated by One External Examiner after an open Viva Voice examination in the presence of External Examiner on the same held on dated 18 / 01 / 2023.

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Now as I carry this thesis in my hand, I carry with me memories that will enrich my nostalgia.

Place: Dapoli
Date: 23/ 01 / 2023

(Ms. Khabale Trupti Raosaheb)

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Abbreviations

@	: At the rate
^{0}C	: Degree Celsius
%	: Per cent
/	: Per
=	: Equal to
+,-	: plus or minus
et al	: And others
Fig	: Figure
ha	: hectare
i.e.	: That is
viz;	: Namely
kg	: Kilogram
MT	: Million tones
Sq.km	: Square kilometer
MS	: Maharashtra
No.	: Number
C.V	: Coefficient variance
S.D	: Standard of deviation
&	: And
GDP	: Gross domestic product
GVA	: Gross value added
NDP	: Net domestic product
NVA	: Net value added

INTRODUCTION

CHAPTER I:INTRODUCTION

1.1 Background information:

Agriculture plays vital role in the process of economic development of less developed countries like, India. Besides providing food for the nation, agriculture absorbs labor, provides saving, contributes to the market of industrial goods and earn overseas exchange. In India, agriculture has the main source of national income and occupation since independence. During the first decade of independence, agriculture and allied activities contributed about 51.81 per cent to India's national income and around 73 per cent of the total working population were engaged in agriculture and allied sector. However, the share of agriculture to national income substantially has declined from 51.81 per cent in 1951 to 18.20 per cent in 2013-14. In spite of this, agriculture still has prominently playing vital role in the India's economic growth. Agriculture provides raw materials for industrial sector and creates employment opportunities in the ever-growing service sector.

Since independence, Indian agriculture has been significantly progressing; it grew at the rate of one per cent per annum for sixty years during pre-independence era 1860-1920. Further, it springs up at the rate of about 2.6 per cent per annum in the post- independence era 1951-56. An increase in total cropped area was the main source of agriculture growth from fifties to eighties. During mid-eighties, a structural change in the production was observed. Area was moderately declined, while per hectare production was increased substantially due to technological transformation. Apart from technological transformation, land reforms, an introduction of agricultural price commission with the objective to ensure remunerative prices to producers, new agricultural strategies, viz., introduction of hybrid seeds, chemical fertilizers, new cultivation & harvesting tools, improved irrigation facilities, agriculture credit & insurance, investment in research and extension services and improvement of rural infrastructure were taking place.

All these developments in Indian agriculture are contributed by a series of actions taken by the Indian government during mid-sixties. However, things are not always gone in the right direction. The dark side of agricultural development is that, it has increased disparity among the operational land holders, increases water scarcity & depletion and increases water logging & salinity. The agricultural investment statistics also show deceleration trends in economic reform period during 1999-2012. Furthermore, natural calamities, higher interest rates, an increase in the wage rates, increase in prices of fertilizers, seeds & pesticides and lower minimum support price have increased degree of vulnerability in marginal and small farmers (i.e., about 86 per cent).

Agriculture is the main occupation and backbone of Indian economy. Agriculture is not mainly an occupation but way of life. After the independence, India has undergone rapid transformation in agriculture. In the 1960's India introduced "Green Revolution" technology for agricultural development. The scenario of Indian agriculture has been change after mid sixties as a result of Green Revolution. According to Dr. M.S. Swaminathan, the Green Revolution in our country has ended the divorce between intellectual and labour in the cultivation of food crops and generated a climate of confidence in our agriculture capabilities. It has solved the food problems, removed our dependence on food import considerably, brought higher income to many farmers and has given fill up to economic development through it's forward and backward linkages.

Agricultural development is the vital component of total economic development. At the time of independence, India's primary industry and source of income was agriculture. Nearly 50 per cent of India's national income was generated by agriculture and related activities. 60 percent of the workforce in India was employed in the agricultural sector, which also accounts for around 17 percent of the country's GDP.

In the 1950s and 1960s, area expansion was the primary driver of growth. Subsequently the contribution of expanded land area used for agriculture has decreased over time and productivity growth has taken over as the primary driver of agricultural production growth. Success in reducing reliance on imported food grains is a crucial aspect of agricultural development.

In India, half of the income generated in industrial sector is based on raw material obtained from agriculture. The trade both international and interstate in our country highly depends on agricultural products. The surplus from agricultural sector, because of increased productivity due to modernization of agriculture serve as the basis for starting several economic activities and finally contribute substantially to an overall economic growth of the country. This is the reason why agricultural development has been given priority in the economic planning during post-independence period in our country.

1.2 Importance of study:

Agricultural development is the process of making rational use of agricultural resources for to improve efficiency of agriculture and standard of living of people. The development of agriculture through which a shift takes place from the traditional agriculture to the modern agriculture, results in an increase in the production and productivity per unit of various resources due to modern technology. Agriculture development is an integral part of overall economic development. The agricultural development process includes the use of high yielding varieties,

adoption of package of practices including the use of fertilizers, plant protection measures, irrigation, modern machinery etc. for increasing productivity of farm enterprises. Any major change in the agricultural sector influences on the general economic situation and any advancement in the agriculture will therefore trend towards the economic progress of the whole country. The development of agriculture has significant effects on the growth of other sectors of the economy. It helps the process of industrialization by providing raw material to the leading agro-based industries as well as small scale and cottage industries.

Agricultural development play a major role in improving food security and nutrition by increasing the quantity and diversity of food. It is a driver of economic transformation and also the main source of income for a majority of the people, who live in the most extreme poverty across the globe.

The development of agriculture is a process through which the traditional agriculture replace by modernized agriculture, resulting in increase the production and productivity per unit of resource due to use of modern technology. During the transformation the position of original equilibrium changes and production function shifts to higher level and occupies a new equilibrium position, where the profits are maximum.

The process of agricultural development includes use of HYV's, adoption of improved package of practices including use of fertilizers, plant protection measures, irrigation, use of modern machinery, etc for increasing productivity of farm enterprises. The aim of process is to getting the maximum advantage of the available resources *viz*; land, labour and capital etc on the farm and finally depicts the prominent changes in resource use and allocation, productivity of crops over a period of time. Agriculture development is one of the most effective strategy for reducing the extreme poverty, creating shared prosperity and providing food for the estimated 9.7 billion people. Compared to other industries, the agriculture sector growth is two to four times more successful at increasing the income of the poorest people.

One of the main pillars of the Indian economy is the agricultural sector, which provides 60 per cent of the workforce and generates 17 per cent of the nation's GDP. Growth in the agricultural sector affects other economic sectors and ultimately national prosperity. Therefore, the success of the agriculture sector is essential to a country's economic prosperity. This is especially true when a country is heavily populated and primarily agricultural. The expansion of other economic sectors is significantly impacted by the development of agriculture. By supplying raw materials to the major agro-based industries as well as cottage and small-scale industries, it helps in the industrialization process.

Due to development of agriculture, higher level of production in food and better standard of living for farm families have been achieved. Agriculture development increases productivity and household income for small holder farmers in rural areas.

The process of agriculture development is important from the view point of increasing agricultural production in the state as well as in the country.

Agriculture also play important role in the process of economic development. Besides providing food to nation, agriculture also providelabour, generate savings, supports the market for industrial goods and earns foreign exchange. The progress of the agriculture sector is a key factor in how quickly a nation's economy develops. It has been tried to examine the evaluation of the level of development in the agricultural sector, infrastructural service sector and overall socio-economic sector because the development of a nation depends on the development of villages. It would be interesting and useful to evaluate the level of development of district. Understanding the district degree of development can aid in determining how it compares to other districts.The study also throws light on the association between the level of development in different sectors. Hence some attempts have been made to analyze the crop wise growth rates in area, production and productivity, livestock, fertilizer consumption, wage rates, agricultural machinery and implements at district levels.

The primary goal of agricultural development is to enhance the agricultural system in order to maximize productivity and reduce regional inequities and to satisfy the growing population's desire for food. Currently, the development of the agricultural sector is crucial in order to improve the living conditions and sustain agro-based enterprises. Additionally, to speed up agricultural development, crop production and productivity growth rates, which would improve farmerseconomic status and standard of living.

1.3Objectives of study:

The present study was undertaken with the following specific objectives;

1. To study existing status of agricultural development in Ratnagiri district.
2. To examine variability and trends in agricultural development over a study period.
3. To estimate the growth in different sectors of agriculture and allied activities in Ratnagiri district.

1.4 Hypothesis:

In light of the foregoing theoretical approaches and the review of literature discussed in the next chapter, the following hypotheses are proposed to be tested in order to meet the requirements of the study's objective.

1) Agriculture development varied during the period under study.

2) Growth in different sectors of agriculture is increasing.

1.5 Scope and Limitations:

Scope:

The goal of the current study is to assess the performance and progress of agricultural development in Ratnagiri district. The various aspects of agriculture included in the study will show, if the rate of development has been uniform or if there have been imbalances and inefficiencies in the growth of agriculture. When establishing the aims for a future plan, the growth rate coefficient can be helpful.

The study's results will be beneficial to government organizations and planners in various disciplines as they construct their strategies for the improvement and advancement of a particular region.

Limitations:

The current study is based on secondary data that was gathered from various publicly released state government records. The analysis is restricted to the stock of data on the study'scomponents that is currently accessible. Therefore, the level of dependability of the secondary data determines the validity of the study's findings.

The information was gathered from the Department of Agriculture, Government of Maharashtra, the Directorate of Economics, the District Statistical Abstracts and the Maharashtra Statistical Abstract. The secondary type of information puts restrictions on its capabilities for further analysis and presentation. Sometime, data on all the aspects are either scanty or not available. However, an effort is made to conduct an in-depth analysis of the data in order to achieve the goals and reach at significant conclusions.

REVIEW OF LITERATURE

CHAPTER II: REVIEW OF LITERATURE

It is necessary to have knowledge of similar previous research work carried out by other researchers in order to conduct any systematic research. It serves as a guideline for the concepts employed. Such knowledge is useful in designing the research problem, selecting appropriate methodology and properly interpreting the results. In this chapter, important past studies relevant to the present study have been reviewed and discussed under the following headings:

2.1 Status of Agricultural development

2.2 Variability and trends in agricultural development

2.3 Growth in agriculture sector and allied activities

2.1 Status of Agricultural development.

Li-San-Duk (1998) studied the agricultural development in Korea Democratic Peoples Republic for the year 1960 to 1968. He observed decrease in share of agriculture in GNP from 37.6 per cent in 1960 to 8.2 per cent in 1993. The main constraint to development was small average size of farm (not more than 3 ha. of cultivated area) which does not allow the most effective use of technological advances. There was also a declining trend in the number of farms and rural population as a result of outflow of young people to towns.

Babar et al. (2000) studied the agricultural development in Kolhapur district (M.S). They concluded that western Maharashtra was always ahead in development in general and Kolhapur district in particular. The various infrastructure faculties had been exploited to the fullest extent in Kolhapur district. The main constraint in agricultural development was of fragmented and small land holdings. The cultivators of this district had achieved substantial success in agricultural development by farming co-operative institutions. The changes, those had occurred in area, production and productivity of important crops and utilization of important inputs like irrigation, fertilizers, area under hybrid varieties, credit etc. were also analyzed the compound growth rates of area sown more than once, net and gross irrigated area, area under irrigated crops showed significant increase. Efforts need to be made to increase the productivity by changing the varieties, rotation of crops and adoption of management practices.

ThammiRaju and Sastry (2000) reported that India claims to passes large number of goats i.e. 122 million with share of 17.4 per cent of the total world population. There was a growth of 21.16 per cent in total world population during study period and about 12 per cent in Asia during the study period. In India, the growth rate varied from 0.94 to 5.13 per cent with an overall average of 3.32 per cent during study period which was highest among other livestock species.

Kudalkar (2000) investigated the growth of agriculture in the Sindhudurg district. She concluded that the Sindhudurg district was seeing significant growth in terms of the area planted with food crops, irrigation, production and productivity of significant crops, area planted with rice HYVs and agricultural wages.

Vijayan (2001) studied the agricultural development in Raigad district and noted positive growth rates for the area covered by forests, production and productivity of principle crops, irrigated area, fertilizer consumption and the wage rates paid to agriculturallabour. All of this showed that Raigad district development was going in the right direction.

Desai (2001) examined the agricultural development in Thane district and came to the conclusion that the district had experienced positive growth rates in terms of the area covered by HYVs, food crops, production and productivity of significant crops, irrigation area, fertilizer consumption and agricultural wages. This demonstrated that agricultural development was proceeding in the desired manner.

Atkare et al. (2001) studied the credit co-operative movement in Vidarbha and came to the conclusion that Maharashtra has experienced a phenomenal expansion in the co-operative sector over the previous few decades. In terms of the overall number of co-operative societies in the nation, Vidarbha contributed 15.78 per cent of the societies, while Maharashtra contributed 33.96 per cent.

Chauhan (2005) studied agricultural development in Pune district of Maharashtra and indicated that, the factors viz; percent of gross sown area to net sown area, percent of area of high yielding variety to gross sown area and average annual rainfall in the district in (mm) showed a significant positive association in increasing the value of aggregate crop production in Pune district.

Ghosh (2010) investigated the expansion and variation in crop production in West Bengal. He concluded that West Bengal has become a progressive state as a result of the production of high yielding cultivars throughout the eighteenth century. The analysis found that since the middle of the 1990s, main crop agricultural growth has drastically decreased. The study also demonstrated that crop production variability varies significantly across the state and has a higher degree of variability with the help of a non-parametric test.

Shaikh (2013) conducted research on the Andhra Pradesh agricultural development's economic evaluation. He saw that the amount of land covered by forests had declined from 22.64 percent in 1981 to 20.50 percent in 2010. During the 2009–10, the total sown area rises from 122.82 lakh ha to 125.61 lakh ha. State wise, the percentage of land planted to cereals dropped

from 55.03percent in 1981 to 37.49 percent in 2009–10. The area of pulses, vegetables, flowers and fruits also increased.

Amutha (2013) she concluded that the agriculture sector is the backbone of the Indian economy, contributing about 15 per cent of the country's Gross Domestic Product (GDP) and more significantly though about half of India's population depends entirely or heavily on agriculture and related activities for a living. The purpose of this study was to support the agricultural sector in both sustainable economic growth and human development.

Kannan et al. (2013) examined the status of common grazing and pasture land and livestock population in Madurai in Tamil Nadu district: an environmental perspective. The important finding of the study is 13142 hectares of grazing land and common pasture has been encroached by the private individuals for various purposes in Tamil Nadu. The reason for changes in livestock population was observed from the study is due to the mechanization of agriculture, slaughtering the animals and reduction in fertility rate. The livestock population decreased not only from technology but also from the non-availability of grazing and pasture, and poor availability of feed and fodder.

Bairwa et al. (2013) the cattle industries performance was examined with particular attention paid to its trade, production and population. According to research, 50 per cent of India’s livestock population is maintained by marginal farm households. With a significant increase in the production of numerous products, the livestock sector has contributed 25 per cent of the value to agriculture and related activities. This sector is primarily managed by women. However, over the past 20 years, exports of livestock have risen. They are concentrated in a small number of unstable nations. The three main exports of livestock from India are buffalo meat, chicken products and dairy products.

Raypure (2016) investigated agricultural development in Maharashtra's Gadchiroli district. For the most recent year, conclusions were reached regarding the district's agricultural mode, land use and cropping pattern. The district's total land area was 14.92 lakh hectares. In 2013-14, the net sown area was 1.82 lakh hectares, accounting for 12.18 per cent of total geographical area. The forest covered 11.05 lakh hectares, accounting for 74.10 per cent of the total geographical area. The total cropped area was 1.95 lakh hectares, with a cropping intensity of 107.48 per cent.

Udhav (2016) studied on agricultural land use and crop production in Soegaontaluka, dist. Aurangabad (MS), India. Soegaon is a hilly Taluka in Aurangabad district completely situated in the lap of the range of Ajintha valleys. There is no city or any industrial area in this taluka. It has hundred percent rural population. Many of the people here have agriculture as a

main occupation. The total geographical area of this taluka is 61694 hector. Out of this, the area occupied by the forest is 12511 hector whereas the area under cultivation is 44747 hector. While comparing it with the total geographical area, 20.38% area comes under forest and 72.53 % area under cultivation.

Elizabeth Rowe et al (2019) they examined the precision livestock farming involves the use of technology to assist farmers in monitoring and managing their livestock and farms. By enabling farmers to take immediate action when a problem emerges, this technology can help to enhance animal welfare. However, the technology can also be utilized to boost farm production effectiveness.

Baig and Salam (2019) they examined the study of regional disparities in agricultural development in the Aligarh district of Uttar Pradesh. Looked at 15 major indicators, including the consumption of fertilizers per hector, population density, the number of livestock per thousand people, the number of plant protection units per lakh people, the proportion of agricultural labourers to all other main workers, the proportion of area food grain to all people and the proportion of the population that is literate. Based on this index, they discovered that the level of technological adoption and the availability of rural infrastructural services in the agricultural sector were the main indicators contributing to the observed difference among the different blocks.

ShoniaSheheli et al. (2019) they revealed that, the Bangladesh faces a significant difficulty due to food insecurity because it is a developing nation. Despite reaching self-sufficiency in food production, a large number of people in this country still struggle with food insecurity. Scientists have long worked to find ways to feed Bangladeshs expanding population. However, the purpose of this study was to evaluate Bangladeshs current status of food security. This systematical investigation reviewed the material that was already in existence and documented the many aspects of food security in Bangladesh.

Krishnakumari et al. (2020) they revealed that, India is a largely agrarian economy. Of such households, 70 per cent are located in rural areas. 60 per cent of people mostly depend on agriculture for their livelihood. In poor nations, a large portion of food is produced by women. Compared to 78 per cent of women, around 63 per cent of economically active men work in agriculture. It has been noted that women have a key role in the growth of agriculture and related activities such as the production of main crops, livestock, horticulture, and post-harvesting activities. Women carry out roughly 70 per cent of the agriculture labour. Additionally, they said that, the women make a huge contribution to agriculture.

Burak Mat et al (2021) revealed that, livestock production also helps Uganda's economy expand and flourish in addition to providing food security and nutrition, opening up job possibilities, and reducing rural poverty. In order to enhance the sectors production, they recommended that the development must identified as well as potential solutions to these limitations.

2.2Variability and trends in agricultural development.

Anonymous researcher (1999) examined the rise in Indian agricultural output. In 1998-1999, agricultural production increased by nearly 3.9% compared to the previous year's decline of 6%. The development of the foodgrain area throughout the 1950s was the primary factor in the yearly 3.22 percent growth in foodgrain production. A low yearly growth rate of 1.72 percent in the 1960s made large-scale imports of food grains necessary. In the 1970s, 2.08 percent annual increase was recorded. The foodgrain industry in India saw a sea change during this decade and the path to self-sufficiency was defined by the groundbreaking advances in seed technology that drove increased productivity levels in both wheat and rice in the 1980s. The green revolution, which allowed India to become self-sufficient in foodgrains and even a minor exporter was characterised by a 3.5% annual growth in food grains in the 1980s.

Ramesh chand (1995) studied the growth of livestock of different categories of animals in the Himachal Pradesh and analysed the factors associated with these aspects. Regional variation in livestock intensity and composition were studied in relation to agroclimatic and socio-economic variables operating in each district. The study was based on state and district level data derived from livestock census, 1972, 1982 and 1992 and showed that the composition of livestock did not undergo any changes during last two decades. The composition of breeding stock of buffalo and cows had shown improvement through increased share of animals in milk and population of buffaloes was increasing.

Singh and Chandra (2001) examined the growth trends in area; yield and production of food grains in Uttar Pradesh registered considerable changes in agricultural development during different phases of green revolution. They found that the growth rates in area and production of food grains were higher in post green revolution period than pre revolution period. They suggested that further increase in food grain production was possible only by increasing the yield which could be achieved by using the inputs more efficiently.

Meenakshi and Indumathy (2009) studied land utilization and cropping pattern in Tamil Nadu. The study covers eight major crops paddy, cholam, cumbu, sugarcane, cotton, groundnut and tapioca, which constitute 61.89% of total cultivated area. The data collected form 31 district which have been formed from the original 13 districts are available for different time period.

They concluded that there is considerable misuse of cultivable area based on crop yield and hence output is affected to great extent roughly 33% of the cultivable area is being used for growing unsuitable crop.

Punithavathi and Baskaran (2010) studied changes in the cropping pattern, crop concentration, agricultural efficiency in PapanasamTaluka, Thanjavur district, Tamil Nadu, India. The study found that there are more than 20 crops with varying hectares are grown in taluka. of those 20 crops only 5 crops based on the properties of land to the total area under cultivation alone has been considered for analysis. Paddy was the dominant crop in taluka. During the year study period 1995-96 to 2008-09 the area covered by paddy was 82.2%, sugarcane 6.5%, oilseeds 4.5%, Pulses 4.1% and cotton 1.9% to the total cropped area in the taluka.

Elumalai(2012) examined national and subnational growth trends in India's agriculture sector. For the years 1967-1968 through 2007-2008, information on significant variables like area, production, input utilisationand output value was obtained from published sources. The analysis showed that, there has been a major shift away from the production of food grains and toward commercial crops in India's cropping pattern throughout time. Between the triennium ending (TE) 1970-1971 and the TE 2007-2008, the area planted to coarse cereals, which is typically grown in dry locations, decreased by 13.3%. Similarly, during the research period, pulses did not perform particularly well in terms of area and productivity. However, since the late 1960s, an important factor in boosting food output in the nation has been an increase in crop yield. Higher growth in crop production was mostly due to modern cultivars, irrigation and fertilisers. However, in some locations, crop area and output composition have undergone considerable changes as a result of technology and institutional support for a few crops, including rice and wheat. The crop output growth models findings suggested that improved capital creation, better irrigation infrastructure, regular rainfall and improved fertiliser use will all contribute to the countrys increased crop output. In some regions, crops like rice and wheat have dramatically altered crop acreage and production composition. According to the conclusions of the crop, output growth model, increased capital development, better irrigation systems, regular rainfall and greater fertiliser use will all contribute to a countrys increased crop output.

Bansode et.al. (2013) studied on land use pattern and cropping pattern of marginal farmers of Marathwada region of Maharashtra. Multistage sampling design was used for selection of zone, tehsils, village and farms in Marathwada region of Maharashtra. Required collected data were analyzed by employing statistical tools like mean, percentage, ratios, budgeting techniques, frequency and log linear multiple regression analysis, in present study.

Tabular analysis consisting of simple mean and percentages were used. Average holding size of marginal farmer was 0.75 ha which proportionate irrigated area was 28.00% .Large no. of crops were grown on marginal farm in which proportionate area of cereals and pulses was 29.63% followed by cash crops 25.92%, horticultural crop 10.19 % and oilseeds 4.63%.

Raypure (2016) studied area, production and productivity of Gadchiroli district in economic appraisal of agricultural development. Over the base period, which is 5.09 percent, the area planted with oilseeds has marginally grown by 0.61 percent. Additionally, compared to the base year, the area of fruits, vegetables, sugarcane and cotton were increased, while the area of spices, medicinal and aromatic plants and fodder crops were declined.

Nayak (2016) conducted a district-by-district study on changing cropping patterns, agricultural diversification and productivity in the state of Odisha. He revealed,Odisha is essentially a monocrop state. The reason for increased crop production performance and the government provision of a minimum support price for the crop. In Odisha, mainly 30 crops covered 96-98 percent of total cropped area. Rice cultivation has increased from 48.1 per cent of the state gross cropped area in 1980 to 1985 and 55.6 percent in 2000 to 2005. Some cereals, cash crops and spices have lost ground to varying degrees.

Takekar (2020a) studied on trend in land utilization pattern in Solapur district Maharashtra. He revealed that, the average area under forest during study period it was 338 hundred ha and its variability occur during study period was 4.93 per cent, average area under the barren and uncultivable land it was observed 338 hundred ha and its variability it was 3.91 ha, area under land put to non-agricultural use during study period he observed 161.07 hundred ha and its variation occur 8.87 per cent, during study period area under cultivable waste occur 388.53 ha and its variability showed 7.40 per cent, average area under the permanent pasture and other grazing land it was 426.40 ha and its variability occur 9.67 per cent. Area under miscellaneous use occur during study period it was 58 hundred ha and its variation occur over the study period it was 14.79 per cent. The average area under the current fallow and other fallow occur in Solapur district during study period it was 1594.20 to 1435.07 hundred ha and its variation occur during study period it was 17.63 to 20.82 per cent respectively. He also said that net sown area of Solapur district over the study period it was increasing as compared to other lands it was 10222.93 ha and its variation occur 6.04 per cent.

Takekar (2020 b) examined the variability and trends on cropping pattern in Solapur district. He revealed that the average area under the Rice over the study period from 2003-04 to 2017-18 it was 3.67 hundred ha and its variation occur during study period it was 52.22 per cent. He also observed, the average area under the total pulses, total oilseeds and total food grains it

was 800.40 hundred ha, 470.87 hundred ha and 8210.60 hundred ha respectively over the study period and the variation occur 34.80, 28.63 and 8210.60 per cent respectively.

Takekar (2020 c) examined the variability and trends on production and productivity of principle crops in Solapur district of Maharashtra. He found that the average production and productivity under the Rice, total cereals, total pulses, total oilseeds and total food grains. The average production and productivity under the rice it was 1.07 hundred tones and 354.40 kg/ha over the period and variation occur 72.04 to 85.03 per cent. Under the total cereals observed the average production and productivity was 4436.80 MT and 587.80 kg/ha over the period and the variation occur 39.30 to 34.54 per cent. He observed the average production and productivity under the total pulses it was 419.93 MT and 516.27 kg/ha, average production and productivity of total oilseeds and total food grains observed during study it was under total oilseeds 317.53 MT and 682 kg/ha, under total food grains 4856 MT and 579.53 kg/ha during study period.

2.2 Growth in agriculture sector and allied activities.

Giri (1969) studied different districts of Punjab found that the increase in the net sown area was mainly contributed by current and other fallow area which declined significantly in all the districts. Afforestation was carried out in the cultivated area, out of eight district in which forest area incrased.

Fertilizer Association of India (1982) reported that the fertilizer consumption in India increased at a compound annual growth rate of 9.3 per cent during the year 1971 to 1981 and revealed that violent fluctuation in fertilizer consumption from year to year as well as amongst regions and states, Punjab, Haryana and Uttar Pradesh recorded a higher growth rate in fertilizer consumption while, Bihar and Gujarat indicated lower rates of growth.

Kumar and Sharma (1983) analysed the growth rates of agricultural wages in Haryana. Agricultural labourers numbered about 4.74 crores, forming a large proportion of the weaker section in the rural areas. The study aimed at examining the trends in the real wages of the agricultural labureres engaged in different agricultural operations during 1960-66 (pre-green revolution period) and during 167-80 (post green revolution period) and analyzing growth rates of the real wages of agricultural labourers, operationwise and period wise. It was concluded that the real wages of agricultural labourers during post green revolution period were higher than in pre-green revolution period. They were seen to be maximum and minimum for the agricultural operations of ploughing and picking of cotton respectively in all the three periods considered. They have remained almost constant over the period under study.

Rao (1989) studied the statewise production growth rates for rice and foodgrains for the periods 1961-62 to 1977- 78 and 1977-78 to 1988-89. There was improvement in the growth rate of production of foodgrains in second period when compared to the first period. Crops such as paddy and pulses, showed higher growth rates. There were clear indications that the major inter crop imbalances in growth witnessed in the early years of Green Revolution were getting redressed to some extent in the recent period.

Mitra and Jena (1991) conducted a study on growth rates of groundnut production in Orissa. The objective was to evaluate the growth rates of area, production and productivity of the crop. For this purpose, the entire period of thirty-six years was divided into two parts viz., period-I (1950- 51 to 1962-63) and period II (1967-68 to 1985-86). Growth rates of entire period i.e. from 1950-51 to 1985-86 were also 16 studied. The study revealed that, the growth in area and production of groundnut during the study period was significant. However, the rates of compound growth in productivity were also observed to be low and non-significant.

Rahane and Joshi (1993) estimated compound growth rate in area, production and productivity of some important oilseed and pulse crops in Maharashtra. The study was based on secondary data for groundnut (1966-67 to 1991- 92), sesamum (1966-67 to 1988-89), safflower (1968-69 to 1989-90), gram and tur (1966-67 to 1990-91). The study revealed that the area, production and productivity of gram and tur increase during this period.

Maheshwari (1996) studied agricultural growth in semi arid in Karnataka state and concluded that, there was growth in the period prior of the green revolution which continued in period-II (1967-68 to 1979-80). In period-I (1955- 56 to 1966-67), the gross irrigated area rose by 3.10 per cent per annum, while in period-II (1967-68 to 1979-80), the gross irrigated area has increased at the rate of 1.70 per cent per annum, per hectare fertilizer consumption was 2.22 Kg. in period- I, 19.08 Kg. in period-II and 47.38 kg. in period-III (1980-81 to 1989-90).

Jha (1997) studied the agriculture growth in NorthEast alluvial plains of Bihar and reported that, compound growth rate of area, production and productivity of paddy, wheat, maize, jute and oilseeds were found to be positive. The study growth performance of major factors of production namely gross cropped area under major crops, area under high yielding varieties, fertilizer consumption and rainfall pattern showed an increased trend. Irrigated area however, showed a declining trend after the year 1974-75 in the zone possibly because of the problem of silting and water logging in Kari command area.

Tadakhe (1999) studied the districtwise growth rates of agriculture in the Konkan region and concluded that, the positive growth rates were observed in terms of area under irrigation, consumption of nitrogenous and phosphatic fertilizer, production of important crops grown in

Konkan region and also concluded that agriculture development was taking place in the desired direction.

Singh and Chandra (2001) examined the growth trends in area; yield and production of food grains in Uttar Pradesh registered considerable changes in agricultural development during different phases of green revolution. They found that the growth rates in area and production of food grains were higher in post green revolution period than pre revolution period. They suggested that further increase in food grain production was possible only by increasing the yield which could be achieved by using the inputs more efficiently.

Naik and Pandit (2001) examined the prospects of fruits and vegetables production in Gujrat vis-à-vis in the 19 country as a whole the diverse agro-climatic conditions prevailing in the country were found favourable for large variety of tropical, sub-tropical and temperate fruits and vegetables. They revealed that growth rates in yield for fruits and vegetables in India were higher than in the world. They emphasized the need to understand market requirement, consumer orientation in research and development of varieties.

Nirmal (2008) examined the production and marketing of the main pulses in Rajnandgoan area of Chhattisgarh. According to this study, the sample households average holding size was 4.35 hectares. With the exception of chickpea and mung bean production, Rajnandgoan district saw positive and significant growth in major pulse production during the 2006-07 period.

Jaypatre et al. (2010) examined the trends in the area, production, and productivity of the mango crop in South Gujrat region. General Statistical Information of Agricultural Development, a publication of the Gujarat government, was used to generate district-level time series data on the acreage, production and productivity of the mango crop. The outcome showed that the mango linear growth rate (LGR) was non-significant for both periods. Area, production and productivity instability indices were shown to be increasing with time.

Shrivastava et al. (2010) studied the pulses performance of India, compared to cereals like wheat and paddy, the growth rate of area and production of pulses negligible and there existed wide variability in their yield in different states of countre. In most of the studies relative to the growth rates, the researchers have been attempted to understand the pattern of growth of agricultural production and possible reasons for variations there in. Studies on growth trends of area, production and productivity in specific crops and for groups of crops such as food grains, oilseeds and for the overall agriculture of production have been attempted to show the likely crop pattern in the future and its implications. The researchers have shown that the farmers were maintaining productivity of food grains crops with more or less stable acerage crops. The future

requirement for increasing population must come from yield rather the area expansion. Thus, it was suggested to increase crop diversification towards vegetables, fruits and cash crops.

Saravanadurai and Kalaivani (2010) examined the growth action of area, production and yield of selected cereal crops in the Tamil Nadu. The study found that the paddy holds good performances in absolute terms among the other cereal crops 15 are concerned. But the compound growth rate reveals that the maize was found to be positive and records a highest growth rate among other cereal crops in terms of area of cultivation, production and yield. It was clear that importance had been given to paddy cultivation and farmers further cultivated maize for money-making purpose.

Saraswati et al. (2012) studied the compound growth function was used to predict the area, production, and productivity growth of several crops in Karnataka. Vegetables and spices showed positive significant growth in area. The area planted with commercial crops and oilseeds increased negatively and significantly. Similar positive growth rates were seen in the output of cereals, legumes, vegetables, spices and fruits. Every year, more land in the state is planted with pulses, vegetables, spices, fruits and nuts. However, the yield of commercial crops like pulses and oilseeds were relatively unchanged.

Acharya et.al. (2012) studied on growth in area, production and productivity of major crops in Karnataka using the compound growth function. The analysis of growth is usually used in economic studies to find out the trend of a particular variable over a period of time and used for making policy decisions. The necessary secondary data were collected for a period of 26 years from 1982-83 to 2007-08. The productivity of different crop recorded significant growth in the case of cereals, pulses and fruits. The productivity of oilseed recorded moderately positive growth. The productivity of commercial crops registered insignificant positive growth and for vegetables the growth in productivity was insignificant and negative.

Bharti et.al (2012) point out that in Uttar Pradesh the production gains in oilseeds were largely due to the expansion in area rather than in productivity. Authors go on to say that the favorable situation created through the technology mission on oilseeds resulted in expansion of marginal lands causing a decline in average yields. In Uttar Pradesh the area under oilseeds increased from 2.97% in 1970-71 to 3.25% in 2005-06.Among the oilseed crops drastic reduction in the area has been found under groundnut (1.47% to 0.42%).

Madhusudhana (2013) carried out a survey on area, production and productivity of groundnut crop in India, Andhra Pradesh and Anantapuram district. The comparative analysis of groundnut production in Andhra Pradesh and in Anantapuram district during 1996-2000 to 2001-2006 was done. Based on the results collected conclusion was made about improving the production of groundnut crop.

Pichad et.al. (2014) studied on growth in area, production and productivity of chickpea in Amravati district, to study growth rates and variability in area, production, and productivity of chickpea. The secondary data on area, production and 17 productivity of chickpea in Amravati district, were collected from various issues of epitome of agriculture and district socio–economic review. The performance of chickpea was examined by estimating the growth rates and co-efficient of variation of area, production and productivity of chickpea. The results revealed that, the compound growth rates of area and production at overall period 1990-91 to 2000-10 where found to be significant. Which were significant at 1per cent to 10 per cent level.

Datarkaet. al. (2015) examine the region wise compound growth rates in area, production and productivity of kharif groundnut in Maharashtra state over different time periods viz; Period-I (1990-91 to 2001-02), Period-II (2002-03 to 2012- 13) and overall period (1990-91 to 2012-13). The growth in the area, production and productivity of kharif groundnut was estimated by using the compound growth function of the non linear form. The study analyzed that area, production and 18 productivity of kharif groundnut had decreased during the study period. The area and production of kharif groundnut were negatively significantly at the rate of -3.90 and -3.48 percent per annum, respectively in the state. The growth rates in area and production of kharif groundnut were positive and significant in Konkan region, while those where negatively significant for Marathwada, Vidarbha and Western Maharashtra region.

Kalaskar (2015) analyzed the economic evaluation of agricultural growth in the Yavatmal district. He indicated that during the past thirty years, the category of land not suitable for cultivation has grown by 20.43 per cent. From 78.45 thousand hectares in 1980–1981 to 65 thousand hectares in 2011–2012, the amount of fallow land declined. From 16.93 per cent in the year 1980–1981 to 16.46 per cent in the year 2011–12, the area covered by forests marginally declined. Yavatmal district net sown area had declined 1.25 percent from the base year.

Muthu (2015) made an attempt to examine the production and growth of major crops in Indian agriculture during 11th Five Year Plan period. The result of the study had shown that the production of all major crops had been increased during the period of the study. There has been remarkable production of food grains at 259.32 million tonnes during 2011-12.The growth rates of production and productivity of all 18 major crops had recorded as positive whereas growth rate of cultivation area under cereals, oilseeds, jute and mesta has reduced as negative.

Dhokar et.al. (2018) studied on growth analysis of pigeon pea and chickpea in Marathwada region of Maharashtra state, India. Compound growth rate was estimated by fitting non-linear model to the area, production and productivity data for the period from 1986-87 to 2015-16. The fitted model was analyzed using Marquardt algorithm. The compound growth rates

were tested for their significance. The results shows that, the compound growth rate in area, production and productivity of pigeon pea was positive and significant at 1 per cent level of significance during overall study period except in Aurangabad and Parbhani district in these districts growth in pigeon pea area was decreased. The results indicated that, average area, production and productivity of pigeon pea and chickpea in the district, region and state level was continuously increased during study period except in Aurangabad district. In Aurangabad districts, the average area of pigeon pea was reduced. The growth in area, production and productivity of pigeon pea and chickpea was positive and significant during overall study period except in Aurangabad and Parbhani district. Consistent improvement in the yield of pulses was a notable feature which shows that improved technology and implementation of government programme has payoff in the state.

METHODOLOGY

CHAPTERIII :METHODOLOGY

The methodology is the general research strategy that outlines the way in which research has to be undertaken and identifies the methods to be used in it. The present study on "**Agricultural development in Ratnagiri District"** attempts to study the existing status of agricultural development, to examine the variability, trends over a study period and to estimate the growth in different sectors of agriculture and allied activities in Ratnagiri district.

The research methodology followed in the conduct of a present study is described in this chapter under the following heads;

3.1 Types of data

3.2 Collection of data

3.3 Statistical method

3.1 Types of data:

The present study was entirely depend on secondary data. Thisdata on agricultural development in Ratnagiri district of different parameters. Such parameters are;

a) Area and population

b) Man power

c) Land utilization

d) Livestock

e) Cropping pattern

f) Production and Productivity of principle crops

g) Daily wage rates of agricultural labour

h) Implements and machinery

i) Financial institution

j) Irrigation sources

k) Fertilizer consumption

l) Sectorwise Gross Value Added and Gross Domestic Product

m) Sectorwise Net Value Added and Net Domestic Product

3.2 Collection of data:

For the study of development of agriculture in Ratnagiri district it is necessary to study the existing status, variability, trends in agricultural development and growth rates in the various selected parameters. Such data were collected from secondary sources i.e. different published records of the state government viz.

a) Socio-economic review and District Statistical Abstract of Ratnagiri district, Directorate of Economics and Statistics, Government of Maharashtra.

b) Statistical Abstract of Maharashtra State, Directorate of Economics and Statistics, Government of Maharashtra.

c) District Domestic Product of Maharashtra, Directorate of Economics and Statistics, Government of Maharashtra.

The published data related to agriculture development was available upto the year 2021. Hence, a time series data for the time period of 2006 to 2021 i.e. 16 year data was considered for studying the variability and growth rates in the selected parameters of Ratnagiri district.

3.3 Method of analysis:

For the purpose of analysis, different statistical tools were used such as;

PART-I:

Under this part, discuss the simple arithmetic averages and percentages of the selected parameters of development.

PART-II:

Under this part find out the average situation and variability in the selected parameters with the help of arithmetic mean (X), standard of deviation (S.D.) and coefficient of variation (C.V.).

PART-III:

Under this part calculate the growth rates of selected parameters of development with the help of linear growth rate and compound growth rate.

3.3.1 Linear growth rate:

The linear trend equation was used for estimating linear growth rates. It is represented as;

$$Y = a + bt$$

Where,

Y = Dependent variable

a = Intercept or constant

b = Regression or Trend coefficient

t = Period (in years)

Linear Growth Rate over the period of timein percentage was calculated using the following relationship.

$$\mathbf{L.G.R = (b/Y) \times 100}$$

3.3.2 Compound growth rate:

Compound growth rates were estimated to study the percentage increase or decrease per annum in the selected parameters. The following exponential growth function was used;

$$Y = ab^{t}e$$

Where,

Y= Dependent variable

a = Intercept or constant

b = Regression or Trend coefficient

t = Period (in years)

e = Error term with zero mean and constant variance

The exponential growth function was converted into log linear form to facilitate easy calculations. Compound Growth Rate per annum in percentage was calculated using thefollowing relationship.

$$\mathbf{C.G.R.\ (r) = [(Antilog\ of\ b) - 1] \times 100}$$

3.3.3 Constant price:

External or international value of Indian rupee is fluctuating. Therefore, considering the year 2011-12 as base year, growth indices at constant prices were worked out to give the real picture of the economy or economic indicators for converting values of current prices into those of constant prices, suitable indices of the parameters have been constructed. The unit value of index number of wholesale prices was drawn from various RBI's bulletins.

The formula used for converting the values of current prices received into constant prices was as follows:

$$\textbf{Deflation factor:} = \frac{\text{Wholesale price indices of the base year}}{\text{Wholesale price indices of the current year}}$$

Year value at constant price = Deflation factor × Actual price in the year

SOCIO-ECONOMIC STATUS OF DISTRICT

CHAPTER IV: SOCIO ECONOMIC STATUS OF THE RATNAGIRI

The main purpose of this chapter is to provide socioeconomic data regarding the research area. In order to analyze the data, draw conclusions and consider the implications of the study's findings, it is essential to have a better understanding of the area.

The study of socio-economic information is essential to understand the economic implication of the physical conditions under which development of agriculture is carried out. There are some factors are *viz*;

4.1 Location

4.2 Boundaries

4.3 Topography

4.4 Soils

4.5 Climate

4.6 Rainfall

4.7 River

4.8 Area and population

4.9 Irrigation

4.10 Land utilization

4.11 Cropping pattern

4.12 Poultry

4.13 Livestock

4.14 Fisheries

4.15 Forestry

4.16 Transport and Communication

4.17 Agro industries

4.18 Banks

4.19 Co-operatives

4.20 Regulated markets

4.21 Electricity use

4.1 Location:

Ratnagiri district is a part of Konkan region, particularly a part of South Konkan region formed by narrow strip running from North to South along the Western coast of India. It lies between $16^0$30'to 18^0 04' north latitude and $73^0$02' to $73^0$52' east longitude. The district has a north south length of about 225 kms and the average east-west extension of about 64 kms except in its extremities, which taper to join coastal line. Total geographical area of the district is 8,208 sq. km which is 2.65 per cent of Maharashtra state.

4.2 Boundaries:

Ratnagiri district is surrounded by Sahyadri hills in the east and Arabian sea in the west. Beyond the Sahyadri hills, there are Satara,Sangli and Kolhapur districts are located. Sindhudurg district lies in the south and Raigad district lies in the north.

4.3 Topography:

The district has an undulating topography with hills and rocky plains alternating. Ratnagiri district can be divided into three geographical zones on the basis of physical features viz.,

- Hilly area of Sahyadri ranges to the east.
- Plateau surface in the middle part of the district, which is used for cultivation of cereal crops, like rice and nagli.
- The coastal plain, where cultivation of coconut and arecanut gardens and fishing are main sources of earning livelihood.

Over 85 per cent of the land surface in Ratnagiri district is hilly. From total geographical area of Ratnagiri district about 69.07 per cent area arable land but from that only 45.72 per cent area is under cultivation.

4.4 Soils:

Lateritic soil is the predominant type of soil of the Ratnagiri district, which vary in colour from bright red to brownish red owing to the predominance of hydrated iron oxides. It is reach in organic matter and consequently in nitrogen and potassium content. As a result, these soils are found to respond to the application of nitrogenous fertilizers. The soil is always acidic in nature, PH ranges from 5.5 to 6.5. Texture of soil is loamy and the depth varies from one foot to three feet, soil is porous, non-retentive of moisture and are found well over the district.

Along, the sea coast in a narrow belt, coastal saline and coastal alluvial soils occur. The coastal saline soils have more than 3 per cent of total soluble salts and PH of 7.5 to 8.0. The coastal alluvial soils are clay loam in texture having PH 7.0 to 7.5 and total soluble salts 0.1 to 0.2 per cent. They have good fertility and support garden crops like coconut, arecanut etc. The hilly high laying terrain in 'Varkas' type soil which suitable for cultivation of millets like nagli, vari and oilseed crops like niger, sesamum.

The soils are found in several grades. The main grades are:

- Soil which holds moisture up to some extent, which is useful for rice cultivation.
- Coastal alluvial soil useful for coconut and arecanut gardens.
- Varkas soils useful for cashewnut, mango fruits and nagli cultivation.
- Salty lands locally known as 'Khar' or 'Khajan' land which is uncultivable.

4.5 Climate:

The cropping pattern of any area is determined by the combined effect of rainfall, temperature and humidity. Warm and humid climate is characteristic feature of the coastal belt. Being a coastal district, the variation in temperature during the day and throughout the season is not large. Maximum temperature at the coast rarely goes beyond 38°C and in the interior, it seldom crosses 40°C.

There are three seasons viz.,i) Summer (March to May), ii) Monsoon (June to October) and iii) Winter (November to February). The climate of the district is very humid and the relative humidity seldom goes below 50 per cent. For agriculture purpose, summer or hot weather season is early Kharif season and the winter is Rabi season.

4.6 Rainfall:

Rainfall in the district is dominated mainly due to South-West monsoon. Winter rains from north-east monsoon are negligible or absent. Rainfall is not evenly distributed in all parts of the district. Although the rainfall is spread over from middle or last week of May to November, the main months of rainfall are only four i.e. June to September nearly 97 per cent of the rainfall is received during these month. July is the month of highest rainfall. Intensity of rainfall increases from the coast towards the Western ghats on the eastern boarder of the district. The average rainfall of Ratnagiri district is 4,289 mm distributed in 90 to 120 days in different parts. There are intermittent dry spells ranging from 7 to 21 days. The maximum dry spells are observed in month of September followed by June.

4.7 River:

The major rivers flowing through the district are Savitri, Vashishit, Jagbudi, Shastri, Bav, Muchkundi. All the rivers in the district originate from the Sahyadri ranges and have reached their base level of erosion within a distance of 20 km. All the rivers in the district flow from east to west and merge in the Arabian sea. Most of the rivers in the district are not perennial through they are over flooded during monsoon due to heavy rains.

4.8 Area and population:

The total geographical area of Ratnagiri district was 8208 sq.km. As per the census 2011, the total population of district was 16.15 lakh. Out of this number of male population was 7.61 lakh and number of female population was 8.54 lakh. The sex ratio ofRatnagiri district, females per 1000 male was 1122. The density of population persons per sq.km in Ratnagiri was 197. The percentage of rural population to the total population in Ratnagiri was higher i.e. 83.67 per cent as compared to urban population i.e. 16.33 per cent. The percentage population of the schedule caste and schedule tribe to the total population was 4.15 per cent to 1.26 per cent respectively.

In Ratnagiridistrict, there is higher literate population as per the illiterate population. The total literate population was 11.99 lakh. Out of number of literate males are 6.19 lakh and number of literate females are 5.80 lakh. The percentage of literate population to the total population in Ratnagiri was 74.26 per cent. In Ratnagiri, total illiterate population was 4.15 lakh. Out of the number of illiterate males are 1.42 lakh and number of illiterate females are 2.73 lakh. The percentage of illiterate population to the total population was 25.74 per cent. The total literacy rate of Ratnagiri district was 82.18 per cent.

According to 2011 census,the total working population of the district was 7.14 lakh. Out of total working population the number of males are 4.07 lakh and number of females are 3.07 lakh.The land-man ratio of Ratnagiri district was 0.51 per cent.

4.9 Irrigation:

The gross cropped area in the district was 268083 ha. Out of which irrigated area was only 14344 hectares, which is 2.45 per cent of the total cropped area. There is no major irrigation project in the district. One minor irrigation project viz., Natuwadi Minor Irrigation Project (Tahsil-Khed) is completed with total command area of 2050 ha. Other minor irrigation projects are onGadnadi, Tal. Sangameshwar, on Jmada and Arjunariver in Rajapurtahsil. Total completed minor irrigation projects in Ratnagiri district are 1065.

The district receives very high rainfall, however most of the water runs into the sea due to undulating and hilly terrain. The main source of irrigation is through minor irrigation projects

and dug wells. The important crops grown under irrigation are rice, pulses, spices, groundnut, coconut, arecanut and other vegetables. The main source of irrigation followed by surface irrigation i.e. government canals, private canals, tanks etc.

4.10 Land utilization:

Land is one of the most important factors of production. Land is undulating and topography of the district makes most of the part of its land unsuitable for cultivation. Pattern of land utilization in Ratnagiri district is given in Table 4.10.

Table 4.10Land utilization pattern in Ratnagiri district (2021)

Sr. No	Land use category	Area (ha)	Percentage to total Geographical Area
1	Total geographical area	816433	100
2	Land put to non-agricultural users	21178	2.59
3	Barren and uncultivable land	197918	24.24
4	Culturable waste land	206901	25.34
5	Land under miscellaneous tree crops and groves	4966	0.61
6	Permanent pastures and other grazing land	5075	0.62
7	Current fallow	36088	4.42
8	Other fallow	87453	10.71
9	Net area sown	261299	32.00
10	Area sown more than once	6784	0.83
11	Forest area	5860	0.72
12	Gross cropped area	268083	-

Source: Socio-economic Review and District Statistical Abstract of Ratnagiri district (2021)

It is observed from the data presented in Table 4.10 that the net sown area of Ratnagiri district was only 32 per cent of the total geographical area. Area sown more than once was only 0.83 per cent of total geographical area. The topography of the district makes large part of its land unsuitable for cultivation. Therefore, uncultivable land constituted 24.24 per cent of total geographical area. The proportion of cultivable waste land in the district was 25.34 per cent, which showed that there was good scope to bring this area under plantation of horticultural crops particularly mango, cashew, coconut and arecanut which has shown signs of increase in recent years. The area under forest was only 0.72 per cent of the total geographical area. Area under the other fallows and current fallows was 10.71 per cent and 4.42 per cent.

4.11 Cropping pattern:

The area under different crops in Ratnagiri district is presented in Table 4.11.

Table 4.11 Cropping pattern of Ratnagiri district (2021)

Sr. no.	Crops	Area (ha)	Percentage to total croppedArea
1	Cereals		
	a)Rice	68833	25.67
	b) Nagli	10599	3.95
	c) Vari	485	0.18
	d) Maize	8	0.002
	Total cereals	**79925**	**29.81**
2	Pulses		
	a) Red gram	431	0.16
	b) Green gram	135	0.05
	c) Black gram	25	0.009
	d) Horse gram	1521	0.57
	e) Wal	992	0.37
	f) Cowpea/ Pea	570	0.21
	g) Other pulses	36	0.01
	Total pulses	**3711**	**1.38**
3	Total food grains (cereals + pulses)	83636	31.20
4	Total spices	94	0.04
5	Fruits		
	a) Mango	66463	24.79
	b) Banana	115	0.04
	c) Other fruits (Cashew, Coconut, Arecanut, etc.)	117539	43.84
	Total fruits	**184117**	**68.67**
6	Total vegetables	11	0.004
7	Total fruits and vegetables	184128	68.68
8	Oilseed crops		
	a) Groundnut	49	0.02
	b) Sunflower	3	0.001
	c) Other oilseeds	123	0.05
	Total oilseeds	**175**	**0.07**
9	Cropped area		
	a) Total food crops	267908	99.93
	b) Total non- food crops	175	0.07
	Total cropped area	**268083**	**100.00**

Source: Socio-economic Review and District Statistical Abstract of Ratnagiri district (2021)

From table 4.11 it was observed that, the total cereals cropped area in the district was 79925 ha. Out of the area under rice, nagli, vari and maize is 68833 ha, 10599 ha, 485 ha, and 8 ha respectively. The percentage of the total cereals to the total cropped area was 29.81 per cent. The total cropped area of pulses under the district was 3711 ha. Out of the area under Red gram (431ha), Green gram (135ha), Black gram (25 ha), Horse gram (1521 ha), Val (992 ha), Cowpea and Pea (570 ha) and other pulses (36 ha). The percentage share of total pulses to the total cropped area was 1.38 per cent.

The total fruit cropped area of Ratnagiri district was 184117 ha. Out of the total fruit cropped area under the Mango, Banana, and other fruit crops (Cashew, Coconut, Arecanut, etc) are 66463 ha, 115 ha and 117539 ha respectively. Area under the total vegetables are 11 ha. The percentage share of total fruits and vegetables to the total cropped area 68.68 per cent.The area under the total spices and total oilseeds are 94 ha and 175 ha. The percentage to the total cropped area was 0.04 per cent and 0.07 per cent respectively.

The area under the total food crop and total non-food crop was 267908 ha and 175 ha. The percentage share to total food crop area to total cropped area was 99.93 percent and total non-food crop was 0.07 per cent respectively in Ratnagiri district.

4.12 Poultry:

Poultry gives a substantial contribution to the economy by providing employment potential to landless labour, food to human population and subsidiary income to farmers. The total poultry population of Ratnagiri district in 2021 was 824703. Out of which total hen population was 820709, which was 99.51 per cent of total poultry population.

4.13 Livestock:

Livestock population of Ratnagiri district is presented in Table 4.13.

Table 4.13 Livestock population in Ratnagiri district (2012)

Sr. No.	Livestock category	Number	Percentageto total livestock
1	Cattle	319312	80.47
2	Buffalo	43816	11.04
3	Total bovine	156	0.04
4	Goat	33071	8.33
5	Sheep	127	0.03
6	Horses , Mule	22	0.006
7	Other livestock	295	0.07
8	Total livestock	396799	100

Source: Socio-economic Review and District Statistical Abstract of Ratnagiri district (2021)

Livestock makes substantial contribution to economy by providing subsidiary income to the farmers, food to human population and employment to landless labours.

The information in Table 4.13 indicated that as per the livestock census (2012), total livestock population of Ratnagiri district was 3.97 lakh. Out of the 80.47 per cent was cattlepopulation, 11.04 per cent was buffalo population. Sheep, goat, horses and mule contributed 0.03 per cent, 8.33 per cent and 0.006 per cent, respectively. Total bovine and other livestock are 0.04 per cent and 0.07 per cent respectively.

4.14 Fisheries:

Ratnagiri district has about 167 km long seacoast. This district is one of the marine district of the state. Fishing is done throughout all the coasts of Ratnagiri. Five tahsils namely Ratnagiri, Dapoli, Mandangad, Rajapur and Guhagar have the seacoast. There are three main ports of fishing namely, Mirya port in Ratnagiri, Harne port in Dapoli and Nate port in Rajapurtaluka. The main fish production is from marine resources. There are 99 coastal villages where fishing is done having 50 landing centers cum ports.

The total marine fish production in 2021 was 73,738 M.T. worth Rs. 231.14 crores. Out of total fish production 7.13 per cent was sun dried, 7.40 per cent was treated with salt and rest 75.47 per cent was sold out as fresh fish.

4.15 Forestry:

Total area under forest in the district, in the year 2021 was 5860 ha. The important forest trees grown in the district are Teak, Khair, Shivan, Ain, Terminalia, Chebula and Bamboo.

4.16 Transport and Communication:

As regards, transport system, roads are one of the important pre-requisites for economic development of any district. This is particularly true for the district Ratnagiri where most of the terrain is hilly. According to 2020-21, the total length of the road in the district is 10518 km. A major National Highway Mumbai-Goa (NH-17) runs lengthwise and serves as an important means of communication. Most of the villages and towns are connected by small roads to this highway. Recently, Konkan railway has become an important transport facility for this region. Total length for railway track is 194 km. There are 15 railway stations in Ratnagiri district. Besides this, navigation facility is also available in the district to some extent. There are 695 post offices and 48882 telephones are in working condition in Ratnagiri district.

4.17 Agro industries:

Main agricultural crops of Ratnagiri district are paddy, nagli, mango, cashew, coconut, arecanut, kokum and jackfruit. In addition to this some plants of medicinal value and forest products like timber woods, kattachu (Kath), grass found in the district.

This district is famous for best quality Alphansomango and also for cashew. The other important products are coconut, arecanut and kokum. There are many cashew processing industries in Ratnagiri district. Export of Cashew kernel of the district fetches good amount of foreign exchange. The minor fruits like kokum, jamun, jackfruit etc. are processed into different products at household level. There are also few licensed units, which are making products of such minor fruits on commercial scale.

Paddy straw and bamboo are useful in manufacturing paper and paper boards. Bamboo is also used for preparation of basket, which have great demand for packing of fruits and storage of agriculture produce.

4.18 Banks:

The district has District Central Co-operative Bank and Urban Co-operative Banks with 79 branches and other commercial banks in the district are 33 with branches 323. Bank of India is the lead bank of district.

4.19 Co-operatives:

The co-operatives are important aspect regarding the development of agriculture. There are total 3007 co-operative societies with 2573 thousand members. Out of the total co-operatives, 367 were Agricultural co-operative credit societies, 282 the total non-agricultural credit societies and remaining 2358 were non-credit societies.

The deposit of District Central Co-operative Bank of Ratnagiri was 222364.30 lakh and given credit to agriculture use are 10043.65 lakh and to non-agriculture use are 145758.86 lakh.

4.20 Regulated markets:

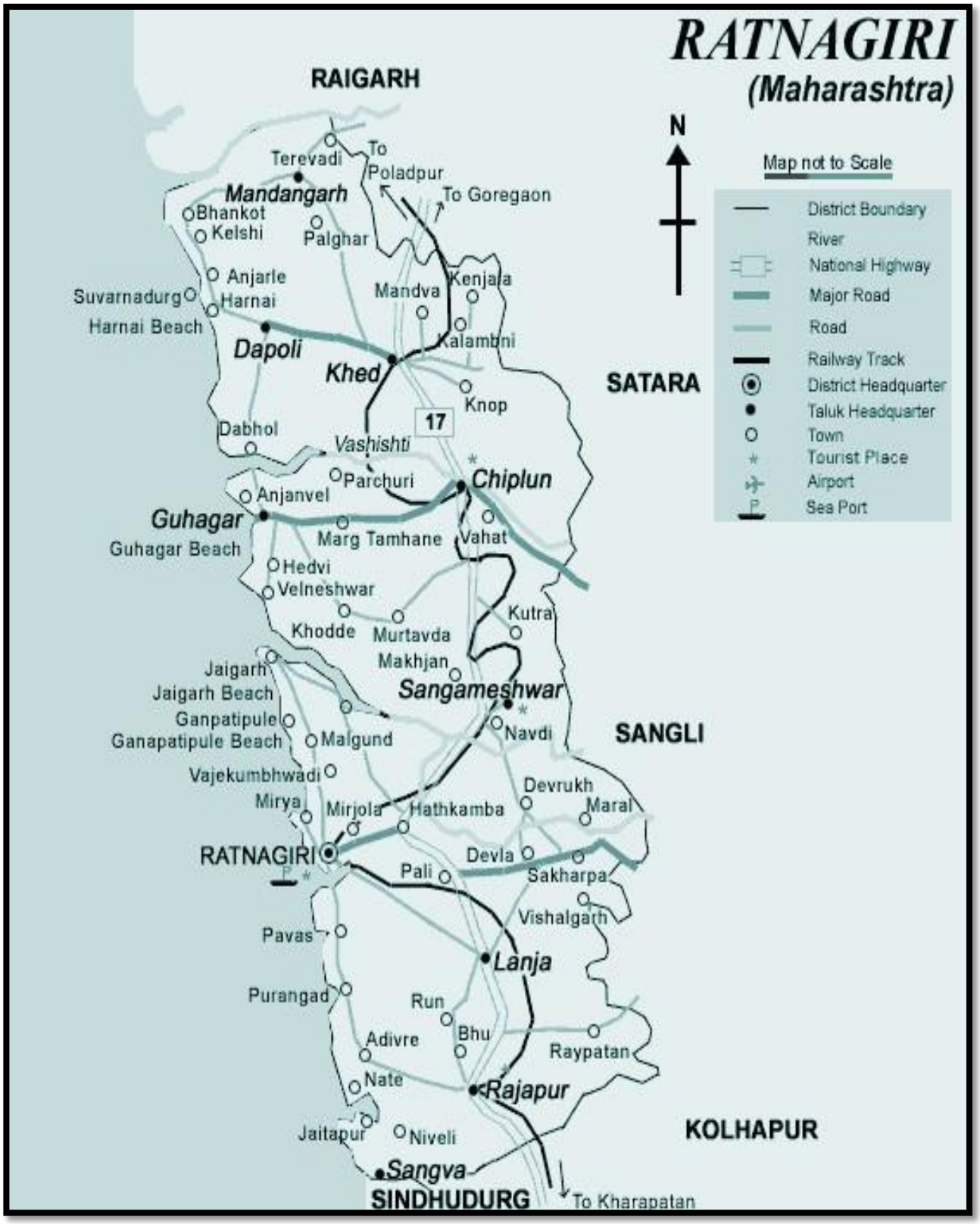
There is one regulated market at Ratnagiri, but it is not functioning as there is no marketable surplus of rice and nagli, which are the important cereal crops. Ratnagiri district is deficit in food grain production. Mango is a commercial crop sold in important city markets like Mumbai and Pune by the cultivators and pre-harvest contractors through commission agents. Cashew is also a commercial crop sold in Vashi market by cultivators. Local sale is negligible. Therefore, the market has not been functioning.

4.21 Electricity use:

In the year 2021, the consumption of electricity has reached 873 million kilowatts per hour, out of which 359 is for domestic use, 57 million kw hours for trade and small scale industries, 370 million kilowatts hours for large scale industries, 7 million kilowatt hours for public lighting, 11 million kilowatt hours for agriculture use and 68 million kilowatt hours for other works.

The number of power connection in the reference year was 5.75 lakh and the consumed 506 kilowatt per capita for such a long time.

MAP OF RATNAGIRI DISTRICT



RESULTS AND DISCUSSIONS

CHAPTER V: RESULTS AND DISCUSSION

The present study was conducted on three important objectives such as 1) Status of agricultural development, 2) Variability and trends in agricultural development and 3) Growth in different agriculture sector and allied activities in Ratnagiri district.

Such collected data are analyzed as per the methodology in the previous chapter. The results of the study are presented and discussed in this chapter in three ways. Part – I deals with simple arithmeticaverages and percentages of the selected parameters, Part – II deals with some statistical tools (Mean, S.D and C.V) for finding out trends and variability of selected parameters and part- III deals with growth rates of selected parameters in Ratnagiri district.

PART – I

Under this part, discuss the simple arithmetic averages and percentages of the selected parameters of agricultural development inRatnagiri district.

5.1 AREA AND POPULATION:

The information regarding the area and population of Ratnagiriis given in Table 5.1.

Table 5.1: Area and Population of Ratnagiri district (2011)

Sr. No.	Particulars	Total	Percentage to Total population
1	Area (sq.km)	8208	-
2	Total population	16,15,069	100
	a) No. of males	7,61,121	47.13
	b) No. of females	8,53,948	52.87
3	Sex Ratio (females per 1000 male)	1122	-
4	Density of population (No. of persons/sq.km)	197	-
5	Rural population	13,51,346	83.67
6	Urban population	2,63,723	16.33
7	Schedule caste population	66948	4.15
8	Schedule tribes population	20374	1.26
9	Literates population	11,99,392	74.26
	a) No. of males	6,19,012	38.33
	b) No. of females	5,80,380	35.94
10	Illiterates population	4,15,677	25.74
	a) No. of males	1,42,109	8.80
	b) No. of females	2,73,568	16.94
11	Literacy rate	-	82.18

According to Table 5.1 the total geographical area of Ratnagiri district was 8208 sq.km. As per the census 2011, the total population of district was 16.15 lakh. Out of this number of male population was 7.61 lakh and number of female population was 8.54 lakh. The sex ratio ofRatnagiri district, females per 1000 male was 1122. The density of population persons per sq.km in Ratnagiri was 197. The percentage of rural population to the total population in Ratnagiri was higher i.e. 83.67 per cent as compared to urban population i.e. 16.33 per cent. The percentage population of the schedule caste and schedule tribe to the total population was 4.15 per cent to 1.26 per cent respectively.

In Ratnagiridistrict, there is higher literate population as per the illiterate population. The total literate population was 11.99 lakh. Out of number of literate males are 6.19 lakh and number of literate females are 5.80 lakh. The percentage of literate population to the total population in Ratnagiri was 74.26 per cent. In Ratnagiri, total illiterate population was 4.15 lakh. Out of the number of illiterate males are 1.42 lakh and number of illiterate females are 2.73 lakh. The percentage of illiterate population to the total population was 25.74 per cent. The total literacy rate of Ratnagiri district was 82.18 per cent.

5.2 MAN POWER:

The information regarding manpower of Ratnagiri district is given in Table 5.2.

Table 5.2: Total Manpower available for agriculture use in Ratnagiri district (2011)

Sr.No.	Particulars	Total
1	Total population	1615069
2	Total working population	714076
	a) No. of males	407008
	b) No. of females	307068
3	Percentage of working population to total population	**(44.21)**
4	Main workers population	554973
	a) No. of males	344089
	b) No. of females	210884
5	Percentage of main workers population to total population	**(34.36)**
6	Agricultural working population	153117
	a) No. of males	68085
	b) No. of females	85032
7	Percentage of agricultural working population to total population	**(9.48)**
8	Non-workers population	900993
9	Percentage of non-workers population to total population	**(55.79)**
10	Land-man ratio	**0.51**

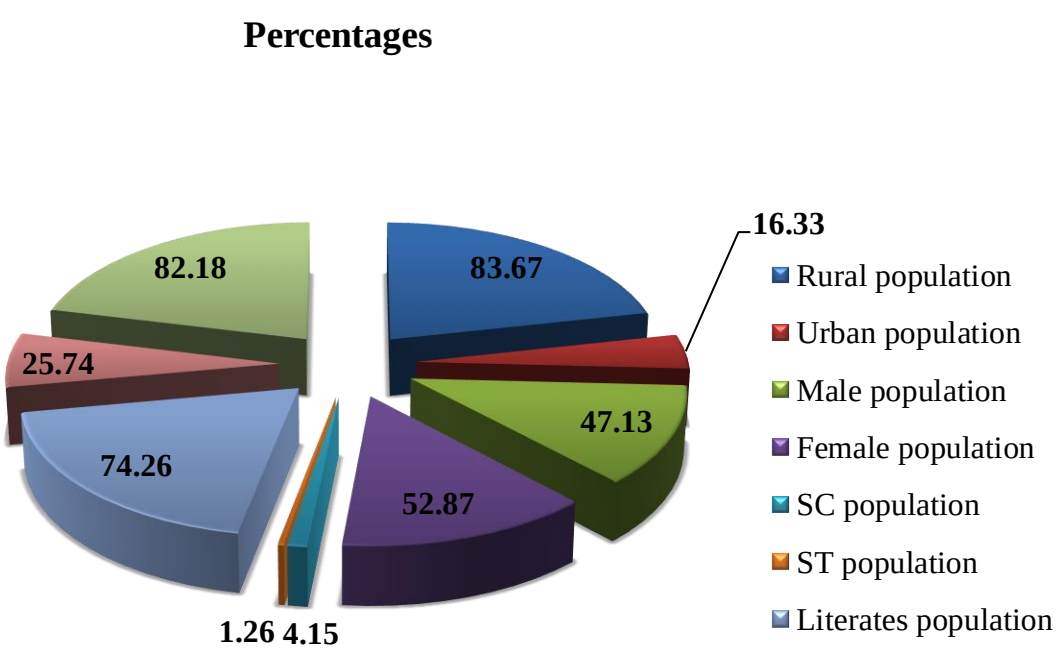


Fig 5.1: Population of Ratnagiri district

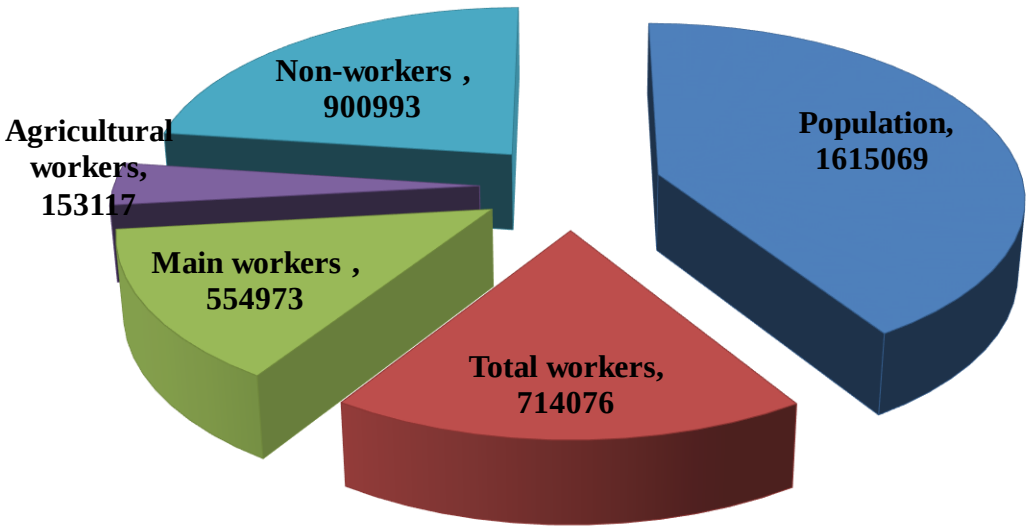


Fig 5.2: Availability of Man power in Ratnagiri district

According to table 5.2,the total population of Ratnagiri district was 16.15 lakhas per the 2011 census. Out of the total population, the total working population of the district was 7.14 lakh. Out of total working population the number of males are 4.07 lakh and number of females are 3.07 lakh. The percentage of working population to total population in Ratnagiri was 44.21 per cent. The main working population of district was 5.55 lakh. Out ofthe number of males are 3.44 lakh and females are 2.10 lakh. The percentage of main working population to total population in Ratnagiri was 34.36 per cent.

The agriculture working population ofRatnagiri district was 1.53 lakh. Out of the number of males and females are 68,085 and 85,032 respectively. The percentage of agricultural working population to total population in Ratnagiri was 9.48 per cent. The percentage of non-working population of Ratnagiri district was 55.79 per cent. The land-man ratio of Ratnagiri district was 0.51 per cent.

5.3 LAND UTILIZATION:

Land utilization pattern depicts the distribution of the total geographical area into various categories and given in Table 5.3.

Table 5.3Land utilization pattern in Ratnagiri district (2021)

Sr. No.	Land use category	Area (ha)	Percentage to total Geographicalarea
1	Total geographical area	816433	100
2	Land put to non-agricultural users	21178	2.59
3	Barren and uncultivable land	197918	24.24
4	Culturable waste land	206901	25.34
5	Land under miscellaneous tree crops and grooves	4966	0.61
6	Permanent pastures and other grazing land	5075	0.62
7	Current fallow	36088	4.42
8	Other fallow	87453	10.71
9	Net area sown	261299	32.00
10	Area sown more than once	6784	0.83
11	Forest area	5860	0.72
12	Gross cropped area	268083	-

According to table 5.3, the total geographical area of Ratnagiri district was 816433 ha. Out of the total geographical area, forest constituted 0.72 per cent. The percentage share of barren and uncultivable land to total geographical area in Ratnagiri was 24.24 per cent. The land used for non-agricultural purposes by industries, factories etc in Ratnagiri district was 2.59 per

cent of the total geographical area. The percentage of culturable waste land to the total geographical area in Ratnagiri was 25.34 per cent.Land under miscellaneous trees crops and grooves and permanent pasture and other grazing land covered 0.61 and 0.62 per cent of total geographical area in Ratnagiri district.

The current fallow and other fallow land covered 4.42 per cent and 10.71 per cent of total geographical area in Ratnagiri district. The percentage of net sown area to total geographical area in Ratnagiri was 32 per cent. In Ratnagiri, area sown more than once was 0.83 per cent of total geographical area. The total cropped area of Ratnagiri was 268083 ha.

5.4 LIVESTOCK:

The information regarding the livestock population of Ratnagiriis given in Table 5.4.

Table 5.4 Livestock population in Ratnagiri district (2012)

Sr. No.	Livestock category	Number	Percentageto totalLivestock
1	Total cattle	3,19,312	80.47
2	Total buffaloes	43,816	11.04
3	Total bovine	156	0.04
4	Total goats	33,071	8.33
5	Total sheep	127	0.03
6	Total horses and mule	22	0.006
7	Other livestock	295	0.07
8	Total livestock	396799	100.00
9	Total poultry	824703	-

From the Table 5.4, it is observed thatin Ratnagiri district the total livestock population was 3.97 lakh. Out of total livestock, the percentage of cattle population was 80.47 per cent. The percentage share of buffaloes in total livestock was 11.04 per cent. The percentage share of goat and sheep in total livestock was 8.33 per cent and 0.03 per cent.

The percentage of total bovine and total horses and mule to the total livestock was 0.04 per cent and 0.006 per cent respectively. The percentage share of other livestock to total livestock was 0.07 per cent. In Ratnagiri district, the total poultry population was 8.24 lakh.

5.5 CROPPING PATTERN:

The type of crops grown and the proportion of area under different crops decide the agricultural economy of any region. This cropping pattern is mainly decided by the climaticconditions, soil types and requirements of the people in that region. The information regarding the cropping pattern of Ratnagiripresented in Table 5.5.

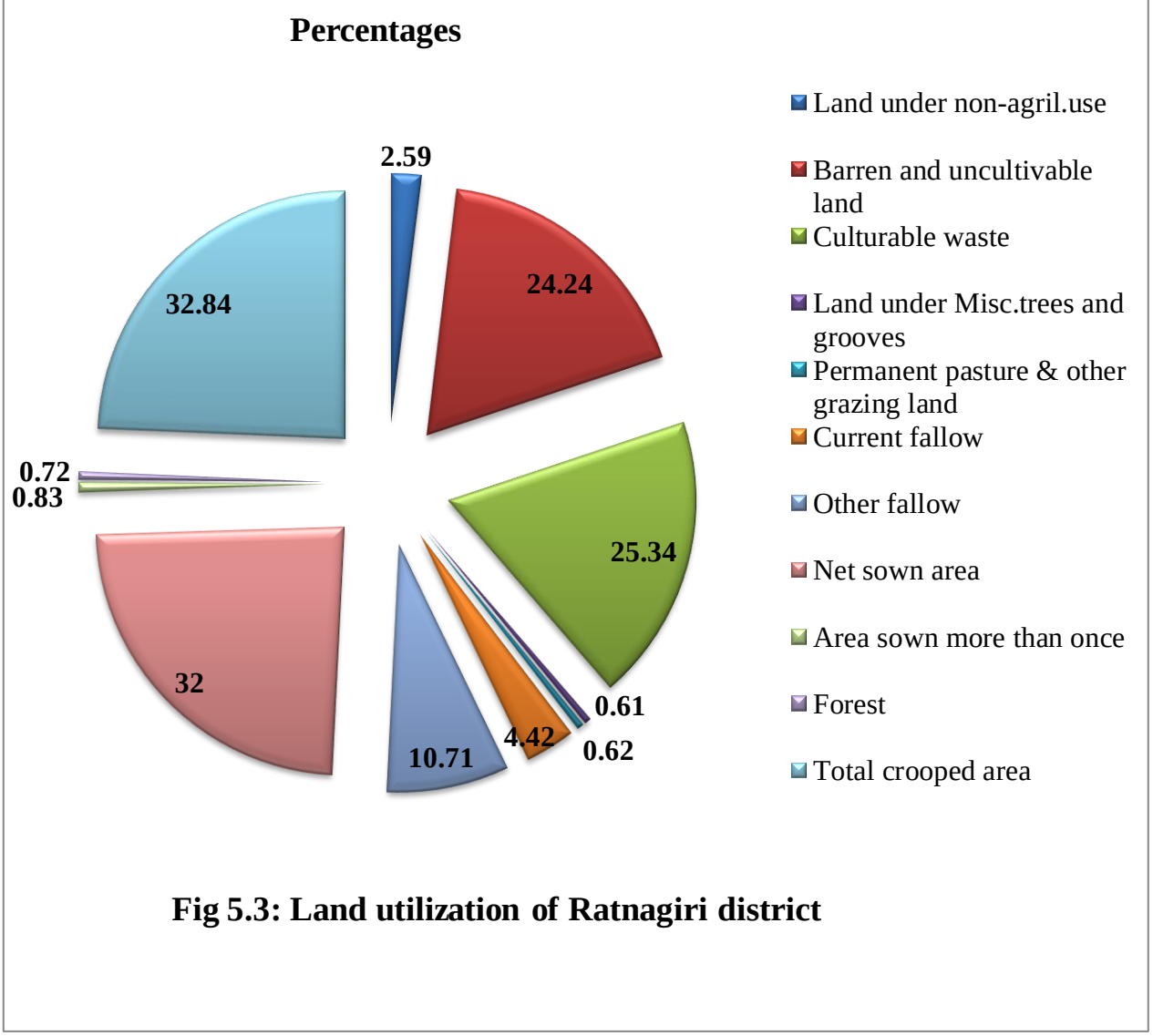


Fig 5.3: Land utilization of Ratnagiri district

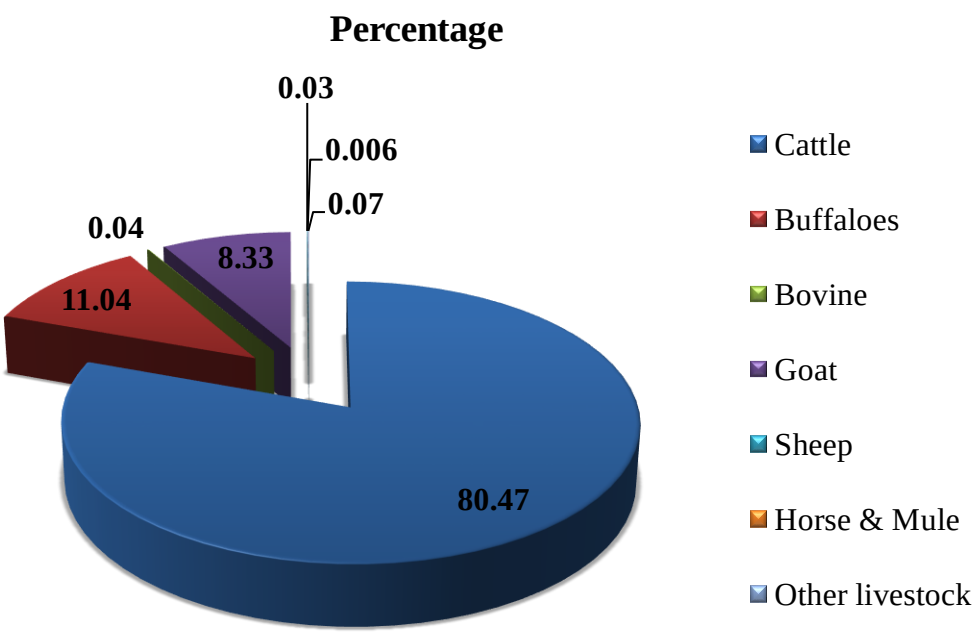


Fig 5.4: Livestock population of Ratnagiri district

Table 5.5 Cropping pattern in Ratnagiri district (2021)

Sr. no.	Crops	Area (ha)	Percentage to total croppedArea
1	Cereals		
	a)Rice	68833	25.67
	b) Nagli	10599	3.95
	c) Vari	485	0.18
	d) Maize	8	0.002
	Total cereals	**79925**	**29.81**
2	Pulses		
	a) Red gram	431	0.16
	b) Green gram	135	0.05
	c) Black gram	25	0.009
	e) Horse gram	1521	0.57
	f) Wal	992	0.37
	g) Cowpea/ Pea	570	0.21
	h) Other pulses	36	0.01
	Total pulses	**3711**	**1.38**
3	Total food grains (cereals + pulses)	83636	31.20
4	Total spices	94	0.04
5	Fruits		
	a) Mango	66463	24.79
	b) Banana	115	0.04
	c)Other fruits(Cashew, Coconut, Arecanutetc)	117539	43.84
	Total fruits	**184117**	**68.67**
6	Total vegetables	11	0.004
7	Total fruits and vegetables	184128	68.68
8	Oilseed crops		
	a) Groundnut	49	0.02
	b) Sunflower	3	0.001
	c) Other oilseeds	123	0.05
	Total oilseeds	**175**	**0.07**
9	Cropped area		
	a) Total food crops	267908	99.93
	b) Total non-food crops	175	0.07
	Total cropped area	**268083**	**100.00**

The cropping pattern followed in Ratnagiri district is presented in Table 5.5. From this table, observed that, the area under total cereals in Ratnagiri was 29.81 per cent. Out of the area under rice, nagli, vari and maize was 25.67, 3.95, 0.18 and 0.002 per cent respectively. The area under total pulses in Ratnagiri was 1.38 per cent. Out of the area, under red gram (0.16 per cent), green gram (0.05 per cent) ,black gram (0.009 per cent), horse gram (0.57 per cent), wal (0.37 per cent), Cowpea and Pea (0.21 per cent) and other pulses (0.01 per cent). The area under total food grains in Ratnagiri was 31.20 per cent.

The area under total fruits inRatnagiri district was 68.67 per cent. Out of the area under mango was 24.79 per cent, area under banana was 0.04 per cent and area under other fruits i.e. cashew, coconut and arecanut etc. was 43.84 per cent. Area under total vegetables in Ratnagiri was 0.004 per cent.The percent share of total spices and total oilseeds in Ratnagiriwas 0.04 per cent and 0.07 per cent.

Total food crops contributed area was 99.93 per cent in Ratnagiri district, whereas the total non-food crops contributed area was 0.07 per cent respectively.

5.6 PRODUCTION AND PRODUCTIVITY OF PRINCIPLE CROPS:

The total production and productivity of principle crops in Ratnagiri district is given in Table 5.6.

Table 5.6: Production and productivity of principle crops in Ratnagiri district (2021)

Sr. No.	Particulars	Production (00 MT)	Productivity (Yield) (kg/ha)
1	Rice	1915	2829
2	Total cereals	2050	2652
3	Total pulses	42	733
4	Total food grains	2092	2519
5	Total oilseeds	5	929
6	Mango	1328	3 t/ha
7	Cashew	1890	2000
8	Coconut	52000 (lakh nuts)	14000 nuts/ha

From the Table 5.6, it was observed that, rice is an important staple food of Ratnagiri district. The production of rice was 1915 MT and the productivity of rice was 2829 kg/ha in current year 2021.

The total cereal production in Ratnagiri was 2050 MT and the productivity was 2652 kg/ha. The total production of pulses in Ratnagiri was 42 MT and productivity was 733

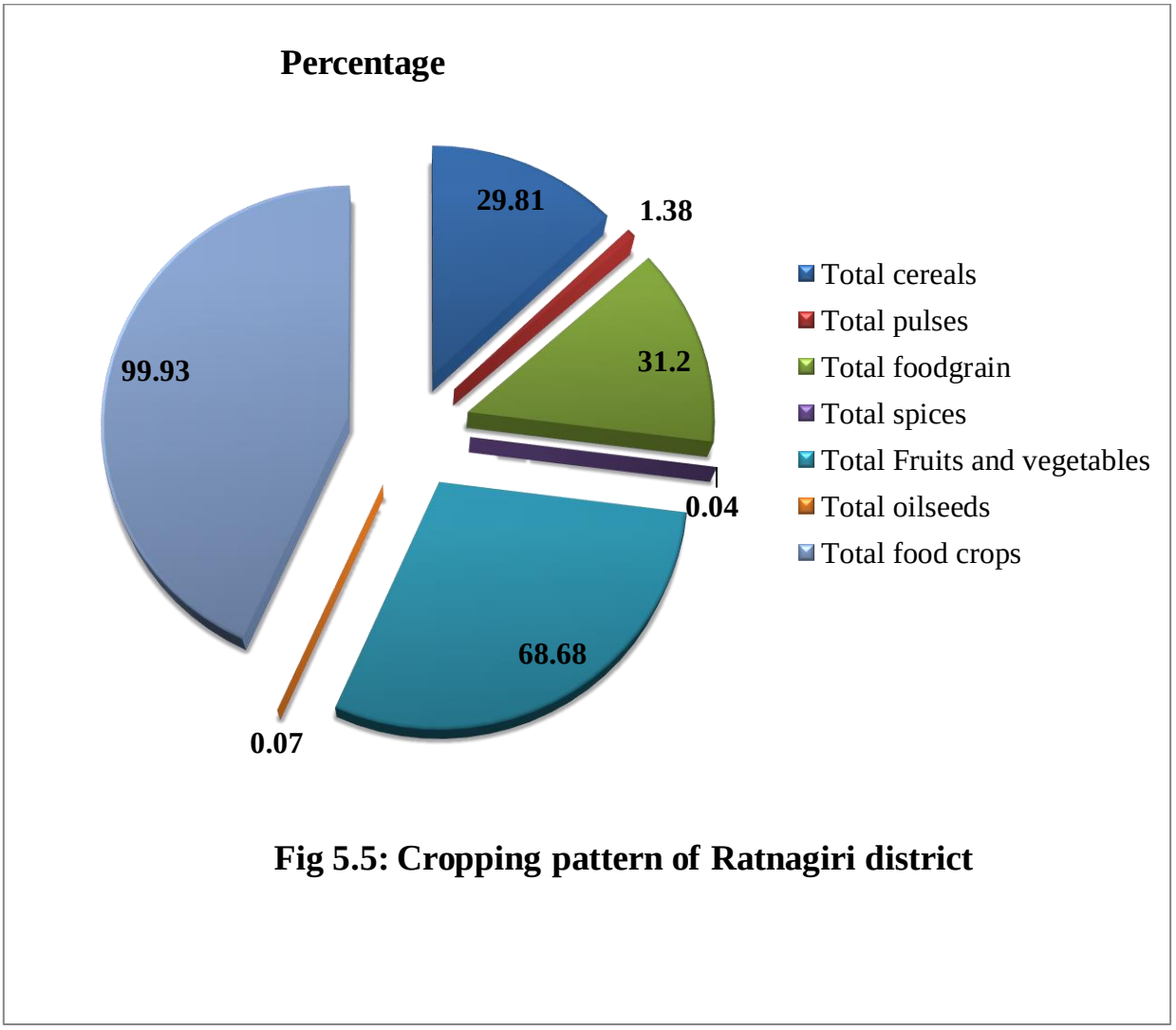


Fig 5.5: Cropping pattern of Ratnagiri district

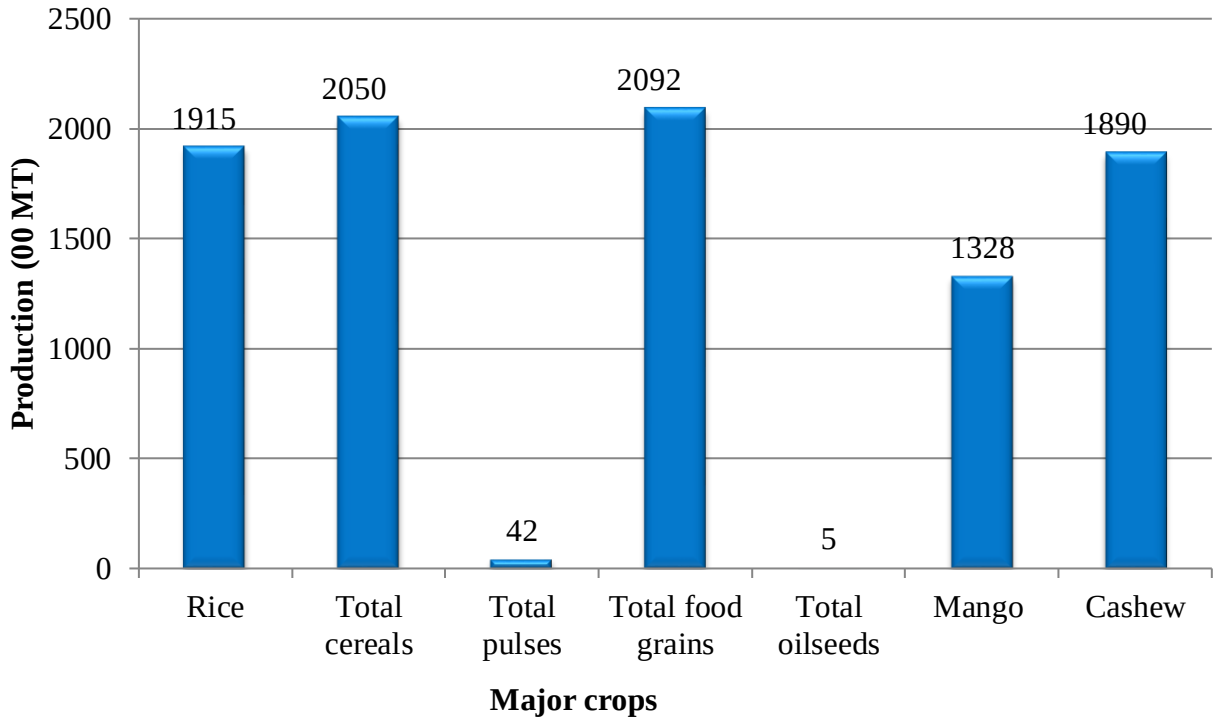


Fig 5.6: Production of Principle crops in Ratnagiri district

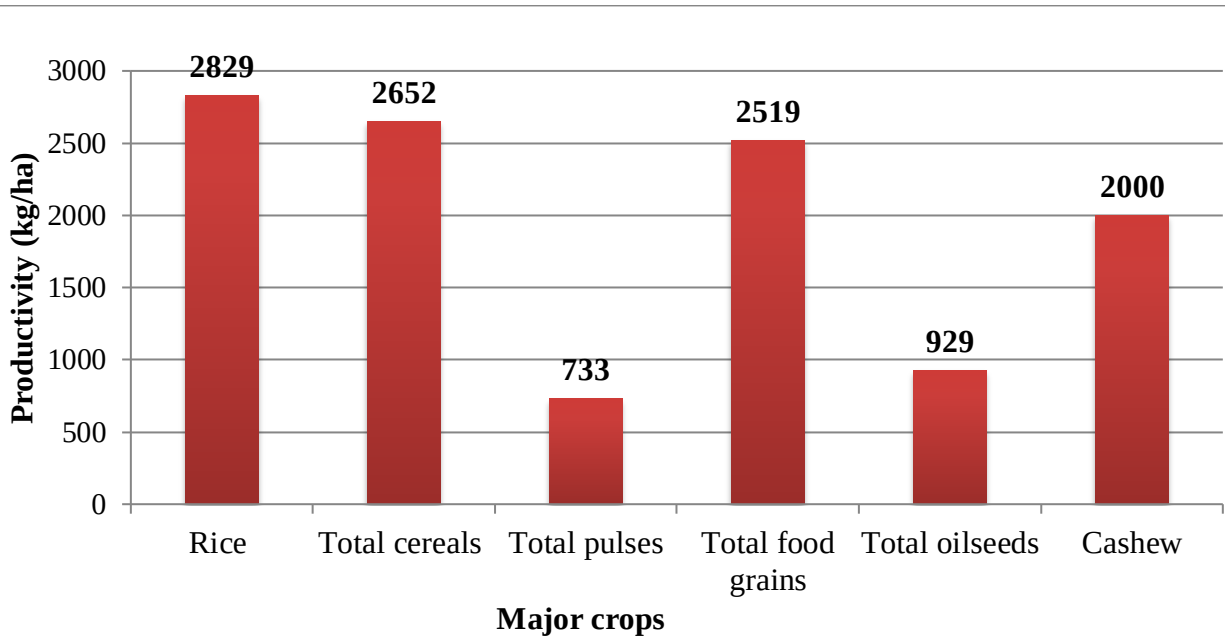


Fig 5.7: Productivity of principle crops in Ratnagiri district

kg/ha.The total food grains production of Ratnagiri district was 2092 MT and productivity are 2519 kg/ha. The total oilseed production in Ratnagiri was 5 MT and the productivity was 929 kg/ha.

In Ratnagiri district, the production of Mango, Cashew and Coconut in current year 2021 was 1328 MT, 1890 MT and 52000 lakh nuts and the productivity was 3 t/ha, 2000 kg/ha and 14000 nuts/ha.

5.7 DAILY WAGE RATES OF AGRICULTURAL LABOUR:

Daily wages paid to agricultural labour in Ratnagiri district at current as well as at constant prices is given in Table 5.7.

Table5.7: Daily Wages paid to agricultural labour in Ratnagiri district (2021)

Particulars	Current (Rs)	Constant (Rs)
Agricultural labour		
a) Male agricultural labour	350	346.5
b) Female agricultural labour	235	232.7

Agricultural labour includes ploughman, transplanter, weeder, harvester etc. From the Table 5.7 observed that, the daily agricultural wages paid to male agricultural labourers in Ratnagiri district at current prices Rs.350 and at constant prices Rs.346.5, whereas female agricultural labour paid wage rates at current prices Rs.235 and at constant prices Rs.232.7.

5.8 IMPLEMENTS AND MACHINERY:

There are some important implements and machineries used in Ratnagiri district for agriculture purpose are given in Table.5.8.

Table 5.8 Agricultural implements and machinery (2012)

Sr. No.	Particulars	Total
1	Total ploughs	124092
2	Cart	2118
3	Tractors	30
4	Paddy threshers	550
5	Plant protection implements	3976
6	Interculturing implements	20138
7	Electric pumps	3727
8	Oil engine pumps	1025
9	Number of ploughs per 100 ha. of total cropped area	46.29

From the Table 5.8 observed that, in Ratnagiri district, there are number of implements and machineries used for agriculture purpose. There are total ploughs in the district was 124092. Number of animal driven cart was2118 and the total tractors are 30.

The interculturing implements and plant protection implementsare 20,138 and 3976 respectively. The electric pumps are 3727 and oil engine pumps are 1025. In the district there are 550 paddy threshers for harvesting. The number of ploughs per 100 ha of total cropped area of Ratnagiri district was 46.29.

From above discussion concluded that, in Ratnagiri district the farmers uses the large amount of implements and machinery in farm for development of agriculture.

5.9 FERTILIZER CONSUMPTION:

The fertilizer consumption of Ratnagiri district given in Table 5.9

Table5.9: Fertilizer Consumption in Ratnagiri district (2021)

Sr. No	Types of fertilizers use	M.T	Per hectare fertilizer consumption (kg)
1	Complex fertilizer	4564.50	17.02
2	Other fertilizers	10651.83	39.73
	Total fertilizers	**15216.33**	**56.76**

According to Table 5.9, the total fertilizer consumption of Ratnagiri district was 15216.33 MT and per hectare fertilizer consumption of total fertilizer was 56.76 kg. Out of the total fertilizer consumption, the consumption of complex fertilizer was 4564.50 MT and per hectare consumption of complex fertilizer was 17.02 kg. Consumption of complex fertilizer was very less because of farmers not use the recommended dose of fertilizers. Other fertilizers consumed inRatnagiri district was 10651.83 MT and per hectare consumption was 39.73 kg.

5.10 FINANCIAL INSTITUTION:

There are various co-operative societies in Ratnagiri district given in Table 5.10.

From the Table 5.10 observed that, in Ratnrgiri district there are total co-operative societies are 3007. The total members of this co-operative societies are 2573.90 thousand and disbursed total credits and capital of Ratnagiri district was Rs415887.21 lakh and Rs 557291.04 lakh respectively.Out of the total co-operative societies, the total agricultural co-operative credit societies of Ratnagiri district was 367, under the Agricultural Cooperative Credit Societies the District central co-operative Bank (1), Primary agricultural co-operative credit society (363), Farmers service societies (2) and other banks (1). The members of total agricultural co-operative

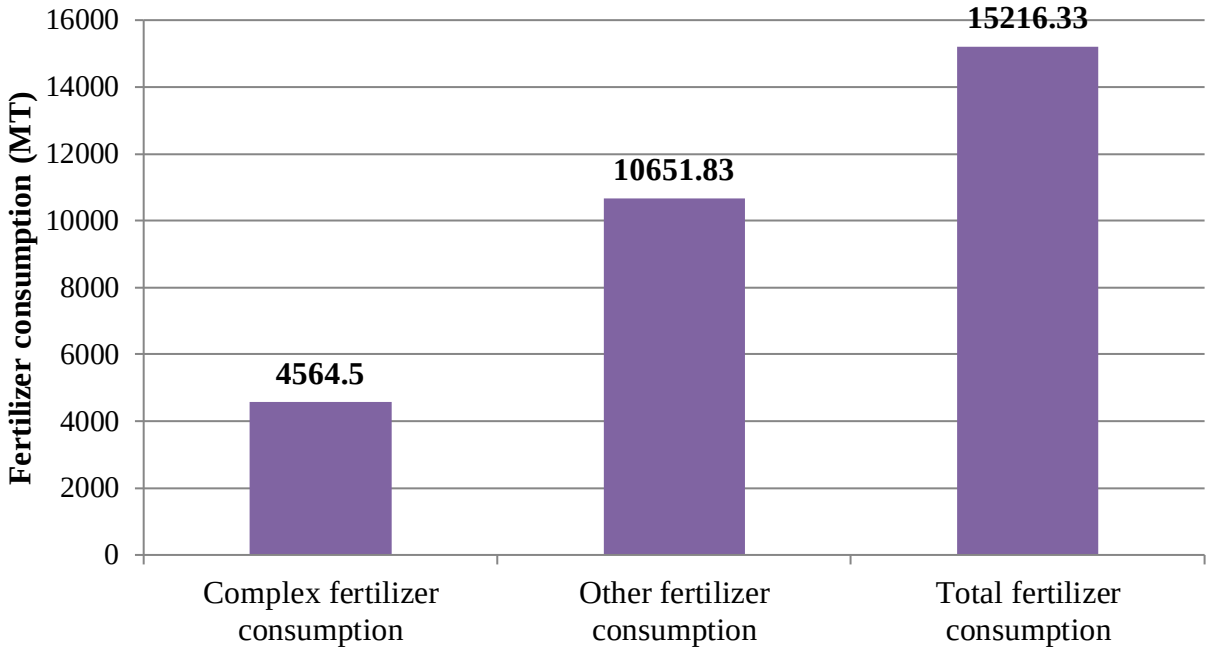


Fig 5.8: Fertilizer consumption of Ratnagiri district

credit societies are 396.44 thousand and the capital of this bank was Rs 263115.48 lakh. The credit is given to people was Rs328450.3 lakh.

Table 5.10: Co-operative societies in Ratnagiri district (2021)

Sr. No.	Co-operative societies	No.of Offices	Members (Thousand)	Capital (lakh)	Gross Credit (lakh)
1	**Agricultural co-operative credit societies**				
	District central co-operative Banks	1	2.24	248068.71	322834.00
	Primary agricultural co-operative societies	363	394.14	15046.49	5616.00
	Farmers service societies	2	0.05	0.27	0.3
	Other Banks	1	0.01	0.01	-
	Total	**367**	**396.44**	**263115.48**	**328450.3**
2	**Non-agricultural credit societies**				
	Gramin Bank	4	1268.39	76386.70	34649.59
	Primary workers credit societies	81	296.94	92886.57	36382.06
	Other non-agricultural credit societies	197	416.38	123933.38	16371.51
	Total	**282**	**1981.71**	**293206.65**	**87403.16**
3	**Total Marketing societies**	**18**	**21.914**	**881.11**	**1.94**
4	**Producers societies**				
	Industrial societies	6	67.01	3.94	-
	Milk societies	224	25	0.45	-
	Fisheries co-operative societies	92	41	27.86	27.55
	Other producers societies	256	3.92	3.82	2.74
	Total	**578**	**136.93**	**36.07**	**30.29**
5	**Social services and other cooperative societies**				
	Consumer stores	91	2.98	1.41	-
	Housing societies	1551	33.25	39.40	1.39
	Contractor’s societies	95	0.29	9.54	-
	Other societies	25	0.39	1.38	0.13
	Total	**1762**	**36.91**	**51.73**	**1.52**
	Total Co-operative societies	**3007**	**2573.90**	**557291.04**	**415887.21**

The total Non-agricultural credit Societies in Ratnagiri are 282, out of the Gramin banks (4), Primary workers credit societies (81) and other non-agricultural credit societies are 197. The members of this societies are 1981.71 thousand and the capital was Rs293206.65 lakh. The credit was given to people Rs87403.16 lakh.

The total marketing co-operative societies in the district are 18. The total members of this societies are 21.914thousand and the capital of this bank was Rs881.11 lakh. Thecredit was given to people are Rs1.94 lakh.

The total producer societies in the district are 578. Out of this under industrial societies (6), milk societies (224), fisheries co-operative societies (92) and other producers societies are (256). The members of this societiesare 136.93 thousand and the capital wasRs36.07 lakh. The credit is given to people wasRs30.29 lakh.

The total social services and other co-operative societies are 1762. Out of the under consumer store society (91), housing societies (1551), contractor's societies(95) and other societies are (25). The members of this societies are 36.91 thousand and the capital was Rs51.73 lakh and the credit is given to people was Rs 1.52 lakh in the Ratnagiri district.

5.11 IRRIGATION SOURCES:

Thedifferent sources of irrigation available in Ratnagiri district are given in table 5.11.

Table 5.11: Area irrigated by different sources in Ratnagiri district (2021)

Sr. No.	Category	Area (ha)	Percentage to net irrigatedarea
1	Surface irrigation	5695	71.56
2	Well irrigation	2263	28.44
	Net irrigated area	**7958**	**100.00**
3	Gross irrigated area	11763	-
4	Gross cropped area	268083	-
5	Percentage of gross irrigated area to gross cropped area	-	4.39
6	Percentage of net irrigated area to net sown area	-	3.05

From Table 5.11, it was seen that the area irrigated by surface irrigation in Ratnagiri district was 5695 ha, constituting 71.56 per cent of net area irrigated. The share of well irrigation in Ratnagiri was 28.44 per cent. The total net irrigated area of Ratnagiri district was 7958 ha.

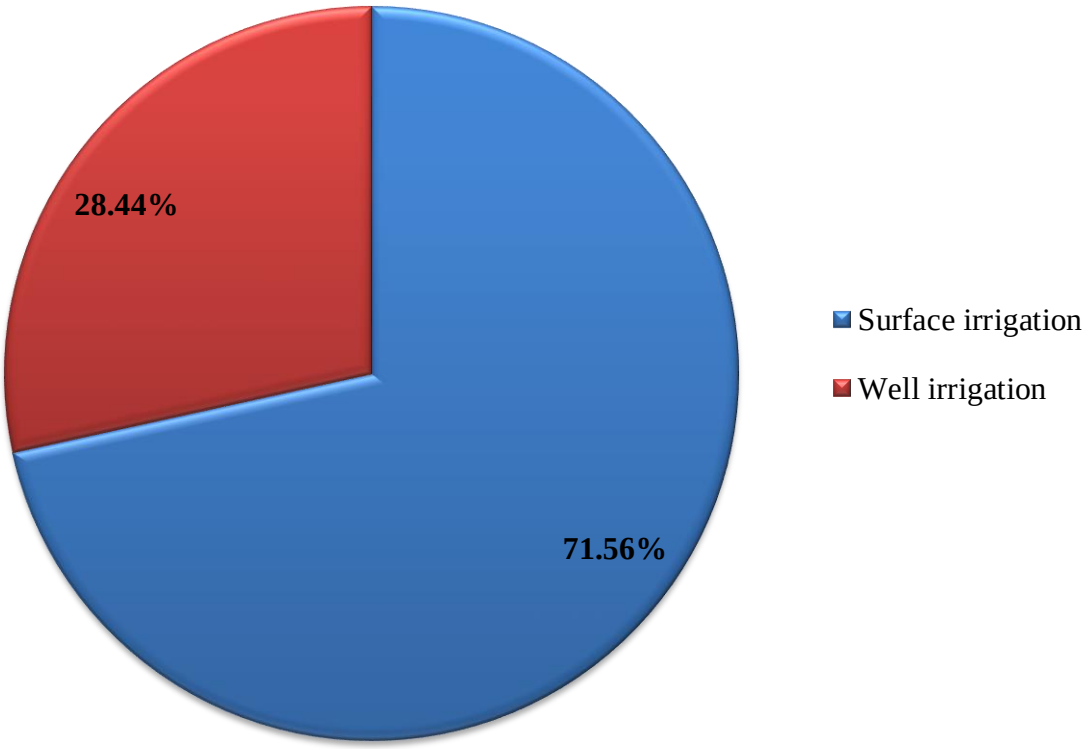


Fig 5.9: Area irrigated by diffrent sources in Ratnagiri district

The percentage of net irrigated area to net sown area in Ratnagiri was 3.05 per cent. Gross irrigated area in Ratnagiri district was 11763ha. The percentage of gross irrigated area to gross cropped area was 4.39 per cent in Ratnagiri district.

5.12 SECTOR WISE GROSS VALUE ADDED AND GROSS DOMESTIC PRODUCT:

The sectorwise gross value added and gross domestic product of Ratnagiri district is given in table 5.12. It was observed that, the share of agriculture sector in total GDP was increasing at decreasing rate over the period at current as well as at constant prices in Ratnagiri district.

Over the period, the percent share of primary sector as well as secondary sector was increasing at decreasing rate at both the current and constant prices in total GDP, whereas the percent share of tertiary sector was increasing over the period at current and constant prices in total GDP of Ratnagiri district.

This showed that, district level income generation and growth in agriculture sector as well as other sectors of the economy increased.

5.13 SECTOR WISE NET VALUE ADDED AND NET DOMESTIC PRODUCT:

From the table 5.13 observed that, the percent share of agriculture sector in total NDP was increasing at decreasing rate over the period at current and constant prices in Ratnagiri district.

Also the share of primary and secondary sector over the period was increasing at decreasing rate in total NDP at both current and constant prices in Ratnagiri district.

The share of tertiary sector in total NDP was increasing over the period at both current and constant prices in Ratnagiri district.

5.12 Sector wise Gross Value Added (GVA) and Gross Domestic Product (GDP) of Ratnagiri district at base year 2011-12.

	Agriculture	Forestryand Logging	Fisheries	Miningand Quarrying	Primary sector	Secondary Sector	Tertiary sector	Total GVA	Total GDP
A) Current Prices (Rs)									
2011-12	2639 (17.04)	371 (2.40)	266 (1.72)	111 (0.72)	3387 (21.87)	3939 (25.44)	6515 (42.07)	15882	15486 (100.00)
2012-13	2930 (16.53)	411 (2.32)	358 (2.02)	278 (1.57)	3977 (22.43)	4328 (24.41)	7423 (41.87)	18136	17727 (100.00)
2013-14	3787 (18.56)	383 (1.88)	438 (2.15)	71 (0.35)	4679 (22.93)	5021 (24.60)	8472 (41.52)	20848	20407 (100.00)
2014-15	6339 (25.43)	406 (1.63)	516 (2.07)	83 (0.33)	7344 (29.46)	5297 (21.25)	9598 (38.50)	25444	24932 (100.00)
2015-16	4586 (18.41)	381 (1.53)	471 (1.89)	217 (0.87)	5655 (22.70)	5613 (22.53)	10528 (42.27)	25300	24908 (100.00)
2016-17	6210 (21.22)	579 (1.98)	844 (2.88)	217 (0.74)	7850 26.83)	5723 (19.56)	11832 (40.44)	29634	29261 (100.00)
2017-18	7154 (22.55)	638 (2.01)	595 (1.88)	545 (1.72)	8932 (28.15)	6146 (19.37)	12762 (40.22)	32090	31728 (100.00)
2018-19	5559 (16.98)	1056 (3.23)	516 (1.58)	423 (1.29)	7554 (23.07)	6784 (20.72)	14447 (44.13)	33116	32741 (100.00)
2019-20	5608 (16.15)	1073 (3.09)	440 (1.27)	165 (0.48)	7286 (20.98)	6972 (20.08)	16406 (47.24)	35147	34727 (100.00)

B) Constant prices (Rs)									
2011-12	2639 (17.04)	371 (2.40)	266 (1.72)	111 (0.72)	3387 (21.87)	3939 (25.44)	6515 (42.07)	15802	15486 (100.00)
2012-13	2715 (16.69)	373 (2.29)	296 (1.82)	130 (0.80)	3514 (21.60)	4072 (25.03)	6934 (42.63)	16662	16267 (100.00)
2013-14	3042 (17.29)	372 (2.11)	343 (1.95)	35 (0.20)	3792 (21.55)	4395 (24.98)	7519 (42.74)	17991	17594 (100.00)
2014-15	4615 (22.44)	387 (1.88)	377 (1.83)	83 (0.40)	5462 (26.56)	4672 (22.71)	8203 (39.88)	20993	20568 (100.00)
2015-16	3178 (15.70)	391 (1.93)	297 (1.47)	325 (1.61)	4191 (20.70)	5036 (24.88)	8749 (43.22)	20568	20245 (100.00)
2016-17	3883 (17.24)	489 (2.17)	436 (1.94)	290 (1.29)	5097 (22.63)	5343 (23.72)	9496 (42.17)	22813	22521 (100.00)
2017-18	4511 (18.47)	472 (1.93)	274 (1.12)	827 (3.39)	6084 (24.91)	5623 (23.02)	9860 (40.37)	24703	24425 (100.00)
2018-19	3535 (14.24)	742 (2.99)	742 (2.99)	651 (2.62)	5201 20.95)	5951 (23.97)	10658 (42.93)	25112	24829 (100.00)
2019-20	3306 (13.08)	745 (2.95)	284 (1.12)	253 (1)	4588 (18.16)	5996 (23.73)	11641 (46.07)	25576	25270 (100.00)

Figures in parentheses indices percentages to total GDP

5.13 Sectorwise Net Value Added (NVA) and Net Domestic Product (NDP) of Ratnagiri district at base year 2011-12.

	Agriculture	Forestry&Logging	Fisheries	Mining and Quarrying	Primary sector	Secondary Sector	Tertiary sector	Total NVA	Total NDP
A) Current prices (Rs)									
2011-12	2499 (18.15)	368 (2.67)	234 (1.70)	98 (0.71)	3199 (23.24)	3368 (24.47)	5537 (40.23)	14084	13765 (100.00)
2012-13	2763 (17.56)	408 (2.59)	318 (2.02)	244 (1.55)	3733 (23.73)	3673 (23.35)	6306 (40.08)	16146	15732 (100.00)
2013-14	3582 (19.75)	379 (2.09)	391 (2.16)	61 (0.34)	4413 (24.33)	4313 (23.78)	7148 (39.41)	18583	18137 (100.00)
2014-15	5884 (26.53)	402 (1.81)	467 2.11)	69 (0.31)	6822 (30.76)	4546 (20.50)	8065 (36.67)	22700	22177 (100.00)
2015-16	4234 (19.07)	377 (1.70)	428 (1.93)	204 (0.92)	5244 (23.62)	4870 (21.94)	8939 (40.27)	22593	22197 (100.00)
2016-17	5825 (22.07)	574 (2.16)	774 (2.93)	208 (0.79)	7380 (27.97)	5008 (18.98)	10090 (38.24)	26766	26388 (100.00)
2017-18	6636 (23.32)	632 (2.22)	551 (1.94)	525 (1.84)	8344 (29.32)	5349 (18.80)	10821 (38.03)	28824	28457 (100.00)
2018-19	5107 (17.49)	1047 (3.59)	479 (1.64)	408 (1.40)	7041 (24.11)	5912 (20.25)	12252 (41.96)	29581	29201 (100.00)
2019-20	5154 (16.70)	1063 (3.44)	408 (1.32)	159 (0.52)	6785 (21.98)	6073 (19.67)	13911 (45.07)	31292	30868 (100.00)

B) Constant prices (Rs)									
2011-12	2499 (18.15)	368 (2.67)	234 (1.70)	98 (0.71)	3199 (23.24)	3368 (24.47)	5537 (40.23)	14084	13765 (100.00)
2012-13	2560 (17.78)	234 (1.63)	258 (1.79)	115 (0.80)	3303 (22.95)	3442 (23.91)	5882 (40.86)	14794	14395 (100.00)
2013-14	2882 (18.55)	368 (2.37)	303 (1.95)	31 (0.20)	3583 (23.06)	3733 (24.03)	6314 (40.64)	15939	15537 (100.00)
2014-15	4302 (23.61)	383 (2.10)	331 (1.82)	71 (0.39)	5088 (27.92)	3996 (21.93)	6871 (37.70)	18656	18224 (100.00)
2015-16	2941 (16.41)	388 (2.16)	262 (1.46)	310 (1.73)	3900 (21.76)	4368 (24.37)	7368 (41.11)	18250	17924 (100.00)
2016-17	3638 (18.11)	484 (2.41)	383 (1.91)	280 (1.39)	4786 (23.82)	4698 (23.38)	7997 (39.80)	20387	20092 (100.00)
2017-18	4199 (19.28)	468 (2.15)	241 (1.11)	804 (3.69)	5711 (26.23)	4920 (22.59)	8256 (37.91)	22057	21776 (100.00)
2018-19	3271 (14.83)	735 (3.33)	243 (1.10)	633 (2.87)	4881 (22.13)	5206 (23.60)	8924 (40.46)	22344	22058 (100.00)
2019-20	3061 (13.70)	738 (3.30)	252 (1.13)	246 (1.10)	4297 (19.23)	5246 (23.48)	9735 (43.56)	22655	22347 (100.00)

Figures in parentheses indices percentages to total NDP

PART II

Under this part, discuss the variation and trends of selected parameters with the help of statistical tools, such as Mean, Standard deviation and Coefficient of variation.

5.14 LAND UTILIZATION PATTERN:

Land utilization pattern is the most important content in the development of agriculture. To know the development in land utilization from 2006 to 2017 worked out by using the mean, S.D and C.V and given in Table 5.14.

Table 5.14: Variation and trend in land utilization of Ratnagiri district (2006 to 2017)

Particulars	Ha		%
	Mean	S.D	C.V
Forest	55.17	1.57	2.85
Land put non-agril.use	144.33	1.55	1.07
Barren & uncultivable land	2302.33	32.50	1.41
Permanent pasture & other grazing land	137.25	1.09	0.79
Land under Misc.use	69.33	1.11	1.59
Culturable waste	1330.83	19.59	1.47
Current fallow	276.58	2.72	0.98
Other fallow	1355.83	10.85	0.80
Net sown area	2491.08	48.83	1.96
Area sown more than once	103.08	13.60	13.19
Total cropped area	2594.17	38.42	1.48

(Note: After 2017 data was not available, so I took data for land utilization pattern from 2006 to 2017)

5.14.1 Land put to non-agricultural use:

It was observed from the Table 5.14, during the study period, the average area of land put to non-agricultural use was 144.33 ha and its variability was 1.07 per cent.

5.14.2 Barren and uncultivable land:

The average area ofbarren and uncultivable land during study period in Ratnagiri was 2302.33 ha and its variability was 1.41 per cent.

5.14.3 Area under permanent pasture and other grazing land:

The average area under permanent pasture and other grazing land during study period it was 137.25 ha and its variability was 0.79 per cent.

5.14.4 Land under miscellaneous trees crops and grooves:

During study period,average area under miscellaneous trees crops and grooves in Ratnagiri was 69.33 ha and its variability occur 1.59 per cent.

5.14.5Culturable waste land:

In Ratnagiri district, the average area under culturable waste land during study period it was 1330.83 ha and variation occur during study period 1.47 per cent.

5.14.6Area under current fallow and other fallow:

The average area under current fallow during study period in Ratnagiri was 276.58 ha and its variability was 0.98 per cent, whereas area under other fallow during study period it was 1355.83 ha and its variability was 0.80 per cent.

5.14.7 Net sown area:

The average net sown area of Ratnagiri district, during study period it was 2491.08 ha and its variation occur 1.96 per cent over the period.

5.14.8 Total cropped area:

The average total cropped area of Ratnagiri, during study period it was 2594.17 ha and its variability was 1.48 per cent over the period.

5.14.9 Area under forest:

During the study period in Ratnagiri district, it was seen that the average area under forest was 55.17 ha and its variability was 2.85 per cent.

Above discussion concluded that, in Ratnagiri district there was stable development in land put to non-agriculture use, barren and uncultivable land, permanent pasture and other grazing land, land under miscellaneous trees crops and grooves, culturable waste land, current fallow, other fallow, net sown area, total cropped area and the forest area.

5.14.9 Area under area sown more than once:

In Ratnagiri district, during study period average area under area sown more than once it was 103.08 ha and variation occur 13.19 per cent.

5.15 AREA UNDER DIFFERENT CROPS:

To know the development of area under different crops in the Ratnagiri district for the study period (2006 to 2021) with the help of mean, S.D and C.V. were worked out and presented in Table 5.15.

Table 5.15: Variability and trends in area under different crops in Ratnagiri(2006 to2021)

Particulars	ha		%
	Mean	S.D	C.V
Rice	73464.44	4594.78	6.25
Other cereals	92706.81	10351.49	11.17
Total pulses	6657.44	2112.68	31.73
Total foodgrains	99641.38	12403.22	12.45
Total spices	586.88	424.12	72.27
Mango	53299.63	19609.09	36.79
Other fruits	83568.38	37747.62	45.17
Total vegetables	1590.81	758.50	47.68
Total oilseeds	2509.69	2338.12	93.16
Total food crops	239086.19	45880.24	19.19
Total non-food crops	40014.94	63046.85	157.56

5.15.1 Area under Rice:

Rice is a staple food of Ratnagiri district, the average area under the rice was 73464.44 ha and the variability of area under rice was 6.25 per cent during the study period.

5.15.2 Area under other cereals and total pulses:

Average area under other cereals during study period in Ratnagiri district, it was 92706.81 ha and variability occur 11.17 per cent, whereas the average area of total pulses over the study period it was 6657.44 ha and the variation occur 31.73 per cent.

5.15.3 Area under total food grains:

The average area under total food grains in Ratnagiri district during study period it was 99641.38 ha and the variability was 12.45 per cent.

5.15.4 Area under Total spices:

The average area of total spices in Ratnagiri district, during study period it was 586.88 ha and the variation occur 72.27 per cent over the study period.

5.15.5 Area under Mango and other fruits:

The average area under mango in Ratnagiri district during study periodwas 53299.63 ha and the variability it was 36.79 per cent occur over the study period.

The average area under other fruits (i.e. cashew, coconut, arecanut etc.) during study period was 83568.38 ha and the variation in area under other fruits over the period it was 45.17 per cent in Ratnagiri district.

5.15.6 Area under total vegetables and total oilseeds:

During study period in Ratnagiri observed, average area under the total vegetables was 1590.81 ha and the variability was 47.68 per cent over the period.

The average area of total oilseeds during study period was 2509.69 ha and the variability was 93.16 per cent.

5.15.7 Area under total food crops and total non-food crops:

The average area under total food crops in Ratnagiri over the study period it was 239086.19 ha and the variability was 19.19 per cent, whereas the average area of total non-food crops in Ratnagiriduring study period it was 40014.94 ha and the variability was 157.56 per cent.

From the above discussion concluded that, in Ratnagiri there was better development in area under rice, followed by area under other cereals, total food grains, total food crops, total pulses, mango and other fruits (i.e. coconut, cashew, arecanutetc).

5.16 SOURCES WISE AREA IRRIGATION:

Ratnagiri district have insufficient irrigation facilities. The main sources of irrigation in the district are wells and other sources, such as minor irrigation projects. For knowing the development of irrigated area by different sources in Ratnagiri district for the study period (2006 to 2021) with the help of mean, S.D and C.V. were worked out and given in Table 5.16.

Table 5.16: Variability and trends in area irrigated by different sources in Ratnagiri (2006 to 2021)

Particulars	ha		%
	Mean	S.D	C.V
Surface irrigation	5353.25	1087.80	20.32
Well Irrigation	3318.31	1563.67	47.12
Net irrigated area	8672.69	566.77	6.54
Total irrigated area	12030.63	1526.93	12.69

From Table 5.16 it was observed that in Ratnagiri district, the average area irrigated by surface irrigation during study period it was 5353.25 ha and the variability occur 20.32 per cent, whereas the average area irrigated by well irrigation it was 3318.31 ha and the variation occur over the period it was 47.12 per cent.

During study period in Ratnagiri district, it was observed that, the average net irrigated area by surface and well irrigationwas 8672.69 ha and variability occur 6.54 per cent over the period, whereas the average total irrigated area of Ratnagiri district during study period it was 12030.63 ha and the variability occur 12.69 per cent.

From above discussion seen that, in Ratnagiri district during study period there was a better development in net irrigated area, followed by total irrigated area and surface irrigated area.

5.17 PRODUCTION OF PRINCIPLECROPS:

For knowing the development in production of principle crops in Ratnagiri district for study period 2006 to 2021 their mean, S.D and C.V are calculated and given in Table 5.17

Table 5.17: Variability and trends in production of principle crops in Ratnagiri district (2006 to 2021)

Particulars	MT		%
	Mean	S.D	C.V
Rice	2059.19	165.78	8.05
Other cereals	2255.13	160.71	7.13
Total pulses	29.17	11.18	38.34
Total foodgrains	2279.55	171.02	7.50
Total oilseeds	7.81	5.69	72.95
Coconut	36514.25	13954.20	38.22
Mango	101488.69	79203.8	78.04
Cashew	84953	49745.69	58.56

5.17.1 Production of Rice:

Rice is a staple food of Ratnagiri district, the average production of rice during study periodin Ratnagiriwas 2059.19 MT and the variability in production of rice was 8.05 per cent over the period.

5.17.2 Production of other cereals and total pulses:

In Ratnagiri the average production of other cereals during study period it was 2255.13 MT and the variability in production of other cereals was 7.13 per cent over the period, whereas

the average production of total pulses during study period it was 29.17 MT and the variability occur 38.34 per cent over the period.

5.17.3 Production of total food grains and total oilseeds:

The average production of total food grains during study period in Ratnagiriwas 2279.55 MT and the variability in production of total food grainsoccur 7.50 per cent over the period, whereas the average production of total oilseeds occur in Ratnagiri district during study periodit was 7.81 MT and variability in production of total oilseeds occur 72.95 per cent over the period.

5.17.4 Production of Coconut, Mango and Cashew:

During study periodobserved that, the average production of Coconut inRatnagiri district it was 36514.25 tones and variability occur in production over the period was 38.22 per cent.

The average production of mango, occur during study period it was 101488.69 MT and the variation in production of mango over the period in Ratnagiri was 78.04 per cent, whereas the average production of Cashew in Ratnagiri district over the study period it was 84953 MT and the variability in production was 58.56 per cent over the period.

From the above discussion seen that, in Ratnagiri district there was better development in production of rice, other cereals, total food grains, coconut and total pulses.

5.18 PRODUCTIVITY OF PRINCIPLECROPS:

For knowing the changes in the productivity of principle crops in Ratnagiri during study period (2006 to 2021) their mean, S.D and C.V are calculated and given in Table 5.18.

Table 5.18: Variability and trends in productivity of principle crops in Ratnagiri district (2006 to 2021)

Particulars	Kg		%
	Mean	S.D	C.V
Rice	2795.75	228.04	8.16
Other cereals	2749.25	916.60	33.34
Total pulses	991.31	1088.38	109.79
Total foodgrains	2587.13	869.00	33.59
Total oilseeds	696.69	520.23	74.67
Coconut	8759.31	1047.48	11.96
Mango	1.96	1.67	85.41
Cashew	1058	475.06	44.88

5.18.1 Productivity of Rice:

In Ratnagiri district, the average productivity of Rice over the period was 2795.75 kg/ha and the variability occur 8.16 per cent over the period.

5.18.2 Productivity of other cereals and total pulses:

The average productivity of other cereals in Ratnagirover the period it was 2749.25 kg/ha and the variability in productivity of other cereals over the period it was 33.34 per cent.

In Ratnagiri district, the average productivity of total pulses over the period it was991.31 kg/ha and the variability in productivity it was seen 109.79 per cent over the period.

5.18.3 Productivity of total food grains:

In Ratnagiri district, it was seen that during study period, the average productivity of total food grains was 2587.13 kg/ha and the variability in productivity it was 33.59 per cent.

5.18.4 Productivity of total oilseeds:

The average productivity of total oilseeds in Ratnagiri district during study period it was 696.69 kg/ha and the variability in productivity over the period it was 74.67 per cent.

5.18.5 Productivity of Coconut, Mango and Cashew:

The average productivity of Coconut in Ratnagiri district during study period it was 8759.31 nuts/ha and the variability in productivity occur over the period it was 11.96 per cent.

The average productivity of mango during study period in Ratnagiriwas 1.96 t/ha and the variation occur in productivity during study period it was 85.41 per cent.

The average productivity of Cashew in Ratnagiri district during study period it was 1058 kg/ha and the variation occur in productivity over the period it was 44.88 per cent.

From the above discussion it was seen that, in Ratnagiri district there was better development in productivity of rice, coconut, other cereals and total food grains.

5.19 FERTILIZER CONSUMPTION:

Fertilizer is the most important input contributing towards productivity and ultimately towards more production. For knowing the development in fertilizer consumption in Ratnagiri for study period (2006 to 2021) their mean, S.D and C.V. calculated and given in Table 5.19.

Table 5.19: Variability and trends in fertilizer consumption in Ratnagiri(2006 to 2021)

Particulars	MT		%
	Mean	S.D	C.V
Complex fertilizer	13772.96	5875.03	42.66
Other fertilizers	5406.66	5347.92	98.91
Total fertilizers	19179.62	3420.39	17.83

From the Table 5.19 observed that, the average total fertilizer consumption of Ratnagiri district during study period it was 19179.62 MT and the variability occur in total fertilizer consumption it was 17.83 per cent over the period.

Out of the total fertilizer consumption, the average consumption of complex fertilizer in Ratnagiri during study period it was 13772.96 MT and the variability occur in consumption of complex fertilizer 42.66 per cent, whereas the average consumption of other fertilizers out of the total fertilizer consumption in Ratnagiri district during study period it was 5406.66 MT and the variability occur in consumption of other fertilizers 98.91 per cent.

From above discussion concluded that, in Ratnagiri district during study period 2006 to 2021 there was better development in total fertilizer consumption.

5.20 AGRICULTURAL WAGES:

Wages paid to the agricultural labour are considered to be an indicator of agricultural development. For knowing the how much change in daily wages paid to agricultural labour over the study period (2006 to 2021) in Ratnagiri district at current as well as at constant prices with the help of Mean, S.D and C.V. given in Table 5.20.1 and 5.20.2

Table 5.20.1: Variability and trends in daily wages paid to agricultural labour at current prices in Ratnagiri district (2006 to 2021)

Particulars	Rs		%
	Mean	S.D	C.V
Male agricultural labour	180	100.40	55.78
Female agricultural labour	120.07	57.09	47.55

From the Table 5.20.1 it was seen that, in Ratnagiri district the average daily wages paid to male agricultural labour at current prices during study period it was Rs 180 and the variation occur in daily wages paid to male agricultural labour at current prices over the period 55.78 per cent, whereas the average daily wages paid to female agricultural labour at current prices during

study period it was Rs 120.07 and the variation occur in daily wages paid to female agriculturallabour at current prices 47.55 per cent.

Table 5.20.2: Variability and trends in daily wages paid to agricultural labour at constant prices in Ratnagiri district (2006 to 2021)

Particulars	Rs		%
	Mean	S.D	C.V
Male agricultural labour	173.92	99.18	57.03
Female agricultural labour	115.68	56.05	48.45

In Ratnagiri district, observed from the Table 5.20.2, the average daily wages paid to male agricultural labour at constant prices during study period (2006 to 2021)it was Rs 173.92 and the variation occur in daily wages paid to male agricultural labour at constant prices was 57.03 per cent, whereas the average daily wages paid to female agricultural labour at constant prices during study period it was Rs 115.68 and the variation occur in daily wages paid to female agricultural labour at constant prices was 48.45 per cent over the period.

PART-III

Under this part calculate the linear growth rate and compound growth rate for land utilization pattern, area under different crops, production and productivity of major crops, area irrigated by different sources, fertilizer consumption and daily wages paid to agricultural labour at current as well as at constant prices for 15 year from 2006-07 to 2020-21 in Ratnagiri district.

5.21 GROWTH IN POPULATION:

The percent increase or decrease during previous decade in population of Ratnagiri district given in Table 5.21.

Table 5.21: Growth in population (1971-81 to 2001-11)

Year	Population (lakhs)	Percent increase or decrease during previous decade
1971	12.70	-
1981	13.79	8.6
1991	15.44	12
2001	16.97	9.9
2011	16.15	- 4.8

From the Table 5.21, observed that the population of Ratnagiri district it was inceased by 8.6 per cent during the period 1971-81. Also the population increased during 1981-91 and 1991-

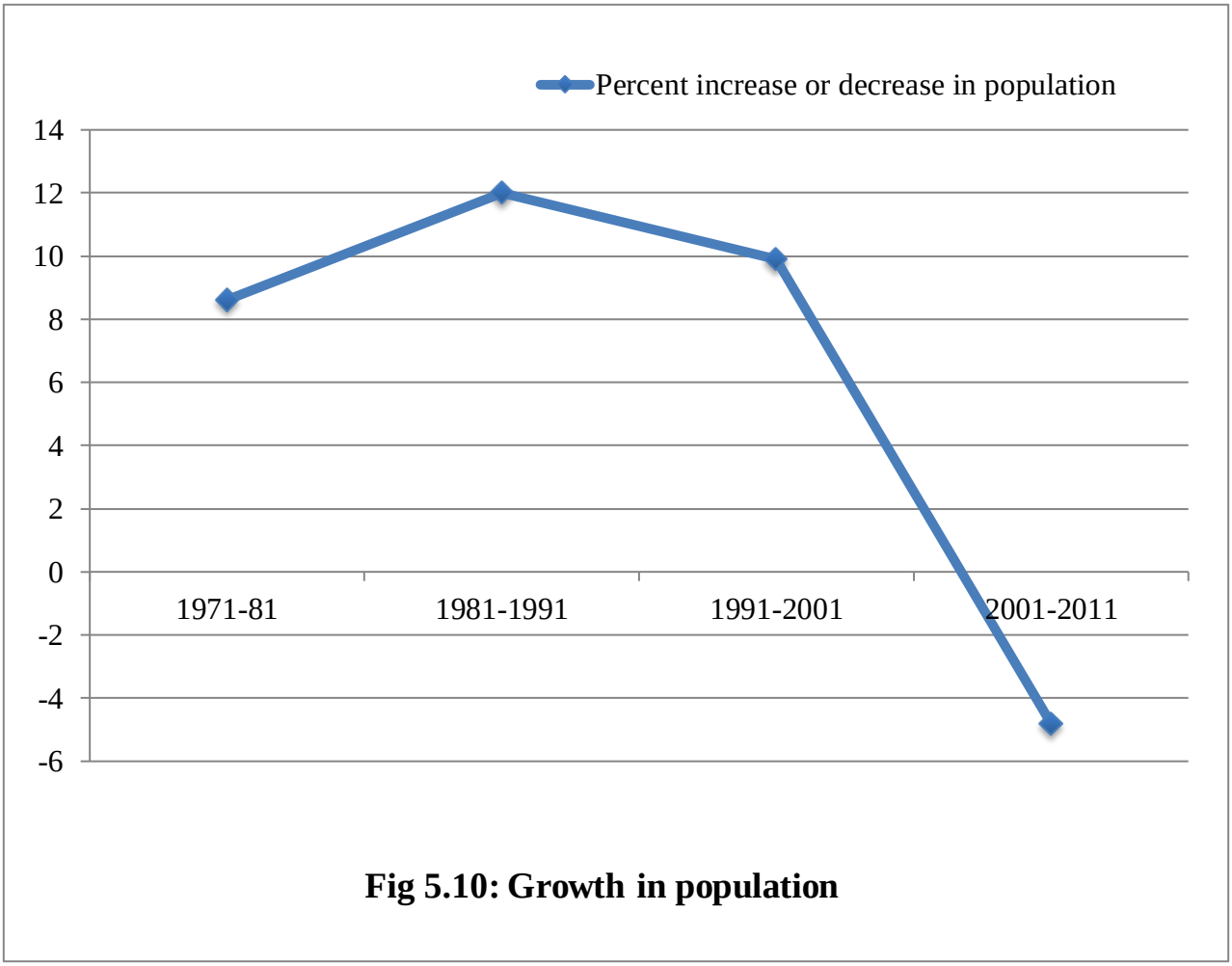


Fig 5.10: Growth in population

2001 by 12 per cent and 9.9 per cent respectively. During the period 2001-2011 the population of Ratnagiri district it was decreased by 4.8 per cent.

5.22 GROWTH RATES OF LAND UTILIZATION PATTERN:

The growth rates of land utilization pattern in Ratnagiri district for the study period (2006 to 2017) were work out with the help of linear growth rate (over the period of time) and compound growth rate (per annum) and presented in Table 5.22.

Table 5.22: Growth rates of Land utilization pattern(2006 to 2017)

Particulars	Linear growth rate	Compound growth rate
Forest area	-0.68**	-0.70**
Land put non-agricultural use	0.28**	0.27**
Barren and uncultivable land	-0.33**	-0.35**
Culturable waste land	-0.34**	-0.35**
Permanent pasture and other grazing land	-0.05	-0.05
Land under Misc. trees and grooves	-0.35**	-0.37**
Current fallow	-0.19**	-0.20**
Other fallow	0.17**	0.18**
Net sown area	0.48**	0.47**
Area sown more than once	-2.60**	-3.28**
Total cropped area	0.32**	0.33**

(** significant at 5 %)

(Note: After 2017 data was not available, so I took data for land utilization pattern from 2006 to 2017)

5.22.1 Growth rates for land put to non-agricultural use, net sown area, total cropped area and other fallow land:

From the Table 5.22, it was seen that in Ratnagiri district, the area under land put to non-agricultural use was significantly increased over the period of time by 0.28 per cent and per annum by 0.27 per cent at 5 per cent level.

The net sown area of Ratnagiri district, it was significantly increased over the period of time by 0.48 per cent and per annum by 0.47 per cent at 5 per cent level.

The total cropped area of Ratnagiri, it was significantly increased over the period of time by 0.32 per cent and per annum by 0.33 per cent at 5 per cent level. The area under the other

fallow significantly increased over the period of time by 0.17 per cent and per annum by 0.18 per cent.

5.22.2 Growth rates for area under forest, barren and uncultivable land, culturable waste land, land under miscellaneous trees crops and grooves, current fallow land and area sown more than once:

The area under forest significantly decreased over the period of time by 0.68 per cent and per annum by 0.70 per cent at 5 per cent level. The barren and uncultivable land significantly decreased over the period of time by 0.33 and per annum by 0.35 per cent. The culturable waste land significantly decreased over the period of time by 0.34 per cent and per annum by 0.35 per cent.

Land under miscellaneous trees crops and grooves significantly decreased over the period of time and per annum by 0.35 to 0.37 per cent. Area sown more than once was significantly decreased over the period of time by 2.60 per cent and per annum by 3.28 per cent. Area under current fallow was significantly decreased over the period of time by 0.19 per cent and per annum by 0.20 per cent.

5.22.3 Growth rates for permanent pasture and other grazing land:

Area under permanent pasture and other grazing land showed non-significant result over the period of time and per annum in Ratnagiri during study period.

5.23 GROWTH RATES OF AREA UNDER DIFFERENTCROPS:

The growth rates of area under different crops is worked out for study period (2006 to 2021) and presented in Table 5.23.

Table 5.23: Growth rates of area under different crops in Ratnagiri district (2006 to 2021)

Particulars	Linear growth rate	Compound growth rate
Total cereals	-2.33**	-7.10**
Total pulses	-5.12**	-5.02**
Total foodgrains	-2.57**	-2.63**
Total spices	-14.23**	-16.47**
Mango	6.46**	8.93**
Other fruits	8.71**	12.63**
Total vegetables	-2.59**	-16.53**
Total oilseeds	-18.72**	-25.88**
Total food crops	3.32**	3.77**
Total non-food crops	-26.51**	-41.30**

(** significant at 5 %)

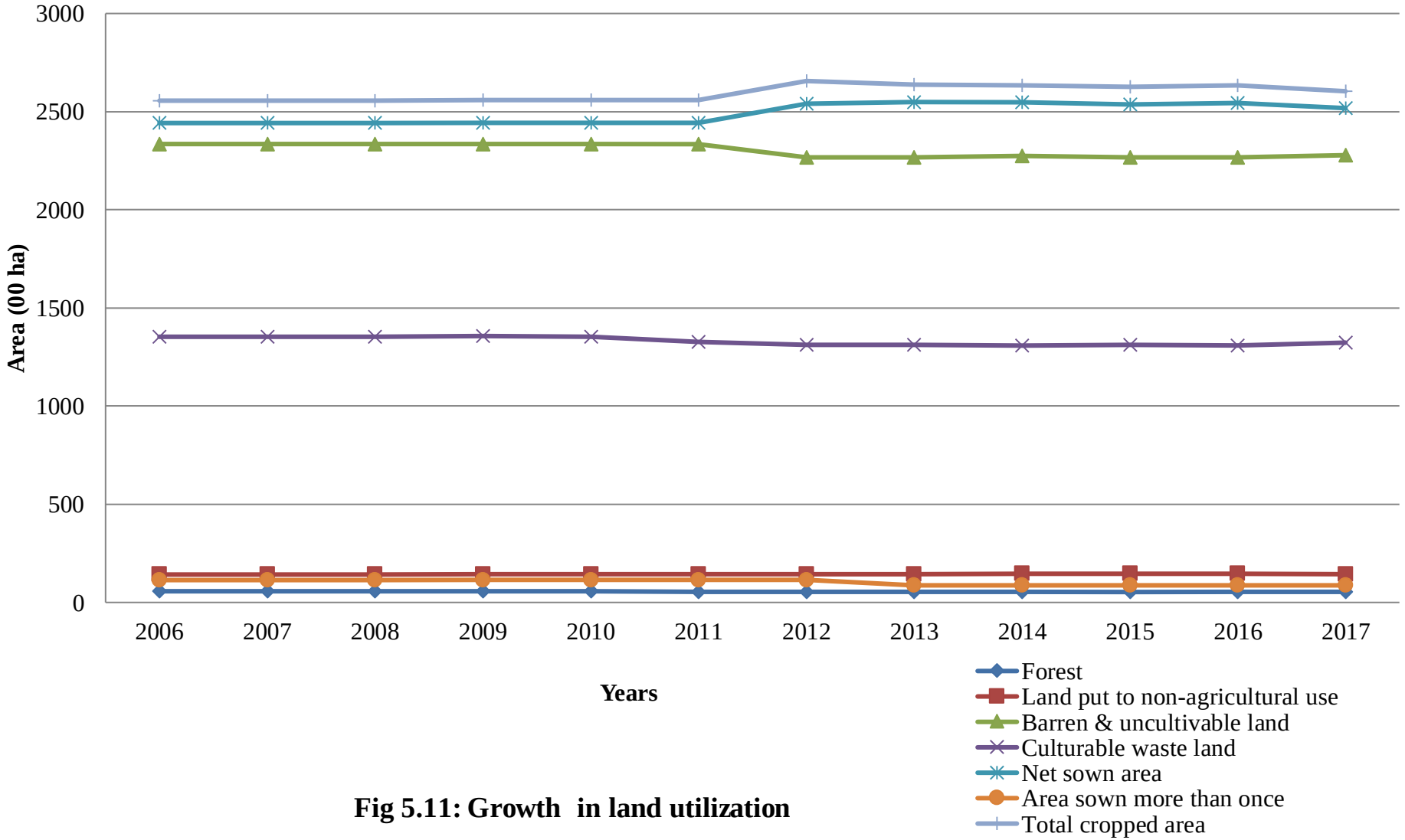


Fig 5.11: Growth in land utilization

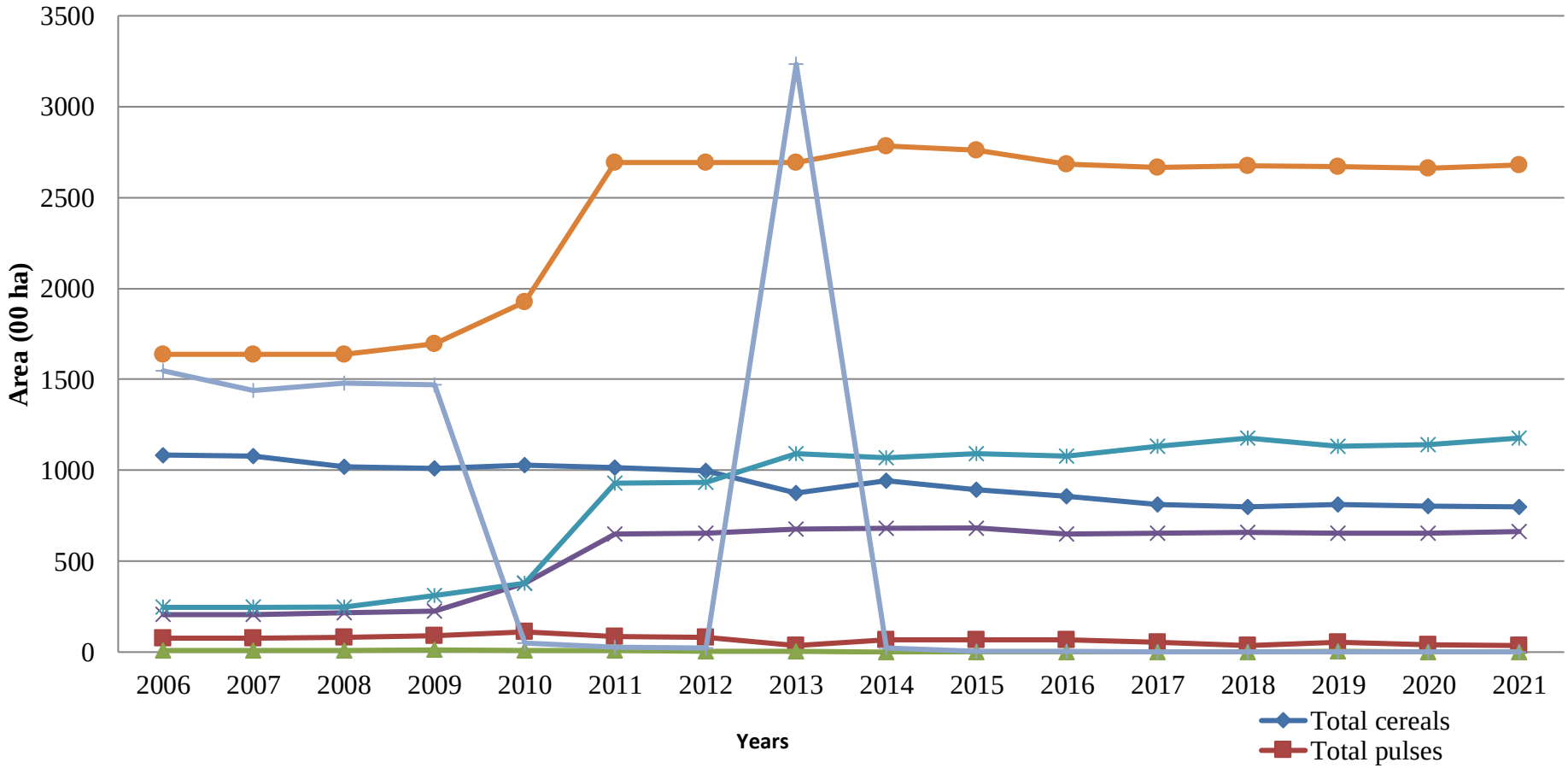


Fig 5.12: Growth in area under different crops in Ratnagiri

5.23.1 Growth rates for area under mango, other fruits and total food crops:

From the Table 5.23 it was seen that growth in area under mango in Ratnagiri was significantly increased over the period of time by 6.46 per cent and per annum by 8.93 per cent at 5 per cent level. Growth in area under other fruits (i.e. cashew, coconut, arecanut etc.) was significantly increased over the period of time by 8.71 per cent and per annum by 12.63 per cent. Growth in area under total food crops was significantly increased over the period of time by 3.32 per cent and per annum by 3.77 per cent in Ratnagiri district at 5 per cent level.

5.23.2 Growth rates for area under total cereals, total pulses, total foodgrains, total spices, total vegetables, total oilseeds and total non-foodcrops:

From the Table 5.23, it was seen that growth in area under total cereals significantly decreased over the period of time and per annum by 2.33 to 7.10 per cent respectively at 5 per cent level. Growth in area under total pulses was significantly decreased over the period of time by 5.12 per cent and per annum by 5.02 per cent. Growth in area under total food grains was significantly decreased over the period of time by 2.57 per cent and per annum by 2.63 per cent at 5 per cent level. Growth in area under total spices was significantly decreased over the period of time by 14.23 per cent and per annum by 16.47 per cent. Growth in area under total vegetables was significantly decreased over the period of time by 2.59 per cent and per annum by 16.53 per cent. Growth in area under total oilseeds was significantly decreased over the period of time by 18.72 per cent and per annum by 25.88 per cent. Growth in area under total non-food crops was significantly decreased over the period of time by 26.51 per cent and per annum by 41.30 per cent at 5 per cent level in Ratnagiri district.

5.24 GROWTH RATES FOR PRODUCTION OF PRINCIPLE CROPS:

The growth rates of production of principle crops for study period (2006 to 2021) in Ratnagiri district is worked out and presented in Table 5.24.

Table 5.24: Growth rates of production of principle crops in Ratnagiri district (2006 -2021)

Particulars	Linear growth rate	Compound growth rate
Rice	0.37**	0.33**
Other cereals	0.06	0.03
Total pulses	4.48**	-6.18**
Total food grains	0.06	0.02
Total oilseeds	-13.80**	-16.21**
Coconut	7.56**	8.51**
Mango	12.30**	18.99**
Cashew	12.39**	18.81**

(** significant at 5 %)

5.24.1 Growth rates of production of Rice, total pulses, coconut, mango and cashew:

From the Table 5.24, it was observed that growth in production of Rice was significantly increased over the period of time by 0.37 per cent and per annum by 0.33 per cent at 5 per cent level. Growth in production of total pulses was significantly increased over the period of time by 4.48 per cent and per annum production of total pulses was significantly decreased by 6.18 per cent at 5 per cent level.

Growth in production of coconut was significantly increased over the period of time by 7.56 per cent and per annum by 8.51 per cent at 5 per cent level. Growth in production of mango was significantly increased over the period of time by 12.30 per cent and per annum by 18.99 per cent. Growth in production of cashew was significantly increased over the period of time by 12.39 per cent and per annum by 18.81 per cent at 5 per cent level.

5.24.2 Growth rates of production of total oilseeds and total food grains:

From the Table 5.24, it was seen that growth in production of total oilseeds was significantly decreased over the period of time by 13.80 per cent and per annum by 16.21 per cent in Ratnagiri district at 5 per cent level.

Growth in production of total food grains showed non-significant result over the period of time and per annum.

5.25 GROWTH RATES OF PRODUCTIVITY OF PRINCIPLE CROPS:

Growth rates of productivity of principle crops for study period (2006 to 2021) was calculated in Ratnagiri district and given in Table 5.25.

Table 5.25 Growth rates of productivity of principle crops in Ratnagiri district (2006-2021)

Particulars	Linear growth rate	Compound growth rate
Rice	1.07**	1.08**
Other cereals	3.59 NS	3.27**
Total pulses	8.57NS	6.06 NS
Total food grains	3.85**	3.59**
Total oilseeds	10.11**	9.57**
Coconut	2.32**	2.37**
Mango	14.99**	35.31**
Cashew	9.23**	11.54**

(** significant at 5 %)

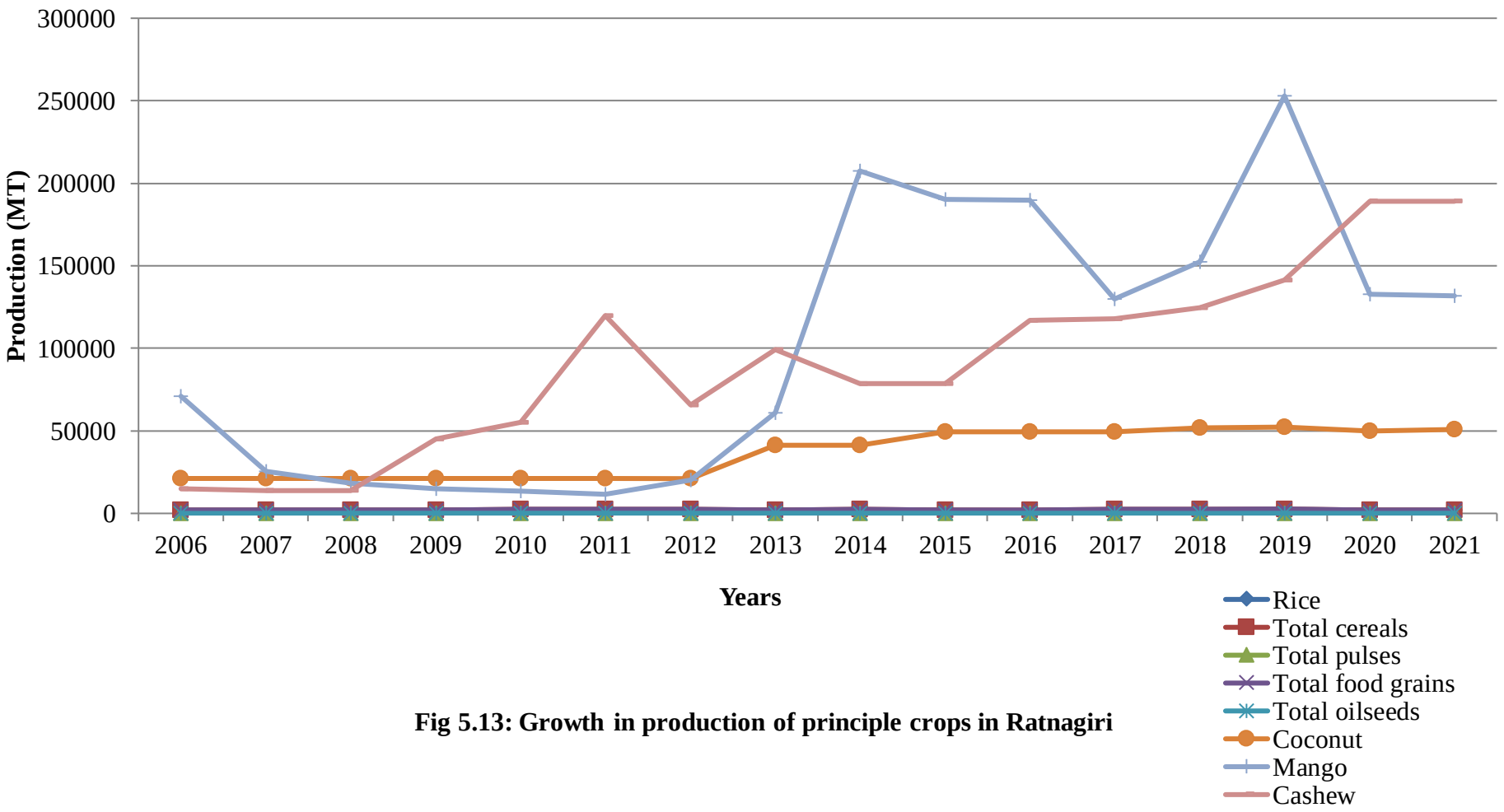


Fig 5.13: Growth in production of principle crops in Ratnagiri

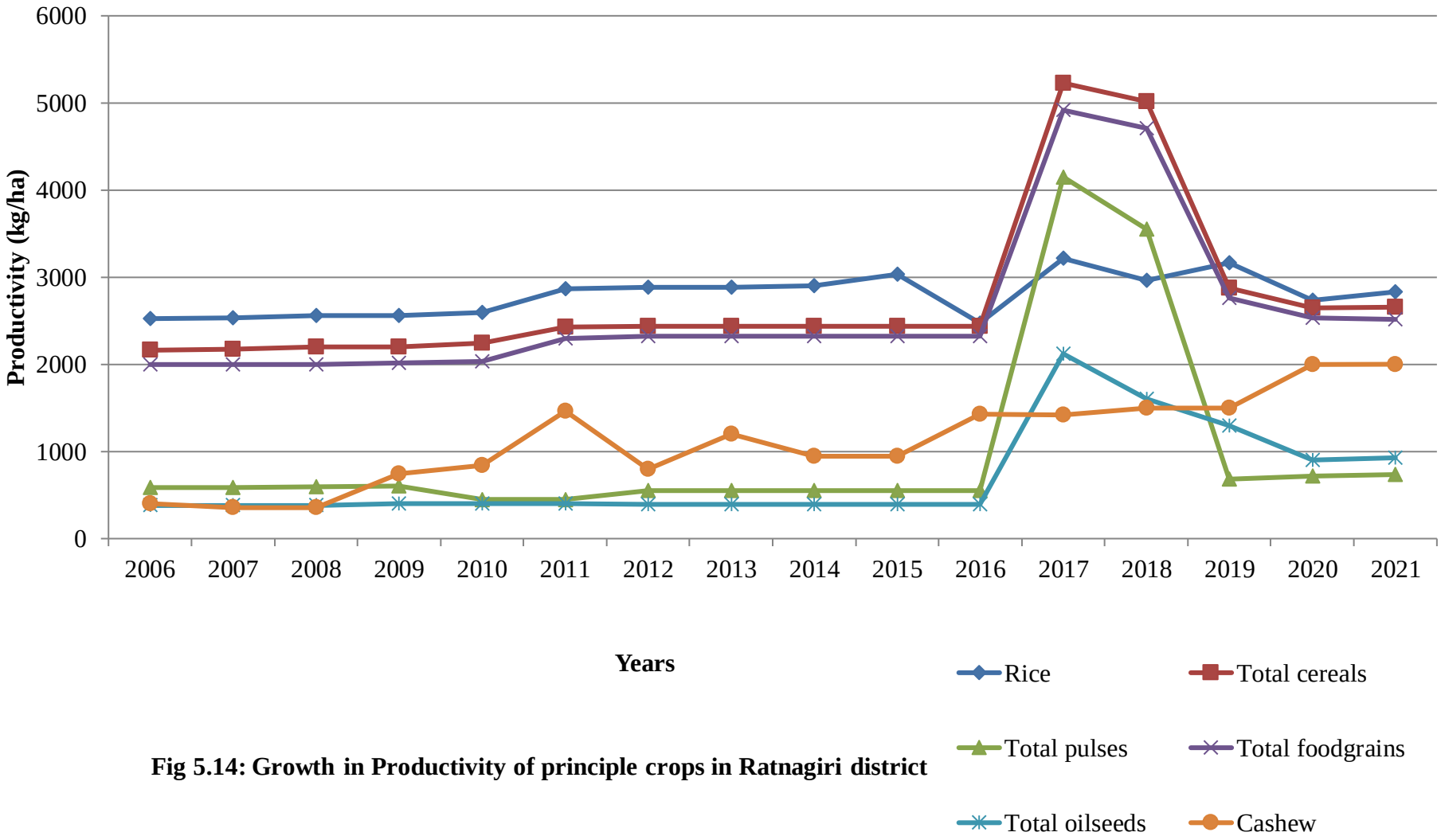


Fig 5.14: Growth in Productivity of principle crops in Ratnagiri district

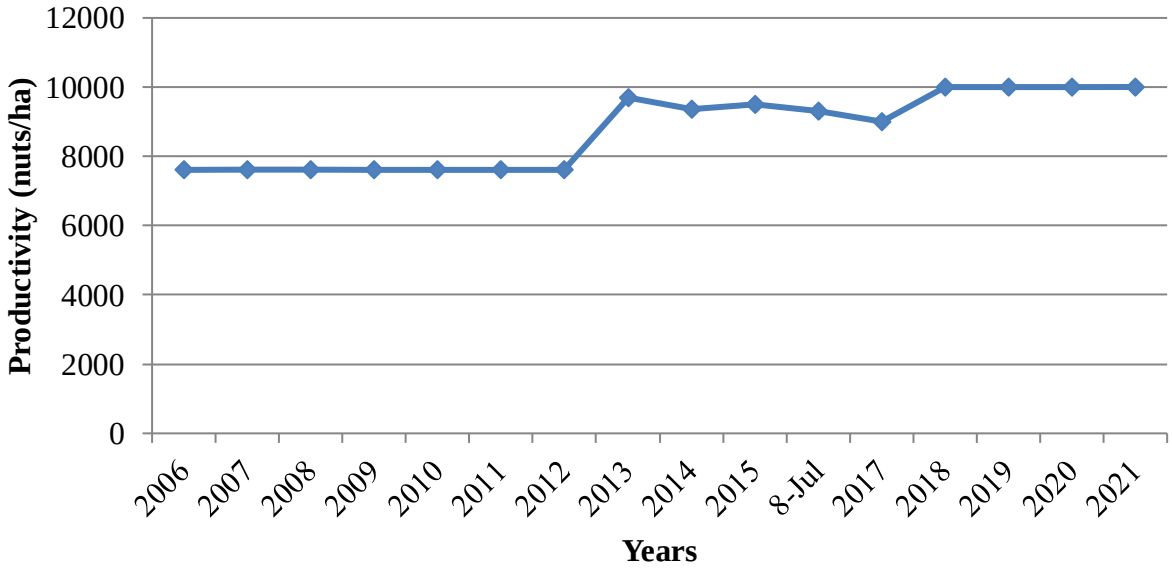


Fig 5.15: Growth in productivity of Coconut

5.25.1 Growth rates of productivity of Rice, other cereals, total food grains and total oilseeds:

From the Table 5.25 observed that in Ratnagiri district, growth in productivity of rice was significantly increased over the period of time by 1.07 per cent and per annum by 1.08 per cent at 5 per cent level. Growth in productivity of other cereals showed non-significant result over the period of time but per annum the productivity of other cereals was significantly increased by 3.27 per cent. Growth in productivity of total food grains was significantly increased over the period of time by 3.85 per cent and per annum by 3.59 per cent. Productivityof total oilseeds in Ratnagiri was significantly increased over the period of time by 10.11 per cent and per annum by 9.57 per cent.

5.25.2 Growth rates of productivity of Coconut, Mango and Cashew:

According to table 5.25, growth in productivity of coconut was significantly increased over the period of time by 2.32 per cent and per annum by 2.37 per cent. The productivity of mango was significantly increased over the period of time by 14.99 per cent and per annum by 35.31 per cent. Growth in productivity of cashew was significantly increased over the period of time in Ratnagiri by 9.23 per cent and per annum by 11.54 per cent at 5 per cent level.

5.25.3 Growth rates of productivity of total pulses:

Growth in productivity of total pulses showed non-significant result over the period of time and per annum in Ratnagiri district.

5.26 GROWTH RATES OF SOURCE WISE IRRIGATION:

The growth rates of area irrigated by different sources for study period 2006 to 2021 in Ratnagiri district is worked out and presented in Table 5.26

Table 5.26 Growth rates of area irrigated by different sources in Ratnagiri (2006 to 2021)

Particulars	Linear growth rate	Compound growth rate
Surface irrigation	3.14**	3.59**
Well irrigation	-8.23**	-7.11**
Net irrigated area	-1.21**	-1.20**

(** significant at 5 %)

5.26.1 Growth rates of area under surface irrigation and well irrigation:

From the Table 5.26 it was seen that in Ratnagiri district, the growth in area irrigated by surface irrigation was significantly increased over the period of time by 3.14 per cent and per

annum by 3.59 per cent at 5 per cent level, but area irrigated by well irrigation it was significantly decreased over the period of time by 8.23 per cent and per annum by 7.11 per cent.

5.26.2 Growth rates ofnet irrigated area:

From the Table 5.26,it was observed that the net irrigated area of Ratnagiri district was significantly decreased over the period of time and per annum by 1.21 to 1.20 per cent.

5.27 GROWTH RATES OF FERTILIZER CONSUMPTION:

The growth rates of fertilizer consumption for the period 2006 to 2021 in Ratnagiri district was worked out and given in table 5.27.

Table 5.27 Growth rates of fertilizer consumption in Ratnagiri district (2006 to 2021)

Particulars	Linear growth rate	Compound growth rate
Complex fertilizer	-3.24	-5.88
Other fertilizer	-3.58	-4.65
Total fertilizer	-3.34**	-3.39**

(** significant at 5 %)

From above the Table 5.27 it was observed that, in Ratnagiri district growth in total fertilizer consumption was significantly decreased over the period of time by 3.34 per cent and per annum by 3.39 per cent.

5.28 GROWTH RATES OF DAILY WAGES PAID TO AGRICULTURAL LABOUR:

The growth rates of daily wages paid to agricultural labour at current as well as at constant prices for the period 2006 to 2021 in Ratnagiri district is worked out and given in Table 5.28.

Table 5.28: Growth rates of daily wages paid to Agricultural labour in Ratnagiri district (2006 to 2021)

Particulars		Linear growth rate	Compound growth rate
A) Current prices			
a)	Male agriculturallabour	11.81**	13.24**
b)	Female agriculturallabour	9.05**	9.50**
B) Constant prices			
a)	Male agriculturallabour	12.15**	13.37**
b)	Female agriculturallabour	9.32**	9.67**

(** significant at 5 %)

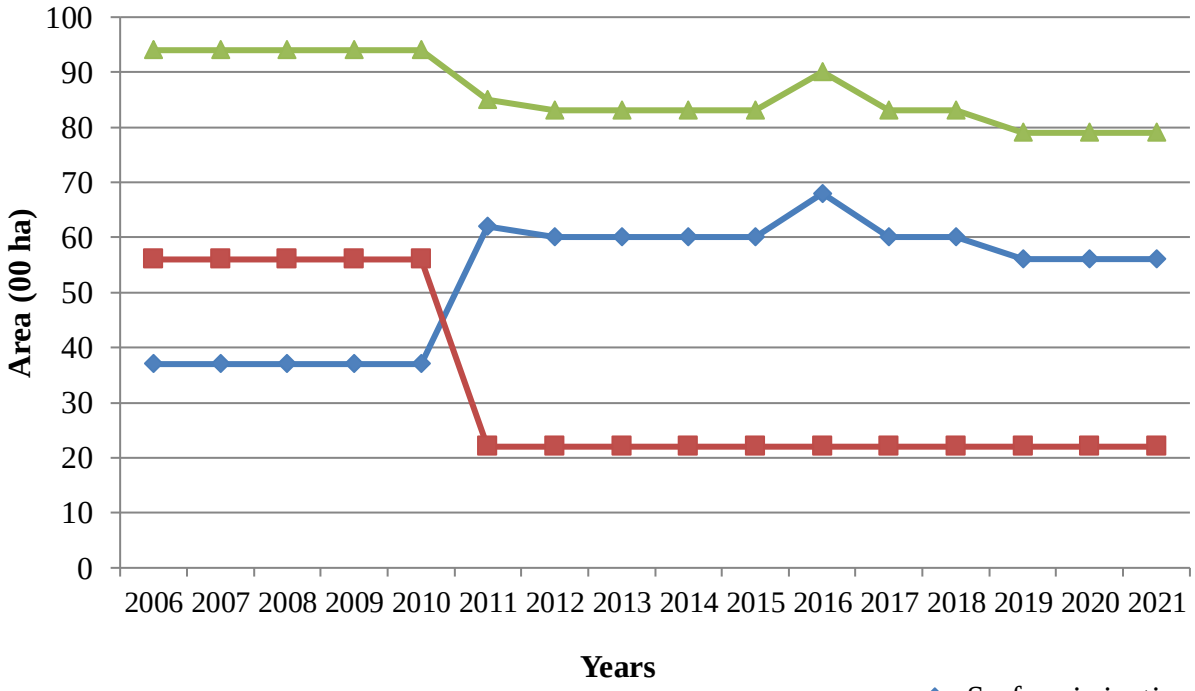


Fig 5.16: Growth in area irrigated by different sources

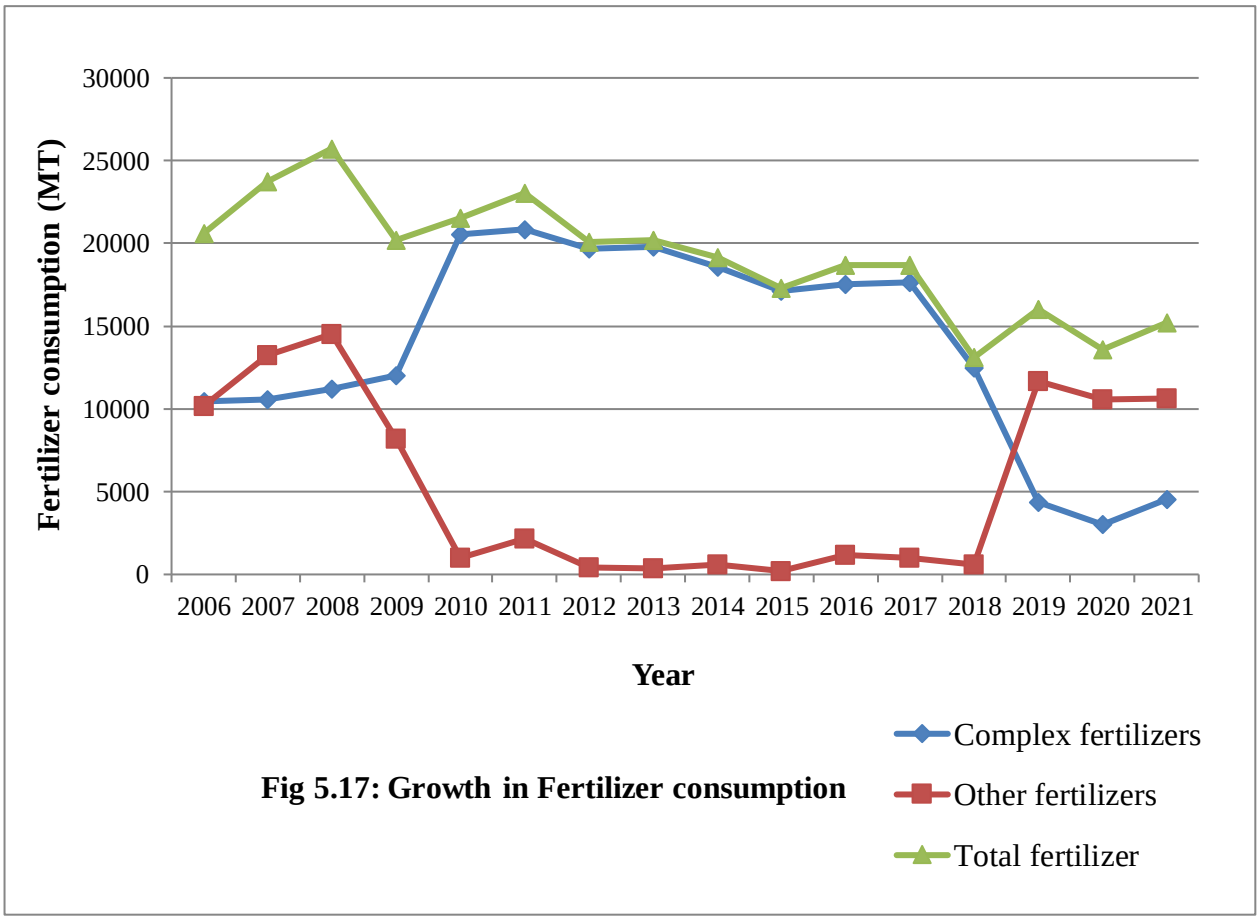


Fig 5.17: Growth in Fertilizer consumption

5.28.1 Growth rates of daily wages paid to male agricultural labour and female agricultural labour at current prices:

From the Table 5.28, it was seen that in Ratnagiri district, growth in daily wages paid to male agricultural labour at current prices was significantly increased over the period of time by 11.81 per cent and per annum by 13.24 per cent.

Growth in daily wages paid to female agricultural labour at current prices was significantly increased over the period of time by 9.05 per cent and per annum by 9.50 per cent.

5.28.2 Growth rates of daily wages paid to male agricultural labour and female agricultural labour at constant prices:

From the Table 5.28, it was seen that growth in daily wages paid to male agricultural labour at constant prices was significantly increased over the period of time by 12.15 per cent and per annum by 13.37 per cent at 5 per cent level in Ratnagiri district.

Growth in daily wages paid to female agriculture labour at constant prices was significantly increased over the period of time by 9.32 per cent and per annum by 9.67 per cent at 5 per cent level.

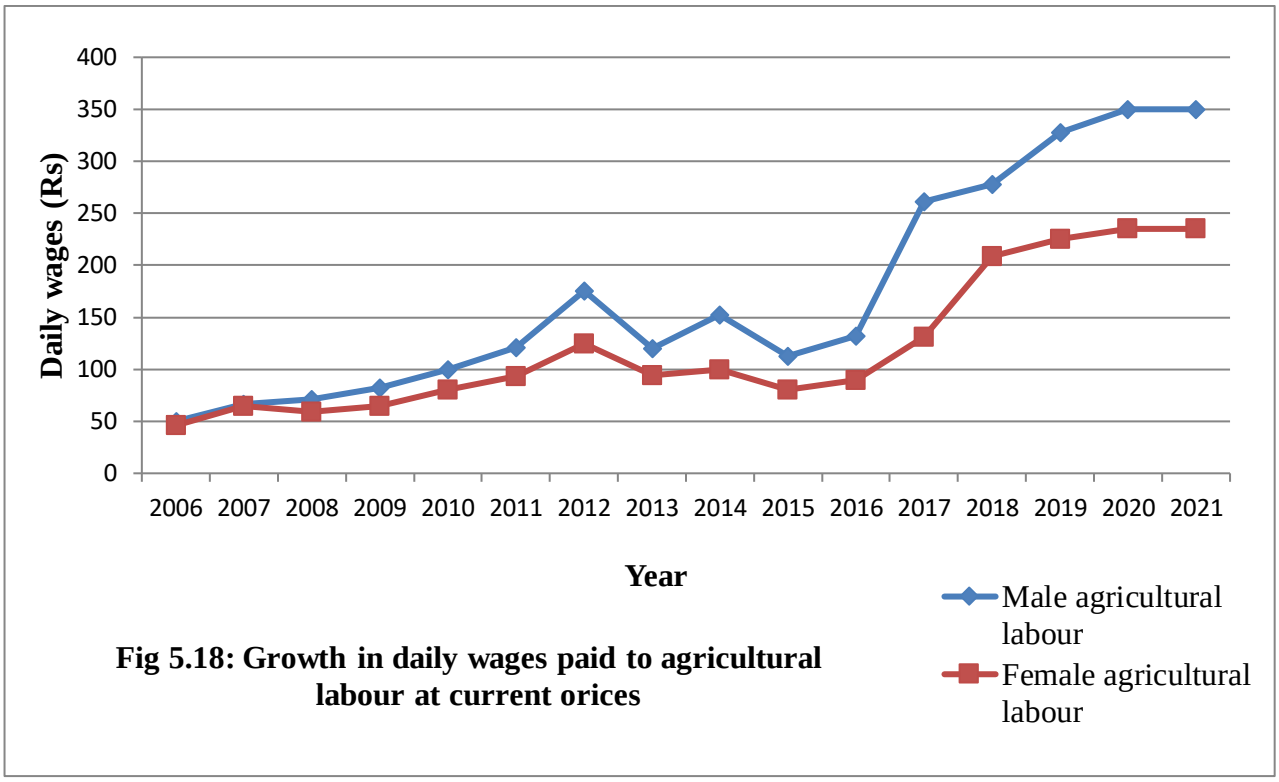


Fig 5.18: Growth in daily wages paid to agricultural labour at current orices

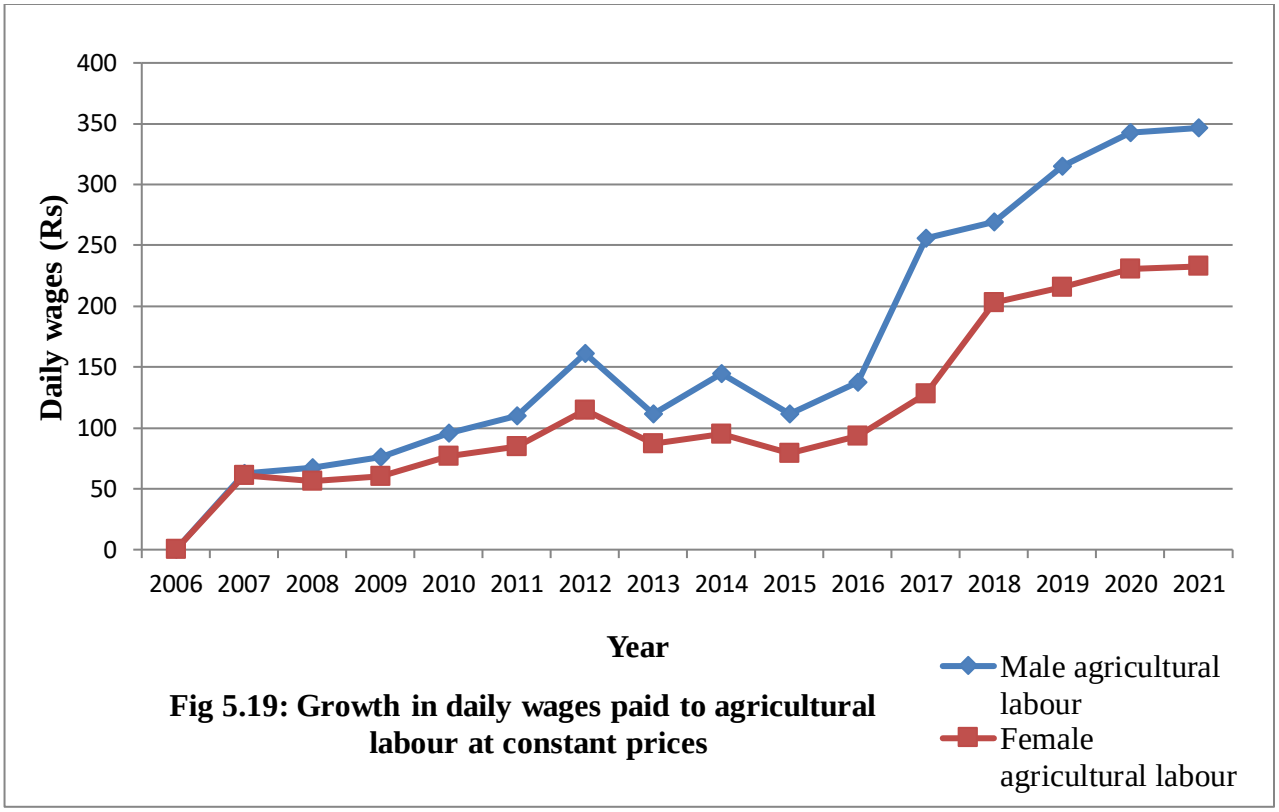


Fig 5.19: Growth in daily wages paid to agricultural labour at constant prices

SUMMARY AND CONCLUSIONS

CHAPTER VI: SUMMARY AND CONCLUSIONS

SUMMARY:

Agriculture plays a very important role in the development of Indian economy. Vast population depends directly or indirectly on the agricultural sector, therefore, being the single largest economic activity, agriculture services as the index of country's economic development. As a result, agriculture has even accorded the prime importance in Five Year Plan of the country. Before the advent of the 'Green Revolutions'. Indian agriculture was mainly subsistence type. The growing population and other factors compelled to transform this traditional way of farming into commercial methods of farming. The modern methods were associated with the use of high levels of capital intensive inputs such as high yielding varieties seeds, chemical fertilizers and plant protection chemicals.

Though, agriculture development is taking place in India through adoption of modern technology, it is not uniform throughout the country. Economic development of Maharashtra state also concealed wide regional disparities. A knowledge of level of development at district level will also help in identifying where a given district stands in relation to others.

For knowing the development of agriculture in Ratnagiri district is necessary to study the existing status, examine the variability, trends in agriculture and growth in various selected parameters. Such data is collected from secondary sources i.e. different published records of the state government *viz*; Socio-economic review and District Statistical Abstract of Ratnagiri district, Statistical Abstract of Maharashtra State and District Domestic Product of Maharashtra, Directorate of Economics and Statistics, Government of Maharashtra.

For the purpose of analysis, the study was divided into three parts; PART-I**:** Under this part, discuss the simple arithmetic averages and percentages of the selected parameters of development.PART-II:Under this part find out the average situation and variability in the selected parameters with the help of arithmetic mean (X), standard of deviation (S.D.) and coefficient of variation (C.V.).PART-III:Under this part calculate the growth rates in selected parameters of development with the help of linear growth rate and compound growth rate.

Total geographical area of Ratnagiri district was 8208 sq.km. As per the census 2011, the total population of Ratnagiri district was 16.15 lakh. The sex ratio of Ratnagiri district, females per 1000 male was 1122. The density of population persons per sq.km in Ratnagiri was 197. The percentage of rural population to the total population in Ratnagiri was higher i.e. 83.67 per cent as compared to urban population i.e. 16.33 per cent. The percentage population of the schedule caste and schedule tribe to the total population was 4.15 per cent to 1.26 per cent respectively. In

Ratnagiri district, there was higher literate population as per the illiterate population. The totalliterate population was 74.26 per cent, whereas the total illiterate population was 25.74 per cent. The total literacy rate of Ratnagiri district was 82.18 per cent.

Out of the total population of Ratnagiri district, the total working population was 7.14 lakh. The percentage of working population to total population in Ratnagiri was 44.21 per cent. The main working population of Ratnagiri was 5.55 lakh. Out of the number of males was 3.44 lakh and females was 2.10 lakh. The percentage of main working population to total population was 34.36 per cent.In Ratnagiri the agriculture working population was 1.53 lakh. Out of the number of males and females was0.68 lakh and 0.85 lakh respectively. The percentage of agricultural working population to total population in Ratnagiri district was 9.48 per cent. The percentage of non-working population of Ratnagiri district was 55.79 per cent. The land-man ratio of Ratnagiri district was 0.51 per cent.

The total geographical area of Ratnagiri district was 816433 ha. Out of the total geographical area, forest constituted 0.72 per cent. The percent share of barren and uncultivable land in Ratnagiri was 24.24 per cent. The land put to non-agricultural use in Ratnagiri district was 2.59 per cent. The percent share of culturable waste land was 25.34 per cent, land under miscellaneous tree crops and grooves was 0.61 per cent, land under permanent pasture and other grazing was 0.62 per cent in Ratnagiri district. The current fallow and other fallow land covered 4.42 per cent and 10.71 per cent of total geographical area in Ratnagiri district. The net sown area of Ratnagiri district was 32 percent, area sown more than once was 0.83 per cent. The total cropped area of Ratnagiri district was 268083 ha.

Total livestock population was 3.97 lakh. Out of total livestock, the percentage of cattle population was 80.47 per cent, buffaloes was 11.04 per cent, goat and sheep was 8.33 per cent and 0.03 per cent respectively. The percent of total bovine was 0.04 per cent and total horses and mule was 0.006 per cent.The percentage share of other livestock to total livestock was 0.07 per cent. In Ratnagiri district, the total poultry population was 8.24 lakh.

The cropping pattern followed in Ratnagiri district, it was observed that, the area under total cereals in Ratnagiri was 29.81 per cent. Out of this, area under rice, nagli, vari and maize was 25.67 per cent, 3.95 per cent, 0.18 per cent and 0.002 per cent respectively. The area under total pulses in Ratnagiri was 1.38 per cent. Out of the area under Red gram (0.16 per cent), Green gram (0.05 per cent),Black gram (0.009 per cent), Horse gram (0.57 per cent), Wal (0.37 per cent), Cowpea and Pea (0.21 per cent) and other pulses (0.01 per cent). The area under total food grains in Ratnagiri was 31.20 per cent. The area under total fruits in Ratnagiri district was 68.67 per cent. Out of the area under mango was 24.79 per cent, area under banana was 0.04 per cent

and area under other fruits i.e. cashew, coconut and arecanut etc. was 43.84 per cent. Area under total vegetables in Ratnagiri was only 0.004 per cent. The area under the total spices and total oilseeds in Ratnagiri district was 0.04 per cent and 0.07 per cent respectively. The percent share of total food crops in Ratnagiri was 99.93 per cent.

In Ratnagiri district, it was observed that, rice is an important staple food of the people. The production of rice in current year (i.e in 2021) was 1915 MT and the productivity of rice was 2829 kg/ha. Also the other cereal production in Ratnagiri was 2050 MT and the productivity was 2652 kg/ha. The total production of pulses in Ratnagiri was 42 MT and productivity was 733 kg/ha. The total food grains production of Ratnagiri district was 2092 MT and productivity are 2519 kg/ha.The total oilseed production in Ratnagiri was 5 MT and the productivity was 929 kg/ha.In Ratnagiri district, the production of Mango, Cashew and Coconut in current year 2021 was1328 MT, 1890 MT and 52000 lakh nuts and the productivity was 3 t/ha, 2000 kg/ha and 14000 nuts/ha respectively.

In Ratnagiri district, the daily agricultural wages paid to male agricultural labourersat current prices Rs.350 and at constant prices Rs.346.5, whereas female agricultural labour paid wages at current prices Rs.235 and at constant prices Rs.232.7 in current year 2021.

In Ratnagiri district, there are number of implements and machineries used for agriculture purpose. There are total ploughs in the district was 124092. Number of animal driven cart 2118 and the total tractors are 30. The interculturing implements and plant protection implements are 20,138 and 3976 respectively. The electric pumps are 3727 and oil engine pumps are 1025. In the district there are 550 paddy threshers. The number of ploughs per 100 ha of total cropped area of Ratnagiri district was 46.29 per cent.

In Ratnagiri district, there are total co-operative societies are 3007. The total members of the co-operative societies are 2573.90 thousand and the given total credits and capital of Ratnagiri district was Rs 415887.21 lakh and Rs 557291.04 lakh respectively.

Out of the total co-operative societies, the total agricultural co-operative credit societies are 367, under the Agricultural Cooperative Credit Societies the District central co-operative Bank (1), Primary agricultural co-operative society (363), Farmers service societies (2) and other banks (1). The member of total agricultural co-operative credit societies are 396.44 thousand and the capital of this bank was Rs 263115.48 lakh. The credit was given to people are Rs328450.3 lakh.The total Non-agricultural credit Societies in Ratnagiri are 282, out of thisGramin banks (4), Primary workers credit societies (81) and other non-agricultural credit societies are 197. The member of this societies are 1981.71 thousand and the capital was Rs293206.65 lakh. The credit was given to people Rs87403.16 lakh.

The total marketing co-operative societies in the district are 18. The total members of this societies are 21.914thousand and the capital of this bank was Rs881.11 lakh. Thecredit was given to people are Rs 1.94 lakh. The total producer societies in the district are 578. Out of the under industrial societies, milk societies, fisheries co-operative societies and other producers societies are 6, 224, 92 and 256 respectively. The members of this societies are 136.93 thousand and the capital was Rs36.07 lakh. The credit was given to people are Rs30.29 lakh.

The total social services and other co-operative societies are 1762. Out of this, under consumer store society, housing societies, contractor's societies and other societies are 91, 1551, 95 and 25 respectively. The members of this societies are 36.91 thousand and the capital was Rs51.73 lakh. Rs1.52 lakh credit was given to the people in the Ratnagiri district.

In Ratnagiri district, it was seen that area irrigated by surface irrigation was 5695 ha constituting 71.56 per cent of net area irrigated. The share of well irrigation in Ratnagiri was 28.44 per cent. The total net irrigated area of Ratnagiri district was 7958 ha. The percentage of net irrigated area to net sown area in Ratnagiri was 3.05 per cent. Gross irrigated area in Ratnagiri district was 11763ha. The percentage of gross irrigated area to gross cropped area was 4.39 per cent.

The total fertilizer consumption of Ratnagiri district was 15216.33 MT and per hectare fertilizer consumption of total fertilizer was 56.76 kg/ha. Out of the total fertilizer consumption, the consumption of complex fertilizer was 4564.50 MT and per hectare consumption of complex fertilizer was 17.02 kg. Other fertilizers consumed in Ratnagiri district was 10651.83 MT and per hectare consumption was 39.73 kg.

The sectorwise gross value added, gross domestic product and net value added, net domestic product of Ratnagiri district, it was seen that, the share of agriculture sector in total GDP was increasing at decreasing rate over the period at current as well as at constant prices. Also over the period, the percent share of primary sector as well as secondary sector was increasing at decreasing rate at both the current and constant prices in total GDP. The percent share of tertiary sector was increasing over the period at current and constant prices in total GDP of Ratnagiri district.

This showed that, the district level income generation and growth in agriculture sector as well as other sectors of the economy increased over the period.

In Ratnagiri district studied the variation and trend in selected parameters over a study period 2006 to 2021.It was observed that, the average area under forest over a study period was 55.17 ha and its variability was 2.85 per cent. The average area of land put to non-agricultural

use was 144.33 ha and its variability was 1.07 per cent over a study period. The average area of barren and uncultivable land during over the study period in Ratnagiri was 2302.33 ha and its variability was 1.41 per cent. The average area under permanent pasture and other grazing land over a study period was 137.25 ha and its variability was 0.79 per cent. During study period average area under miscellaneous trees crops and grooves in Ratnagiri was 69.33 ha and its variability was 1.59 per cent. The average area under culturable waste land during study period it was 1330.83 ha and variation occur during study period was 1.47 per cent. Area under current fallow during study period was 276.58 ha and its variability was 0.98 per cent, whereas area under other fallow during study period in Ratnagiri was 1355.83 ha and its variability was 0.80 per cent. Net sown area of Ratnagiri district during study period it was 2491.08 ha and its variation occur 1.96 per cent. The area under area sown more than once during study period was 103.08 ha and its variability was 13.19 per cent. The average area under gross cropped area during study period was 2594.17 ha and its variability was 1.48 per cent.

Rice is a staple food of Ratnagiri district, the average area under the rice was 73464.44 ha and the variability of area under rice was 6.25 per cent over a study period. Average area under other cereals during study period was 92706.81 ha and variability occur 11.17 per cent during study period. The average area of total pulses over the period was 6657.44 ha and the variation occur 32 per cent over the period. The average area of total spices in Ratnagiri district during study periodwas 586.88 ha and the variability was 72.27 per cent. The average area under mango in Ratnagiri district during study period was 53299.63 ha and the variability was 37 per cent. The average area under other fruits (i.e. cashew, coconut, arecanut etc.) during study period was 83568.38 ha and the variability occur 45.17 per cent. The average area under the total vegetables was 1590.81 ha over the period and the variability occur 48 per cent. The average area of total oilseeds during study period was 2509.69 ha and the variability was 93.16 per cent.The average area under total food crops in Ratnagiri over the period was 239086.19 ha and the variability was 19.19 per cent over the period in Ratnagiri.The average area of total non-food crops in Ratnagiri district during study period was 40014.94 ha and the variability was 158 per cent during study period. The average area under total food grains in Ratnagiri district during study period was 99641.38 ha and the variability was 13 per cent.

In Ratnagiri district during study period 2006 to 2021, it was seen that, the average area irrigated by surface irrigation was 5353.25 ha and the variability was 20.32 per cent. The average area irrigated by well irrigation in Ratnagiri district during study period it was 3318.31 ha and the variability was 47.12 per cent. The average net irrigated area by surface and well irrigation of Ratnagiri district during study period it was 8672.69 ha and variability occur 6.54 per cent. The average total irrigated area of Ratnagiri district during study period was 12030.63 ha and the variability was 12.69 per cent.

In Ratnagiri district over a study period 2006 to 2021 it was seen that,Rice is a staple food of Ratnagiri district, the average production of rice during study period it was 2059.19 MT and the variability occur 8.05 per cent. The average production of other cereals during study period it was 2255.13 MT and the variability occur 7.13 per cent. The average production of total pulses in Ratnagiri during study period it was 29.17 MT and the variability occur 38.34 per cent. During study period, the average production of total food grains in Ratnagiri was 2279.55 MT and the variability occur 7.50 per cent. The average production of total oilseeds occur in Ratnagiri district during study period it was 7.81 MT and variability in production of total oilseeds was 73 per cent. The average production of Coconut, Mango and Cashew over a study period it was 36514.25 tones, 101488.69 MT and 84953 MT and the variability occur in production of coconut, mango and cashew over a study period it was 38.22, 78.04 and 58.56 per cent respectively in Ratnagiri.

In Ratnagiri district studied the variation and trends in productivity of major crops over a study period 2006 to 2021, it was seen that the average productivity of Rice over the period was 2795.75 kg/ha and the variability occur 8.16 per cent over the period. During study period the average productivity of other cereals in Ratnagiri was 2749.25 kg/ha and the variability occur 33.34 per cent. The average productivity of total pulses over the period was 991.31 kg/ha and the variability occur 109.79 per cent. The average productivity of total food grains was 2587.13 kg/ha and the variability was 33.59 per cent.The average productivity of total oilseeds during study period was 696.69 kg/ha and the variability was 74.67 per cent. During the study period the average productivity of Coconut, Mango and Cashew in Ratnagiri was 8759.31 nuts/ha, 1.96 t/ha and 1058 kg/ha and the variability in productivity of Coconuts, Mango and cashew was 11.96, 85.41 and 44.88 per cent over a study period.

In Ratnagiri district studied the variation and trends under fertilizer consumption over a study period 2006 to 2021 it was seen that, the average total fertilizer consumption of Ratnagiri during study period was 19179.62 MT and the variability occur in total fertilizer consumption was 17.83 per cent. Out of the total fertilizer consumption, the average consumption of complex fertilizer in Ratnagiri during study period was 13772.96 MT and the variability occur42.66 per cent.The average consumption of other fertilizers out of the total fertilizer consumption in Ratnagiri district during study period it was 5406.66 MT and the variability occur98.91 per cent.

In Ratnagiri district studied variability and trends under agricultural wages over a study period 2006 to 2021 it was seen that, the average daily wages paid to male agricultural labour at current prices during study period was Rs 180 and the variation occur 55.78 per cent, whereas the average daily wages paid to female agricultural labour at current prices during study period was Rs 120.07 and the variation occur 47.55 per cent during study period. The average daily

wages paid to male agricultural labour at constant prices during study period it was Rs173.92 and the variation occur 57.03 per cent, whereas the average daily wages paid to female agricultural labour at constant prices during study period it was Rs 115.68 and the variation occur 48.45 per cent over the period.

The percent increase or decrease during previous decade in population of Ratnagiri district studied for the year 1971-81 to 2001-11 it was observed that, the population of Ratnagiri was increased by 8.6 per cent during the period 1971-81. Also the population increased during 1981-91 and 1991-2001 by 12 per cent and 9.9 per cent respectively. During the period 2001-2011 the population of Ratnagiri district was decreased by 4.5 per cent.

In Ratnagiri district studied the growth rates in land utilization pattern, cropping pattern, production and productivity of principle crops, area irrigated by different sources, fertilizer consumption and daily wages paid to agricultural labourfor the period 2006 to 2021at 5 per cent level.

From this study it was seen that, the growth in land put to non-agricultural use was significantly increased over the period of time by 0.28 per cent and per annum by 0.27 per cent. The net sown area of was significantly increased over the period of time by 0.48 per cent and per annum by 0.47 per cent. The total cropped area was significantly increased over the period of time by 0.32 per cent and per annum by 0.33 per cent. The other fallow land was significantly increased over the period of time by 0.17 per cent and per annum by 0.18 per cent.The forest land was significantly decreased over the period of time by 0.68 per cent and per annum by 0.70 per cent. The barren and uncultivable land significantly decreased over the period of time by 0.33 and per annum by 0.35 per cent. The culturable waste land significantly decreased over the period of time by 0.34 per cent and per annum by 0.35 per cent. Land under miscellaneous trees crops and grooves significantly decreased over the period of time and per annum by 0.35 to 0.37 per cent respectively. Area sown more than once was significantly decreased over the period of time by 2.60 per cent and per annum by 3.28 per cent. Area under current fallow was significantly decreased over the period of time by 0.19 per cent and per annum by 0.20 per cent. Area under permanent pasture and other grazing land showed non-significant result over the period of time and per annum.

Growth in area under total cereals significantly decreased over the period of time and per annum by 2.33 to 7.10 per cent respectively. Growth in area under total pulses was significantly decreased over the period of time by 5.12 per cent and per annum by 5.02 per cent. Growth in area under total food grains was significantly decreased over the period of time by 2.57 per cent and per annum by 2.63 per cent. Growth in area under total spices was significantly decreased

over the period of time by 14.23 per cent and per annum by 16.47 per cent. Growth in area under total vegetables was significantly decreased over the period of time by 2.59 per cent and per annum by 16.53 per cent. Growth in area under total oilseeds was significantly decreased over the period of time by 18.72 per cent and per annum by 25.88 per cent. Growth in area under total non-food crops was significantly decreased over the period of time by 26.51 per cent and per annum by 41.30 per cent at 5 per cent level.

Growth in area under mango in Ratnagiri was significantly increased over the period of time by 6.46 per cent and per annum by 8.93 per cent at 5 per cent level. Also the growth in area under other fruits (i.e. cashew, coconut, arecanut etc.) was significantly increased over the period of time by 8.71 per cent and per annum by 12.63 per cent. Growth in area under total food crops was significantly increased over the period of time by 3.32 per cent and per annum by 3.77 per cent in Ratnagiri district at 5 per cent level.

Growth in production of Rice was significantly increased over the period of time by 0.37 per cent and per annum by 0.33 per cent. Growth in production of total pulses was significantly increased over the period of time by 4.48 per cent and per annum production of total pulses was significantly decreased by 6.18 per cent at 5 per cent level. Growth in production of coconut was significantly increased over the period of time by 7.56 per cent and per annum by 8.51 per cent. Growth in production of mango was significantly increased over the period of time by 12.30 per cent and per annum by 18.99 per cent. Growth in production of cashew was significantly increased over the period of time by 12.39 per cent and per annum by 18.81 per cent at 5 per cent level.Growth in production of total oilseeds was significantly decreased over the period of time by 13.80 per cent and per annum by 16.21 per cent in Ratnagiri district at 5 per cent level. The growth in production of total food grains showed non-significant result over the period of time and per annum.

In Ratnagiri district, studied the growth rates of productivity of principle crops for the period 2006 to 2021 at 5 per cent level. It was seen that, the growth in productivity of rice was significantly increased over the period of time by 1.07 per cent and per annum by 1.08 per cent. Growth in productivity of other cereals showed non-significant result over the period but per annum the productivity of other cereals was significantly increased by 3.27 per cent. Growth in productivity of total food grains was significantly increased over the period of time by 3.85 per cent and per annum by 3.59 per cent. Productivity of total oilseeds in was significantly increased over the period of time by 10.11 per cent and per annum by 9.57 per cent.

During study period, growth in productivity of coconut seen significantly increased over the period of time by 2.32 per cent and per annum by 2.37 per cent. The productivity of mango

was significantly increased over the period of time by 14.99 per cent and per annum by 35.31 per cent. Growth in productivity of cashew was significantly increased over the period of time in Ratnagiri by 9.23 per cent and per annum by 11.54 per cent at 5 per cent level. Growth in productivity of total pulses showed non-significant result over the period of time and per annum.

During study period, growth in area irrigated by different sources it was seen that, the growth in area irrigated by surface irrigation was significantly increased over the period of time by 3.14 per cent and per annum by 3.59 per cent, but area irrigated by well irrigation it was significantly decreased over the period of time by 8.23 per cent and per annum by 7.11 per cent.The total net irrigated area of Ratnagiri district was significantly decreased over the period of time and per annum by 1.21 to 1.20 per cent.

During study period 2006 to 2021, the growth in total fertilizer consumption was significantly decreased over the period of time by 3.34 per cent and per annum by 3.39 per cent at 5 per cent level.

In Ratnagiri district seen that, the growth in daily wages paid to male agricultural labour at current prices was significantly increased over the period of time by 11.81 per cent and per annum by 13.24 per cent and growth in daily wages paid to female agricultural labour at current prices was significantly increased over the period of time by 9.05 per cent and per annum by 9.50 per cent at 5 per cent level.

Growth in daily wages paid to male agricultural labour at constant prices was significantly increased over the period of time by 12.15 per cent and per annum by 13.37 per cent and growth in daily wages paid to female agriculture labour at constant prices was significantly increased over the period of time by 9.32 per cent and per annum by 9.67 per cent at 5 per cent level.

CONCLUSION:

1) In Ratnagiri district, the percent of agricultural working population was very low i.e. 9.48 per cent as compared to other working populations, because of number of people using the new developed techniques for agricultural purpose.

2) The proportion of land under miscellaneous trees crops and grooves, permanent pasture and other grazing land, area sown more than once and area under forest was low in Ratnagiri as compared to other lands. The proportion of net sown area was high i.e. 32 per cent of reported area.

3) In Ratnagiri, the proportion of total cattle population was high i.e. 80.47 per cent as compared to other livestock population of the total livestock.

4) Rice is a staple food of Ratnagiri district. The area under the rice was very high i.e. 25.67 per cent as compared to other cereals.

5) Area under total fruits in Ratnagiri was very high as compared to total cereals and total pulses i.e. 68.67 per cent, because most of the area of Ratnagiri district was hilly area. Out of the total area, area under other fruits (Cashew, Coconut and arecanut etc.) was high i.e. 43.84 per cent, followed by in mango was 24.79 per cent and in banana was very low 0.04 per cent.

6) In Ratnagiri district, land put to non-agricultural use, land under barren and uncultivable, culturable waste land, land under miscellaneous trees and grooves, permanent pasture and other grazing land, land under current fallow, other fallow, net sown area and total cropped area there was seen stable development in land utilization over the period, while the land under forest and area sown more than once showed the high variation in land utilization over the period.

7) The area under forest, barren and uncultivable land, culturable waste land, land under miscellaneous trees and grooves, current fallow and area sown more than once was significantly decreased, while the net sown area and other fallow area increased significantly in Ratnagiri district.

8) Growth rates of area under total cereals, total pulses, total spices, total vegetables and total oilseeds was significantly decreased, whereas area under Mango and other fruits (i.e. Cashew, Coconut, arecanut etc.) was significantly increased over the period in Ratnagiri district.

9) In Ratnagiri district, the production of coconut, mango and cashew was significantly increased over the period, while the production of rice, other cereals and total food grains showed non-significant result over the period.

10) In Ratnagiri, the productivity of rice, other cereals, total food grains, total oilseeds, Coconut, Mango and Cashew was significantly increased over the period, while the productivity of total pulses showed non-significant result over the period in Ratnagiri district.

11) Area irrigated by surface irrigation was significantly increased, while the area irrigated by well irrigation was significantly decreased over the period.

12) Fertilizer consumption of Ratnagiri district over the period it was significantly decreased.

13) In Ratnagiri district, daily wages paid to agricultural labour at current as well as constant it was significantly increased over the period.

14) The gross value added & gross domestic product and net value added & net domestic product of the Ratnagiri district it was increasing at current as well as at constant prices due to major contribution from tertiary sector followed by primary and secondary sector. Agriculture was the major trend in primary sector.

IMPLICATIONS

In the light of the present findings, the following policy implications have been suggested for the rapid development of agricultural sector in Ratnagiri district.

1) Agriculture is an ideal means to improve rural economy of Ratnagiri district government has to develop non-agricultural sector especially industrial and service sectors rapidly. It would be helpful to commercialize agriculture in this globalization and economic liberalization era.

2) In case of land use pattern of the Ratnagiri district, there is a need to bring about change in the technique of land utilization to increase land under plough and economic activities. Improved land use is the only answer and this includes provision for more and more irrigation facilities and application of whole range of practices as well as efficient management of forests and pastures.

3) The potential for commercial production of fruits and vegetables, for which many parts of the Ratnagiriare ideally suited, has not been fully exploited. Thus, government should look into various problems of marketing.

4) In Ratnagiri district, the area under the total cereals, total pulses, total oilseeds and total vegetables was declining. This was mainly due to increase in area under horticultural crops. However, it careful planning to maintain food security of the district.This challenge can be met by increasing production and productivity in agriculture through increased use of fertilizers, improved seeds, credit, improved agricultural implements, improved farm practices etc.

5) With the removal of subsidy on chemical fertilizers, its consumption has been decreased. Thus, the government should not subsidise chemical fertilizers and also other modern costly inputs till the initial breakthrough are achieved and purchasing power of the farmer is increased adequately.

6) Marketing of agricultural produce is as important as production. Marketing of agricultural produce is a great problem in Ratnagiri district due to the lack of transportation and communication network due to the hilly and mountainous districts. The limitation of road and transport has also made the modern technology, modern inputs, credit and skilled manpower inaccessible and expensive in those regions. Thus government construct rural roads in all commercial production pockets and to link all headquarters by road network.

7) In Ratnagiri district, there is airrigation facilities are insufficient. Hence, the government give some irrigation projects to improve the irrigation facilities at desired level and develop the agriculture sector.

8) Large proportion of the area under barren and uncultivable land, culturable waste land. This area need to be brought under plantation crops to increase the income and employment opportunities in the district.

9) Most of the area of Ratnagiri district was hilly area, so government suggested the Ratnagiri people to grow the plantation crops like mango, cashew, coconut and arecanut etc. for to enhance the horticulture sector in district.

10) Animal husbandry is very important next to agriculture and horticulture but it is not developed at desired level in Ratnagiridistrict. The government efforts will have to be concentrated to grow pasture to ensure growth in animal husbandry sector.

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APPENDICES

Appendix I

Land utilization pattern of Ratnagiri district (2006 to 2017) (Area '00' ha)

Year	Forest	Land put to non-agril.use	Barren & uncultivable land	Permanent pasture & other grazing land	Land under Misc. tree crops and grooves	Culturable waste land	Current fallow	Other fallow	Net sown area	Area sown more than once	Total cropped area
2006	57	142	2335	137	70	1352	280	1344	2442	114	2556
2007	57	142	2335	137	70	1352	280	1344	2442	114	2556
2008	57	142	2335	137	70	1352	280	1344	2442	114	2556
2009	57	143	2335	137	70	1357	277	1345	2443	115	2558
2010	57	145	2335	139	70	1353	277	1344	2444	115	2559
2011	54	145	2333	139	70	1326	278	1375	2444	115	2559
2012	54	145	2267	139	70	1312	275	1361	2541	115	2656
2013	54	145	2267	136	70	1312	270	1361	2549	87	2636
2014	54	146	2273	136	69	1310	276	1354	2546	87	2633
2015	53	146	2267	136	69	1311	276	1366	2538	87	2625
2016	54	146	2267	137	67	1309	275	1366	2545	87	2632
2017	54	145	2279	137	67	1324	275	1366	2517	87	2604

(Note: After 2017 data was not available, so I took data for land utilization pattern from 2006 to 2017)

Appendix II

Area under different crops in Ratnagiri district (2006 to 2021) (Area 'ha')

Year	Total cereals	Total pulses	Total foodgrains	Total spices	Mango	Total fruits	Total vegetables	Total oilseeds	Total food cropped area	Total non-food cropped area
2006	108422	7562	115984	1099	20674	24611	1529	5474	163897	154512
2007	108031	7580	114963	1077	20671	24618	1545	5489	163899	144151
2008	102131	8100	113021	1121	21679	24895	1599	5999	168974	147878
2009	101213	9199	112704	1222	22789	31086	1671	6461	169472	146987
2010	102705	11120	113825	1137	38118	37894	1658	5182	192632	5179
2011	101665	8629	110294	1000	65139	92840	895	2517	269168	2517
2012	99868	7900	107768	578	65554	93567	2569	2364	269458	2346
2013	87417	3693	91110	430	67749	109009	1590	2346	269458	32346
2014	94428	6889	101317	234	67973	107034	1884	2307	278447	2307
2015	89167	6807	95974	270	68324	109220	2368	578	276161	578
2016	85896	6786	92682	270	65109	107834	2368	578	268263	578
2017	81208	5311	86519	270	65561	113056	1473	171	266879	171
2018	79925	3711	83636	94	65930	117704	2800	175	267644	175
2019	81208	5311	86519	399	65561	113056	1473	171	267008	171
2020	80100	4210	84329	95	65550	114246	20	173	266111	173
2021	79925	3711	83636	94	66463	117654	11	175	267908	175

Appendix III

Production of principle crops in Ratnagiri district (2006 to 2021) (MT)

Year	Rice	Total cereals	Total pulses	Total foodgrains	Total oilseeds	Coconut	Cashew	Mango
2006	1946	2219	14	2233	17	21062.5	14760	71136
2007	1950	2220	14	2232	17	21062.5	13809	25381
2008	1960	2110	13	2125	15	21062.5	13809	18485
2009	1968	2185	12	2197	14	21062.5	44920	15037
2010	2013	2281	36	2317	10	21062.5	55315	13313
2011	2216	2461	43	2504	6	21062.5	119824	11589
2012	2218	2430	43	2473	9	21062	65700	20284
2013	2024	2127	20.28	2147.28	9.2	41253	99105	60840
2014	2115	2297	37.82	2334.82	12.16	41253	78557	207560
2015	2141	2169	37.37	2206.37	2.27	49658	78543	190131
2016	1719	2090	37.26	2127.26	2.27	49658	116900	190000
2017	2203	2376	31	2407	2	49658	117880	130000
2018	2239	2396	21	2417	1	52000	124500	152500
2019	2409	2626	35	2661	2	52300	141588	252920
2020	2162	2338	38.5	2376.5	3.5	51655	165336	132877
2021	1915	2050	42	2092	5	51011	189084	131766

Appendix IV

Productivity of principle crops in Ratnagiri district (2006 to 2021) (Kg)

Year	Rice	Total cereals	Total pulses	Total foodgrains	Total oilseeds	Coconut (nuts/ha)	Cashew	Mango
2006	2527	2162	587	1998	380	7611	401	0.1
2007	2530	2174	590	1998	380	7612	355	0.1
2008	2557	2199	599	2000	380	7612	355	0.1
2009	2562	2200	600	2020	400	7611	742	0.1
2010	2597	2247	450	2032	400	7611	839	0.2
2011	2870	2426	450	2300	400	7611	1459	0.2
2012	2883	2433	549	2321	392	7611	799	1
2013	2883	2433	549	2321	392	9706	1198	1.04
2014	2904	2433	549	2321	392	9355	943	4
2015	3037	2433	549	2321	392	9500	943	4.2
2016	2474	2433	549	2321	392	9300	1424	4.5
2017	3215	5228	4150	4917	2121	9000	1420	3.45
2018	2959	5013	3550	4711	1600	10000	1500	3.25
2019	3166	2877	686	2762	1298	10001	1500	3
2020	2997	2764	709	2640	1113	10003	1750	3
2021	2829	2652	733	2519	929	10005	2000	3.1

Appendix V

Area irrigated by different sources (2006 to 2021) **(Area 'ha')**

Year	Surface irrigation	Well Irrigation	Net irrigated area	Total irrigated area
2006	3783	5642	9425	10448
2007	3784	5641	9425	10448
2008	3784	5639	9423	10446
2009	3783	5637	9425	10448
2010	3783	5629	9425	10448
2011	6273	2263	8536	14603
2012	6095	2263	8358	14190
2013	6095	2263	8358	14190
2014	6095	2263	8358	13207
2015	6095	2263	8358	14007
2016	6807	2275	9082	12769
2017	6095	2263	8358	11569
2018	6095	2263	8358	10428
2019	5695	2263	7958	11763
2020	5695	2263	7958	11763
2021	5695	2263	7958	11763

Appendix VI

Fertilizer consumption (2006 to 2021) **(MT)**

Year	Complex fertilizer	Other fertilizers	Total fertilizers
2006	10463	10149	20612
2007	10548	13215	23763
2008	11211	14521	25732
2009	12011	8167	20178
2010	20559	974	21533
2011	20852	2164	23016
2012	19664	439	20103
2013	19817	380	20197
2014	18552	621	19173
2015	17109	208	17317
2016	17508	1162	18670
2017	17654	1011	18665
2018	12482	623	13105
2019	4361.7	11665.99	16027.69
2020	3011.1	10554.77	13565.87
2021	4564.5	10651.83	15216.33

Appendix VII

Daily wages paid to agricultural labour in Ratnagiri District (2006 to 2021)

	Current prices (Rs)		Constant prices (Rs)	
Year	**Male agricultural labour**	**Female agricultural labour**	**Male agricultural labour**	**Female agricultural labour**
2006	50	46	-	-
2007	67	65	62.98	61.1
2008	71	59	67.45	56.05
2009	82	65	76.26	60.45
2010	100	80	96	76.8
2011	121	93	110.11	84.63
2012	175	125	161	115
2013	120	94	111.6	87.42
2014	152	100	144.4	95
2015	113	80	111.87	79.2
2016	132	90	137.28	93.6
2017	261	131	255.78	128.38
2018	278	209	269.66	202.73
2019	328	225	314.88	216
2020	350	235	343	230.3
2021	350	150	346.5	148.5

THESIS ABSTRACT

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The present study was an attempt to investigate the existing status, variability, trend and growth rates in different selected parameters of Ratnagiri district. The information in this regard was obtained from different published records of State Government of Maharashtra for the period from 2006 to 2021. Study findings revealed that, the geographical area of Ratnagiri district it was 8208 sq.km. As per the census 2011, the total population was 16.15 lakh. The sex ratio of females per 1000 male 1122. The total literacy rate 82.18 per cent. The agriculture working population was only 9.48 per cent. The land-man ratio 0.51 per cent.

The proportion of land under miscellaneous trees crops and grooves, permanent pasture and other grazing land, area sown more than once and area under forest was low as compared to other lands. The proportion of total cattle population was high i.e. 80.47 per cent. Rice is a staple food of Ratnagiri district. The area under the rice was very high i.e. 25.67 per cent as compared to other cereals. Area under total fruits it was very high as compared to total cereals and total pulses i.e. 68.67 per cent, because most of the area of Ratnagiri district was hilly area. The gross value added & gross domestic product and net value added & net domestic product of the Ratnagiri district it

was increasing at current as well as at constant prices due to major contribution from tertiary sector followed by primary and secondary sector. Land put to non-agricultural use, land under barren and uncultivable, culturable waste land, land under miscellaneous trees and grooves, permanent pasture and other grazing land, land under current fallow, other fallow, net sown area and total cropped area there was seen stable development in land utilization over the period. The net sown area and other fallow area increased significantly. The area under Mango and other fruits (i.e. Cashew, Coconut, arecanut etc.) was significantly increased over the period. The production of coconut, mango and cashew was significantly increased over the period. The productivity of rice, other cereals, total food grains, total oilseeds, Coconut, Mango and Cashew was significantly increased over the period. Area irrigated by surface irrigation was significantly increased. Fertilizer consumption was significantly decreased. The daily wages paid to agricultural labour at current as well as constant it was significantly increased over the period. This indicated that the agricultural development is taking shape in desired direction.

Keywords: Ratnagiri, Agricultural development, Significantly, increased, proportion, per, cent.

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