CHAPTER – VIII

SUMMARY, CONCLUSION AND RECOMMENDATION.

In the present research work, an attempt is made to study the spatio temporal changes in agricultural landuse in Ratnagiri district. From the preceding analysis, following findings has been emerged, and suitable suggestions have been also recommended in this chapter to change the existing situation and to achieve agricultural development in the study region. Ratnagiri district has significant location on coast of Arabian Sea. It is characterized by notable spatial variation in the ecological and socio – economic frameworks. The forms of agricultural activities and farm economy, as whole influenced in a large measure of relief, climate, and soil. It is very essential to study the relationship between the main physiography an various land use and agricultural practices.

The relief is an important element of the ecological setting, directs influencing land- utilization and the degree of accessibility. Ratnagiri district forms a part of the Maharashtra littoral, the micro- level divisional coastal plains. District as whole is a hill tract. Over 85% of the land surface is hilly. On the basis of local variation in physiography and other characteristics the district can be grouped into three parts.

i) The Sahyadri hills,
ii) Ratnagiri plateau
iii) The Ratnagiri coast

Sahyadri hills are spread elongated over the parts of Mandangad, Khed, Chiplun, Sangmeshwar, Lanja & Rajapur tahsils in the north–south direction in the extreme east of the district. The hills have an elevation of over 200 metres, which is more than 600 metres at the upper reaches and is characterized by having very steep slopes. The highest spot heights is 1239 meters in Khed tahl. Ratnagiri plateau has an elongated north – south extent varying considerably in width through the center of the district. The height of plateau varies between 110 meters and 200 meters form mean sea level. The slopes of have partly, eroded yellowish red soil, which are shallow in depth, coarse in texture and poor in fertility. In kharif season, rice, ragi, small millets, kulith udid etc. are grown in this area. In the valley areacnut and
coconut gardens thrive well in deep sandy loams. The Ratnagiri coast is extending in a narrow stripe of land running the entire length of the district covering parts of Rajapur, Ratnagiri, Guhagar, Dapoli and Mandangad tehsil. It attains the height below 100 meters. The coastal strip in Dapoli, Guhagar, Ratnagiri, and Rajapur tahils have a deep sandy, loam soil. In which coconut and areca-nut gardens thrive well Rice, Ragi, kulith and other crops are grown in the kharif season.

The rivers like Shastri, Bav, Ratnagiri, Muchkundi, Jaitapur, and Jagbudi drain the district. All these rivers in the district originate from Sahyadri ranges and flow from east to west and merge in the Arabian Sea. All these rivers are May well be described as un–directional and parallel, all drainage is carried by short and swift flowing streams, which have curved out, deep valleys on the west facing slope of the Sahyadries. Each river have a small drainage area and hence they are of small size and volume. Their intensely seasonal region is yet another limitation to their economic use. In the monsoonal season, they become rushing torrents of water, but during the rest of the year, they develop threaded channels of sluggish water in the otherwise dry and boulders beds, with hardly a capacity for fulfilling the local need for drinking water. This seasonal regime and the deeply entrenched nature of their bed make the rivers of the district unsuitable for irrigation, though attempts are now under way to develop lift irrigation and bunding under modem methods. In spite of these natural drawbacks, the river are of great value of the district, form the point of view of navigation.

Climatic condition in Ratnagiri district are strongly influenced by its geographical position and relief and provide a major physical control in land use. From an agricultural point of view the climate are the mildness and moistness of the climate, the seasonality of rainfall, which tends to accentuate the inevitable uncertainties of farming. The average annual rainfall in the district is about 4047 M.M. The district gets the heaviest rainfall from south–west monsoon wind. Highest rain fall occurs in Sangmeshwar tehsil i.e. 6943 M.M. and lowest annual rainfall reported in Guhagar tehsil 3833 M.M. The rainfall increases from the cost towards the interior and also with alttitude.

The co-efficient of rainfall variability ranges from 16.20% to 26.40% in the district. The highest rainfall variability is marked in Guhagar tehsil (29.25%) and lowest in Sangmeshwar tehsil (16.20%) during the period of investigation. Intensity of rainfall is very high in Mandangad tehsil (36.42) and very low intensity is in the
Ratnagiri tehsil (23.71). The average rainfall intensity of district is marked 30.03 M.M.

The soil characteristics in the study area differ considerably from place to place, being mostly controlled by local topography, under laying rocks and the types of vegetation. Soil can broadly be classified in to three groups

i) Laterite Soil
ii) Coastal alluvium Soil
iii) Salt land.

Laterite soils, which are predominant in the district, vary in color from bright red to brownish red owing to the preponderance of hydrated iron oxide. The coastal strips in Dapoli, Guhagar, Ratnagiri tahsils are covered with soils of recent deposits and are locally known as pulanwat. They are deep sandy loams and coconut garden and areconut gardens thrice well in them paddy is also taken here to some extent. Salt soil is locally known as khar. The western strips are salty while in other coastal tehsil are only salt patches, which are suited to the coarser types of paddy are to be noticed.

About 5860 hectares (0.71%) of the total geographical area of the land area is covered by different types of forests. Khed rank first (3622) hectares and Rajapur tehsil last (826) hectares, whereas four tehsil, namely Dapoli, Gahagar, Ratnagiri and Sangeshwar have not observed forest are during the period of investigation. It may be mentioned that the district’s flora is rich from the point of view of domestic economy.

Table 3.1 reveals that the trend of general population growth was increased by 5.1% during the decade of 1961-71. After it was decreased by 3.7% in 1971-81, which in 1981-91, it was increased by 4%. During 1991-2001, the trends of general population growth was declined by 2% In 2001-2011 decade shows reverse trend i.e. 4.93%. Rural population was increased by 5.1% from 1961 to 1971. It was decreased by 2.2% form 1971-81. During 2001-2011 decade, indicates reverse trend in rural growth by -10.33% urban population growth rate was increased form 24.5% to 37.35% between 2001 to 2011. The growth rate of urban population of the district was decreased by 1.85% in 2011 (37.35%) as compared to 2001 (39.2%)

Crude density, Physiological density, Caloric density and agricultural density varies from tehsil to tehsil in the Ratnagiri district during 1991 to 2011. Average crude density for a district as a whole was 187/sq.mk in 1991 and it was increased up to 198 in 2011. Whereas the average physiological density was registered in 667/sq.km in 1991, which decreased upto 614/sw.km in 2011. Agricultural density
per square km. was 181 in 1991 and it was increased up to 128 in 2011. Below 100 agricultural density per sq.km as found in Madangad, and Dapoli tehsil whereas 100 to 150 agricultural density per sq.km. was noticed in Guhaghar, Khed, Ratnagiri and Lanja tehsil. Above 150 agricultural density per sq.km was marked in Rajapur, Chiplun and Sangemeshwar tehsil in 2011. The caloric density of population for the year 1991 was 998 person / sq.km, as against 500 in 2011. It is noticed that the caloric density of population decreased in 2011.

Table 3.3 indicates that the total surface irrigation area in the district was about 13.25 hundred hectare in 1991-92, which suddenly increased up to 6.96 hundred hectares in 2011-12. It is observed that (table 3.3) last twenty one year area under surface irrigation has increased by 360.07% during the period of investigation. There were four tahsils, namely Madengad (451.85%), Chiplun(1513.72%), Guhagar (14.28.30%) and Ratnagiri (1507.54%), which registered higher increase in surface irrigated area than the district average of 360.07% The remaining give tahsils, namely Dapoli, Khed, Sangemeshwar, Lanja and Rajapur have registered below district average of surface irrigation.

In the year 1991-92, the share of well irrigation in the net irrigated area was, 56.28% where the wells were the dominant source of irrigation. But during the year 2011-12, the share of wells irrigation in net irrigated area was decreased upto 27.08%. The Sangameshwar tehsil has marked highest increase in area under wells (184.61%) and least increase in Lanja tehsil (8%) during the period understudy. While Dapoli and Rajapur tahsils were marked 19.78% and 12.03% negative increase in irrigated area under wells respectively. In case of area under net irrigation, it was observed that four tahsils namely Manangad (178.83%), Chiplun(583.63%), Guhager (490.42%) and Ratnagiri (340.75%) have marked higher increase in irrigated area than the district average (175.78%). The total net irrigated area in the district was about 1.96% in 1991-92, which increased upto 5.38% in 2011-12. The highest irrigation facilities was enjoyed by Chiplun(932.98%) and lowest by Dapoli(42.32%) tehsil.

Table 3.4 indicates that agriculture in Ratnagiri district completely depends on traditional agricultural implements i.e. wooden plough and iron plough. Only 30 tractors were found in the district during the year 2011-12. About 3727 electric pumps were used for lifting water to agriculture in the study region. In the area 1991-
92, about 160 oil engine were marked in the district, while in the year 2011-12, the total number of oil engine were increased upto 1025 in the study area.

Bullock carts increased from 1889 to 2118 between 1991-92 to 2011-12. Out of the total bullock carts of the district below 6% bullock carts were observed in Mandangad(5.86%) Guhagar(2.07%) and Lanja(5.94%) tehsil, while 6% to 10% bullock carts were found in Chiplun (6.46%) and Rajpur (8.92%) during the year 2011-12. Above 10% bullock carts were registered in Dapoli (19.83%).Khed(24.97%) and Ratnagiri (10.48%) tahsils during the same year.

Total length of state highway was marked 902km., while the major district roads have the length of 1409km in the study region. Whereas, other district road occupied 1502km and villages road was marked 3463km length during the year 2011-12. Table 3.5 reveals that the village roads were account near about half of the total length of the district (45.89%), followed by other district highway (19.89), further followed major district highway (18.65%) during 2011-12. The state highway occupier more than 10% of the total length of the district, while the national highway have little more than 3% length of the district.

Table 3.6 shows change in the pattern of distribution of operational holdings and operated area between 1991-92 and 2011-12. It is seen that more than 47% of households operated less than one hectare of land in the both years. The proportion increased marginally, from 47.16% in 1991-92 to 51.55% during 2011-12, and the proportion of area operated by them increased from 7.12% in the former year to 10.42% in the latter. The top group (20 and above), it included 0.68% in 1991-92. By 2011-12, these percentage came down to 0.44 and 6.74 respectively. This also resulted in the average area operated by this group to decrease from 29.45% former period to 26.95% in the latter.

During the year 2011-12, out of the total consumption of electricity about 51.33% electricity was consumed by industrial sector. Domestic, commercial and Agricultural categories have shown negative change in electricity consumption during the study period. While industrial, road lighting, and other consumption have shown positive change to a large extent in electricity consumption due to increase industrialization and urbanization in the district.

Table 3.8 reveals that, the district head quarter Ratnagiri is the most important marketing centre for agricultural commodities. At present 19 marketing organizations
are actually engaged in the deposal of various agriculture commodities in the study region.

There are 380 agricultural credit societies in the district and number of member are 268310 as on 31st March 2012. The highest number of agricultural societies are observed in Ratnagiri (55) tehsil and lowest in Mandangad(26) tehsil in 2012. While tehsil wise distribution of agricultural credit societies are marked in Mandanged 26, Dapoli 41, Khed 49, Chiplun47, Guhagar 29, Sangmeshwar 50, Lenja 35 and Rajapur 48 during the same year. The highest numbers of member of credit societies are marked in Sanmeshwar(43363) tehsil, whereas lowest in Rajapur(14700)tehsil in 2012. In loan advanced, Khed tehsil is rank first(24.58%) and Mandengad least(6.41%), while highest loan recovery is experienced in Khed(22.32%) and lowest loan recovery in Dapoli (4.06) tehsil.

Ratnagiri district has 1543 villages of various sizes and 16 urban centers. The rural settlements types and their distribution in the district are intimately related to its morphology and the agrarian economy. The settlements in the district generally consist of small groups of house dotting the paddy field. The hamlets are locally known as ‘Vadas’ and situated according to the available of land for cultivation.

Ratnagiri district is one of the agriculturally back ward region of Konkan division. Therefore, the use of chemical fertilizer very less as compared to state. The highest share of consumption of chemical fertilizers was noticed in Chiplun(21.40%) tehsil, whereas, the lowest share of consumption was registered in Lanja(5.40%) in 1991-92. During the year 2011-12, the highest share of consumption of chemical fertilizer was noticed in Ratnagiri(26.44%) and lowest in Mandangad(2.22%) tehsil. Use of chemical fertilizer increased by 15.95 times during the period of investigation.

The proportion of cattle in the total livestock was ranked first in 1991-92, as well as in 2011-12 in all tehsils of the Ratnagiri district. There were about 2.44 lakh cows, 0.60 lakh buffaloes, 1.80 lakh bullocks, 0.37 lakh goat and small number of sheep during the year 2011-12. The highest percentage of cows were found in Mandangad(59.40%) and lowest in Lanja(32.48%) in 2011-12. Out of the total livestock below 45% cow was noticed in Dapoli(41.90%), Khed(43.52%), Guhagar(40.48%), Ratnagiri(40.44%), Sangmeshwar(43.55%), Lanja(32.48%) and Rajapur(43.57%) during 2011-12. Above 45% cow observed in Chiplun(47.66%) and Mandanged(59.28%) during the same year. The highest percentage of bullock population was marked in Lanja(48.99%) tehsil and lowest in Mandanged (24.23%)
in 2011-12. Below 6% positive changer in bullock population was took place in Ratnagiri and Chiplun tehsils and above 6% positive change was marked in Lanja and Sangmeshwar tahsils during the study period. While negative change in bullock and population was registered in Dapoli, Khed, Rajapur, Mandangad and Guhaghar during 2011-12.

Buffaloes ranked third in livestock in Ratnagiri district. Buffaloes increased from 41107 to 60220 between 1991 and 2012. The percentage contribution of buffaloes to total livestock population was 5.36 and 10.65 during the years 1991-92 and 2011-12 respectively. All tahsils reveals positive change in buffalos’s number during the period under study.

The highest percentage of goat population was marked in Rajapur (8.52%) tehsil and lowest in Lanja (3.56%) tehsil. Out of the total livestock, below 5% was occupied by the goat in Lanja (3.56%), Guhagar (5.00%) and Khed (4.42%) tahsils in 2011-12. About 5% to 8% goat population was noticed in Mandangad (5.89%), Dapoli (7.73%), Chiplun (7.53%), Ratnagiri (7.88%) and Sangmeshwar (6.74%) tehsil, whereas above 8% goat population was experienced in Ratnagiri tehsil (8.52%). The number of sheep are negligible in the district, out of nine tehsils, only six tahsils have few number of sheep other animals are mainly associated with to low class, landless population, to which these animals particularly horses and donkeys etc. are largely associated as means of earning live hood. The highest number of other animals is found in Ratnagiri tehsil and lowest in Mandangad.

The improved verities of food grain crop evolved by the Konkan Krishi Vidya peeth Dapoli, which give about 10% to 15% increased yield over the local verities of seeds. The improved seed of rice generally used in the district are IR8, IR12, Jaya, village etc.

Zero percent area under forest was marked in Dapoli, Guhagar, Ratnagiri and Sangmeshwar tehsils for two reference years, i.e. 1991-92 and 2011-12. Ratnagiri district has only 0.66%(5400 hectares) of its total area under forest in 1991-92, with a marginal increase of 0.05% during the period under observation. There are marked variations in tehsil level, ranging from below 0.50% in Chiplun to over 2% in Khed tehsil.

About 176900 hectares of land was not available for cultivation in the district during 1991-92. Area not available for cultivation increased from 176900 hectares to 219096 hectares (5.12%) from 1991-92 and 2011-12 in entire study region. Out of
the total geographical area below 2.5% area is found under this group of land use in Mandanged (21.25%), Khed (23.12%) and Rajapur (13.48%), whereas, 25% to 30% area is not available for cultivation in Dapoli (28.10%), Guhagar (27.20%), Chiplun (27.92%) and Lanja (27.41%) during 2011-12. Above 30% geographical area is noticed in Ratnagiri (40.38%) and Sangmeshwar (31.91%) tahsils during the same year.

During 1991-92 about 203900 hectare land was other uncultivable land. This land has increased from 203900 hectares to 215465 hectares between 1991-92 and 2011-12. There was marked 1.37% (11565 hectares) increase during the period of investigation. Total area under these land-use category amounts 26.41%, which was higher than the state average of 7.8%. Regional distribution under this category varies from below 15% to over 25%. The highest percent of area under this land use category is marked in Rajapur (58.48%) and lowest in Mandanged (6.86%) during 2011-12. The positive change in this land use category is registered in Mandanged, Khed, Chiplun, Rajapur, Sangmeshwar tahsils, whereas negative change is experience in Guhagar, Lanja, and Dapoli tahsils during the period of investigation.

Fallow land comprised 24.18% (197000 hectares) of the total area of the study region in 1991-92. It came down to 13.79% (112614 hectares) in 2011-12. The decrease in fallow land in the study region varies ranging from 3.83% in Ratnagiri tehsil to 50.54% in Khed tehsil. The study region marked 13.79% area under fallow land, which is more than the state averages of 7.4%. This is because of the topographic and edaphic-climatic conditions. Below 5% positive change in fallow land is marked in Lanja tehsil and above 5% positive change is recorded in Guhagar and Chiplun tehsil from 1991-92 and 2011-12. While remaining tahsils are marked negative change in this land use category during the period of investigation.

The net area sown increased from 231500 hectare to 263398 hectare between 1991-92 and 2011-12. It means that about 313898 hectares net area sour was increased in the entire study region during the period of investigation. But this proportion is not uniform all parts of the district. Out of the total geographical area below 30% area is marked under net sown area in Chiplun (29.23%), Sangmeshwar (28.73%) and Rajapur (24.46%) tahsils in 2011-12. About 30% to 35% area is experienced under this land use category in Ratnagiri (35.1%) and Lanja tahsils during 2011-12. Above 35% geographical area is marked in Mandangad (44.85%), Dapoli (37.06%) and Khed (38.39%) tahsils during the same year.
The proportion of land involved in change from one land use type to another land use in Ratnagiri district accounted to 10.39 percent, which indicate high proportion of land involved in the process of land transformation. Table 4.3 reveals that very high degree of total volume of change (above 15%) is found in Mandangad, Dapoli and Khed tahsils. The high magnitude (10% to 15%) land use change is experienced in Guhagar and Rajapur tahsils during the study, period. Moderate (5% to 10%) and low volume (below 5%) of changes are found in Chiplun and Lanja, Ratnagiri, Sangmeshwar tehsils respectively.

During 2011-12, Mandangad tehsil marked 104.37% index of landuse efficiency. Whereas, Dapoli 10.27%, Khed 103.15%, Chiplun 103.38%, Ratnagiri 102.35% and Rajapur 103.20% index of land use efficiency. All tahsils are marked positive change in land use efficiency, that is increase the land use efficiency more varies from under 0.12% to over 3% increase, Mandangad(3.68%) tehsil has highest percentage increase in the land use efficiency. Whereas, the lowest positive change in land use efficiency is registered in Khed (0.12%) tehsil during the period of investigation.

Table 5.1 reveals that the highest mean was registered in rice crop area (80326.23 hectares) while the lowest mean was found in the case of mung crop area (96.30 hect.) from 1991-92 to 2011-12. Other fruit come in rank first in slandered deviation in the district. The highest variability was found in rice crop area. The variability in the area of these crops ranged from 2.55% to 87.67% during the study period. Out ten crops four crops have shown positive compound growth rate from 1991-92 to 2011-12. The highest negative compound growth rate (3.10) was noticed in rice area while the lowest negative compound growth rate was marked in various crop area.

In the period of 1991-92 to 1995-96, the total gross cropped area was 234011 hectares. Of the TCA, 84518 hectares area was under rice, 7227 hect. Under Vari, 28896 hect. Under Nachani, 5714 hect. Under Kodrs and 2100 hect. Under other cereal crops. Whereas the area shares of pulses was 2385 hectares. The share of Mango and other fruits area were registered 11704 hect. and 5419hect respectively during the 1991-92 to 1995-96. During 1996-97 to 2000-01, the total gross cropped area increase from 234011 hectare to 250913 hectares and marked 16902 hectares increase in it. Area under total cereals decrease from 54.89% to 42.41% in second quinquennium. The share of rice, vari, nachani, kodra, and cereals were declined
from 36.11% to 31.64%, 3.08% 1.75%, 12.34% to 8.21%, and 0.89% to 0.80% respectively. Total pulses area was slightly increased from 1.02% to 1.50% in this quinquennium. The overall area share of mango and other fruit increased from 5.00% to 5.60% to 6.18% and 2.69% to 6.18% respectively. The area under groundnut crop was increase from 0.08% to 0.11%, whereas, area under other oilseed declined from 2.61% to 2.31%, while area under fodder crop was increased 33.50% to 41.50% during the second quinquennium.

During third quinquennium (2001-02 to 2005-06), the total gross cropped area increased form 250913 hectares to 309532 hectares and market 23.36% increase in it. Of the total gross cropped area about 35.02% (108422 hectors) area was under cereals. The percentage share of total pulse increased form 1.50% to 2.44%. Total fruits area was increased 11.79% to14.63% in this period. Total oilseed crops area decreased form 2.31% to 1.76%, where of fodder crop area increased form 41.50% to 42.23% during third quinquennium.

During 2006-07 to 20011-12, the total gross cropped area was decreased by 37728 hectarers. During the same period area under total cereal slightly increased form 35.02% to 38.74%, particularly rice, nachani crop area was increased. Where of the area under vari and other cereal area was increased. Where of the area under vari and other cereal area were decreased in the last quinthinkennium. Area under total pulse increased for 2.44 to 2.90%, vegetable and total fruits area was increased from 0.49% to 0.94% and 14.63% to 51.16% respectively. Area under oil seeds decreased form 1.76% to 0.80% during the last quinquennium. It may be concluded that during the last quinquiennium area under various crops indicated ups and down trends.

Table 5.3 reveals that, rice crop share in the total cropped area has shrunken form 36.11% (1991-92) to 28.31% (2011-12. The highest percentage share of rice in total cropped area was found in Sangmeshwar (35.43%) and lowest in Guhagar tahsil (28.56%) during 2011-12.

The area under vari varies from tehsil to tehsil. Out of the total gross cropped area of the region, below 1% area was found under vari in Lanja (0.35%) and Rajapur (0.40%) tehsils, where 1% to 2% gross cropped are was found in Dapoli (1.84%) tehsil and above 2% area was observed in Madangad, Khed, Chiplun, Guhagar, Ratnagiri and Sangeshwar during the year 2011-12. The increase in gross cropped area under vari crop was marked in Khed, Ratnagiri, and Sangmeshwar tahsils,
whereas decrease was registered in chiplun, Madangad, Dapoli, Guhagar, Lanja and Rajapur form 1991-92 to 2011-12.

Nachani occupies about 17350 hectares of the total gross cropped area in the district. It is grown all tahsils ranging from 4.06% to 8.01%. The highest percentage of gross cropped area under nachani was marked in Guhagar (12.02%) and lowest in Lanja (3.87%) during 2011-12.

Total pulse were covered about 452 hectares gross cropped area in 1991-92, as against 774 hectares are in 2011-12. Out of the total gross cropped are below 3% area was marked under total pulse in Khed (2.69%), Guhagar (1.16%) tahsils, whereas 3% to 20% area was observed under pulse in Madangad (3.08%), Dapoli (3.03%) and Chiplun (3.51%) tehsil during 2011-12, above 20% gross cropped are was experienced under pulses in Ratnagiri (23.05%), Lanja (24.54%) and Rajapur (22.60%) tehsil during the same year. All tahsils had shown positive change in pulse area. Below 2% positive change in pulse area was noticed in Dapoli, Khed, Guhagar tehsil, whereas above 2% positive change in pulse area was noticed in Madangad, Chiplun, Ratnagiri, Lanja, and Rajapur tahsils from 1991-92 and 2011-12.

Total area under mango cultivation in Ratnagiri district was rose form 11704 hectares in 1991-92 to 65554 hectares in 2011-12. Out of the total gross cropped area, below 20% area was under mango in Khed, Chilun, and Sangmeshwar tehsil, whereas 20% to 25%area was marked in Madangad, Dapoli, Guhagar and Lanja tehsil during 2011-12. Above 25% gross cropped area under same fruit crop was experienced in Ratnagiri and Rajapur tehsil during the same year.

Cashwenut, Chiku, Banana, Jack fruit, Pineapple etc. were considered together under other fruits. Other fruits occupied about 2.31% (5419 hectares) of area in 1991-92 as against 27.14% area (73517 hectares) in the year 2011-12.

Out of the total gross cropped area below 1% area under oilseeds was noticed in all tahsils except Guhagar tehsil during the year 2011-12. Total cropped area under the total oilseeds was decreased for 6322 hectors in 1991-92 to 2346 hectares in 2011-12. There was marked 62.89% decrease in gross cropped area under total oilseed during the period of investigating.

High concentration of fodders was seen in Madangad and Guhagar tehsil during 2011-12. Major increase below 5% is confined in Khed and Rajapur tehsil. Significant decrease in fodder percentage has occurred in Madangad, Guhagar, Chiplun, Ratnagiri, Sangmeshwar and Lanja tehsil between 1991-92 and 2011-120
Two tehsil (fig 5.11 A & B) namely Madangad and Guhagar showed a very high diversification in corps during 1991-92, as against four tahsils were registered same level of diversification in 2011-12. Guhagar tehsil alone indicated a very high diversification of crops in all the year under consideration. While Madangad tehsil first indicated a very high degree of crop diversification in 1991-92. Latter on this tehsil showed a very low diversification. High degree of diversification, was marked in Dapoli and Rajapur tahsils during 1991-92. But during 2011-12, whereas Dapoli and Rajapur tahsils were registered low and very high degree of crops diversification respectively low diversification was experienced in Khed and Lange tahsils in 1991-92, latter on these tehsil showed a very high degree of crop diversification in 2011-12. Very low crop diversification was noticed in Ratnagiri, Sangmeshwar and Chiplun in 1991-92, while Ratnagiri and Sangmeshwar tehsil were marked high level of crop diversification during 2011-12.

Table 5.5 showed that, during 2011-12, Madangad, Guhagar and Ratnagiri. tehsil took low degree concentration, unless Chiplun, Ratnagiri, Sangeshwear, Lanje, and Rajapur indicated a shift in degree of concentration. Of which Chiplun, Ratnagiri and Sangmeshwar tehsil were marked upward shift and Rajapur and Lanja tehsil marked down word shift. While Madangad, Dapoli, Khed and Guhagar tehsil were not experienced any change in their place between 1991-92 and 2011-12. Vari took to high degree of concentration in Madangad, Dapoli, Guhagar, and Rajapur tehsil, while Chiplun registered medium degree of concentration during 1991-92. The low degree concentration was marked in Khed, Ratnagiri, Sangmeshwar and Lanja tehsil during the same year. During the study period Guhaghar, Ratnagiri and Lanja tahsils changed their level of degree of concentration in Mango, which were moved up word shift, while remaining six tehsil were not indicated any change in their level of place.

According to weaver’s method, monoculture was absent at the two study points i.e. 1991-92 and 2011-12. While two crop combination zones were noticed in Madangad, Chiplun, Ratnagiri and Lanja tehsil. Three crop combination observed in Guhagar and Sangmeshwar tehsil. Four and five crop combination noticed in Khed, Dapoli and Rajapur tehsil respectively in 1991-92. During 2011-12 the two crop combination was marked only in Ratnagiri tehsil. Three combination was extended to Dapoli, Khed, Chiplun, Sagameshwar and Rajapur tehsil. While four and five are combination was found in Lanja, Madangad and Guhagar tehsil respectively.
Table 6.1 reveals that the contemporary position of yield in Ratnagiri district as well Maharashtra state. The normal yield of rice in the district has been 2870 kg/hect. In 2011-12. Which is approximately 1.18 times more than that of 1991-92 (2413 kg) and marked 18.93 % increased during the study period, the average yield of rice is more than the state average (1776 Kg/ heceter). The corresponding increase at Maharashtra level of rice vari and nachani are marked 6.1%, 54.16%, and 12.03% during the study period. The average per hectare yield of gram is decreased form 532 kg in 1991-92 to 498 kg in 2011-12, where it marked 6.39% decrease in the per hectare yield since 1991-92 and 2011-12. During 2011-12, per hectare yield of chilies is 318 kg. Which shows decrease of 35.75% over 1991-92.

The production of rice (table 6.2) was decreased form 194600 M.tonnes in 1991-92 to 22160, M.tonnes in 2011-12. The production of vari and nachani have marked 2000M.tonnes and 1985M.tonnes respectively during 2011-12. The production of mung was marked 42.85% increase whereas the wal production registered 28.57% during the study period. The percentage of kulith was observed 1.33 times increase during the twenty one years, from 1200 M.tonnes in 1991 to 1600 M.tonnes in year 2011-12. The production of groundnut decreased for 700 tone to 320 M.tonnes during the study period. The production of sesame was marked 0.75 times increase during the study period.

The highest index number of rice was found in 2009-10 (128.05%), while lowest index number of rice was marked (75.42%) during 1997-98. Index number of vari yield was below 100% in 2001-02, 2003-04, and 2005-06, which was recorded 78.37%, 63.51%, and 68.91% respectively. The highest index number of nachani was found in 2007-08 (149.92), while the lowest index number was registered in 2001-02 (72.01%). Index of mung was marked above 100% form the year 1999-2000 to 2011-12. The index number of gram was registered above 100% in 1993-94 to 1999-2000. The highest index number of groundnut was registered in 2007-08 (165.92%) and lowest index number was recorded in 1993-94 (61.11%)

The highest percentage of rice production was marked in Chiplun (15.18) tehsil, following by Ratnagiri (13.18%), Khed (12.28) Guhagar (11.98%) Sangmeshwar (11.67%), Lanja (10.20%), Rajapur (8.96%), Madangad (8.78%), and Dapoli (7.42%) tehsil in the year 2011-12. Bellow 10% vari output was received form Rajapur, Lange, Madangad, Dapoli and Khed tehsil. About 10% to 15% output was get from Ratnagiri and Sangemeshwar and above 15% vari production was received.
from Guhagar and Chiplun tehsils. The highest percentage of nachani production was obtained from Khed (21.15%) and lowest in Guhagar tahsil (3.52%) during 2011-12.

Below 5% positive change in tur production was experienced in Chiplun and above 5% change in Dapoli tehsil.
The highest percent of Mango production was found in Chiplun, followed by Dapoli, Sangmeshwar, Rajapur, Guhagar, Lanja, Mandanger Ratnagiri and Khed in 2011-12. The lowest wal production was registered in Chiplun(2.17%) and highest from Sangmeshwar (17.22%) tehsil during the same year. Below 10% output of kulith was received from Sangmeshwar, mandangad, and Guhagar tehsil, while 10% to 15% production of same crop was received from Dapli, Khed, Chiplun, Ratnagiri and Lanja tehsil in 2011-12. Above 15% output of kulith was get from Rajapur tehsil during the same year.

Below 2% positive change in sesame output took place in Khed, Chiplun, Sangmeshwar and Ratnagiri tehsil and above 2% positive change was experienced in Dapoli and Lanja tehsil between 1991-92 and 2011-12. Below 5% negative change in sesame production took place in Rajapur and Mandangad tehsil. The production of chilies was marked 10% decrease during last twenty-one year; from 200 metric tonnes in 1991-92 to 180 M.tonnes in the year 2011-12.

The high productivity (below 3%) was confined only in Rajapur tehsil in the year 1991-92. The moderate productivity (3 to 5) was observed in Mandangad, Dapoli, Khed, Guhagar and Ratnagiri tehsil. The low (above 5) productivity was noticed in Chiplun, Sangmeshwar and Lanja tehsil. During the year 2011-12 seven tehsils indicated a shift in the level of rice productivity whereas, Khed, Chiplun, Ratnagiri, Sangmeshwar and Lanja showed an upward shift, while Dapoli and Rajapur indicated a downward shift. In the level of Vari productivities, high productivities was dominated in Guhagar, Ratnagiri and Rajapur tahsils and low productivity was found in Mandanged, Dapoli, Sangmeshwar and Chiplun tehsils in 1991-92. After the 21 year, Khed, Ratnagiri and Rajapur indicated downward shift and Chiplun showed upward shift. High level nachani productivity was noticed in Dapoli and Khed, moderate productivity occurred in Mandangad, Ratnagiri, Sangmeshwar and Rajapur tehsils in 1991-92. Low productivity was experienced in Chiplun and Lanja tehsils.
The high productivity of tur was found in Lanja tehsil. The moderate productivity was noticed in Mandangd, Dapole, Khed Chiplun, Sangmeshwr and Rajapur tehsils, while low productivity was noticed in Guhagar tahsils in 1991-92. During the year 2011-12, Mandangad, Dapoli, Guhagar, Sangmeshwar, Lanja and Rajapur indicated a change in their position. The high level of Kulith productivity as associated with Dapoli, Lanja and Rajapur tahsils, while low level productivity was observed in Chiplun, Ratnagiri and Sangmeshwar tehsils in 1991-92. During the year 2011-12, Chiplun and Ratnagiri marked upward shift, while Dapoli indicated a downward shift.

High level of sesame productivity obtained from Mandangad, Guhagar and Rajapur tehsils, similarly, moderate productivity was recorded in Dapoli, Chiplun, Ratnagiri and Sangmeshwar tehsils. Low productivity was registered in Khed and Lanja tehsils in 1991-92. During 2011-12, Mandangad, Dapoli, Ratnagiri and Lanja indicated change in their position during the study period.

Table 6.8 reveals that overall high productivity was found in Rajapur tehsil, while moderate productivity occurred in Mandangad, Dapoli, Khed, Guhagar, Ratnagiri and Lanja tahsils during 1991-92. Low productivity was found in Chiplun and Sanmeshwar tahsils during the same year. After, a gap of 21 years, five tehsils change in level of overall productivity. Chiplun, Guhagar and Ratnagiri indicated upward shift, while Dapoli and Rajapur showed downward shift in overall productivity.

According to table 7.5, below 30% area is marked under net area sown un Purus and Rajwadi villages, whereas 30% to 45% area is found under this category in Dayal, Ganpatipule, Nivekhurd and above 45% area is registered in Malgunda and Sadvali villages during 2011-12. The highest percent of net irrigated area to net sown area is registered in Ganpatipule followed by Nivekhurd, Malgunda, Dayal, Dayal, Sadvali, Rajwadi and Purus villager during the year 2011-12.

The highest percentage share of wooden plough was noticed in Dayal, whereas, lowest percentage share is found in Rajwadi villages during 2011-12. The number of ploughs are varying from villagers to village. The higher number of iron ploughs noticed in Rajwadi. There were 21 bullock carts in the year 1991-92 and its number was reached upto 32 in 2011-12.

All selected villager were marked increase in total number of electric pumps except Sadvali village during the study period. The highest percentage of iron plough
are marked in Purus (23.62%) and lowest in Rajwadi (7.08) during 2011-12. In selected villages there were 21 bullock carts in the year 1991-92 and its number is reached upto 32 in 2011-12. The total number of tractors are increased from 06 in 1991-92 to 18 during 2011-12.

Low category (below 20%) of cattle according to share in total livestock is marked in Purus (16.21%) and Sadvali (18.44%) villages, while medium (20% to 30%) category is noticed in Dayal (29.10%), Nivekhurd (28.44%) and Rajwadi (23.55%) villages during the year 2011-12. High category (above 30%) is experienced in Malgundha (40.90%), Ganpatipule (30.30%) villages during same year. The lowest percentage of buffaloes are found in Rajwadi (4.14%) during 1991-92, while highest percentage is marked in Nivekhurd (15.78%) village during the same year.

High category of goat (above 30%) is noticed in Dayal (32.83%), Purus (38.73%), and Sadvali (30.73%) villages, whereas, medium category (25% to 30%) is found in Rajwadi (28.04%) villager in the year 2011-12. While low category is noticed in Mandangad, Nivekhurd, Ganpatipule villages during the same year.

Table 7.6 reveals that out of the total cropped area below 30% area is noticed in Purus and Ganpatipule villages and above 30% cropped area is experienced in Dayal and Rajwadi villager during the same year. Ragi is the second ranking crop in all selected villages. The highest percentage of area under nachani was marked in Malgund village and lowest in Ganpatipule (8.27%) during 2011-12.

**RECOMMENDATION**

The majority of the people in the study region are mainly depended on agriculture. The large number of working population is migrated to Mumbai. The problems of agricultural land use planning are envisaged in the following aspects…

The monsoonal rains, though generally plenty in Ratnagiri district, show considerable variation in their time of arrival, amount and duration. During the dry period, there is scarcity of water. To overcome the problem of erratic rainfalls is very essential to percolate the each and every drop of rainwater in the soil. To stop the surface running water in the region more percolation tanks, more Kolhapur type weirs and field tanks should be constructed in each and every villages in the study region.

The depletion of soil is serious problem in the study region. In many parts, the lack of forest cover has reduced the infiltration of moisture leading to increasing run-
off and thus giving rise to soil erosion. Though incentives should be given to plantation. Horticulture schemes should be effectively implements. Efforts should be made to bring barren and follow land under forest.

Overall shortage of arable land is also a major problem confronting the very dense population in the district. There are vast area under fallow land, we can think of this land seriously and should be change it into productive land. Increase in the gross cropped area can be achieved by a reduction of fallows, culturable waste and by increasing multiple cropping.

There should be make more effective use of water resources in the district. Which involve bringing the benefits of irrigation to hundreds of small farms, improving the efficiency of water use through reduction of losses in storage and distribution systems and in farmer’s fields, improving water distribution and drainage system to allow controlled water applications which is so important in case of new varieties and also soil conservation crop management practices, which enable more effective utilization of water in rain-fed area.

The agricultural development in the Ratnagiri district bears the influence of physical characteristics. The extension of agriculture and modernization has been checked by the numerous hills and plateaus in the region. Many village of the study area are not yet well connected with main roads or with market centres. Most roads in rural areas are bullock cart roads and become useless in rainy season. To overcome this problem, the availability of village road should be increased; good quality road should be constructed in villages, market places and towns. All villages should connect to the district road or state high ways.

Low levels of literary in the countryside also inhibit agricultural programmes by restricting the use of written material and necessitating direct contact between the limited numbers of agricultural extension worker. To overcome the problem of illiteracy, it is essential to literate them with the help of volunteers and teachers, special efforts should be made to literate the farmer, so that they can apply the new techniques in cultivation. Agricultural literacy is very essential in order to increase the production and productivity.

The large proportion of farmer were away from having a set of new ‘rice’ varieties sufficiently adaptable to study region conditions, similarly unawareness about government schemes. The government should give regular information about new verities of rice and schemes and programmes regarding agriculture development
to the farmer through media. Gramsevak and Talhati should give direct information about new verities of rice and the government schemer to the farmer. The information regarding schemes should put on notice boards of Grampanchayat.

There has been a lack of systematic long-run planning of the needed production, processing and distribution of many of the agricultural commodities, other than food crops. To solve this problem an efficient marketing structure has to be developed in the study region. The farmer should get the market facility with a radius of five km. from the place of production. The existing weekly markets should be developed in to sub-market.

There is a surplus of population in the district rural area, many of the young male working people from this district prefer to work in mills factories and offices in Mumbai and other urban area. The economic condition of the agricultural labour is very poor. The government should regulate the hours of work of agricultural labour. Problem of unemployment and under employment should be stopped in the region. Agricultural labour should get the work for minimum 280 days.

In the study region agro-based industries i.e. rice processing mills should be developed on co-operative basis; these industries not only increase employment potential but also raise the socio-economic status of the study region.

Plant protection measure are implemented in the irrigated area, little progress has been made in adopting improve agricultural implements in the study area. Small and marginal farmer should be supplied modern agricultural implements on concession rate.

Agricultural training centre should be organize and training programmer regarding various practices of agriculture.