CHAPTER VIII

CONCLUSIONS, PROBLEMS AND SUGGESTION

8.1 Conclusion
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8.3 Suggestion
CONCLUSIONS, PROBLEMS AND SUGGESTION

In previous chapter various aspects of selected villages from the study area have been analysed. Investigations carried out in the previous chapters have thrown light on population pressure and landuse pattern in Parbhani District.

The main purpose of this chapter is to Cum up the main conclusion of the study presented in the previous chapter to get comprehensive view on the basis of these conclusions. Population pressure and landuse problems are also discussed in this chapter. Some remedies or suggestions have also been suggested to solve the problems relating to this study in this chapter.

8.1 Conclusions

The following conclusions are drawn from second to seven chapter.

There are four hills in Parbhani district. The Jintur range is the more prominent portion in the heights of the district. A low range of Malhura hills generally
trending west-east separates the Penganga valley from that of the Kayadhu to its south, in the south a section of the Balaghat ranges a transverse member of the Sahyadris, belongs to this district. Irrespective of the above mentioned hills there are some isolated hills in the study region. These hilly areas are not suitable for agricultural activities due to rough topography. These hilly regions are also having steep slope along the all sides, therefore it very difficult to cultivate these areas.

Plateau region covers most of the region. The hight of the plateau is 533.75 meters above sea level but here and there rounded peaks record heights unto 549 meters and 579.5 meters above sea level. This plateau is having black cotton soil which is good for agriculture. Particularly cotton cultivation is found on large scale over the plateau region.

River Godavari covers the south-west, south and south-east part of Pathri and north-west northern part of Gangakhed tahsils. Godavari and its tributaries have made fertile land in above mentioned part of the study region. Soil erosion and monsoon floods are the twin major problems all along the Godavari banks; hence
agriculture is not well developed as it should be in a black soil tract. The deeply entrenched course renders canal irrigation difficult. The riverside villages are necessarily small and precarious in both form and activity. However the fertile black soil plain on either side makes many roads unmetalled again.

The orientation of the north-eastern portion of Parbhani is towards the Penganga which drains the land with the help of its main tributary Kayadhu. The topography is undulating with gully erosion locally intensified along the banks of the main river and even in streams as those near Kalamnuri. Underlain by the Deccan basalt the soil is black and is for a major part devoted to agriculture. But enclosing hill ranges and plateau tops which have a cover of poorer soils restrict the agricultural land.

Purna basin is found in north-western, northern and north-western part of Jintur, eastern part of Parbhani and western part of Basmat tahsil. The narrow and winding Purna valley is still to a large extent an economically undeveloped belt, with isolated patches of cultivation and small riverside hamlets. Only in recent
years this economic development on account of the Purna irrigation and Power project. This central belt is economically a well developed part of Parbhani district. Marathwada Purna in its lower reach lends some individuality to the local landscape after its emergence from the Jintur hills. This basin is a richer agricultural zone with cotton, oilseeds, pulses and Jowar as the main crops.

The hilly country receives the maximum rainfall. The groundwater is mostly tapped from percolation in wells and springs. The plain comprising the Penganga, Godavari, canal, Karpara and Dudhana river valleys have sufficient water supply and may be said to be well irrigated tracts of the study region. Presence of curvaceous flows and closely spaced system of joints in hard and massive basalts help the percolation of water and wells situated near either of these suitable conditions, have adequate water supply.

Godavari runs for a stretch of about 152.88 K.m. the south-central and southern belt of the district. The only major tributary river is the Purna. The right bank, it receives the Sindhaphana and the Wan, the Macchili,
the Galati and the Dhond streams. The land of the Parbhani district belonging to Penganga River and its chief tributary, the Kayadhu belonging to Penganga River and its tributary the Kayadhu is uneven and deeply dissected. Purna River has a length of about 144.81 km. All these rivers are useful to irrigate the land of Parbhani district.

The period from March to May is one of continuous increase in both day and highest temperatures. May, the hottest month with the mean daily maximum temperature at 43°.16' Cg. With the advance of the south-west monsoon into the district by about the second week of June temperatures fall appreciably and the weather is pleasant throughout the south-west monsoon season. By about the first week of October the monsoon withdraws and the day temperatures show a slight increase in October. Temperature condition in all season is favorable for agricultural development.

It will be seen from Table 2.1 that the variability of rainfall in the Parbhani district ranges from 30.88 per cent. Above 35 Per cent rainfall variability was observed
in only in Basmat tahsil. Whereas, 30 to 35 per cent rainfall variability was noticed in Jintur, Kalamnuri and Gangakhed tahsils from 1980-2005. Below 30 per cent rainfall variability was noticed in Parbhani, Hingoli and Pathri tahsils. There is a guarantee of crop production in Parbhani, Hingoli and Pathri tahsils as compared to other tahsils of the study region because these tahsils are having less variability of rainfall during the period of investigation.

The district of Parbhani is one of the main agriculturally useful areas of Marathwada and Maharashtra. This is mainly because its major portion belongs to the rich alluvial Godavari valley. Local variations in relief and landuse, however, introduce regional changes in landscape which lend themselves to a classification of the district geographical sub regions.

Out of the total soil nearly 65.17 per cent soil is medium black soil, 20.88 per cent deep black soil, and 13.95 per cent coarse and shallow soil. Light medium black soil is found in Basmat, northern part of Parbhani, Gangakhed, Kalamnuri, Pathri and Jintur tahsils. The most of the soils in Parbhani district is very
good from viewpoint of agricultural development. Hilly
tracts like Jintur, Malhura, Balaghat and isolated hills
have coarse type of soils and rigid topography hence,
these hilly slopes are not useful for agricultural
activities.

The forest of the district includes Jintur, Hingoli,
Parbhani, Kalamnuri and Basmat tahsils. During 2000-
2005 about 3.21 per cent land was under forest in the
district. There was not a single hectare area under forest
in Gangakhed and Pathri tahsils. Natural vegetation is
important to maintain the rate of rainfall and to provide
the wood for agricultural implements. It is also
important for the purpose of fodder.

Purna, Jaykwadi, Upper Penganga and Majalgaon
projects provides water to the study area. These
projects have changed the cropping pattern of the
Parbhani district. Karpara medium project in Jintur,
Masoli in Gangakhed and Borna medium projects also
provides water for irrigation.

The study area i.e. Parbhani District is central
most district in Marathwada region of the Maharashtea
state. It lies in the Godavari basin in terms of area and
population in covers per cent area and per cent population of the state respectively.

During the period 1901 to 2001 highest decadal population variation of Parbhani district was found in 1991 (28.88%) where as lowest decadal population variation was found in the year 1931 (11.5%) because during to 1911 to 1921 there were plague and diseases there was lowest rate of population but from 1951 to 2001 there is increasing trend in population in Parbhani district.

Tahsil wise population of Parbhani district from 1951 to 2001 is as follows. In 1951 highest population was found in Parbhani district (74 Thousand) and lowest rate of population was found in Jintur, Kalamnuri tahsil same population rate was found in both the tahsils (54 Thousand). In 1961 highest rate of population was found in Parbhani tahsil (86 Thousand) where as lowest rate of population was found in Kalamnuri tahsil of the region (64 Thousand). In 1971 Parbhani tahsil- highest growth rate of population was (1 lakh 10 thousand), where as lowest growth rate of population was found in Kalamnuri tahsil. In 1981
highest growth rate of population was found in Parbhani tahsil (154 Thousand) then Hingoli and Pathri tahsil have 1.18 thousand and lowest Kalamnuri tahsil. In 1991 highest growth of population in Parbhani tahsil, secondly Hingoli and lowest rate of population was found in Kalamnuri tahsil (1.15 Thousand) finally in 2001 census highest growth rate of population was found in Parbhani (6.23 Thousand), then Hingoli (5.33 Thousand) and lowest population was in Kalamnuri tahsil (1.97 thousand) from 1951 to 2001 in Parbhani tahsil is highest growth rate of population was found, except in 1951 in Jintur and Kalamnuri lowest population. But in 1961 to 2001 during this period in Kalamnuri tahsil lowest population total growth rate of rural population in 1901 to 1911, 1991 to 2001 during this period highest growth rate of rural population was found in 1981 to 1991 (24.63%) and lowest growth rate of population was during 1911-1921. (1.84%) urban growth rate of population. 1901-1911 and 1991-2001 during this period highest growth rate of population was found in 1981-1991 (46.02%) lowest growth rate of population was in 1911-1921 (-0.96%).
Highest Arithmetic Density was found in 1981, 1991, 2001 is 223, 303, 324 respectively, in Parbhani tahsil, lowest arithmetic density in 1981 was found in Hingoli tahsil (128) in 1991 Kalamnuri tahsil (162) and in 2001 Jintur tahsil (116).

Highest Rural Density in Parbhani district during 1981 was found in Basmat tahsil (156) in 1991 (Basmat tahsil (209) and in 2001 Basmat tahsil (219) and lowest rural density of population in 1981 Jintur tahsil (103), in 1991 Jintur (133) in 2001 Pathri (138) highest physiological density in Parbhani district during 1981 Parbhani tahsil (232) in 1991 and Jintur tahsil (410) in 2001 Parbhani (360) and lowest physiological density during 1981 was found in Pathri tahsil (132) in 1991 Pathri (186) in 2001 Hingoli tahsil (239).

In 1981 highest Agricultural Density was found in Kalamnuri tahsil (79.98) 1991 Pathri (186) in 2001 Hingoli tahsil (239). In 1981 highest agricultural density was found in Kalamnuri tahsil (79.98) 1991- Basmat tahsil (85.33) in 2001 Gangakhed tahsil (116.09) persons per km square lowest agricultural density was found in Pathri tahsil during 1981 (49.05 persons per
km square) in 1991 Pathri tahsil (63.90 persons per km square) in 2001 lowest agricultural density was in Kalamnuri tahsil (85.08 persons per km square) and in 1981 agricultural density of the regions was (56 persons) in 1991-88.49 persons per km square in 2001- (88.94 persons per km square). During 1981 to 2001 district agricultural growth rate increased by 32.94.

In 1981 highest Nutritional density was found in Kalamnuri tahsil (174). In 1991 – Basmat tahsil (210), in 2001-Basmat tahsil (265) and in 1981 lowest nutritional density was found in Pathri tahsil (97.42). In 1991-Pathri tahsil (135) in 2001- Pathri tahsil (161) and in 1981 regional nutritional density was observed 2681, in 1991-229 and in 2001-210.

In the same way in 1981 highest Caloric density was found in Basmat tahsil (277) and in 1991 highest caloric density was found in Kalamnuri tahsil (452) and in 2001- Jintur tahsil highest density was 480, 1981 to 2001 during this period caloric density was increased by 203. And Caloric Density of regions in 1981 was observed 276 and in 1991 it increased in 1981 was observed 276 and in 1991 it increased up to 305 and in
2001 it reached up to 327, 1981 to 2001 regional Caloric Density was increased by 51.

Total Sex Ratio observed in 1901 was 978 and 2001 it was 922 means by 56 it was decreased in 10 decades (of the state). And in Parbhani district total sex ratio observed in 1901-996 and in 2001 952. In last 10 decades sex ratio of Parbhani district was decreased by 44, However urban sex ratio in Maharashtra State increased by 11 in last 10 decades. In the same way urban sex ratio of Parbhani district was observed 1901 to 2001 sex ratio decreased by 54. In the same way rural sex ratio of Maharashtra State-from 1901 to 2001 decreased by 43, in comparison from 1901 to 2001 sex ratio of Parbhani district decreased by 33 with comparison of Maharashtra State with Parbhani sex ratio of Parbhani was lower by 10.

Tahsil wise Rural Urban population observed in the following way in 1981 rural sex ratio of Maharashtra State was observed 64.96. In comparison with that in 2001 it was observed 57.58 means it was decreased by 7.38. In 1981 rural population was 81.81 and in 2001 rural population was 77.52. During these three decades
rural population was decreased by 4.29. In comparison with Maharashtra State population of Parbhani district was decreased by 3.09. In the same way in 1981 urban population of Maharashtra State was observed 35.04, and 2001 it was 42.41. It was increased by 7.37 percentage of region in Parbhani district 81.81 in 1981. In the same way 1991-80.02 and in 2001-77.52 from 1981 to 2001 the percentage of rural population decreased by 4.29 per centage of 1981 urban population was 35.04 and in 2001-42.41. The percentage of urban population increased by 07.37. Urban population of Parbhani district in 1981 was 18.19 and 2001-22.48. It was increased by 4.29Per cent. Urbanization of Maharashtra State comprised with Parbhani district was equal (4.29%).

Literacy structure in 1901 to 2001 in Parbhani district is as follows. In 1901 literacy of Parbhani district was 2.50 and in 2001 it was 66.00. In ten decades literacy increased by 63.50Per cent in the same way male-female structure was 72.22 female literacy structures difference was 51.54. Male-female variation in 1901 to 2001 was decreased by 20.68.
Per 100 hectares cultivators, agricultural labours in Parbhani district is as follows. In Basmat tahsil cultivators and agricultural labours were highest in Parbhani district and lowest in Parbhani tahsil i.e. 71.14%.

After studying the relative coefficient in Parbhani district in 1981 (0.37) and in 2001 (0.52) it was increased by 0.15. In the same way in 1981 tahsil wise coefficient of over population in Pathri tahsil was very high i.e. 1.02 and 2001 1.90 (Same Pathri tahsil) from 1981 to 2001 difference of Pathri tahsil was observed 0.88.

After observation of Man-Land ratio in Parbhani district per capita cultivated area is as follows in 1981 (0.51) whereas in 1991 (0.46) and in 2001 (0.34) from 1981 to 2001 man land ratio per capita cultivated area was increased by 0.17. After surveying agricultural labours in Parbhani district per centage wise cultivators in 1981 (45.75%), in 1991 (38.95%) and in 2001 (41.17%) from 1981 to 2001 it was observed that cultivators, were decreased by 4.58%.

After observation from 1981 to 2001 Agricultural labours were increased 0.35 Per cent there was not much increase in agricultural labours in Parbhani district other workers per centage in 1981 in Parbhani district (14.17%) , in 1991 (19.63%) and in 2001 (19.59%). Comparative observation from 1981 to 2001 there was an increase in other workers by 5.42Per cent.

Main workers in Parbhani district in 1981 highest workers were found in Pathri tahsil (46.97%) whereas lowest main workers were found in Kalamnuri tahsil (19.15Per cent). And main workers in region in 1981 were 44.32Per cent and in 1991 (42.5%) and in 2001 (39.86%). In 1981 rural main workers were (47.57%), in 1991 (46.32Per cent), in 2001 (43.03%), In 1981 urban main workers were (30.24%), in 1991 (27.27%), in 2001 (25.82%). After comparative study of region main workers we can say that it was decreased by 4.46Per cent. After comparative study rural main workers we can say that it was decreased by 3.65Per cent and urban main workers also decreased by 4.42 per cent.
from 1981 to 2001. From 1981 to 2001 rural urban main workers after studying comparative observation we can say that per centage of urban main workers increased by 0.77Per cent.

The foregoing discussion reveals that Landuse and cropping pattern of the region are strongly influenced by Physical and socio-economic factors more than 80 per cent of the total geographical area in Parbhani district is under cultivation the remaining area is occupied by forests, area not available for cultivation, other uncultivable land and fallow land. Parbhani tahsil and Gangakhed tahsil has recorded.

Area under forest is recorded 3.21 per cent (2000 – 2005) of the region. Above 4 per cent area under forest is observed in Hingoli (6.12Per cent), Jintur (6.27Per cent), Basmat (4.87Per cent), below 4 per cent area under forest is noticed in Kalamnuri and Parbhani tahsil, 0.00 per cent area under forest is recorded in Gangakhed and Pathri tahsil.

Out of the total geographical area 5.94 Per cent area not available for cultivation is noticed in the region. Above 6 per cent area not available for cultivation is
recorded in Jintur, Kalamnuri, and Gangakhed and below 4 per cent area not available for cultivation is recorded in Parbhani, Hingoli, and Basmat and Pathri tahsil.

Out of the total geographical area 5.63 per cent other uncultivable land excluding fallow land is noticed in the region, the area under other uncultivable land varies from tahsil to tahsil in the study region. Above 8 per cent area under other uncultivable land is observed in Jintur tahsil below 8 per cent area under other uncultivable land is noticed in Parbhani, Hingoli, Kalamnuri, Basmat, and Gangakhed and in Pathri tahsil.

The area under fallow land is 4.67 per cent recorded in the study region follows land decreased from 6.72 per cent to 4.67 per cent in the study region from 1980-85 to 2000-05, the proportion of fallow and is very high in Jintur tahsil (10.98%) Below 10 per cent Hingoli (5.21%), Kalamnuri (4.08%), Basmat (3.31%) Parbhani (3.28%), Gangakhed (2.94%) and Pathri (2.86%).

Highest net sown area followed by Basmat (77.76%), Kalamnuri (77.4%) and Hingoli (75.42%) and
Jintur (65.55%) during 1980-85. In the years 2000-2005 highest net sown area has recorded in Parbhani tahsil (91.60%) followed by Pathri (85.03%), Gangakhed (81.27%), Basmat (82.76%), Kalamnuri (79.46%), and Hingoli (78.42%) and lowest in Jintur (65.12%) during 2000-2005. In comparison with 1980-85 in the year 2000-05 net sown area was increased by 3.54 per cent which is highest.

Per capita net sown area is decreased by 0.12 hectares during the period. It varies from tahsil to tahsil in the study region in Pathri tahsil, Kalamnuri, Gangakhed and Jintur per capita net sown area is more than other tahsils lowest per capita net sown area is recorded in Parbhani tahsil (0.14%) hectar decreasing per capita net sown area in the study region is a serious problem of the region the policy implication of decreasing per capita net sown area is that the pressure of population on land is increasing and ways and means have to found out to increase productivity of available land for meeting the growing food needs of the region. It is possible through adopting new farm technology in the entire study region.
While studying statistical data of landuse efficiency highest landuse efficiency recorded is Basmat, pathri and Gangakhed tahsil,during the period 1980–85, 1990-95 and 2000-05.

While observing statistical data of cropping pattern we can say or highest take conclusion about it as fallows during 1980-85 highest area under Rice is observed in Basmat and Kalamnuri tahsil and lowest in Pathri tahsil. In 1990-95 & 2000-05 The same situation is observed. Highest area under Wheat is noticed in Basmat, Kalamnuri and Parbhani whereas lowest below 3 per cent in Jintur tahsil in 1980-85.In 1990-95 highest area under wheat is observed in Basmat, Kalamnuri and Parbhani and lowest in Jintur tahsil .During 2000-05 highest area under this crop is noticed in Basmat, Hingoli, Jintur and lowest in Gangakhed tahsil. While observing total Jowar highest area under this crop is recorded in Gangakhed, Pathri tahsil during 1980-85. During 1990-95 per centage of area under Jowar is decreased in comparison with 1980-85 but in 2000-05 there is miner growth in area under Jowar in minimum tahsil in comparison with 1990-95 .Area
under Jowar in 1990-95 and 2000-05 is decreased in comparison with 1980-85 because of area under cotton and total oilseeds in increased.

While studying total cereals in 1980-85 highest area under cereals in noticed in Gangakhed, Pathri, Kalamnuri, Basmat. In comparison with 1980-85 in the year 1990-95 and 2000-05 area under total cereals is decreased.

Highest area under Gram in 1980-85 is noticed in Parbhani, Gangakhed tahsil and Pathri tahsil and lowest in Jintur and Hingoli tahsil. During 1990-95 highest area under Gram is observed in Parbhani, Hingoli and Gangakhed tahsil and lowest in Jintur and Pathri tahsil. In 2000-05 highest area under Gram is noticed in Parbhani, Kalamnuri and Gangakhed tahsil and lowest in Jintur and Pathri tahsil.

Highest area under Tur in 1980-85 in recorded in Gangakhed and Basmat tahsil. In 1990-95 highest area under this crop is observed in Parbhani, Gangakhed and Pathri tahsil. In 2000-05 more than 10 per cent area under Tur is observed in Pathri and Jintur tahsil.
Highest area under Mug is recorded in Parbhani and Pathri tahsil in 1980-85 in 1990-95 in Pathri, Gangakhed, Jintur and Parbhani tahsil highest area under Mug is recorded in 2000-05.

Highest area under Mug is noticed in Pathri and Kalamnuri tahsil. Highest area Under Udid in 1980-85 is observed in Hingoli, and Kalamnuri tahsil in 1990-95 and 2000-05 the same situation is observed.

Highest area under total pulsed in 1980-85 in recorded in Parbhani, Pathri, Gangakhed and in 1990-95 in Parbhani, Pathri, Hingoli. Highest per centage of observed in 2000-05 in Kalamnuri, Hingoli, Jintur and Pathri.

Highest area under total pulses in observed

Highest area under food grains in noticed in Parbhani and Gangakhed tahsil in 1980-85 in 1990-95 am 2000-05 with slight changes same situation is observed

Highest area under sugarcane in noticed above 3 per cent in Basmat tahsil in 1980-85 and all other tahsil are below 3 per cent in 1990-95 and 2000-05 the same situation is noticed about sugarcane.
Highest area under Spices and Fruits and Vegetables is recorded in Basmat tahsil in 1980-85 and same situation is observed in 1990-95 and 2000-05.

Highest area under all food crops is observed above 70 per cent in Parbhani, Gangakhed and Basmat tahsil in 1980-85 in 1990-95 above 65 per cent area under all food crops is recorded Parbhani tahsil and in 2000-05 in Pathri and Gangakhed tahsil are noticed.

Highest area under Cotton during 1980-85 is recorded in Kalamnuri tahsil (above 30%). In 1990-95 above 25 per cent is observed in Kalamnuri and Gangakhed tahsil, In 2000-05 above 25 per cent area under Cotton is noticed in all tahsils. Highest area under total fiber crops in recorded in 1980-85 and 1990-95 in Kalamnuri tahsil in 2000-05 in Basmat, Kalamnuri and Gangakhed tahsil.

Highest area under total Oilseeds is observed in Gangakhed tahsil and Pathri tahsil in 1980-85 and lowest in Parbhani and Kalamnuri tahsil in 1990-95 highest area under total Oilseeds is recorded in all tahsil above 10 per cent except Parbhani tahsil. During 2000-05 above 10 per cent area under total Oilseeds in
noticed in Hingoli, Kalamnuri, and Basmat tahsil and in remaining all tahsil area under total Oilseeds below 10 per cent in comparison with 1980-85 in 1990-95 and 2000-05 area under total Oilseeds is increased because area under Udid, Mug, Cereals and Pulses are decreased. Oilseeds are emerged as cash crop particularly soybean. Reasons of this are good market value.

While studying volume of changes of cereals in 2000-05 is decreased in comparison with 1980-85. With minor changes the same situation about pulses in recorded in 2000-05 area under total Oilseeds is increased in comparison with 1980-85.

Cropping Intensity is defined as extend to which net sown area has been copped or resown. The total cropped area or Gross area sown as per centage to net sown area gives a measure of landuse efficiency. Which really means the Intensity of cropping? The effect of irrigation facilities, cultivators per 100 hectares of the cultivated area the impact of nature of soil, meager and major rainfall and size of holding were the most direct explanation of the variation of the aerial distribution of copping Intensity. The Intensity of cropping of the study
region was 105.14 during 1980-85 and 131.16 per cent during 2000-05 the much low cropping Intensity is alarming situation to planners, Geographers and economist. Out of seven tahsils five tahsils are Hingoli, Kalamnuri, Gangakhed, Jintur, Parbhani tahsil registered very low cropping Intensity and varied from 100 to 115 Basmat and Pathri tahsil has sown 115 above Intensity during 1980-85. whereas in 2000-05 above 130 cropping Intensity was observed in Pathri, Gangakhed, Basmat and Parbhani tahsil and in Jintur and Hingoli tahsil lowest cropping Intensity was recorded. And cropping Intensity of the region was 131.16.

Productivity is the major landuse efficiency and landuse efficiency is largely related to the choice of inputs but these inputs may tend to increase and decrease the efficiency is largely related to increase or decrease the efficiency of land to improve the productivity there is need of inputs like irrigation, fertilizers, pesticides HYV seeds etc.

Irrigation is essentially the artificial application growing crops. The cultivators having irrigational...
facilities adapt more improved farm practices than cultivators who are without irrigation. In 1980-85 9.25 per cent area under irrigation was noticed in the region. And highest area under irrigation was Basmat tahsil whereas in 2000-05 12.6 per cent area under irrigation was recorded in the region. 33.6 per cent area under irrigation was noticed in Basmat tahsil which is highest.

While observing overall crop productivity in 1980-85 high crop productivity is observed in Basmat tahsil followed by Parbhani, Gangakhed and Pathri tahsils. Low level of crop productivity is noticed in Hingoli followed by Jintur and Kalamnuri tahsils.

During 2000-05 while observing overall crop productivity is noticed in Basmat, Parbhani and Kalamnuri tahsil, Low level of crop productivity is observed in Gangakhed and Pathri tahsil.

While studying population characteristics and Landuse pattern and student t test we can take out following conclusions, they are as follows. Population and area under forest land, Population and area not available for cultivation, Population and other uncultivable land, Population an fallow land and
Population and Net sown area, statistical calculation of all these is significant at 1 per cent level observed, so relationship between them is positive during 1981. But in 2001 four landuse categories and population characteristics negative relationship is noticed in them. But population and net sown area's relationship is noticed positive.

Density and forest land, density and area not available for cultivation, density and other uncultivable land, density and fallow land, density and net sown area relationship between them is observed positive during 1991 and 2001 significant at 1 per cent and 5 per cent positive relationship.

Relationship between sex ratio and all landuse category is positive and significant at 1 per cent relationship is noticed during 1981 and 2001.

Relationship between Literacy and all landuse categories is observed as follows. Except literacy and net sown area all landuse categories relationship is positive but in literacy and net sown area relationship is negative in 1981 and 2001.
While studying relationship between Population and area under Jowar, Population and area under Cotton, population and Jowar Yield, Population and Cotton Yield is positive in 1981 and in 2001 it is negative relationship.

While observing relationship between Density and area under Jowar, Density and area under Cotton is noticed positive relationship in 1981 and 2001, And density and Jowar Yield, density and Cotton Yield is observed negative relationship between them in 1981 and 2001.

While studying relationship between Sex Ratio and area under Jowar, Sex Ration and area under Cotton, Sex Ratio and Cotton Yield is positive bit Sex Ratio and Jowar Yield is negative relationship in 1981 and 2001.

In the same way Literacy and area under Jowar, literacy and area under cotton, literacy and cotton Yield and literacy and Jowar Yield situation of this category is same as Sex Ratio.

Population and net irrigated area ,Density and net irrigated area ,Sex Ratio and net irrigated area ,Literacy and net irrigated area  relationship between them is as
follows in 2001 population and net irrigated area during 1981 Literacy and net irrigated area relationship between them is negative and remaining all other category relationship is positive.

The population growth rate has surpassed the rate of food supply. This trend has become more acute during last twenty five years. Due to general poverty, low production of food grains and less per capita land, the availability of food supply is also low. That is seen in the less food consumption than the normal standards.

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Yield per hectare of food grains, varied enormously within the region. There is disparity in food grains production in the study region during the period under investigation. During period 1981-2001 substantial increase in food grains production in noticed in almost all tahsils of the region, but the growth rate of
population is relatively high than the food grains production rate in the study region

While studying availability of cereals highest cereals are noticed in Hingoli during 1981 and lowest in Jintur tahsil. In the year 2001 highest cereals are noticed in Pathri and lowest in Jintur tahsil. Highest availability of pulses is recorded in Gangakhed tahsil and lowest in Hingoli tahsil during 1981. In the year 2001 highest pulses are noticed in Kalamnuri and lowest in Pathri tahsil.

In the year 1981 while studying availability of various nutrients per capita per day is as follows. Highest energy is recorded in Basmat, Protein in Gangakhed, Fat in Kalamnuri, Carbohydrate in Basmat and Iron in Basmat. Lowest energy is recorded in Jintur, Protein in Jintur, Fat in Jintur, Carbohydrate in Kalamnuri and Iron in Jintur.

During 2001 per capita per day highest availability of nutrients is as follows. Highest energy is recorded in Pathri, Protein in Kalamnuri, Fats in Gangakhed, Carbohydrate in Pathri and Iron in Hingoli tahsil.
Lowest energy, Protein, Carbohydrate and Iron is observed in Jintur tahsil

The entire nutrient are not easily available in the diet of people in the study region. Lack of various nutrients in diet could cause certain disease. Many people die every year because of deficiency diseases.

For the field survey fourteen villages were selected among them one is irrigated and one is non-irrigated. They are as follows, Daithana, Pachalegaon, Ghota, Kanhegaon, Dhamangaon, Isad and Renapur are irrigated villages. Panher, Waddhuti, Pangri, Ada, Pangra shinde, Gunjegaon and Karanji are non-irrigated villages.

Rural Density of all these villages is above 200 they are Pangri, Khanhegaon, Ada, Dhamangaon, and Pangra Shinde, in the same villages agricultural density is observed above 100.

Physiological density is observed above 250 in the following villages. Daithana, Kanhegon, Ada, Dhamangaon and Pangra Shinde.
Nutritional density is observed above 200 in the following villages they are Daithana, Ada, Dhamangaon and Pangra Shinde.

Coloric density is observed above 500 in the following villages they are Daithana, Ada, Pangra Shinde, Isad.

Sex Ratio in selected villages is observed above 950 they are Daithana, Panher, Pangri, Ada, Dhamangaon, Renapur and Karanji. In Panher, Ada and Dhamanagon and Karanji villages above 1000 Sex Ratio is noticed. And very low Sex Ratio is noticed in Waddhuti, (932), Kanhegaon (930), Pachelegaon (933) while observing the Literacy of selected villages highest Literacy in observed in Kanhegaon, (70.4 Per cent) and in Ada (77.9%) but considering about Male –Female in 90 Per cent selected villages Literacy more than 70 Per cent but while observing in Ada village Female Literacy rate is observed satisfactory i.e. 63.3 Per cent Below 40 Per cent Literacy is noticed in Panher (29.97%), Pangri (35.8%), Dhamangaon (36.9%).

While studying occupational structure highest cultivators were noticed in Pangra (62%), Dhamangaon
(55%), Waddhuti (40%), lowest cultivators are in Karanji (13%), Renapur (18%), Daithana (23%) Highest Agriculture labours are observed as follows in Karanji (52%), Renapur (43%) and lowest agriculture labours are Pangra (5%), Dhamangon (10 Per cent), Waddguti (15 Per cent). Highest other workers are in Daithana, (21%), Pachlegon (14%) and in all other selected villages other workers are below 20 Per cent Non-Workers position is as follows. Above 35 Per cent in Daithana, Pachalegaon and Isad. Below 35 Per cent all other selected villages.

Relative Co-efficient is observed as follows. Above 50 is in Panher (0.63), Pachalegaon (0.61), Waddhuti (0.50), Ghota (0.55), Gunjegaon (0.54), Renapur (0.81), Karanji (0.74) Relative Co-efficient of Renapur villages is Highest i.e. (0.81) and all other selected villages are below 50.

Per capita cultivated area is noticed as follows Renapur (0.99 hectare), Karanji (0.98 hectare), and lowest per capita cultivate area is in Pangra Shinde (0.41 hectare), Ada (0.49 hectare), and Dhamangaon (0.49 hectare). In the way conclusions of population characteristic's we can say.
Landuse use pattern, cropping pattern, crop productivity. Irrigation and students t test (significant and non significant) and nutritional value conclusions are as follows.

Highest area under forest land is observed in Waddhuti (2.10 %), Pangri (0.78 %), and 0.0 Per cent forest land is Gunjegon, Renapur, Karanji, Isad, Panher, Pachelegaon, Land put to area not available for cultivation 6.06 Per cent Daithana, Waddhuti, (4014 %), and in all others selected villages below 3 Per cent. Other uncultivated land 6.15 Per cent in Waddhuti and other all villages below 3 Per cent. Fallow land Waddhuti (15.35%) Isad (6.40 %), Daithana (6.90 %), and other villages below 5 Per cent. Net sown area position is as follows Daithana(86.07 %), Waddhuti(72.27), Isad (89.28%), in other all villages above 90 Per cent net sown area in noticed.

While studying cropping pattern of selected villages more then 30 Per cent food grains are noticed in Daithana, Pachlegaon, Waddhuti, Pangra, Isad and below 15 per cent foodgrains are observed in Ghota and Karanji villages. While considering cropping pattern of
pulses above 30 per cent pulses are noticed in Wadhiti, Pangra, and Gunjegaon. Below 20 per cent pulses are noticed in Daithana, Pachlegaon, Pangra Shinde, Isad etc. About total foodgrains above 60 per cent foodgrains are noticed in Waddhuti, Pangra. While considering all food crops are above 60 per cent foodgrains are observed in Waddhuti, Pangra, Isad, Gunjegaon etc. Below 40 per cent total food crops are noticed in only Ghota village. Taking into consideration cotton above 30 per cent cotton is noticed in Panher, Pachlegaon, Renapur and Karanji villages. About total fibers crops in Panher, Pachelegon, Renapur, and Karanji there is more percentage or area under fiber crop is highest than other selected villages. While considering about total oilseeds there is difference in all the selected villages in fourteen selected villages while considering total oilseeds highest area under this crops is noticed in Ghota, Pangra Shinde, Dhamngaon and lowest in Karanji, Pangra, Waddhui and Pachlegaon. And in remaining selected villages area under total oilseeds is medium during year 2000-2005.
Irrigation position is as follows. Highest irrigation is observed in Isad, Dhamangaon, and lowest in Pangra Shinde and Karanji.

During 2001 Population and all Landuse categories relationship is observed negative. Same positive in Rural density and net sown area, sex Ratio and net sown area, Literacy and except forest land all landuse categories relationship is negative. In the same way population and area under Jowar, Population and area under Cotton, Population and Jowar and Cotton Yield, Density and area Under Jowar, density and area under Cotton, Literacy and area under Jowar, Density and area under Cotton, Literacy and area under Jowar and Literacy and area under Cotton and population and Irrigation relationship between all these is negative.

Rural density and forest land, Rural density and area not available for cultivation, Rural density and other uncultivable land, Rural density and Fallow land relationship between them is observe positive. Sex Ration and all landuse categories except Sex Ration and net sown area all relationship is positive. In the same way Literacy and forest land relationship is positive.
Density and Jowar Yield, Literacy and Cotton Yield, Sex Ratio and Irrigation, Literacy and irrigation, Density and Irrigation, Sex Ration and area under Jowar, Sex Ration and area under Cotton, Sex Ration and Jowar Yield, Sex Ratio and Cotton Yield between all these relationship is positive.

Availability of cereals and pulses in the selected villages is as follows. In Pachalegaon, Renapur and Pangri highest cereals are observed and lowest cereals are noticed in Pangra Shinde, Gunjegaon per capita per day. Highest pulses are recorded in Pangri, Pachalegaon and lowest in Pangra Shinde, Waddhuti per capita per day in grams.

Per capita availability of nutrients in fourteen villages Jowar, Wheat, Rice (Cereals) and Tur and Gram (Pulses) with the help of these (Crop nutritional value is noticed in it protein, fat, carbohydrate, calcium, iron and energy is taken villages wise.

While studying availability of various nutrients per capita per day. Highest energy is observed in Pachalegaon, Pangri and Renapur and lowest in Gunjegaon, Ghota, etc. Highest Protein Pachalegaon and
lowest in Pangra Shinde. Highest fats are recorded in Pachalegaon and lowest in Gunjegaon. Highest Carbohydrates are noticed in Pachalegaon and lowest in Pangra Shinde. Highest Iron in Pachalegaon and lowest in Gunjegaon.

8.2 PROBLEMS OF THE STUDY REGION

1. Irregularity of Monsoon in the study region

About 88 per cent of the total annual rainfall is received during the southwest Monsoon. Average annual rainfall for the district is 916.87 mm, which is not evenly distributed. In general, the amount of rainfall increases from south to north. Very important aspect of rainfall in the rainfall variability in the study region.

2. Harsh Rural Atmosphere

The region’s farmers are poor, illiterate, ignorant, superstitious, and conservative and bound by old customs and institutions. Very small group of enlightened farmers who was adopted quickly modern techniques of production. Vast majority of farmers are not motivate by considerations of economic progress. They are so poor that they did not have the means to improve their economic conditions.
3 Low Fertility Rate of Soil:

Today's fertilizers and pesticides contain chemicals so productivity becomes less and percentage of salinity is increasing and after some time or in future that soil/land will become dead land.

4. Ignorance of Farmers about Cropping Pattern

Most of the farmers in district do not know about cropping pattern in agriculture. They do not know market value of certain crops which will give them money. Today farmers using single cropping pattern Ex. Soyabean, Sugarcane so fertility rate of soil is decreasing year by year cropping pattern is same. There is no change in cropping pattern.

5. Unawareness of Soil Testing:

Farmers do not know which the contents in their soil are. They do not test their soil in laboratory so they are unaware about the biotech factors which their soil contain which fertilizer their soil need they do not know and instead of it they are using only expensive fertilizers Ex. DAP. In rural areas soil testing laboratory is not available.
6. **Changeable Net Sown Area:**

Due to urbanization, industrialization, tourist centers Accommodation facility gardens, water dams, floods net sown area is decreasing farmers are not using their total land for cultivation. Tahsil to tahsil net sown area must be used but it is not used.

7. **Low Growth Rate of Cropping Intensity:**

Tahsil to tahsil and decade by decade cropping intensity is not increasing in comparison with it because in villages there is no good irrigation facilities, agricultural awareness no use of modern agriculture instruments. In a year recycling of crops is not taken because of unaware about that knowledge per capita net sown area land is much available in district in comparison with other districts farmers attitude towards net sown area is negative.

8. **Imbalance of Sex Ratio:**

In district per one thousand male 800-900 scale of female is noticed because of negative attitude towards females, male dominated society, dowry system, no reservation for ladies in government offices literacy due to all these factors sex ratio is decreased.
9. **Problem of literacy:**

Tahsil by tahsil and decade by decade problem of literacy is more in comparison with Maharashtra State. Because literacy campaign is not fast, no education to girls, poor economic condition of farmers, child labours, leakage in education is more, no concession in fees for students, scholarship is not given, no road facility due to all these factors district is facing the problem of literacy.

10. **Workers problem:**

Today in district availability of cultivators and agricultural labours is a big problem. Because per capita land of this region is very high, good climatic condition, good soil, irrigation facility is good so labours availability is less than need. Migration of rural labours in urban areas because of high daily wage in urban areas, no security of job in rural areas, lack of skilled labours due to all these things workers problem is here.

11. **Unavailability and Unawareness of Fertilizer and Pesticides:**

As per demand of farmers fertilizers and pesticides are not available in the market. How much demand of fertilizers should came, survey of it should be made by
Government before one year man made problem of fertilizers and pesticides lack of awareness in farmers about biotech fertilizers and biotech pesticides.

12. Ignorance Regarding the Nutritional Diet:

In district except urban areas there is no knowledge of nutritional diet in rural areas per capita per day how much diet is necessary, they do not know and because of poor condition the diet taken by farmers is of low quality Ex. Milk is a good diet but due to poor condition farmers sell their milk in urban areas. Importance of fruits and vegetables they do not know per capita per day the food taken by them is not sufficient for necessary energy or calories.

13. Problem of Water Planning

In district rivers are there but water in these rivers is used property canal facility is available, depth of underground water level is less, dams are also available but no planning of water in it or people are unaware about water planning more than necessary use of water is observed in district wastage of canal water is also found no knowledge of sprinkler use. Due to all these
reasons water in Parbhani district is not used properly
no awareness about harvesting.

14. **Load shading problem:**

In rural areas near about 15 to 18 hours electricity
is not available so where irrigation facility is available so
where irrigation facility is available but due to load
shading farmers can not use that available water and its
effect is in low production, and indirectly there is effect
in country's production.

15. **Agriculture as Main Earning Source**

Generally speaking, agriculture is a chronically
depressed occupation. There are too many people who
depend on agriculture. Above 78 per cent population is
engaged in agricultural activities. Agricultural density
has increased in every tahsil during the period under
study. It means majority population depends on
agriculture and agriculture income is not sure to erratic
nature of Mansoon rainfall.

16 **Problem of Sub-Division and Fragmentation of
Holding.**

In study region the average land holdings are
small but also they are fragmented and are found not in
one compact block but also in tiny plots scattered all
over the villages. Each holding consist of many small pieces, which are found in different parts of villages. Growing population, decline of joint family system, rural indebtedness and indigenous moneylenders are the causes of small agricultural holding in the study region.

17 Uncertainty of Price of Agricultural Commodities

Nearly 80 per cent farmers interviewed of the selected villages total that they are getting fewer prices to their agricultural commodities. Most of the small farmers sell their goods in the Weekly market. The farmers of the study region do not get proper price during the period of harvesting. The Government has fixed prices of cotton and sugarcane crops. The farmers get their prices of cotton by two or three installments. The amount of cotton is not received at proper time, the farmers have to face economic problems, and Sugar factories of the study region also exploit the farmer about the payment of sugarcane.

18 Lack of Training Centers

The farmers of the region are using out dated methods and techniques of production, since they are traditionally bound and also poor. They have not
adopted the modern methods, which are so widely used in advanced countries. They require particular training for the adoption of modern techniques. The farmers is unaware from the recent agricultural technology.

19. Other problems:

In district Tahsilwise major and minor projects are planned but due to government found (Which is not available) they are not in working procedure problem of population explosion.

8.3 Suggestions:-

1. Micro Level Study of Rainfall in the study region:

To solve the problem of untimely and unequal distribution of rainfall micro level planning should be done in all tahsil for crops system on the basis of ecological considerations. It is necessary to identify the best cropping system for any local area under the prevailing rainfall and climatic conditions. The farmers should be given training about the drip irrigation. Each and every drop of rainwater should be percolated in the soil and extra running water should be collected in
percolation tanks. more and more percolation tanks, Kolhapur types bandharas should be constricted in all villages.

2. **Increasing forestation:**

Today district is facing the problem of deforestation so forestation should be the need of time on Government level there should be planning about tree plantation. According to the total population of district in comparison with it tree plantation should be done and an ideal of it should the district present such type of planning should be made by Collector, Tahsildar, Talathi, Gramsevak and People. In urban areas while giving permission for building a home minimum ten small or big tree planting should be made compulsory. To tell the importance of trees boards can be used effectively. In Schools, College, administrative officer, besides railway routers, road ways, canals tree plantation should be planned. Government employees tree plantation should be made compulsory farmers who plant more and more trees in their farm Government
should give them loans with zero per cent interest. And it’s registration should be available in Talathi office for forestation forest act should be very strict.

3. **Increase in Fertility Rate of Soil:**

   To increase fertility rate of soil agricultural planning should be done. Cultivators should be trained for doing this, measurement, water, pesticides, fertilizers; salinity of soil about all these things awareness should be made.

4. **To Create Awareness about cropping pattern:**

   To create awareness about cropping pattern which is most demanded crop should be found and to retain fertility rate of soil recycling of crops is necessary every year same crop should not be taken for this farmers have good knowledge about all this, for this circle wise guidance centers should be organized.

5. **The New circlewise soil testing centers in rural areas:**

   In which soil which crop should be taken for this soil testing in necessary? For this purpose in rural areas centers of soil testing should be started
Government and soil testing officer should give farmers soil testing freely. Those farmers who have tested their soil their names should be attached in tahsil record.

6. **To Attain Dynamic Growth in Net Sown Area:**

   Land is limited but population is increasing day by day so automatically load of over population is on existing land so fallow land should be used for cultivation Government offices, schools, colleges, military camps, dams, grounds, factories are built on fallow land so area or land under net sown area is not decreased.

7. **To Increase Cropping Intensity:**

   Decade by decade cropping intensity is increasing but its rate is not satisfactory. To increase cropping intensity irrigation facility is very necessary; take seasonal crops in the same land. To fulfill the needs of over population cropping intensity must be increased.

8. **To Increase Sex Ratio:**

   Per 100 male condition of female is very low. To increase female policy of Kerala State should be
used. Ex. To give free education to women, give different Government schemes, to stop dowry system to give share in property, positive attitude towards them to give knowledge about human eights, women empowerment to create awareness about all this. And to increase sex ratio insurance of girls should be drawn on Government level and the educated girl will get that money at the age of 18. And it’s result will be increase in sex ratio of girl’s, attitude of society towards seeing women will change female infanticide will decrease in future due to this reason

9. **To Increase Literacy Rate:**

Government should made primary education compulsory, female education free, to attract children give them different schemes to give reservation in government services to females, all government facilities should be given after 10th standard literate women should given women saving group.
10. **To Increase Skilled Workers:**

Today to create skilled labours is the need of time for this training should be given to workers and during training period fixed salary should be given to them. Migration of rural worker to urban sectors must be stopped. If the work is not available then also Government should give them money, chance of daily wages should be available in rural areas minimum above 90 Rs. daily wages should be given in rural areas to workers central Government scheme national rural employment guarantee scheme should be developed in the district.

11. **Increase in Biotech Fertilizers and Pesticides:**

Government should give biotech fertilizers and pesticides to farmers for this talukawise biotech fertilizers and pesticides research centers should be started through seminars and conferences importance about biotech fertilizers should be made. Those farmers who use biotech fertilizers and pesticides in their farm Government should buy all the grain from them with high
prices in comparison with other grains. Agricultural officers should literate people about the importance of biotech fertilizers pesticides.

12. **To Create Awareness about Nutritional Diet:**

Which diet should be taken, for how many times it will be taken, about this awareness should be there. Whatever we are eating what is in it we should see it, that energy, protein, minerals, carbohydrates, iron all these factors are necessary and in how much level they are available, to see this. In rural areas except using cereals and pulses fruits and vegetables other foods also used in diet.

13. **To Create Awareness About Water Planning:**

How much water is necessary for filed about this there should be awareness in the farmers, modern instruments and techniques Ex. Sprinkler, drop irrigation, belt, irrigation, bullet irrigation should be used. In this way water can be saved. In each and every village there should be a small lake. On village level these lakes should be planned. Help of NSS students should be taken.
14. To Create Awareness about Sex-Education:

Recently population growth rate is very fast in district for this family planning scheme should be planned effectively. In rural areas sex education awareness is very low. Use of condoms and various population control medicine, defensive period, small family one family one child to create awareness and importance of all this, Those families who have two children or below two various Government facilities should be made available to them.

15. To Reduce Load Shedding:

Government load shedding programme should be stopped and need of electricity of farmers should be fulfilled by government should give farmers free electricity for their fields.

16. Plant protection measures should be adopted chemicals to control the pests and crops diseases.

17. The pressure on land may be reduced by starting industries in the rural areas provide employment to the landuse labours.
18. Actual consumption of food grains of individual, or a family depends not on availability but its purchasing power. Therefore, there is a need to increase the purchasing capacity of poor people.

19. To increase the use of animal foods, green leafy vegetables and fruits, mixed farming should be attempted.

20. **Other suggestions:**

   Minor projected dams should be completed by giving them fund. To create awareness about tree plantation on tahsil level. Religion-wise population control should be made. Fertility rate should be decreased. Rural to Urban migration should be controlled. Control on population growth should be made.