CHAPTER IV

GENERAL LANDUSE AND CROPPING PATTERN OF THE STUDY REGION

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CHAPTER IV

GENERAL LANDUSE AND CROPPING PATTERN OF THE STUDY REGION

4.1 Introduction:

In the previous chapter population characteristics and its distribution is presented. This chapter proposes to study the landuse pattern of the region. Landuse pattern includes numerous and complex aspects, but it is proposed to examine landuse pattern, general landuse pattern, changes of general Landuse pattern, landuse efficiency, cropping intensity, trends of cropping pattern, intensity of cropping, agricultural inputs and agricultural productivity.

Land is the basic resource of human life. This is because Landuse changes to meet the variable demands of the land by the life in its new ways and conditions of life. The demand for new uses of land may be inspired by a technological change or by a change in the size, composition and requirements of a life. Some changes
are short lived. Where as other represent a more constant.

Land is basic resource. It fulfills the human beings need of food, habitation and housing materials. About 2/3rd of our population depends upon land for livelihood. Therefore, proper utilization of land is very essential. Landuse is the surface utilization of all developed and vacant land on a specific point, at a given time and space.” This leads one back to the village, farm and the farmer to the fields, gardens, pastures, fallow land, forests and to the isolated farmstead.” (Freeman, T.W.1968). Geography deals with the spatial relationship between these aspects and planning land utilization shows a reciprocal relationship between the prevailing ecological conditions of a particular region and man. The importance of landuse studies is increasing with the continuous increase in population. The diversity of topography and soils should be studied carefully in order to put land to the most deficient use and the development programmer should be properly used and implemented.
In this way, land utilization is the land use planning has, been recently introduced in land utilization studies which means the formulation and administration of land policies aimed at the employment of land resources and the uses for which they are socially, politically and economically best suited. The idea of a land use hierarchy varies with the production and consumption factors. The production factors are land, transportation facilities and the stage of technological advancement. The consumption factor includes the number of people, consumption of goods per person and gross export. The growth of population may change the forest and pasture land into cropland, including residential and industrial land utilization survey made up till now were mostly concerned with the smaller areas of rural and urban sector.

The study of land utilization has geographic and demographical dimensions. The geographic aspect consists largely of a survey of the temperature, humidity, topography and soil conditions which influence the utilization of land for crops, pasture or forest. The demographic aspect considers the studies of
population distribution, composition, characteristics and trends not only in the area being surveyed, but in the whole country.

4.2 **Meaning and importance of landuse:**

The difference between landuse and land utilization is important. Landuse is the use actually made of any parcel of land, house, apartments and industrial location are Landuse categories, where as the term residential, industrial and agricultural refer to a system of land utilization implying roads, neighborhood retail and service activities as well as location of industries, and the carrying of agricultural pursuits. In a rural area, tree cop or row crop would identify landuse, where orcharding, truck farming and grazing indicate a system of land utilization. The term 'Land utilization' is also used for varied utilization of land and soil surveys e.g. land under cultivation, pasture barren. Orchard, fallows, waste, cultivable waste, settlements forest, water bodies etc. According to J.L.Burck "Land utilization is the satisfaction, which the farm population derives from the type of agriculture developed, the provision for future production and the contribution to
national needs." While the definition given by Salter is as follows: "Land utilization research can be described as dealing with problem situations in which people in a given locality are in the process of transformation from activities with certain land requirements to activities with different land requirements. "In this sense land utilization involves an examination of the natural factors affecting both the harnessed and the potential productivity of the land in a changed situation of the locality and its requirements. These factors are the land, temperature, rainfall and soil, which in a configuration together constitute the physical background of agriculture and determine the limits of both the cultivability and productivity of the land.

Land utilization mainly deals with the problems related to the society and the region as a whole, rather than a private farmer. Landuse is mainly related to the optimum use of the limited land between the alternative major types of Landuse. In rural areas, the major types of Landuse are as follows:–

1) Agricultural land (a) non-irrigated lands, (b) irrigated lands, (c) dry farming areas. (d) Grazing areas. 2) Village
orchards or forest lands 3) Forest land (a) forest covered
b) forest reclaimed landuse, (c) cultivable or recreational
landuse. Land utilization is also related to “Conservation
of land from one major use to another general use.”
After reclamation of forestland a question arises as to
how the land should be utilized. The rotation of crops
and their combination are after all minor problems of
landuse study. This is because these aspects depend
upon personal experience and institution of the farmer
who decides which crop should be grown in rotation.

There is an intimate relationship between land
economics and land utilization. The efficient use of land
depends on the capacity of the man to utilize the land as
well as to manage it. It also depends upon the system of
farming. Systems of land tenures and size of the
holdings. Whereas, the production efficiency and level
of production depend upon the institutional frame work
and the production function carried on by the farmer.

The man-land relationship can be experienced in
three different aspects. First, the land and the individual
person who uses it, second, the man and his influence
on the use of the land as a means of production. In this
case institutional infrastructure should be studied for improved Landuse. The third relationship between land and man can be expressed in terms of man as social being and the land as an inexhaustible resource.

For human existence, within certain biotic, ecological and economic conditions the utilization of land is of prime importance. It involves a relationship that exist between the societies on the one hand, and cultural advancement, resource planning and carrying capacity of the land on the other.

The intensive use of land depends upon population concentration, economic prosperity through better agricultural production, human establishments, industrial locations, communication and transport, while extensive use of the land is related to sparse population, dispersed settlements, the absence of communication lines and the crude forms of transport. However, only systematic utilization of land is able to promote economic and cultural advancement. There is no utilization of land, one cannot think of any progress. Thus the study of land utilization is of immense value in tracing out the past use of land and its future trend.
Only through the study of the past land utilization, one is able to predict its future use and involve Landuse planning of a particular region. The changing population and the economic, the biological and the ecological problems are so alarming that not only the conservation but also the best utilization of land becomes a necessity.

4.3 Landuse Classification:

Landuse classification is the systematic arrangement of various classes of land on the basis of certain similar characteristics, mainly to identify and understand their fundamental utilities, intelligently and effectively in satisfying the needs of human society. Thus, land must be carefully utilized, so that it may fulfill our varied needs after its proper allocation. The best use of each parcel of land requires a scientific and methodically appreciable classification of the present landuse. This may help us in investigating the landuse problems and the basis of planning for the best use of our land after considering the major landuse categories.

The landuse types and its classification must be clearly presented in comparison with other land classification according to productivity and the Yield and
quality of crops grown under physically defined system of management or according to historic index based upon soil profile, soil texture, and other physical factors combined to control the use of capabilities of environmental conditions. The increase in population needs additional land for shelter and food produce and requires judicious utilization of our resource. In view of this surging problem, world Landuse inventory survey had been proposed in the International Geographical congress at Lisbon in April 1949. On this basis landuse survey has been carried out in several countries including Poland, Cyprus, Italy, Jamaica and others. At the second time, the commission met at the International Geographical congress in 1953 and it was proposed to carry out pilot survey in as many parts of the world as possible. L.D. stamp was made of the Eastern hemisphere and van Walsenburg of the Americas. "Impressive records of pilot survey on different scales of various parts of the world were presented. These commission proposed as simple classification of world landuse along with colour scheme
which is mainly suited to local condition. The classification is as follows.

World Landuse survey was drawn up under the auspices of UNESCO.

1. Settlements and associated non-agricultural land (Dark and lightened)
2. Horticulture (deep purple).
3. Tree and perennial crops (light purple).
4. Crop land continental rotation cropping (dark brown) land rotation (light brown)
5. Improved permenant pasture (light green)
6. Unimproved grazing: used (orange) not used (yellow).
7. Wood lands: dense (dark green) open (median green) scrub (olive green,) Swampy forest (blue green) etc.
8. Swamps and marshes (blue).

L.D. stamp had suggested the classification of the land of Britain into categories, for broad national policy of Landuse planning and conservation of land resources.
He had proposed three major categories and 10 type, based on.

(a) The nature of the site (elevation and slope)

(b) The nature of the soil (its depth, texture and water condition).

The major categories are as follows.

(1) Good (2) Medium and (3) Poor

He suggested following ten sub-types:

**Good quality land:**

1. First class land
2. Good general purpose farmland.
3. First class land with grass.
4. Good but heavy land.
5. Medium quality light land.

**Medium quality land:**

6. Medium quality general.
7. Poor quality heavy land.
8. Poor Quality Mountain and moorland

**Poor quality land:**

J.L. Budk, in his monumental study of land utilization in China\textsuperscript{12}, concludes, from a survey of 16,786 farms in 168 localities of eight agricultural regions, that for agricultural China there can be no great increase in amount of farm land. He has given seven types of land utilization of China. They are as follows.

1. Arable land
2. Cultivated land
3. Uncultivated land
4. Forest area
5. Land suitable for forestation
6. Grassland
7. Desert land.

In India, land use categories recognized by different scholars belong to two different types, e.g., town planners and urban geographers. Town planners often categorize urban land use as residential, commercial, industrial, transport, communication, public utilities, open space, agricultural, vacant land, and water bodies\textsuperscript{13}. On the other hand, there are minor differences amongst the urban geographers and most of them classify the urban land use into the following categories: residential, agricultural, open spaces, military lands, parks, and burial grounds\textsuperscript{14}.

In the light of physioco-socio-economic environment, man determines the uses of land. These
are taken into consideration while classifying the land under different categories and sub-categories. The census of India, has classified the land into nine different categories, as forest, barren, cultivable waste, cultivated area etc. But for the present study, they are grouped into five landuse categories viz. (i) Area under forest (2) area not available for cultivation (3) other uncultivated land excluding fallow land, (4) fallow land and (5) net sown area, because area under other categories are insignificant.

Out of these categories, the first and the second comprise the total non-agricultural land. Third is the potential agricultural land and fourth and fifth constitute the agricultural land.

4.4 Landuse Pattern

4.4.1 Forest:

This category includes all actual area under forests, whether state owned or private and classed or administered as forests out of total geographical area 3.34 per cent area was under forest in Parbhani district for the year 1980-85 averages which decreased to 3.21 per cent in the years 1990-95 average.
PARBHANI DISTRICT

Area Under Forest 2000-2005 (A)

REGION AVERAGE 3.21

Volume of Change in Area Under Forest 1980-85 to 2000-2005 (B)

REGION AVERAGE -0.13

Fig. No. 4.1
Area under forest during 1980-85 in Parbhani tahsil 0.23 per cent area was under forest whereas 6.27 per cent (Appendix No.1) area was found in Jintur tahsil. In Hingoli tahsil 8.48 per cent area was under forest, in Kalamnuri tahsil it was 3.53 per cent, in Basmat tahsil it was 4.87 per cent. But in Gangakhed and Pathri tahsils 0 per cent area was under forest means highest area under forest was found in Hingoli tahsil i.e. 8.48 per cent and lowest was in Gangakhed and Pathri tahsils i.e. 0 per cent.

3.30 per cent geographical area of Parbhani district was under forest during 1990-95, In Gangakhed and Pathri tahsils 0 per cent area was under forest means in these two tahsils we do not found any type of forest (Appendix II). Then in Parbhani tahsil also very low per cent of area under forest was found that is 0.23 per cent, in Kalamnuri and Basmat tahsil comparatively with slight difference same area was under forest that is 5.35 per cent. 6.35 per cent area under forest was found in Hingoli tahsil that is on second number and highest area under forest was found in Jintur tahsil that is 7.33 per cent means in 1990-95 also highest area
under forest was found in Jintur tahsil whereas lowest area under forest was found in Gangakhed and Pathri tahsils.

In the years 2000-2005 total area under forest of Parbhani district was 3.21 per cent (Fig. No. 4.1). In comparison with 1980-85 it decreased by 0.13 per cent (Appendix III) in it 0 per cent area under forest was found only in Gangakhed tahsil whereas 0.01 per cent area and 0.00 per cent area under forest was found in Parbhani and Pathri tahsils respectively. In Kalamnuri tahsil 3.63 per cent area was under forest. But in these years total area under forest in Jintur tahsil decreased and it was 4.98 per cent then in Hingoli tahsil 6.12 per cent area was under forest and in these years in Basmat tahsil highest area under forest was found that is 7.75 per cent means lowest area under forest was found in Gangakhed tahsil i.e. 0 per cent whereas highest area under forest was found in Basmat tahsil i.e.7.75 percent.

4.4.2 Area not available for cultivation:

This category includes the land put to non-agricultural use, barren and uncultivable land. These areas, which are not available for crop cultivation, show
Fig. No. 4.2

PARBHANI DISTRICT

Area Not available for Cultivation 2000-2005 (A)

REGION AVERAGE 5.94

INDEX

Above 6%
3 - 6 %
Below 3%

Volume of Change in Area Not available for Cultivation 1980-85 to 2000-2005 (B)

REGION AVERAGE 1.26

INDEX

Above +3%
 Below +3%
 Below -1%
 Above -1%
a close association with other uncultivated land the net sown area in Parbhani district. The land under this category can not be brought under cultivation but for a very high cost it can be brought under cultivation.

About 4.68 per cent of the total geographical area of Parbhani district was under land put to area not available for cultivation during 1980-85. It increased from 4.68 to 5.28 per cent in the years 1990-95 and in 2000-2005 its percentage reached up to 1.26 means there is an increasing trend in the land put to area not available for cultivation.

In 1980-85 4.68 per cent total area was under land put to area not available for cultivation. In Pathri tahsil its percentage was 1.90 whereas in Basmat tahsil it was 3.19 per cent. 4 to 6.1 per cent land put to area not available for cultivation in the year 1980-85 was found in Hingoli, Gangakhed, Kalamnuri and Parbhani tahsil and highest percentage of land put to area not available for cultivation was found in Jintur tahsil and its percentage is 6.41 per cent,

In the years 1990-95 about 5.28 per cent of the total geographical area of Parbhani district was under
land put to area not available for cultivation. Lowest per centage of land put to area not available for cultivation was found in Basmat tahsil 2.66 per cent then in Pathri tahsil its per centage was 3.01 per cent. In Hingoli and Gangakhed tahsils per centage of land put to area not available for cultivation was 3.39 per cent and 4.88 per cent respectively. In Parbhani tahsil its per centage was 6.61 per cent whereas 7.09 per cent land put to area not available for cultivation was found in Kalamnuri tahsil. Highest per cent 9.35 per cent of land put to area not available for cultivation was found in Jintur tahsil of the Parbhani district.

In 2000-2005 5.94 per cent total geographical area of land put to area not available for cultivation was found in Parbhani district (Fig. No. 4.2). In it lowest per centage of land put to area not available for cultivation was found in Basmat tahsil and its per centage was 2.40 per cent whereas in Jintur tahsil highest per centage of land put to area not available for cultivation was found and its per centage was 10.26 per cent. Between 4 to 5 per cent land put to area not available for cultivation was found in Parbhani 4.05 per cent, Hingoli tahsil 4.25
per cent and in Pathri tahsil 4.13 per cent whereas between 8 per cent land put to area not available for cultivation was found in Kalamnuri tahsil 8.09 per cent and in Gangakhed tahsil 8.37 per cent.

4.4.3 Other uncultivated land:

Other uncultivated land excluding fallow land consist three types of land viz. (a) Cultivable waste (b) Permanent pasture and grazing land (c) Land under miscellaneous tree crop and groves etc. In the ensuing discussion they are considered together. This is potential agricultural land which will be available for extension of agriculture but not been cultivate owing to different reasons. During 1980-85 about 8.25 per cent land has been found under this category, which increased to 6.96 per cent in 1990-95 in the study region. In 1980-85 lowest other uncultivated land was found in Parbhani tahsil i.e. 1.81 per cent whereas highest per centage of other uncultivated land was found in Jintur tahsil that is 15.13 per cent. In Kalamnuri and Basmat tahsil per centage of other uncultivated land was 9.74 per cent and 9.36 per cent respectively. In Hingoli tahsil 8.40 per cent other
PARBHANI DISTRICT

Other Uncultivable Land 2000-2005 (A)

REGION AVERAGE 5.63

Volume of Change in Other Uncultivable Land 1980-85 to 2000-2005 (B)

REGION AVERAGE 2.62

Fig. No. 4.3
uncultivated land was found 6.56 per cent and 6.74 per cent other uncultivated land was found in Gangakhed and Pathri tahsil respectively.

In 1990-95 total area under other uncultivated land was 6.96 per cent. In it 5.43 per cent other uncultivated land was found in Gangakhed tahsil. Highest percentage of other uncultivated land was found in Jintur tahsil that is 12.01 per cent. Between 6 per cent to 7 per cent other uncultivated land was found in three tahsil, they are Parbhani 6.79 per cent, Basmat 6.98 per cent and Pathri tahsil 6.37 per cent. In Kalamnuri tahsil 7.85 per cent other uncultivated land was found lowest. Lowest percentage of other uncultivated land was found in Hingoli tahsil that is 3.33 per cent.

In 2000-2005 total area under other uncultivated land was 5.63 per cent (Fig. No. 4.3). In it 0.80 per cent other uncultivated land was found in Parbhani tahsil that is lowest in percentage whereas in Jintur tahsil highest per centage of other uncultivated land was found 8.67 per cent. Between 7 per cent 8 per cent. Other uncultivated land was found in Pathri tahsil 7.94 per
cent and in Gangakhed was found in three tahsils of the region and they are as follows Hingoli tahsil 6.01 per cent, Kalamnuri tahsil 4.75 per cent and Basmat tahsil 3.79 per cent.

4.4.4 Fallow Land:

The fallow land includes current fallow land old fallow land taking into consideration the period of fallow, census of India, has divided this category into two types viz (1) Land kept fallow during the current year duly is called “Current fallow land” and (2) Other fallow land are such lands which have been cultivated but which are temporarily out of cultivation for a period of not less than one year and not more than five years. However, in the present study both the sub categories are together.

The land kept fallow temporarily, either because of continuous irrigation or excess of moisture supply, heavy fertilizer doses, extensive holdings heavy clayey soils difficult for tilling of proper time or same time due to delay in rainfall during sowing period. They are kept fallow for preserving fertility and to prevent soil exhaustion thus efficiency of fallow land system in
Fallow Land
2000-2005
(A)
REGION AVERAGE 4.67

Volume of Change in
Fallow Land
1980-85 to 2000-2005
(B)
REGION AVERAGE -2.05

Fig. No. 4.4
preserving fertility and minting crop Yields to be acknowledged.

About 6.72 per cent of the geographical area of Parbhani district was under fallow land during 1980-85. In it lowest per cent of fallow land was found in Hingoli tahsil 2.75 per cent and highest per cent of fallow land was found in Pathri tahsil 13.88 per cent. Between 4 to 5 per cent fallow land was found in the following tahsils of the region. Kalamnuri tahsil 4.13 per cent, Basmat tahsil 4.79 per cent and Gangakhed tahsil 4.93 per cent fallow land was found Jintur tahsil whereas in Parbhani tahsil 9.95 per cent fallow land was found in the year 1980-85.

In the year 1990-95 total geographical area of fallow land was 4.70 per cent. In it lowest per centage of fallow land was found in Gangakhed tahsil 3.40 per cent whereas highest per centage of fallow land was found in Pathri tahsil of the region 5.58 per cent. Between 4 to 5 per cent fallow land was found in the following tahsils of the region they are as follows. Hingoli tahsil 4.01 per cent, Jintur tahsil 4.61 per cent and Kalamnuri tahsil 4.98 per cent, more than 5 per cent fallow land was
found in Parbhani and Basmat tahsil and their percentage was 5.25 per cent and 5.07 per cent respectively.

In the year 2000-2005 total geographical area under fallow land was 4.67 per cent (Fig. No. 4.4). In it highest per cent of fallow land was found in Jintur tahsil and it’s per centage was 10.98 per cent whereas lowest per cent of fallow land was found in Pathri tahsil of the region 2.86 per cent, 5.21 per cent fallow land was found in Hingoli tahsil of the region, and 4.08 per cent fallow land was found in Kalamnuri tahsil. Between 3 to 4 per cent fallow land was found in Parbhani tahsil 3.28 per cent and in Basmat tahsil 3.31 per cent and in Gangakhed tahsil very low per cent of fallow land was found and its per centage was 2.94 per cent.

4.4.5 Net Sown Area:

Net sown area and fallow lands together constitute the extent of cropped land in any region and therefore, is of vital significance in studies relating to agricultural geography. The net sown area is the actual area under crops counting areas sown more than once in the same year only once. (Shinde S.D. 1974).
Net Sown Area 2000-2005 (A)
REGION AVERAGE 80.55

Volume of Change in Net Sown Area 1980-85 to 2000-2005 (B)
REGION AVERAGE 3.54

Fig. No. 4.5
Out of the total geographical area this landuse category has covered 77.01 per cent land in the region during 1980-85. In it highest net sown area was found in Gangakhed tahsil 83.19 per cent of the region whereas lowest net sown area was observed in Jintur tahsil that is 65.55 per cent. In Hingoli tahsil 75.42 per cent Net sown area was found. Between 77 per cent to 78 per cent net sown area was found in the following tahsils of the region. They are as follows. Kalamnuri tahsil 77.04 per cent, Pathri tahsil 77.49 per cent and Basmat tahsil 77.76 per cent, 82.60 per cent Net sown area was found in Parbhani tahsil of the region.

In the year 1990-95 out of the total geographical area this landuse category has covered 79.90 per cent land in the region. In it lowest per cent of net sown area was found in Hingoli tahsil of the region that is 66.98 per cent whereas highest per centage of net sown area was found in Gangakhed tahsil of the region that is 89.01 per cent which is more than overage of the region. Between 74 to 80 per cent Landused for net sown area was found in the following tahsils of the region. In Kalamnuri tahsil 74.51 per cent and in Basmat tahsil
General Landuse Pattern in Parbhani District
(1980 - 85)

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Fig. No. 4.6

Fig. No. 4.6

1. Forest
2. Area Not Suitable for Cultivation
3. Other Uncultivable Land
4. Fallow Land
5. Net Sown Area
General Landuse Pattern in Parbhani District
(1990 - 95)

INDEX

- Forest
- Area Not available for Cultivation
- Other uncultivable land
- Fallow Land
- Net Sown Area

Fig. No. 4.7
General Landuse Pattern in Parbhani District
(2000-05)

INDEX

Fig. No. 4.8

- Forest
- Area Not available for Cultivation
- Other uncultivable land
- Fallow Land
- Net Sown Area
79.45 per cent and between 81 to 85 per cent net sown area was found in Parbhani, Pathri tahsil 84.98 per cent.

80.55 per cent land was used for this category in the year 2000-2005 (out of total geographical area). In it highest net sown area was found in Parbhani tahsil (Fig. No. 4.5) of the region that is 91.60 per cent and lowest per cent of net sown area was observed in Jintur tahsil that is 65.12 per cent. Between 78 to 80 per cent net sown area was found in two tahsil they are as follows Hingoli tahsil 78.42 per cent and Kalamnuri tahsil 79.46 per cent, above 80 per cent net sown area was found in three tahsil of the region they are Gangakhed tahsil 81.27 per cent, Basmat tahsil 82.76 per cent and pathri tahsil 85.03 per cent.

4.5 Changes of General Landuse pattern in Parbhani district.

(1) Forest - Tahsilwise volume of changes in Parbhani district

In Parbhani tahsil of the region area under forest in the years 1980-85 was 0.23 per cent, and in the years 2000-2005 it was 0.10 per cent and volume of changes observed in this tahsil was 0.13 per cent (Fig. No. 4.7,
4.8, 4.9). In Jintur tahsil of the region area under forest in the years 1980-85 was 6.27 per cent and in the years 2000-2005 it’s per centage was 4.98 per cent means volume of changes observed in this tahsil about area under forest was -1.29 per cent. In Hingoli tahsil 8.48 per cent area under forest was observed and in 2000-2005 it was 6.12 per cent and volume of changes observed was -2.35 per cent. Whereas, in Kalamnuri tahsil of the region 3.53 per cent area under forest was found in 1980 – 85 and 3.63 per cent area was under forest during the year 2000 – 05 and its volume of changes was 0.10 per cent. In Basmat tahsil in 1980 – 85 4.87 per cent area under forest was found and 7.75 per cent area under forest was found in the year 2000 – 05 and its volume of changes was 2.88 per cent. Whereas in Gangakhed tahsil there is 0 per cent area under forest during the year 1980-85 (0.0%) and 2000-2005 (0.0%). So there is also 0 per cent volume of changes observed.

In Pathri tahsil of the region in 1980-85 (0.00%) area was under forest and in 2000-2005 (0.00%) area
was under forest and (0.00%) volume of changes observed in this tahsil of the region.

Area under forest of the region in 1980-85 was 3.34 per cent and in 2000-2005 it was 3.21 per cent and total volume of changes observed of the region was -0.13 per cent (Appendix IV).

(2) **Area not Available for Cultivation:**

In the years 1980-85 in Parbhani tahsil of the region land put to area not available for cultivation was 5.14 per cent and in 2000-2005 it's percentage was 4.26 per cent and volume of changes observed in this tahsil was -1.15 per cent. In Jintur tahsil of the region 6.41 per cent land put to area not available for cultivation was found in the years 1980-85. Whereas, in 2000-2005 it was 10.26 per cent. 3.85 per cent volume of changes observed in this tahsil. In Hingoli tahsil of the region in the years 1980-85 land put to area not available for cultivation was 4.96 per cent and 4.25 per cent was observed in 2000-2005. It means -0.71 per cent volume of changes observed in Kalamnuri tahsil of the region 5.57 per cent land put to area not available for cultivation was in 1980-85. Whereas, 8 to 9 per cent
was observed in 2000-2005. Volume of changes observed was 2.52 per cent. In Basmat tahsil 3.19 per cent land put to area not available for cultivation was found in 1980-85. Whereas its per centage in 2000-2005 was 2.40 and -0.79 per cent volume of changes observed. In Gangakhed tahsil 5.32 per cent land put to area not available for cultivation in 1980-85 and in 2000-2005 it was 8.37 per cent and volume of changes observed in this tahsil was 3.05 per cent. In Pathri tahsil 1.90 per cent land of 4.14 per cent and volume of changes observed was 2.24 per cent. Per centage of land put to area not available for cultivation in the years 1980-85 and 2000-2005 was 4.68 per cent and 5.94 per cent respectively and volume of changes observed of the region was 1.26 per cent.

(3) Other Uncultivated Land:

Area of other uncultivated land of Parbhani tahsil during 1980-85 was 1.81 per cent and in 2000-2005 it was 0.80 per cent. Volume of changes observed in this tahsil about other uncultivated land was -1.01 per cent. In Jintur tahsil of the region area under other uncultivated land during the years 1980-85 was 15.13
per cent and in 2000-2005 it was 8.67 per cent, and volume of changes observed was -6.46 per cent. In Hingoli tahsil 8.40 per cent area was found under other uncultivated land in the years 1980-85 and 6.01 per cent was found in 2000-2005 volume of changes observed in this tahsil about area under other uncultivated land was -2.39 per cent. In Kalamnuri tahsil of the region 9.74 per cent other uncultivated land was found in the years 1980-85 and it's per centage in 2000-2005 was 4.75 per cent. -4.99 per cent volume of changes observed. In Basmat tahsil other uncultivated land was 9.39 per cent in 1980-85 and in 2000-2005 it was 3.79 per cent. -5.60 per cent volume of changes of other uncultivated land was found in this tahsil. In Gangakhed tahsil in 1980-85 6.56 per cent area under other uncultivated land was observed and in 2000-2005 it was 7.43 per cent and volume of changes observed was 0.87 per cent. In Pathri tahsil of the region 6.74 per cent area under other uncultivated land was found in 1980-85 and in 2000-2005 it was 7.94 per cent and 1.21 per cent volume of changes observed. Area under other uncultivated land of the region in 1980-85 was
8.25 per cent and in 2000 - 2005 it was 5.63 per cent. 
-2.62 per cent volume of changes observed of the region.

(4) Fallow land:

Area of fallow land of Parbhani tahsil in the years 1980-85 was 9.95 per cent whereas in 2000-2005 it was 3.28 per cent and volume of changes observed -6.67 per cent. 6.64 per cent fallow land was found in Jintur tahsil of the region in the years 1980-85 and in 2000-2005 per centage of fallow land in Jintur tahsil increased up to 10.98 and volume of changes observed in this tahsil was 4.34 per cent. In Hingoli tahsil 2.75 per cent fallow land was observed in 1980-85 and in 2000-2005 it increased up to 5.21 and 2.46 per cent volume of changes observed. In Kalamnuri tahsil of the region 4.13 per cent fallow land was observed in 1980-85 and in 2000-2005 it decreased up to 4.08 per cent and volume of changes observed -0.05 per cent. In Basmat tahsil 4.79 per cent fallow land was observed in 1980-85 and in 2000-2005 it was 3.31 per cent. Here volume of changes observed -1.49 per cent. In Gangakhed tahsil of the region in 1980-85 per centage of fallow land was 4.93 and in 2000-2005 per centage of
fallow land was 4.93 and in 2000-2005 it decreased up to 2.94 per cent and volume of changes observed -1.99 per cent. In Pathri tahsil per centage of fallow land in 1980-85 and 2000-2005 was 13.88 and 2.86 per cent respectively and -11.01 per cent volumes of changes observed in this tahsil. 6.72 per cent fallow land was observed in 1980-85 of the region and in 2000-2005 it decreased up to 4.67 per cent and -2.05 per cent volumes of changes observed in the region about fallow land.

(5) Net sown area:

Net sown area of Parbhani tahsil in 1980-85 was 82.60 per cent and in 2000-2005 it increased and become 19.60 per cent volume of changes observed in this tahsil about net sown area are 8.99 per cent. In Jintur tahsil of the region 65.55 per cent net sown area was found in 1980-85 and 2000-2005 it was 65.12 per cent and -0.43 per cent volume of changes observed. In Hingoli tahsil 75.42 per cent net sown area was found and in 2000-2005 it was 78.42 per cent and volume of changes observed was 3.00 per cent. In Kalamnuri tahsil of the region 77.04 per cent net sown are was
Changes of General Landuse Pattern in Parbhani District
(1980-85 to 2000-05)

Fig. No. 4.9

INDEX

- Forest
- Area Not available for Cultivation
- Other uncultivable land
- Fallow Land
- Net Sown Area
there and in 2000-2005 it was 79.46 per cent and volume of changes observed 2.42 per cent. In Basmat tahsil 77.76 per cent net sown area was found and in 2000-2005 it increased up to 82.76 per cent and volume of changes observed 4.99 per cent. In Gangakhed tahsil in 1980-85 net sown area was 83.19 per cent whereas in 2000-2005 it became 81.27 per cent and volume of changes observed was -1.92 per cent. In Pathri tahsil of the region in 1980-85 per centage of net sown area was 77.49 per cent and in 2000-2005 it was 85.03 per cent volume of changes observed in this tahsil was 7.55 per cent. Per centage of net sown area in 1980-85 was 77.01 and in 2000-2005 it was 80.55 per cent and volume of changes about net sown area of the region was observed 3.54 per cent (Fig. No. 4.10).

(6) Positive Changes of the Region:

Total changes increase of General Landuse in Parbhani districts are as follows. Volume of changes of Parbhani tahsil about total changes increase was 4.80 per cent. In Jintur tahsil of the region 8.19 per cent total changes increase observed. In Hingoli tahsil 5.46 per cent total changes increased observe whereas in
Overall Changes of General Landuse Pattern in Parbhani District. 
(1980-85 to 2000-05)

Fig. No. 4.10
Kalamnuri tahsil of the region 5.04 per cent total changes increase found. In Gangakhed tahsil 3.92 per cent volume of changes observed about total changes increase. In Basmat tahsil of the region 7.87 per cent total changes increase observed. In Pathri tahsil of the region 11.02 per cent volume of changes observed about total changes increase. Total changes increase observed of region were 4.80 per cent.

(7) Negative Changes of the Region:

Total changes decrease of general Landuse pattern in Parbhani district (Tahsilwise) are as follows. Volume of changes of Parbhani tahsil about total changes decrease were -4.80 per cent. In the region total changes decrease was -5.46 per cent. In Kalamnuri tahsil it was -5.04 per cent. In Basmat tahsil it's percentage was -7.88 per cent and in Gangakhed and Pathri tahsils of the region -3.91 and -11.01 per cent total changes decrease observed, whereas 4.80 per cent total changes decrease of the region.

4.6 Per capita net sown area in Parbhani district:

In 1980-85 in Parbhani tahsil of the region 316234 population was there and net sown area was 1194
hectare per capita net sown area in it was 0.38 hectare. In Jintur tahsil 196714 population was recorded in the same year and net sown area observed in that tahsil was 1098 hectare and in it per capita net sown area was 0.56 hectare and in it per capita net sown area was 1406 hectare per capita net sown area observed of that tahsil was 0.58 hectare population of Kalamnuri tahsil in 1980-85 was 198472 and net sown area was 1112 hectare and 0.56 hectare per capita net sown area was population of Basmat tahsil was 222611 and net sown area was 1035 hectare in it 0.46 hectare per capita net sown area found population of Gangakhed tahsil was 229033 and 1342 hectare net sown area was whereas 0.59 hectare per capita net sown area was population of Pathri tahsil was 237958 and net sown area was 1240 hectare per capita net sown area of that tahsil was 0.52 hectare. Total population of the region recorded was 1829378. Net sown area was 9256 hectare and per capita net sown area was 0.51 hectare.

In the years 1990-95 population of Parbhani tahsil was 440194 and net sown area was 1304 hectare 0.30 hectare per capita net sown area was observed
population of Jintur tahsil was 252558 recorded. Net sown area of this tahsil during these years was 1004 hectare and 0.40 hectare per capita net sown area was observed. 304477 was the population of Hingoli tahsil and 1884 hectare net sown area. Population of Kalamnuri tahsil was 236992 recorded and 909 hectare was net sown area and 0.38 hectare per capita net sown area was observed. 0.31 hectare per capita net sown area was observed in Basmat tahsil of the region whose net sown area was 905 hectare and 293883 population of the same tahsil population of Gangakhed tahsil was 299610 and net sown area was 1363 hectare and 0.45 hectare per capita net sown area was observed. 289321 and 1457 hectare net sown area was population of Pathri tahsil observed and 0.50 hectare per capita net sown area was recorded. Total population of the region was 2117035 and 8935 hectare net sown area was recorded in it. 0.42 hectare per capita net sown area was observed.

In the years 2000-2005 population of Parbhani tahsil was 623084 and 863 hectare net sown area was in it. 0.14 hectare per capita net sown area was recorded. 234405 was the population of Jintur tahsil in
2000-2005 and 819 hectare net sown area was recorded in it 0.35 hectare per capita net sown area was recorded. In Kalamnuri tahsil 197392 population recorded and net sown area was 748 hectare and 0.38 hectare per capita net sown area was recorded in Gangakhed tahsil of the region whose net sown area was 1125 hectare and population was 303632 population of Pathri tahsil was 346594 and net sown area was 1517 hectare in it 0.44 hectare per capita net sown area was recorded. Total population of the region recorded in 2000-2005 was 2278499 and 8991 hectare net sown area was and 0.39 hectare per capita net sown area was observed.

4.7 **Landuse Efficiency**

A critical appraisal of land resource use need a scientific explanation for such aspect as to how efficiency land has utilized (Sharma 1978). The concept of landuse efficiency has been developed on ranking score basis. Six variables such as (1) Net sown area (2) Non cultivable land (3) Cultivable land (4) Irrigated Land (5) Area Cropped more than once and Cropping Intensity have been considered in calculating the ranking score,
Non cultivable the ranking includes forest land and area not available for cultivation, cultivable land includes other uncultivable land, fallow land and net sown area. Cropping intensity is the area sown more than once a percentage to net sown area.

On the basis of the method mentioned here, the tahsil in the study area have been divided into three efficiency group-viz I) High efficiency II) Moderate efficiency III) Low efficiency (Table 4.5)

Fig. 4.11(A) show that landuse efficiency for the period 1980-85, 1990-95 and 2000-05. Landuse efficiency above 35 ranking score index was found in North-east part of Parbhani district landuse efficiency i.e. less than 30 ranking score index was recorded in northern and southern part of the region. i.e. Hingoli and Gangakhed tahsil of the region. moderate landuse efficiency was observed i.e. Parbhani, Kalamnuri, Jintur, and Pathri tahsil during 1980-85.

Fig. 4.11(B) indicates that the landuse efficiency during the year 1990-95 was less than 30 ranking score index was found nil. Moderate landuse efficiency i.e. 30-35 ranking score index was noticed in Parbhani
High landuse efficiency i.e. more than 35 ranking score was found in Basmat and Pathri tahsil.

Fig. 4.12(B) showing landuse efficiency for the year 2000-05 reveals the low efficiency i.e. less than 30 ranking score index was observed in nil. Moderate efficiency ranking score index 30-35 recorded in Jintur and Hingoli tahsil. High landuse efficiency more than 35 ranking score index was found in Parbhani, Kalamnuri, and Basmat, Gangakhed, and Pathri tahsil of the region.

The fundamental factors of high efficiency are high net sown area, high cultivable land, low uncultivable land on one hand and high irrigated land, area cropped more than once and cropping intensity on the other land. Pathri and Basmat tahsil was recorded high landuse efficiency for the period 1980-80 to 2000-05 because of high irrigated area, high cultivable land and low non cultivable land area, where as Hingoli and Jintur tahsil of the study region was recorded low landuse efficiency due to highest non-cultivable irrigated area low cropping intensity. Main region for this is Physiography unsuitability.
LAND USE EFFICIENCY PARBHANI DISTRICT

INDEX

1990-1995
1980-1985

> 35 Low Efficiency
30 - 35 Mod. Efficiency
< 30 High Efficiency

Fig. No. 4.11
### Table No.4.1
Landuse Efficiency in Parbhani District.

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Year</th>
<th>Efficiency Class</th>
<th>Rank Score</th>
<th>No of Tahsil</th>
<th>Tahsil</th>
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<td>01</td>
<td>1980-85</td>
<td>Low Efficiency</td>
<td>&lt;30</td>
<td>02</td>
<td>Hingoli, Gangakhed.</td>
</tr>
<tr>
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<td></td>
<td>Moderate Efficiency</td>
<td>30-35</td>
<td>04</td>
<td>Parbhani, Pathri, Jintur, Kalmnuri,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Efficiency</td>
<td>&gt;35</td>
<td>01</td>
<td>Basmat</td>
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<tr>
<td>02</td>
<td>1990-95</td>
<td>Low Efficiency</td>
<td>&lt;30</td>
<td>00</td>
<td>Nil</td>
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<tr>
<td></td>
<td></td>
<td>Moderate Efficiency</td>
<td>30-35</td>
<td>05</td>
<td>Parbhani, Jintur, Hingoli, Kalmnuri, Gangakhed.</td>
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<td>&gt;35</td>
<td>02</td>
<td>Basmat, Pathri.</td>
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<td>03</td>
<td>2000-05</td>
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<td>&lt;30</td>
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<td>30-35</td>
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<td>Jintur, Hingoli.</td>
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<td>High Efficiency</td>
<td>&gt;35</td>
<td>05</td>
<td>Parbhani, Kalmnuri, Basmat, Gangakhed, Pathri.</td>
</tr>
</tbody>
</table>

Source: - Compiled by Author.

### 4.8 Cropping Pattern:

Cropping and agricultural enterprise pattern are the extent to which the arable land under different agricultural activities can be put to use (Sing and Dillon-1995) These largely depend up to the socio-economic influents, which determine the possibility of
the enterprise the farmer choose and the input intensity with which be farms with an assured supply of water and availability of modern inputs, specially high Yielding verity seeds and chemical fertilizers it becomes possible for farmers to replace less profitable land by growing two or even there crops in the same field in a year (Sing V.R.1979). Difference in attitude towards rural land, in the level of prosperity and in technology have produced significant changes which are only gradually coming to be appreciated although in the long run their effects in both landscape and landuse studies are likely to be for reaching (Coppock J.T.1968).

Cropping pattern mean the proportion of area under various crops at a time. It is dynamic concept because no cropping pattern can be said to be ideal for meet the requirements and is governed largely by the physical as well as cultural and technological factors the change in the cropping pattern in a particular span of time clearly indicates the changes that have taken place in the agricultural development. Crop pattern is influenced by various factors, such as ecological, technological and institutional (Shafi, 1966). The
ecological factors determine the broad patterns of agricultural landuse. But these technological and institutional factors have brought drastic shifts in the cropping practices.

**Cropping pattern in Parbhani district:**

1) **Cereals:**

During the years 1980-85 area under cereals in the selected tahsils is recorded as follows. Above 45 per cent area under cereals is noticed in Parbhani (45.93%), Kalamnuri (47.57%), Basmat (49.02%), (Appendix No. V) Gangakhed (51.46%) and in Pathri (47.89%), below 45 per cent area under cereals is observed in Jintur tahsil i.e.44.31 per cent and in Hingoli tahsil i.e.44.30 per cent.

In the years 1990-95 area under cereals is observed as follows. Above 40 per cent area under cereals is noticed in Jintur tahsil (42.00%), Basmat (41.97%), (Appendix No. VI) and in Gangakhed tahsil i.e.41.51 per cent. Between 30 to 40 per cent area under cereals is recorded in Parbhani (38.55%), Hingoli (36.59%), Kalamnuri (38.87%), and in Pathri i.e.38.24 per cent.
AREA UNDER CEREALS AND PERCENTAGE VOLUME OF CHANGES IN PARBHANI DISTRICT

Region Average 47.25
1980-1985

Region Average 37.78
2000-2005

Region Average 39.30
1990-1995

Region Average -9.48
Volume of changes in area under cereals 1980-85 to 2000-05

Fig. No. 4.12
Area under cereals above 40 per cent is recorded in Basmat tahsil (45.42%), Gangakhed tahsil (42.42%), and in Pathri tahsil i.e. 40.52 per cent (Fig. No. 4.12). Between 35 to 40 per cent area is recorded in Parbhani tahsil (37.85%) only. Below 35 per cent area is noticed in Jintur (31.21%), Hingoli (33.75%), and Kalamnuri (33.07%) in the years 2000-2005.

1.1 Rice:

The crop requires hot and humid climate and rainfall above 150cms. Most of the rice is raised with the help of rainfall and irrigation facilities in the study region. In the year 1980-85 area under rice is observed as follows. Above 5 per cent area under rice is noticed in Basmat tahsil i.e. 6.97 per cent. Between 2 to 5 per cent area under rice is noticed in Kalamnuri (2.81%). Below 2 per cent area is recorded in Parbhani (1.84%), Jintur (1.08%), Hingoli (1.77%), and Gangakhed (1.41%) and in Pathri tahsil (0.74%) (Fig. No. 4.13).

During the year 1990-95 area under rice above 4 per cent is recorded in Basmat tahsil (4.23%). Between 3 to 4 per cent is noticed in Hingoli (3.47%), Kalamnuri (3.10%) and below 3 per cent area under rice is observed
PARBHANI DISTRICT

Volume of Change in Area Under Rice 1980-85 to 2000-2005

REGION AVERAGE -0.33

Above +1%
Below +1%
Below -1%
Above -1%

Fig. No. 4.13
in Parbhani (1.09%), Jintur (2.51%), Gangakhed (1.12%) and Pathri (0.33%).

In 2000-2005 above 3 per cent area under rice is noticed in Hingoli (3.42%), Kalamnuri (3.12%) and in Basmat tahsil (3.16%). Between 2 to 3 per cent area is observed in Jintur (2.60%) tahsil only. Below 2 per cent area under rice is recorded in Parbhani (0.77%), Gangakhed (1.50%) and in Pathri tahsil i.e.0.23 per cent.

1.2 Wheat:

In the years 1980-85 above 8 per cent area under wheat is recorded in Basmat tahsil i.e.8.33 per cent. Between 5 to 8 per cent area under wheat is noticed in Parbhani (6.13%), Kalamnuri (7.08%), and Gangakhed (5.52%), and Pathri tahsil (5.36%). Whereas below 5 per cent area is observed in Jintur (3.73%) and Hingoli (4.60%).

During 1990-95 above 6 per cent area under wheat is noticed Kalamnuri (6.17%) and Basmat tahsil (6.06%). Between 4 to 6 per cent area under wheat is observed in Parbhani (5.27%) and Pathri tahsil (4.17%). Below 4 per cent area under wheat is noticed in Jintur
Fig. No. 4.14

**PARBHANI DISTRICT**

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**Area Under Wheat 2000-2005**

**REGION AVERAGE 6.30**

**Volume of Change in Area Under Wheat 1980-85 to 2000-2005**

**REGION AVERAGE 0.51**

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**INDEX**

- Above 8%
- 6 - 8 %
- Below 6%

---

**INDEX**

- Above 1%
- Below -1%
- Above -1%
(2.54%), Hingoli (3.66%) and Gangakhed (2.40%) (Fig. No. 4.14).

In 2000-2005 above 8.00 per cent area under this crop is recorded in Hingoli (8.07%) and Basmat tahsil (8.06%). Between 6 to 8 per cent area is recorded in Jintur (7.14%) and Kalamnuri (6.52%) tahsil. Below 6 per cent area is observed in Parbhani (5.81%), Gangakhed (4.02%) and Pathri (5.02%).

1.3 Jowar:

In 1980 – 85 above 35 per cent are under Jowar (K, Jowar & R. Jowar) is recorded in Gangakhed and Pathri tahsil. Between 30 – 35 per cent area under Jowar recorded in Basmat, Kalamnuri, Hingoli and Jintur tahsil. Lowest area under Jowar were recorded in Jintur Tahsil (35%) (Fig. No. 4.15).

During the year 1990 – 95 Above 35 per cent area under Jowar is observed in Gangakhed and Jintur tahsil. Between 30 to 35 per cent area under Jowar recorded in Parbhani and Pathri tahsil.

In the year 2000-05 above 35 per cent area under Jowar recorded in Gangakhed tahsil only. Between 30 to 35 per cent are under Jowar recorded in Basmat and
Area Under Jowar 2000-2005 (A)

Volume of Change in Area Under Jowar 1980-85 to 2000-2005 (B)

REGION AVERAGE 28.68

REGION AVERAGE -9.30

Fig. No. 4.15
Pathri tahsil. Below 25 per cent are under Jowar recorded in Jintur, Hingoli and Kalamnuri tahsil.

In 1980-85 Highest area under other crops is observed in Jintur tahsil (3.67%) followed by Pathri tahsil i.e.1.54 per cent whereas lowest in Parbhani tahsil (0.21%) followed by Basmat (0.32%). In 1990-95 highest area under other crops is recorded in Pathri tahsil (2.25%) followed by Jintur (1.32%) whereas lowest in Basmat (0.19%) followed by Kalamnuri (0.29%). In 2000-2005 in Pathri tahsil (3.04%) highest area under other crop is recorded whereas lowest in Jintur tahsil i.e.0.6 per cent.

2 Food Pulses:

During 1980-85 area under total food pulses is recorded as follows. Above 20 per cent area is noticed in Parbhani (26.71%), Jintur (20.33%), and Gangakhed (20.31%) and in Pathri (20.16%). Between 15 to 20 per cent area is observed in Hingoli (19.30%) only. Below 15 per cent area under pulses is observed in Kalamnuri (14.13%) and Basmat tahsil i.e.13.61 per cent (Fig.No.4.16).
AREA UNDER PULSES AND PERCENTAGE VOLUME OF CHANGES IN PARBHANI DISTRICT

Region Average 19.41
1980-1985

Region Average 22.29
1990-1995

Region Average 21.49
2000-2005

Volume of changes in area under Pulses
1980-85 to 2000-05

INDEX

Above 20
15 - 20
Below 15

INDEX

Above 25
20 to 25
Below 20

INDEX

Above -4%
2 - 4 %
Below 2 %
Below -3%
Above -6%

Fig. No. 4.16
In the years 1990-95 area under pulses is recorded as follows. Above 25 per cent area under pulses is noticed in Parbhani (28.04%) and Hingoli (27.07%). Between 20 to 25 per cent area under pulses is observed in Jintur (21.03%) and in Pathri (22.24%). Below 20 per cent area under total food pulses is seen in Kalamnuri (19.69%), Basmat (11.52%) and in Gangakhed i.e. 19.58 per cent (Fig. No. 4.16).

During the year 2000-2005 above 25 per cent area under pulses is observed in Jintur (25.86%) and Kalamnuri (27.39%). Between 20 to 25 per cent area under pulses is noticed in Parbhani (20.31%), Hingoli (22.60%), and in Pathri (21.58%). Below 20 per cent area is observed in Basmat (14.14%) and in Gangakhed tahsil i.e.19.73.

2.1 Gram:

In the year 1980-85 above 6 per cent area under gram is recorded in Parbhani (6.76%) tahsil. Between 4 to 6 per cent area is noticed in Gangakhed tahsil i.e.4.66 per cent and below 4 per cent area under Gram is recorded in Jintur (2.36%), Hingoli (0.91%),
Area Under Gram 2000-2005 (A)

Region Average 5.80

Volume of Change in Area Under Gram 1980-85 to 2000-2005 (B)

Region Average 2.62

Fig. No. 4.17
Kalamnuri (1.50%), and Basmat (2.30%) and in Pathri tahsil (3.30%) (Fig. No. 4.17).

In 1990-95 area under above 6 per cent is noticed in Parbhani (11.07%) and in Hingoli (7.80%). Between 3 to 6 per cent area under gram is recorded in Gangakhed tahsil i.e.3.41 per cent and below 3 per cent area is noticed in Jintur (1.43%), Kalamnuri (2.88%), and Basmat (2.91%) and in Pathri tahsil (1.84%).

In the year 2000-2005 above 8 per cent area under gram is recorded in Parbhani tahsil (9.18%), and in Kalamnuri tahsil i.e.9.53 per cent. Between 6 to 8 per cent area under gram is observed in Basmat (6.56%) and Gangakhed tahsil i.e.7.90 per cent. Below 6 per cent area under gram is noticed in Jintur (2.86%), Hingoli (3.19%), and in Pathri tahsil (2.99).

2.2 Tur:

In the year 1980-85 area under Tur above 5 per cent is noticed in Basmat (5.07%) and Gangakhed tahsil i.e.5.11 per cent. Between 4 to 5 per cent area is observed in Jintur (4.16%), Hingoli (4.32%), and Kalamnuri (4.42%). Below 4 per cent area is observed in Parbhani (3.59%) and in Pathri (3.40%) (Fig. No. 4.18).
PARBHANI DISTRICT

Area Under Tur 2000-2005 (A)

REGION AVERAGE 6.77

Volume of Change in Area Under Tur 1980-85 to 2000-2005 (B)

REGION AVERAGE 2.49

Fig. No. 4.18
During 1990-95 above 8 per cent area under Tur is recorded in Parbhani (9.98%), and in Pathri tahsil i.e. 8.35 per cent. Between 6 to 8 per cent area is noticed in Jintur (6.66%), Kalamnuri (6.07%) and in Gangakhed i.e. 7.45 per cent. Below 6 per cent area is noticed in Hingoli (4.86%), and Basmat (5.54%) tahsil.

In 2000-2005 above 10 per cent area under Tur is recorded in Jintur (13.67%) and in Pathri tahsil i.e. 10.24 per cent. Between 5 to 10 per cent area under Tur is observed in Parbhani (5.93%), Hingoli (6.50%) and Gangakhed (5.12%). Below 5 per cent area is observed in Kalamnuri (4.91%) and in Basmat tahsil (1.03%).

2.3 Mug:

Above 10 per cent area under Mug is observed in Parbhani (16.07%) and Pathri tahsil i.e. 12.06 per cent. Between 5 to 10 per cent area is recorded in Jintur (6.28%), Hingoli (5.35%), and in Gangakhed (9.89%). Below 5 per cent area is noticed in Kalamnuri (2.85%) and Basmat tahsil (4.24%) in 1980-85 (fig. No. 4.19).

During 1990-95 above 10 per cent area under Mug is recorded in Jintur (10.44%) and Pathri tahsil i.e. 11.48
Volume of Change in Area Under Mug 1980-85 to 2000-2005
REGION AVERAGE -2.12

Fig. No. 4.19
per cent. Between 8 to 10 per cent area is observed in Hingoli (8.24%), and in Gangakhed tahsil (8.45%). Below 8 per cent area under this crop is recorded in Parbhani (6.34%), Kalamnuri (6.30%), and Basmat (2.60%).

In the years 2000-2005 above 6 per cent area under Mug is noticed in Hingoli (6.54%), Kalamnuri (7.72%), and Gangakhed (6.46%) and in Pathri (7.61%). Between 5 to 6 per cent area is noticed in Jintur (5.88%) tahsil and below 5 per cent area is recorded in Parbhani (4.64%), Basmat (4.51%).

2.4 **Udid:**

In the years 1980-85 above 3 per cent area under Udid is noticed in Hingoli (4.55%), and Kalamnuri tahsil i.e.3.36 per cent. Between 1 to 2 per cent area under Udid is recorded in Jintur tahsil i.e.1.31 per cent and below 1 per cent area is observed in Parbhani (0.07%), Basmat (0.28%), Gangakhed (0.10%), and in Pathri tahsil i.e.0.39 per cent.

During 1990-95 above 5 per cent area under Udid is recorded in Hingoli tahsil i.e.5.77 per cent and between 3 to 5 per cent area under Udid is noticed in Kalamnuri tahsil i.e.3.71 per cent and below 3 per cent
area is observed in Parbhani (0.25%), Jintur (1.60%), Basmat (0.30%), and Gangakhed (0.07%) and in Pathri tahsil i.e. 0.28 per cent.

In the year 2000-2005 above 6 per cent area under Udid is recorded in Hingoli tahsil i.e. 6.14 per cent. Between 2 to 5 per cent area is noticed in Kalamnuri (4.90%) and in Basmat (2.02%). Below 2 per cent area under Udid is observed in Parbhani (0.44%), Jintur (1.98%), Gangakhed (0.23%) and in Pathri tahsil i.e. 0.67 per cent.

In 1980-85 highest area under other pulses is recorded in Jintur tahsil (6.22%) followed by Hingoli (4.18%) and lowest in Parbhani tahsil (0.22%) followed by Gangakhed tahsil (0.55%). In 1990-95 area under other pulses in all the tahsils decreased. Below 1 per cent area under other pulses is recorded in all the selected villages. The same situation about other pulses is recorded in the year 2000-2005.

3 **Total Food Grain:**

In the years 1980-85 highest area under total food grains is recorded in Parbhani tahsil i.e. 72.63 per cent whereas lowest in Kalamnuri tahsil i.e. 61.70 per cent, in
Gangakhed taluk 71.78 per cent area is noticed in total food grain. Between 60 to 70 per cent area is observed in Jintur (64.64%), Hingoli (63.60%), Basmat (62.64%), and in Pathri (68.05%).

During 1990-95 highest area under total food grain is observed in Parbhani taluk i.e.66.59 per cent followed by Hingoli taluk i.e.63.66 per cent whereas lowest in Basmat taluk i.e.53.53 per cent followed by Kalamnuri taluk i.e.58.56 per cent. Area between 60 to 65 per cent under total food grain is observed in Jintur (63.03%), Gangakhed (61.09%), and Pathri taluk i.e.60.48 per cent.

In 2000-2005 highest area under total food grain is recorded in Gangakhed taluk i.e.62.15 per cent followed by Pathri taluk i.e.62.10 per cent whereas lowest in Hingoli taluk i.e.56.35 per cent followed by Jintur i.e.57.07 per cent. Between 55 to 60 per cent area under total food grain is noticed in Parbhani taluk (58.16%), Kalamnuri (60.46%) and Basmat i.e.59.56 per cent.

4 Sugarcane:
In the years 1980-85 highest area under sugarcane is recorded in only Basmat taluk i.e.3.28 per
cent. In all other remaining tahsils below 1 per cent area under sugarcane is noticed they are Parbhani (0.20%), Jintur (0.45%), Kalamnuri (0.24%), Gangakhed (0.14%), and in Pathri (0.26%), lowest area under sugarcane is noticed in Hingoli tahsil i.e.0.04 per cent.

During the years 1990-95 highest area under sugarcane is observed in Basmat tahsil i.e.5.40 per cent whereas lowest in Hingoli tahsil i.e.0.47 per cent. Between 1 per cent to 2 per cent area under sugarcane is noticed in Kalamnuri (1.52%), and Pathri tahsil i.e.1.61 per cent. Below 1 per cent area under sugarcane is recorded in the remaining tahsils they area Parbhani (0.74%), Jintur (0.73%), and Gangakhed tahsil i.e.0.50%.

In 2000-2005 highest area under this crop is recorded in Gangakhed tahsil i.e.2.17 per cent whereas lowest in Jintur tahsil i.e.0.77 per cent. Between 1 to 2 per cent area under sugarcane is observed in all the remaining tahsils they are Parbhani (1.68%), and Pathri (1.36%).
5  **Spices Fruits and Vegetables:**

Below 1 per cent area under spices is observed in all the tahsils except Basmat tahsil in the year 1980-85. In Basmat tahsil highest area under total spices is recorded i.e.2.88 per cent and lowest in Pathri tahsil i.e.0.13 per cent. In the year 1990-95 below 0.50 per cent area under total spices is noticed except Basmat tahsil i.e.0.93 per cent. It mean there is decrease in the production of total spices is observed lowest area under total spices is recorded in Pathri tahsil i.e.0.05 per cent. The same situation of 1990-95 is observed in the year 2000-2005 about total spices.

Highest area under fruits and vegetables is recorded in Basmat tahsil i.e.2.88 per cent followed by Pathri tahsil i.e.1.14 per cent whereas lowest in Hingoli and Gangakhed tahsil i.e.0.12 per cent during the year 1980-85.

In the year 1990-95 highest area under fruits and vegetables is recorded in Basmat tahsil i.e.3.11 per cent and lowest in Pathri tahsil i.e.0.31 per cent. During 2000-2005 area under fruits and vegetables is increased in all the selected villages. Highest area under fruits and
vegetables is noticed in Parbhani tahsil i.e. 1.53 per cent followed by Hingoli i.e. 1.48 per cent and lowest in Gangakhed tahsil i.e. 0.34 per cent followed by Kalamnuri tahsil i.e. 0.95 per cent.

6 Food Crops:

In the years 1980-85 area under all food grain above 70 per cent is noticed in Parbhani tahsil i.e. 73.58 per cent, Basmat tahsil (71.68%), and Gangakhed tahsil (72.23%). Between 60 to 70 per cent area under total food grain is noticed in Jintur tahsil i.e. 65.71 per cent, Hingoli (63.91%), Kalamnuri (62.54%), and Pathri (69.58%). Below 60 per cent area is not noticed in a single tahsil.

During the year 1990-95 above 65 per cent area under all food grain is observed in only Parbhani tahsil i.e. 68.13 per cent. Between 60 to 65 per cent area under all food grain is recorded in all the remaining tahsils they are Jintur (64.29%), Hingoli (64.81%), Kalamnuri (61.37%), Basmat (62.98%), Gangakhed (62.39%), and Pathri tahsil i.e. 62.46 per cent.

During the year 2000-2005 above 65 per cent area under total food grain is not noticed in a single village.
Between 60 to 65 per cent area is recorded in Parbhani tahsil (61.97%), Kalamnuri (63.55%), Basmat (63.08%), Gangakhed (64.89%), and in Pathri tahsil i.e.64.77 per cent. Below 60 per cent area is observed in two tahsils they are Jintur (58.99%), and Hingoli (59.55%).

7 Cotton:

During the years 1980-85 area under cotton is recorded as follows. Above 30 per cent area is noticed in Kalamnuri tahsil i.e.32.75 per cent. Between 20 to 30 per cent area under cotton is observed in Jintur tahsil (21.78%), Hingoli tahsil (23.11%), below 20 per cent area under cotton is noticed in Parbhani tahsil (17.10%), Basmat tahsil (17.88%), Gangakhed (12.91%), Pathri tahsil i.e.14.57 per cent (Fig. No. 4.20).

In the years 1990-95 area under cotton above 25 per cent is recorded in Kalamnuri tahsil (28.04%), Gangakhed tahsil (25.64%), and Pathri tahsil (26.37%). Between 20 to 25 per cent area under cotton is observed in remaining four tahsils they are Parbhani (22.90%), Jintur (24.39%), Hingoli (24.60%), and Basmat tahsil i.e. 22.91 per cent.
Fig. No. 4.20

Area Under Cotton 2000-2005 (A)

REGION AVERAGE 28.13

Volume of Change in Area Under Cotton 1980-85 to 2000-2005 (B)

REGION AVERAGE -8.40
During 2000-2005 position of cotton is as follows. Area under cotton above 30 per cent is noticed in Jintur tahsil i.e. 34.89 per cent and Hingoli tahsil i.e. 30.66 per cent. Between 25 to 30 per cent area under cotton is noticed in all the remaining tahsils they are Parbhani (27.18%), Kalamnuri (25.01%), Basmat (25.28%), Gangakhed (26.68%) and Pathri tahsil i.e.26.99 per cent.

8 Other Fibers:

In the year 1980-85 above 2 per cent area under other fibers is observed in Hingoli tahsil i.e. 2.15 per cent. Between 1 to 2 per cent area is noticed in Jintur (1.15%), Gangakhed (1.31%) and in Pathri tahsil i.e. (1.44%). Below 1 per cent area is recorded in Parbhani (0.54%), Kalamnuri (0.38%) and in Basmat tahsil i.e. 0.77 per cent.

During 1990-95 below 1 per cent area under other fibers is recorded in all the selected tahsils. In the year 2000 - 2005 the same situation of 1990-95 is observed.

9 Fibers Crops:

In the year 1980-85 above 30 per cent area under total fiber crops is observed in Kalamnuri tahsil i.e.33.14 per cent. Between 20 to 25 per cent area under
This crop is recorded in Jintur (22.93%) and Hingoli (24.85%). Below 20 per cent area is noticed in Parbhani tahsil (17.64%), Basmat (18.65%), Gangakhed (14.22%) and in Pathri tahsil (16.01%).

During 1990-95 above 25 per cent area under total fibers crops is recorded in Kalamnuri tahsil i.e.28.21 per cent, Gangakhed (25.81%), and in Pathri tahsil (26.41%), Below 25 per cent area is observed in Parbhani (23.04%), Jintur (24.88%), Hingoli (24.65%), and Basmat (22.96%).

In the years 2000-2005 above 30 per cent area under this crop is recorded in Jintur tahsil (35.06%) and Hingoli tahsil (30.67%). Between 26 to 28 per cent area is noticed in Parbhani tahsil (27.79%), Gangakhed tahsil (26.70%) and in Pathri tahsil (27.01%). Below 26 per cent area is observed in Kalamnuri (25.04%) and Basmat tahsil (25.34%)

10 Groundnut:

In the years 1980-85 highest area under groundnut is observed in Basmat tahsil due to irrigation i.e.6.98 per cent followed by Pathri tahsil i.e.2.26 per cent whereas lowest in Kalamnuri (0.18%) followed by
Hingoli tahsil i.e.0.40 per cent. Between 1 to 2 per cent area under groundnut is noticed in Jintur (1.51%) and Gangakhed tahsil i.e.1.72 per cent.

During 1990-95 highest area under groundnut is recorded in Basmat tahsil i.e.8.92 per cent and lowest in Hingoli tahsil (0.40%). Between 1 to 3 per cent area under groundnut is noticed in Parbhani (2.67%), Jintur (1.78%), and Gangakhed (1.83%) and in Pathri (1.92%).

In the years 2000-2005 above 3 per cent area under groundnut is recorded in Basmat tahsil i.e.3.77 per cent. Between 1 to 3 per cent area is observed in Parbhani tahsil (2.03%) and Kalamnuri tahsil (1.39%). Below 1 per cent area is noticed in Jintur (0.20%), Hingoli (0.50%), Gangakhed (0.55%) and Pathri (0.14%).

11 Safflower:

In the years 1980-85 above 6 per cent area under safflower is noticed in Jintur (6.08%), Hingoli (9.78%) and in Pathri (7.51%). Between 3 to 6 per cent area is noticed in Parbhani (3.84%), Kalamnuri (3.08%), and in Gangakhed tahsil i.e.4.75 per cent. Below 3 per cent area is observed in Basmat i.e.2.00 per cent.
During 1990-95 above 6 per cent area under safflower is observed in Hingoli (6.97%) and Kalamnuri (6.16%) tahsil. Between 4 per cent to 6 per cent area is noticed in Jintur (5.02%), Gangakhed (5.00%) and in Pathri (5.95%). Below 4 per cent area under safflower is noticed in Parbhani (3.60%) and Basmat (1.56%) tahsil.

In 2000-2005 above 4 per cent area under this crop is recorded in Hingoli (4.70%), Kalamnuri (4.19%), and Basmat (4.29%) and in Pathri 4.99 per cent. Between 3 to 4 per cent area under safflower is observed in Parbhani (4.00%), Jintur (2.59%) and in Gangakhed (2.74%).

12 Other Oilseeds:

During 1980-85 above 7 per cent area under other oilseeds is recorded in Gangakhed tahsil i.e.7.07 per cent. Between 3 per cent to 5 per cent area under this crop is observed in Parbhani (4.45%), Jintur (3.78%) and in Pathri tahsil i.e.4.65 per cent. Below 2 per cent area is in Hingoli, Kalamnuri (1.07%) and Basmat (0.70%) tahsil observed.

In 1990-95 above 4 per cent area is noticed in Jintur (4.02%) and in Gangakhed tahsil i.e.4.97 per
cent. Between 3 to 4 per cent is recorded in Hingoli (3.17%), Basmat (3.58%) and in Pathri (3.26%) below 3 per cent area is recorded in Parbhani tahsil i.e.2.58 per cent.

During 2000-2005 above 5 per cent area under other oilseeds is recorded in Kalamnuri tahsil i.e.5.82 per cent and in Gangakhed tahsil i.e.5.12 per cent. Between 4 to 5 per cent area is noticed in Parbhani (4.22%), Hingoli (4.59%). Between 4 per cent area is observed in Jintur (3.16%), Basmat (3.51%).

13 Total Oilseeds:

In the years 1980-85 area under total oilseeds above 10 per cent is recorded in Jintur tahsil (11.36%), Hingoli (11.24%), Gangakhed (13.55%) and Pathri (14.41%). Below 10 per cent area under total oilseeds is observed in the remaining tahsils they are Parbhani (8.78%), Kalamnuri (4.33%), and Basmat (9.67%) (Fig. No. 4.21).

During the year 1990-95 area under total oilseeds above 10 per cent is observed in overall tahsils except Parbhani tahsil 8.84 per cent area under total oilseeds is noticed. In Jintur tahsil (10.83%), Hingoli tahsil
PARBHANI DISTRICT

Area Under Oilseed 2000-2005 (A)

REGION AVERAGE 9.41

Volume of Change in Area Under Oilseed 1980-85 to 2000-2005 (B)

REGION AVERAGE -1.21

Fig. No. 4.21
(10.54%), Basmat (14.06%), Gangakhed (11.80%) and Pathri tahsil i.e.11.13 per cent.

In the 2000-2005 above 10 per cent area under oilseeds is observed in Parbhani tahsil (10.25%), Kalamnuri tahsil (11.41%) and Basmat tahsil (11.57%). Below 10 per cent area is noticed in all the remaining tahsils they are Jintur (5.94%), Hingoli (9.79%), Gangakhed (8.41%) and Pathri tahsil i.e.8.23 per cent.

4.9 Changes of Cropping Pattern in Parbhani District

1) Cereals:

There is decrease in all the selected tahsils in the production of cereals is observed from 1980 - 85 to 2000 - 2005 there is 8.08 per cent decrease in Parbhani tahsil, (Appendix No. VIII). In Jintur tahsil (-13.10%), In Hingoli tahsil (-10.55%), Kalamnuri tahsil (-14.50%), Basmat tahsil (-3.60%), Gangakhed tahsil (-9.05%), and in Pathri tahsil (-7.37%) decrease is recorded in the production of cereals.

2) Pulses:

About total food pulses there is an increase in all the tahsils except Parbhani tahsil (-6.39%), and Gangakhed tahsil (-0.58%). Highest increase in pulses is
recorded in Kalamnuri tahsil i.e.(13.26%) and lowest increase in Basmat tahsil i.e.0.53 per cent. In Jintur tahsil (5.53%), Hingoli (3.30%), and Pathri (1.42%) increase in pulses is recorded between 1980-85 to 2000-2005.

3) Food Grain:

In all seven tahsils there is decrease in total food grain from 1980-85 to 2000-2005. Highest decrease in total food grain is noticed in Parbhani tahsili.e.(-14.47%) and lowest in Kalamnuri tahsil i.e.(-1.24%). Between 5 to 10 per cent decrease is observed in Jintur (-7.57%), Hingoli (-7.25%), Gangakhed(-9.62%) % Pathri (-5.95%). Below 5 per cent decrease in total food grain is recorded in Basmat tahsil only i.e.-3.07 per cent.

4) Sugarcane:

There is an increasing trend in the production of sugarcane in all the tahsils except one tahsil i.e. Basmat. In Basmat tahsil there is decrease in the production of sugarcane i.e.-2.05 per cent recorded. Highest increase in sugarcane is noticed in Gangakhed tahsil i.e.2.02 per cent and lowest in Jintur tahsil i.e.0.32 per cent. Between 1 to 2 per cent increase in all
the remaining tahsils is recorded from 1980-85 to 2000-2005. In Parbhani tahsil (1.48%), Hingoli (1.33%), Kalamnuri (1.62%), and Pathri tahsil i.e.1.11 per cent increase is recorded in the Production of sugarcane.

5) All Food Crops:

There is decrease in all the tahsils in the production of total food grain except one tahsil i.e. Kalamnuri. In Kalamnuri tahsil there is an increase in total food grain i.e.1.02 per cent is recorded Highest decrease in the production of total food grain is observed in Parbhani tahsil i.e.-11.61 per cent and lowest in Hingoli tahsil i.e.-4.36 per cent from 1980-85 to 2000-2005. Between 5 to 10 per cent decrease is observed in Jintur tahsil i.e. -6.71 per cent, Basmat (-8.59%), and Gangakhed tahsil (-7.34%). Below 5 per cent decrease in total food grain is noticed in Pathri tahsil i.e.-4.81 per cent.

6) Cotton:

There is an increase in the production of cotton in all the tahsils except Kalamnuri tahsil. In Kalamnuri tahsil there is decrease in production of cotton i.e.-7.74 per cent is recorded from 1980-85 to 2000-2005.
Highest increase in cotton is noticed in Gangakhed tahsil i.e. 13.77 per cent followed by Jintur tahsil i.e. 13.11 per cent and lowest in Basmat tahsil i.e. 7.40 per cent followed by Hingoli i.e. 7.55 per cent in Parbhani tahsil (10.09%) and Pathri tahsil 12.42 per cent increase in the production of cotton is observed from 1980-85 to 2000-2005.

7) Oilseeds:

In the production of total oilseeds there is an increase and decrease is recorded. In four tahsils there is decrease and in three tahsils there is an increase is observed from 1980-85 to 2000-2005. Highest decrease in total oil seeds is noticed in Pathri tahsil i.e. -6.19 per cent followed by Jintur tahsil i.e. -5.42 followed by Gangakhed tahsil i.e. -5.14 per cent and lowest in Hingoli tahsil i.e. -1.46 per cent. Highest increase in the production of total oil seeds is recorded in Kalamnuri tahsil i.e. 7.08 per cent and lowest in Parbhani tahsil i.e. 1.46 per cent followed by Basmat tahsil i.e. 1.90 per cent from 1980-85 to 2000-2005.
4.10 Cropping Intensity in Parbhani district:

Cropping intensity is defined as the extent to which the net area sown has been cropped or resown. The total cropped area or grass area sown as percentage to net area sown gives a measure of landuse efficiency, which really means the intensity of cropping. (Singh, 1972) Intensity of cropping refers to the number of crops grown on the same area in any year, for example, if one crop is grown on a field in one year, the cropping is 100 per cent, if two crops in a year are taken, the cropping intensity is 200 per cent. Therefore, higher the intensity of cropping higher is the landuse efficiency and vice versa (T.S.Choudhan, 1987)

To calculate the cropping intensity following method is used.

\[
\text{Intensity of cropping} = \frac{NJ}{NO} \times 100
\]

Where,

\(NJ = \) Total cropped area.
\(NO = \) Net sown area.

The effect of irrigation facilities and cultivators per 100 hectares of the cultivated area, the impact of the nature of soil, meager rainfall and size of holding were
the most direct explanations of the variation in the area distribution of cropping intensity.

In 1980-85 net sown area in Parbhani tahsil was 1194 hectare and 1344 hectare Gross cropped area was and cropping intensity of the tahsil was 112.56 per cent. In Jintur tahsil of the region net sown area was 1098 hectare recorded and Gross cropped area was 1241 hectare and cropping intensity was 113.02 per cent. In Hingoli tahsil Gross cropped area was 1530 hectare and net sown area in it was 1406 hectare and cropping intensity decreased up to 108.82 per cent. In Kalamnuri tahsil Gross cropped area was 1269 hectare and in it net sown area was 1112 hectare and cropping intensity increased up to 114.12 per cent. In Basmat tahsil 121.45 per cent cropping intensity was recorded where Gross cropped area was 1257 hectare and net sown area in it was 1035 hectare. In Gangakhed tahsil Grass cropped area was 1477 hectare in it 1342 hectare net sown area was and 110.06 per cent cropping intensity was recorded. In Pathri tahsil of the region highest cropping intensity that is 126.05 per cent recorded.
whereas lowest cropping intensity was recorded of the region i.e. 105.14 per cent. (Table 4.2 & Fig. No. 4.22).

**Table No.4.2**

**Cropping Intensity in Parbhani District**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
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<td>112.56</td>
<td>116.95</td>
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<td>2</td>
<td>Jintur</td>
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<td>Hingoli</td>
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<td>125.41</td>
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<td>7</td>
<td>Pathri</td>
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<td>130.54</td>
<td>139.48</td>
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<td></td>
<td><strong>105.14</strong></td>
<td><strong>122.23</strong></td>
<td><strong>131.16</strong></td>
</tr>
</tbody>
</table>

Source:- 1) Socio Economic Review and District statistical Abstract of Parbhani District 2) Compiled by Author

In 1990-95 Gross cropped area in Parbhani tahsil was 1525 hectare and net sown area in it was 1304 hectare. Cropping intensity of that tahsil in these years was 116.95 per cent. between 113 to 114 per cent cropping intensity was noticed in the two tahsils of the
REGION AVERAGE 105.14
1980-1985 (A)

REGION AVERAGE 122.23
1990-1995 (B)

REGION AVERAGE 131.16
2000-2005 (C)

INDEX (A)

Above 120
114 - 120
Below 114

INDEX (B)

Above 120
115 - 120
Below 115

INDEX (C)

Above 135
130 - 135
Below 130

Fig. No. 4.22
region and they were Jintur and Hingoli tahsil respectively. In Jintur tahsil 1210 hectare. Gross cropped area was and 1004 hectare was under net sown area. Cropping intensity observes was 102.52 per cent. In Hingoli tahsil Gross cropped area was 2144 hectare and net sown area was 1884 hectare 113.80 per cent cropping intensity was observed in that tahsil. In Kalamnuri tahsil of the region 1068 hectare. Gross cropped area was and 909 hectare net sown area in it whereas 117.49 per cent cropping intensity was. In Basmat tahsil of the region highest cropping intensity was noticed and that is 125.41 per cent. Gross cropped area was 1135 hectare and net sown area was only 905 hectare. In Gangakhed and Pathri tahsil of the region 114 to 126 per cent cropping intensity was noticed. In Gangakhed tahsil 1566 hectare Gross cropped area was and 1363 hectare net sown area was and 114.89 per cent cropping intensity was in Pathri tahsil 125.94 per cent cropping intensity was noticed while considering about region Gross cropped area of the region was 10921 hectare in the years 1990-95 and net sown area

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was 8935 hectare and cropping intensity noticed of the region was 122.23 per cent.

In the years 2000-2005 Gross cropped area of Parbhani tahsil was 1141 hectare and net sown area was 863 hectare cropping intensity observed of this tahsil was 132.21 per cent. In Jintur tahsil of the region 1019 hectare Gross cropped area was observed and net sown area was 819 hectare. In this tahsil 124.42 per cent cropping intensity was noticed, which is lowest in all tahsils of the region during these years. In Hingoli tahsil of the region 956 hectare Gross cropped area was and 742 hectare net sown area was cropping intensity of this tahsil was 128.84 per cent. In Kalamnuri tahsil 982 hectare Gross cropped area was and 748 hectare area was net sown cropping intensity was 131.28 per cent. In Basmat tahsil of the region Gross cropped area was 984 hectare and 729 hectare area was under net sown 134.98 per cent cropping intensity was noticed of this tahsil. In Gangakhed tahsil of the region Gross cropped area was noticed and i.e.1515 hectare and net sown area was 1125 hectare and cropping intensity also highest and that is 134.67 per cent. In Pathri tahsil
Gross cropped area was 2116 hectare and net sown area was 1517 hectare cropping intensity of Pathri tahsil was 139.49 per cent. Gross cropped area of the region was 11793 hectare and net sown area of the region was 8991 hectare and cropping intensity of the region was 131.16 per cent.

Table No 4.3
Category Wise cropping intensity in Parbhani District

<table>
<thead>
<tr>
<th>Period</th>
<th>Below 125</th>
<th>126-130</th>
<th>131-135</th>
<th>Above 136</th>
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<tbody>
<tr>
<td>1980-85</td>
<td>Parbhani, Basmat, Jintur, Hingoli, Kalamnuri, Gangakhed, Region</td>
<td>Pathri</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>1990-95</td>
<td>Jintur, Hingoli, Parbhani, Basmat, Gangakhed, Kalamnuri, Region</td>
<td>Pathri</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>2000-05</td>
<td>Jintur</td>
<td>Hingoli</td>
<td>Parbhani, Kalamnur, Basmat, Gangakhed Region</td>
<td>Pathri</td>
</tr>
</tbody>
</table>

4.11 Agricultural Inputs

Modern agriculture inputs are playing an important role in development countries like India where the population is increasing at a faster rate to satisfy the basic needs like food, clothing and shelter of growing population the land must be cultivated intensively. Productivity as a measure of landuse efficiency and is
largely related to the choice of inputs but these inputs may tend to increase or increase and decrease the efficiency of land. Land is the most important means of agricultural production. The productivity of land is not constant as it is reduced after taking many crops, so to improve this productivity; there is a need of input like Irrigation, Fertilizers, Pesticides, HYV seeds etc. Today the enormous amounts in inputs, which are going into agriculture, are being reflected in the increased agriculture production per unit of area. In this section an attempt is made to analyses the distributional pattern of these inputs. The main inputs considered here are Irrigation.

(I) Irrigation:

Irrigation is an agricultural strategy designed to reduce moisture deficiency i.e. the imbalance between the moisture supplied by rainfall and the evapotranspiratory demand more over, the adverse result of unreliability of rainfall is well countered through irrigation to be successful and well developed agriculture requires supply of water at regular interval and in required quantities. Irrigation is essentially the
artificial application of water to overcome deficiencies in rainfall for growing crops (Cantor L.M., 1967). If the rainfall is highly erratic in a region, then other climatic conditions have to be favorable for the cultivation of a variety of crops with the help of irrigation development. Development of irrigation depends on the existence of three factors i.e. (1) The need for irrigation (2) The facilities and resources and an organization to utilize resources are such as a state or a central authority (3) As a rule, lower the rainfall greater is it's variability and more is the need for irrigation.

The socio-economic need for irrigation has also been recognized for supporting the growing population, rehabilitating the poor sections of society and narrowing the gap of regional imbalances. The impact of irrigation is all prevailing as it leads to changes in cropping pattern, increases yield rates and labour utilization and in the ultimate analysis brings prosperity to the area, hence, it is regarded as catalyst for socio-economic change that sets motion the productive forces in the agricultural sector. (Sivarma Krishnarao and Mahamad Ali 1986)
Irrigation is the most important and basic ingredient, plays a vital role in the changing agricultural landscape. It provides assurance of agricultural crops, useful for multiple cropping and for adapting agricultural innovation in areas where rainfall where rainfall is both inadequate and unreliable. It is found that the cultivators having irrigational facilities adopt more improved farm practices than those cultivators who are without irrigation (Das Gupta and Das, 1966) and therefore, it is a pivot of modern agricultural growth.

**Mode of Irrigation**

There are different irrigational sources in Parbhani district. The following modes of irrigation are use for irrigating the agricultural land.

A) Major and medium irrigation projects.

B) Miner irrigation Project.

**A) Major and medium irrigation project**

An irrigation project which covers more than 10,000 hectares as the cultivated command area is called major irrigation project. Major irrigation project can change the socio-economic structure of the region. Medium
irrigation project are those with cultivable command areas between 2000 to 10000 hectares. Parbhani district is benefited by the Purna, Jayakwadi, Upper Penganga, Majalgaon and Lower Dudhana major project.

I) Purna Project

The height of the dam is 51.36 meter. The length of the main canal is 48.80 and sub canals length is 177.60 km. The storage capacity of Purna project is 954 million cubic meter. About 301 cubic meter water was available as on 31st March 2000.

II) Jaykwadi Project

Jaykwadi project is also useful to this district. Nearly 4726.00 hectares of land was irrigated in 2004-2005 by Jaykwadi project.

III) Upper Penganga

Actually dam was constructed on Penganga River near Isapur village tahsil Pusad district Yavatmal. It was completed in 1995. In 2004-2005 nearly 16888 hectares of land of Parbhani district got water for Irrigation.
IV) Majalgaon Project

Majalgaon dam was constructed on Sindhaphana River near Majalgaon. About 3200 hectares of land received water for irrigation from this project during 2004-2005.

Medium Projects

There are three medium project in Parbhani district such as Masoli, Borna and Karpara project.

I) Masoli Project

Dam was constructed on Masoli river near Isad village in Gangakhed tahsil. It was completed in June 1982. About Rs. 469.20 lakh amount was spent on this project. The total height of the dam is 27.10 meters. About 15 canal is constructed from Masoli project. Total water storage capacity of the project is 34.08 million cubic meter. About 18.14 million cubic water was stored in this dam as on 31st March 2000. In 2004-05 about 2025 hectares land of Parbhani district was irrigated by this dam.

II) Borna Project

The dam was constructed on Bornaa River near Kasarwadi tahsil Ambejogai district Beed. It was
completed in 1996. The total expenditure of this dam is Rs.298.15 lakh. The height of the dam is 33.30 meters and about 14 km canal was constructed from this dam. The water storage capacity of the dam is 3.52 million cubic meters.

Nearly 2406 hectares of land will be benefited if the dam will be fully stored by the water. In 2004-05 about 1298 hectares land of Parbhani district was irrigated by this dam.

III) Karpara project

Dam was constructed on Karpara River near Nivali Village in Jintur Tahsil. It was completed in 1974. About Rs.112.31 lakh was spent on this project. The height of the dam is 16.55 meters. About 24.22 km sub canal is also constructed from this dam, whereas about 11.4 km sub canal is also constructed from Karpara Project. Total storage capacity of these projects is 28.86 million cubic metres. About 15.56 million cubic meter water was available in this dam as on 31st March 2000. Irrigation capacity of Karpara project is 5870 hectares but actually 1545 hectares land was brought under irrigation in 2004-05.
In short, these medium irrigation projects are playing an important role in the agricultural development of the study region. Since the last three years, distribution of rainfall has been very low, hence these projects dry up in the summer season.

B) Minor Irrigation Projects

An irrigation project which covers less than 2000 hectares as the cultivated command area. During the rainy season when water collects and forms a pond, it is usually called a tank. This water is used for irrigating the standing crops after the wet season. The level of water in the tank is solely dependent on the quantum of rainfall of that season. After the independence of the Government of Maharashtra, more emphasis has been given to minor irrigation in the state. Map No. 4.23 shows us the distribution of minor irrigation schemes.

Area under irrigation of the district in 1980-85 was 9.25 per cent. In Parbhani tahsil of the region, the area under irrigation was 10.65 per cent. In Jintur tahsil, 3.064 per cent area was under irrigation. In Hingoli tahsil of the region, the lowest percentage of area under irrigation was observed and i.e. 1.628 per cent. In
Kalamnuri tahsil 4.84 per cent area was under irrigation, whereas highest area under irrigation was noticed in Basmat tahsil of the region and per centage was 20 per cent. In Gangakhed tahsil of the region there is also very low area was under irrigation and that is 2.52 per cent. 5.22 per cent area was under irrigation in Pathri tahsil of the region during the years 1980-85.

**Table No 4.4**

**Statement Showing Tahsilwise Distribution Of Minor Irrigation Scheme (2004-2005)**

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Tahsil</th>
<th>Total Minor Schemes</th>
<th>Irrigation Potential in Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Parbhani</td>
<td>17</td>
<td>1072</td>
</tr>
<tr>
<td>02</td>
<td>Jintur</td>
<td>98</td>
<td>6501</td>
</tr>
<tr>
<td>03</td>
<td>Hingoli</td>
<td>104</td>
<td>9413</td>
</tr>
<tr>
<td>04</td>
<td>Kalamnuri</td>
<td>30</td>
<td>2450</td>
</tr>
<tr>
<td>05</td>
<td>Basmat</td>
<td>61</td>
<td>4613</td>
</tr>
<tr>
<td>06</td>
<td>Gangakhed</td>
<td>34</td>
<td>2272</td>
</tr>
<tr>
<td>07</td>
<td>Pathri</td>
<td>18</td>
<td>850</td>
</tr>
<tr>
<td></td>
<td><strong>Parbhani District</strong></td>
<td><strong>362</strong></td>
<td><strong>27171</strong></td>
</tr>
</tbody>
</table>

Source: Socio-economic Abstract of Parbhani District.
Table No. 4.5
Development in Irrigation facility in Parbhani district

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Tahsil</th>
<th>1980-85</th>
<th>1990-95</th>
<th>2000-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Parbhani</td>
<td>10.65</td>
<td>10.01</td>
<td>11.03</td>
</tr>
<tr>
<td>02</td>
<td>Jintur</td>
<td>3.064</td>
<td>5.15</td>
<td>9.78</td>
</tr>
<tr>
<td>03</td>
<td>Hingoli</td>
<td>1.628</td>
<td>5.99</td>
<td>19.07</td>
</tr>
<tr>
<td>04</td>
<td>Kalamnuri</td>
<td>4.84</td>
<td>13.71</td>
<td>13.14</td>
</tr>
<tr>
<td>05</td>
<td>Basmat</td>
<td>20</td>
<td>24.92</td>
<td>33.6</td>
</tr>
<tr>
<td>06</td>
<td>Gangakhed</td>
<td>2.52</td>
<td>4.28</td>
<td>8.86</td>
</tr>
<tr>
<td>07</td>
<td>Pathri</td>
<td>5.22</td>
<td>7.1</td>
<td>11.08</td>
</tr>
</tbody>
</table>

Region | Parbhani District | 9.25 | 9.32 | 12.6 |

Source:- Socio-Economic Review and District statistical abstract of Parbhani District

In the years 2000-2005 area under irrigation was increased almost in all tahsils of the region. Area under irrigation of the district was noticed 12.6 per cent. In Parbhani tahsil of the region 11.03 per cent area was under irrigation 9.78 per cent area under irrigation of Jintur tahsil was observed. In Hingoli tahsil of the region 19.07 per cent area was under irrigation which is highest in all tahsils of the above tahsil (Fig. no. 4.24). In Kalamnuri tahsil of the region 13.14 per cent area was under irrigation. In Basmat tahsil of the region
highest area under irrigation was noticed and i.e. 33.6 per cent. In Gangakhed tahsil of the region lowest area under irrigation was observed and i.e. 8.86 per cent. Whereas 11.08 per cent area under irrigation of Pathri tahsil was observed.

**Table No 4.6**


<table>
<thead>
<tr>
<th>Years</th>
<th>Parbhani</th>
<th>Jintur</th>
<th>Hingoli</th>
<th>Kalamnuri</th>
<th>Basmat</th>
<th>Gangakhed</th>
<th>Pathri</th>
<th>District</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-85</td>
<td>10.65</td>
<td>3.064</td>
<td>1.628</td>
<td>4.84</td>
<td>20</td>
<td>2.52</td>
<td>5.22</td>
<td>9.25</td>
</tr>
<tr>
<td>2000-05</td>
<td>11.03</td>
<td>9.78</td>
<td>19.07</td>
<td>13.14</td>
<td>33.6</td>
<td>8.86</td>
<td>11.01</td>
<td>12.06</td>
</tr>
<tr>
<td>Volume of Change in%</td>
<td>0.38</td>
<td>6.716</td>
<td>17.44</td>
<td>8.3</td>
<td>13.6</td>
<td>6.34</td>
<td>5.86</td>
<td>3.35</td>
</tr>
</tbody>
</table>

Source:- Socio-Economic Review and District statistical abstract of Parbhani District

Volume of changes in irrigation of the district during 1980-85 to 2000-2005 was 3.35 per cent. In Parbhani tahsil of the region lowest volume of changes in irrigation was observed and i.e.0.38 per cent. In Jintur tahsil of the region 6.716 per cent volume of changes in irrigation was observed. In Hingoli tahsil of the region highest volume of changes in irrigation was noticed and the per centage was 17.442 per cent. In Kalamnuri tahsil 8.3 per cent volume of changes in irrigation was noticed. Whereas, 13.6 per cent volume of
Volume of Change in Irrigation 1980-85 to 2000-2005 (B)

REGION AVERAGE 3.35

Fig. No. 4.24
changes in irrigation was observed in Basmat tahsil of the region. In Gangakhed and Pathri tahsil of the region between 5 to 7 per cent volumes of changes in irrigation was noticed. In Gangakhed tahsil 6.34 per cent volume of changes noticed in irrigation and in Pathri tahsil 5.86 per cent volume of changes in irrigation was noticed.

Table No.4.7

**Major Projects working process in Parbhani District**

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Tahsil</th>
<th>Project</th>
<th>Name of Project</th>
<th>Irrigation Capacity in Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Gangakhed</td>
<td>01</td>
<td>Digras.</td>
<td>3618</td>
</tr>
<tr>
<td>02</td>
<td>Gangakhed</td>
<td>01</td>
<td>Muli.</td>
<td>1705</td>
</tr>
<tr>
<td>03</td>
<td>Pathri</td>
<td>01</td>
<td>Mudgal</td>
<td>1269</td>
</tr>
<tr>
<td>04</td>
<td>Pathri</td>
<td>01</td>
<td>Dhalegaon</td>
<td>1088</td>
</tr>
<tr>
<td>05</td>
<td>Pathri</td>
<td>01</td>
<td>NimnDudhna</td>
<td>28507</td>
</tr>
<tr>
<td>06</td>
<td>Majalgaon (Gangakhed)</td>
<td>01</td>
<td>Majalgaon Project</td>
<td>25330</td>
</tr>
</tbody>
</table>

**Medium Project working process in Parbhani District**

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Tahsil</th>
<th>Project</th>
<th>Name of Project</th>
<th>Irrigation Capacity in Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Pusad (Kalamnuri &amp; Basmat)</td>
<td>01</td>
<td>Urdhav Penganga Project</td>
<td>15852</td>
</tr>
</tbody>
</table>

**Minor Project working process in Parbhani District.**

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Tahsil</th>
<th>Project</th>
<th>Name of Project</th>
<th>Irrigation Capacity in Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Gangakhed</td>
<td>01</td>
<td>Pimpaldari</td>
<td>745</td>
</tr>
</tbody>
</table>

Source: - Minor Irrigation Division, Parbhani (2005)
### Table No.4.8
Map and Budget of Minor Project in Parbhani District

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Tahsil</th>
<th>Project</th>
<th>Name of Project</th>
<th>Irrigation Capacity in Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Parbhani</td>
<td>00</td>
<td>---</td>
<td>00</td>
</tr>
<tr>
<td>02</td>
<td>Jintur</td>
<td>02</td>
<td>Mankeshwar, Hiwarkheda.</td>
<td>1072</td>
</tr>
<tr>
<td>03</td>
<td>Hingoli</td>
<td>01</td>
<td>Kapashingi.</td>
<td>404</td>
</tr>
<tr>
<td>04</td>
<td>Kalamnuri</td>
<td>00</td>
<td>---</td>
<td>00</td>
</tr>
<tr>
<td>05</td>
<td>Basmat</td>
<td>00</td>
<td>---</td>
<td>00</td>
</tr>
<tr>
<td>06</td>
<td>Gangakhed</td>
<td>08</td>
<td>Galathi, Ukaddgaon, Peth Pimpalgaon, Chorwad, Dongarpimpla, Harangul, Bhenewadi, Dagdwadi.</td>
<td>4916</td>
</tr>
<tr>
<td>07</td>
<td>Pathri</td>
<td>00</td>
<td>---</td>
<td>00</td>
</tr>
</tbody>
</table>

Source: - Minor Irrigation Division, Parbhani (2005)

### Table No.4.9
Minor Project processing in future (Parbhani District)

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Tahsil</th>
<th>Project</th>
<th>Irrigation Capacity in Hectare</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Parbhani</td>
<td>32</td>
<td>14597</td>
</tr>
<tr>
<td>02</td>
<td>Jintur</td>
<td>24</td>
<td>10966</td>
</tr>
<tr>
<td>03</td>
<td>Hingoli</td>
<td>68</td>
<td>37433</td>
</tr>
<tr>
<td>04</td>
<td>Kalamnuri</td>
<td>23</td>
<td>9775</td>
</tr>
<tr>
<td>05</td>
<td>Basmat</td>
<td>18</td>
<td>8871</td>
</tr>
<tr>
<td>06</td>
<td>Gangakhed</td>
<td>15</td>
<td>8519</td>
</tr>
<tr>
<td>07</td>
<td>Pathri</td>
<td>17</td>
<td>8497</td>
</tr>
</tbody>
</table>

Source: - Minor Irrigation Division, Parbhani (2005)
As Table No. 4.7 Major and Minor developing projects throughout the talkative region with their own irrigation capacity. The Table gives irrigated capacity of respective tahsils like Gangakhed (2), Pathri (2), and Majlgaon canal is in development. The next work through Digras, (3618 Hectare), Mule (1705 hectare), Mudgal (1269 hectare), Dhalegaon (1088 hectare), Nim Dudhana (2850 hectare) and Mahalgaon right canal (25330 hectare) land will come under irrigation.

In medium project Urdhva Penganga Kalamnuri and Basmat tahsil (15852 hectare) land will come under irrigation. Minor project under Gangakhed is Pimpaldhari in progressive from for 745 hectare irrigated land.

Table No. 4.8 is on mapping and budgeting for minor project like Mahkeshwar (Jintur), Hiwarkheda project occupies 1072 hectare land irrigated in Hingoli tahsil from Capshingi minor dam of 404 hectare and Galathi, Ukaddgaon, Pathpimpalgaon, Dongarpimpla, Hrngul, Bhandewadi, Dagdwadi dam Occupies 4916 hectare land will come under irrigation.
Table No.4.9 in future there may be talkative minor project which denotes 68 projects in Hingoli tahsil which occupies 37433 hectare land under irrigation there where 24 projects in Jintur having irrigation capacity of 10966 hectare land ,in Parbhani 32 projects are there which have 14597 hectare land irrigation capacity ,in Kalamnuri tahsil 23 projects where under work which have capacity of irrigation 9775 hectare land .In Basmat 18 projects are there having 8871 hectare land in Pathri 17 projects having irrigation capacity of 8497 hectare in Gangakhed tahsil 15 projects where in work which have 8519 hectare land will come under irrigation

There may be more land will come under irrigation through these planning of resource material and more land may come under irrigation .The most important role should be played by state Government to give running wheel to this irrigated plan.


Agricultural production is the effect of farming. J. Kostrowick (1964). However, the ups and downs of agricultural production are a result of the whim of
nature that has played our agriculture. But, since 1970. Our food grain is increasing and the country is self sufficient in the food grains production due to the technological development (Roy, Fllegel and sen 1971). Technological factors have a profound influence on agriculture and its productivity in recent years. Prior to independence and particularly, before first five year plan (1951), the region, as the rest of India was largely a region of self sustained villages in which traditional agriculture, based on centuries of experiences was way of life than business. Since the beginning of present century, the region has suffered from intense pressure of population upon available resources. As stated earlier in chapter three the pressure of population has increased to a greater extent in the study region for analyzing the agricultural productivity selected crops are considered viz Rice, wheat, Jowar, Tur, Gram, Groundnut, sugarcane and cotton.

(1) Rice: -

In the years 1980-85 agricultural productivity of rice in Parbhani tahsil was 6.76 quintals per hectare. In Jintur tahsil it was 4.87 quintals (Appendix No. IX).
Whereas, in Hingoli tahsil Yields per hectare of rice was notice 4.86 quintals. In Kalamnuri tahsil it lowered up to 3.93 quintals. In Basmat tahsil Yield per hectare of rice of the region in 1980-85 recorded 4.89 quintals.

In the year 2000-2005 Yields per hectare of rice in Parbhani tahsil was 4.2 quintals. In Jintur tahsil it was 4.28 quintals. 5.77 quintals Yields per hectare of rice were recorded in Hingoli tahsil of the region during 2000-2005. In Kalamnuri tahsil 3.61 quintals Yields per hectare of rice is noticed. In Basmat tahsil it is 6.27 quintals whereas in Gangakhed tahsil 5.24 quintals and in Pathri tahsil Yields per hectare of rice is noticed 3.89 quintals and Yields per hectare of rice of the region in 2000-2005 is notice 4.47 quintals. With the help of above information we can say that highest Yield per hectare of rice is recorded in Parbhani tahsil i.e.6.76 quintals whereas the lowest rice Yield per hectare i.e.3.17 quintals noticed in Pathri tahsil during 1980-85. During 2000-2005 highest Yields per hectare of rice is recorded in Basmat tahsil i.e.6.27 quintals whereas the lowest Yield per hectare of rice is recorded in Kalamnuri tahsil i.e.3.61 quintals.
(2) Mug:

In the year 1980-85 Yields per hectare of mug in Parbhani tahsil is noticed 1.63 quintals. In Jintur tahsil it is 1.62 quintals. In Hingoli tahsil 1.58 quintals, in Kalamnuri tahsil 1.62 quintals, in Basmat tahsil 167 quintals, in Gangakhed tahsil 1.59 quintals and in Pathri tahsil 1.57 quintals whereas Yields per hectare of mug is the region is noticed 1.15 quintals.

In the year 2000-2005 Yields per hectare of mug in Parbhani tahsil of the region is noticed 3.49 quintals, in Jintur tahsil 3.78 quintals, in Hingoli tahsil 2.86 quintals, in Kalamnuri tahsil 4.76 quintals, in Basmat tahsil 3.99 quintals, in Gangakhed tahsil 1.73 quintals and in Pathri tahsil 9.96 quintals, whereas Yields per hectare of mug of the region is noticed 4.31 quintals.

In the year's 1980-85 highest Yields per hectare of mug recorded in Basmat tahsil i.e.1.67 quintals, whereas the lowest Yield per hectare of mug recorded in Pathri tahsil i.e.1.57 quintals. Highest Yield per hectare of mug recorded in Pathri tahsil i.e.9.96 quintals whereas the lowest mug Yield per hectare i.e.1.73
quintals is noticed in Gangakhed tahsil during 2000-2005.

(3) Gram:

In the year 1980-85 Yields per hectare of Gram in Parbhani tahsil is noticed 3.08 quintals. In Jintur tahsil 3.01 quintals, In Hingoli tahsil 3.86 quintals in Kalamnuri tahsil 3.02 quintals, In Basmat tahsil 2.75 quintals, and in Pathri tahsil 2.99 quintals. Whereas Yields per hectare of Gram of the region is noticed 3.15 quintals.

During the year 2000-2005 Yields per hectare of Gram in Parbhani tahsil of the region is noticed 5.42 quintals, in Jintur tahsil 5.7 quintals, in Hingoli tahsil 6.32 quintals, in Kalamnuri tahsil 5.74 quintals, in Basmat tahsil 5.28 quintals, in Gangakhed tahsil 5.32 quintals and in Pathri tahsil 6.32 quintals. Yields per hectare of Gram of the region is noticed 5.73 quintals.

Highest Yield per hectare of Gram recorded in Hingoli tahsil i.e.3.86 quintals noticed in Basmat tahsil during 1980-85. In the years 2000-2005 highest Yield per hectare of Gram recorded in Hingoli 6.32 quintals & Pathri tahsil i.e.6.32 quintals whereas the lowest Yield
(4) **Wheat:**

During the year 1980-85 Yields per hectare of wheat in Parbhani tahsil of the region is noticed 7.34 quintals, in Jintur tahsil 6.88 quintals, in Hingoli tahsil 8.71 quintals, in Kalamnuri tahsil 9.56 quintals, in Basmat tahsil 9.85 quintals, in Gangakhed tahsil 6.45 quintals and in Pathri tahsil 6.45 quintals. Yield per hectare of wheat of the region is recorded 7.89 quintals in the years 1980-85.

In the years 2000-2005 Yields per hectare of wheat in Parbhani tahsil is noticed 13.7 quintals which is double than 1980-85. In Jintur tahsil 11 quintals, in Hingoli tahsil 15.2 quintals, in Kalamnuri tahsil 15.4 quintals, in Basmat tahsil 16.1 quintals, in Gangakhed tahsil 11.3 quintals and in Pathri tahsil 12.5 quintals. Yields per hectare of wheat of the region is noticed 13.6 quintals in the years 2000-2005.

Highest Yield per hectare of wheat recorded in Basmat tahsil i.e.9.85 quintals whereas the lowest wheat Yield per hectare i.e.6.45 quintals noticed in two
tahsils of the region and they are Gangakhed and Pathri tahsil during 1980-85. In the year's 2000-2005 highest Yields per hectare of wheat recorded in Basmat tahsil of the region i.e.16.1 quintals whereas lowest Yield per hectare of wheat recorded in Jintur tahsil i.e.11 quintals.

(5) Cotton:

In the years 1980-85 Yields per hectare of cotton in Parbhani tahsil is noticed 3.88 quintals, In Jintur tahsil 3.9 quintals, in Hingoli tahsil 2.43 quintals, in Kalamnuri tahsil 2.46 quintals, in Basmat tahsil 3.41 quintals, in Gangakhed tahsil 3.21 quintals and in Pathri tahsil 3.95 quintals. Yields per hectare of cotton of the region are recorded 3.32 quintals in 1980-85.

During the years 2000-2005 Yields per hectare of cotton in Parbhani tahsil of the region is recorded 5.18 quintals, in Jintur tahsil 3.82 quintals, in Hingoli tahsil 5.33 quintals, in Kalamnuri tahsil 4.65 quintals, in Basmat tahsil 4.07 quintals, in Gangakhed tahsil 4.27 quintals and in Pathri tahsil 4.38 quintals. Yields per hectare of cotton of the region are noticed 4.53 quintals in the years 2000-2005.
Highest Yield per hectare of cotton recorded in Pathri tahsil of the region i.e. 3.95 quintals whereas the lowest cotton Yield per hectare i.e. 2.43 quintals noticed in Hingoli tahsil during 1980-85. In the years 2000-2005 highest Yield per hectare of cotton recorded in Hingoli tahsil of the region i.e. 5.33 quintals whereas lowest Yield per hectare of cotton recorded in Jintur tahsil i.e. 3.82 quintals.

(6) Groundnut:

In the years 1980-85 Yields per hectare of Groundnut in Parbhani tahsil of the region is noticed 3.46 quintals, in Jintur, Hingoli and Kalamnuri tahsil 3.9 quintals, in Basmat tahsil 11.2 quintals, in Gangakhed tahsil 7.86 quintals and in Pathri tahsil 4.82 quintals. Yields per hectare of Groundnut of the region are recorded 5.43 quintals in 1980-85.

During the years 2000-2005 Yields per hectare of Groundnut in Parbhani tahsil of the region is recorded 4.82 quintals, in Jintur tahsil 4.75 quintals, in Hingoli tahsil 5.53 quintals, in Kalamnuri tahsil 5.5 quintals, in Basmat tahsil 4.18 quintals, in Gangakhed tahsil 5.91 quintals and in Pathri tahsil 3.68 quintals. Yields per
hectare of Groundnut of the region are noticed 4.84 quintals.

Highest Yield per hectare of Groundnut recorded in Basmat tahsil of the region i.e.11.2 quintals, whereas the lowest Groundnut Yield per hectare i.e.3.46 quintals observed in Parbhani tahsil during 1980-85. In the years 2000-2005 highest Yield per hectare of Groundnut recorded in Gangakhed tahsil of the region i.e.5.91 quintals, and lowest Yield per hectare of Groundnut noticed in Pathri tahsil i.e.3.68 quintals.

(7) Tur:

During the years 1980-85 Yields per hectare of Tur in Parbhani tahsil of the region is recorded 6.89 quintals, in Jintur tahsil 5.5 quintals, in Hingoli tahsil 5.1 quintals, in Kalamnuri tahsil 5.47 quintals, in Basmat tahsil 4.18 quintals, in Gangakhed tahsil 7.39 quintals and in Pathri tahsil 7.25 quintals. Yields per hectare of Tur of the region are observed 5.9 quintals.

In the years 2000-2005 Yields per hectare of Tur in Parbhani tahsil of the region is noticed 5.58 quintals, in Jintur tahsil 14.1 quintals, in Hingoli tahsil 7.3 quintals, in Kalamnuri tahsil 7.28 quintals, in Basmat
tahsil 6.51 quintals, in Gangakhed tahsil 4.5 quintals and in Pathri tahsil 2.68 quintals. Yields per hectare of Tur of the region are noticed 6.82 quintals.

Highest Yield per hectare of Tur recorded in Gangakhed tahsil of the region i.e.7.39 quintals whereas the lowest Yield per hectare of Tur i.e.4.18 quintals observed in Basmat tahsil during 1980-85. In the year 2000-2005 highest Yield per hectare of Tur recorded in Jintur tahsil of the region i.e.14.1 quintals and lowest Yield per hectare of Tur observed in Pathri tahsil i.e.2.68 quintals.

(8) Jowar:
In the years 1980-85 Yields per hectare of Jowar in Parbhani tahsil of the region is noticed 5.53 quintals, in Jintur tahsil 4.36 quintals, in Hingoli and Kalamnuri 4.9 quintals, in Basmat tahsil 5.53 quintals, in Gangakhed tahsil 5.58 quintals, in Pathri tahsil 5.7 quintals. Yields per hectare of Jowar of the region are recorded 5.12 quintals in 1980-85.

In 2000-2005 Yields per hectare of Jowar in Parbhani tahsil of the region is noticed 12.2 quintals, in Jintur tahsil 12 quintals, in Hingoli tahsil 12.6 quintals, in Kalamnuri tahsil 12.7 quintals, in Basmat tahsil
13.6 quintals, in Gangakhed tahsil 12.1 quintals and in Pathri tahsil 12.6 quintals. Yields per hectare of Jowar of the region are noticed 12.5 quintals.

Highest Yield per hectare of Jowar is recorded in Gangakhed tahsil of the region i.e. 5.58 quintals whereas lowest Yield of Jowar per hectare i.e. 4.9 quintals observed in Hingoli and Kalamnuri tahsil during 1980-85: In the year's 2000-2005 highest Yields per hectare of Jowar recorded in Basmat tahsil of the region i.e. 13.6 quintals whereas lowest Yield per hectare of Jowar is recorded in Jintur tahsil i.e. 12 quintals.

(9) Sugarcane:

In the year 1980-85 Yields per hectare of sugarcane in Parbhani tahsil of the region is noticed 0.65 tones, in Jintur tahsil same 0.65 tones of sugarcane observed, in Hingoli tahsil 0.57 tones, in Kalamnuri tahsil 0.56 tones, in Basmat tahsil 0.63 tonnes, in Ganagakhed tahsil 0.57 tones and in Pathri tahsil 0.59 tones agricultural productivity of sugarcane of the region in 1980-85 was 0.6 tones.

In 2000-2005 Yields per hectare of sugarcane in Parbhani tahsil of the region is noticed 0.73 tonnes, in
Jintur tahsil 0.64 tones, in Hingoli tahsil 0.7 tonnes, in Kalamnuri tahsil 0.6 tonnes, in Basmat tahsil 0.68 tonnes, in Gangakhed tahsil 0.64 tonnes and in Pathri tahsil 0.58 tones. Yields per hectare of sugarcane of the region are observed 0.63 tonnes.

Highest Yield per hectare of sugarcane recorded in two tahsil of the region and they are Parbhani and Jintur i.e.0.65 tonnes whereas lowest Yield of sugarcane per hectare i.e.0.56 tonnes observed in Kalamnuri tahsil during 1980-85. In the year's 2000-2005 highest Yield per hectare of sugarcane recorded in Parbhani tahsil of the region i.e.0.73 tones, whereas, lowest Yield per hectare of sugarcane recorded in Kalamnuri tahsil i.e.0.6 tones.

4.13 Crop Yield and Concentration indices ranking co-efficient of selected food crops

Productivity as defined in economics or agriculture Geography means output per init o area respectively and the improvement in agricultural productivity is generally the result of a more efficient use of the factors of production viz. Environment , arable land , labour , capital an the like . The level of agriculture productivity as a concept , means the degree to which the economic
cultural, technical, and organizational variables (i.e., the man-made frame) are able to exploit the abiotic resources of the area for agriculture production. The concept of productivity seems to be a relative term and cannot be uniformly applied everywhere. The spatial variations in physical output from the soils are the result of natural circumstances and partly of human manipulations of the land resources. The regional differences in Yields per unit area indicate the magnitude and the direction of the interplay of a multitude of factors. Furthermore, the level of agricultural productivity is a dynamic concept as any modification in physical factors and improvement in non-physical vases of farming affect agricultural per hectare product.

The measurement and evaluation of agriculture productivity forms a basis for planning, evaluation, and taking appropriate measures for the improvement of agricultural production at various levels. Measurement of agricultural productivity helps in knowing the areas that are performing rather less efficiently in comparison to the neighboring areas. By delimiting the areas of low, Medium and high productivity, agricultural plans may
be formulated to remove and minimize the regional inequalities. It also provides an opportunity to ascertain the ground reality, the real cause of agricultural backwardness of a tract/area or region.

The measurement of agricultural productivity is more complicated than that of industry or any other activity. The method of mapping of spatio-temporal characteristics of the level of agricultural productivity provides a rational base for future orientation in agricultural planning. Several techniques for computing efficiency in level of agricultural productivity per unit area per unit of time, of per unit of farm work force etc. are as following.

1. Assessing the value of agricultural production per unit area.
2. Measuring production per unit of farm labour or man hour.
3. Determining output in relation to input or output ratio and profitability of farming measured in terms of the returns for the sum total of human efforts or paid-out-cost in relation to the output (Khusro 1964)
4. Output expressed in "terms of grain equivalent"

5. Ranking co-efficient method.


7. The crop Yield and concentration indices ranking co-efficient.

8. Delimiting agricultural productivity by computing the intensity and spread indices of three variables i.e. (i) Yield (ii) grain equivalents (iii) cropping system.

Of these, the first three techniques seems to require such statistics as are not readily available and easily accessible. Technique fourth which advocates measuring agricultural progress in terms of grain equivalents per head of population was used for the first time by Buck in 1967. Kendall (1939) developed a method of determining agricultural efficiency based on output per unit area and devised a system of ranking efficient. Stamp (1960) applied by Kendall's ranking co-efficient technique for international comparisons by selecting twenty countries and nine major crops. In India Shafi Mohammad (1960) used techniques of Kendall for Uttar Pradesh.
Each of the techniques advocated and applied for the measurement of agricultural productivity suffers from one weakness of the other. The application of a technique may give satisfactory results at the micro or meso level but the same technique fails to deliver the goods at the national or global level. The input and output ratio technique seems to be a reasonably good one but the determination of inputs including environmental and social costs involved in the production is not an easy task. The conversion of production of all crops in terms of money is also a useful technique but it is constrained by the prevailing prices of agricultural commodities which fluctuate from one areal unit to another and from one region to another. Spare and Eshpande (1964) have used the weighted average of ranks instead of the simple seems to have an inherent weakness which arises from not taking into account the harvested regional strength of crops.

The techniques introduced by Jasbir Singh et al (1982) is used in order to study the regional differences in the level of food production and to delimit the weaker areas from the point of view of agricultural production.
This technique is found superior as it gives due weightage to the Yield index and crop concentration index and their ranking for various crops.

The procedure is as follows:

\[
\frac{Yae}{Yar} = \frac{Yi}{Yar} \times 100 \quad \text{I}
\]

Where,
- \(Yi\) = is the crop Yield index
- \(Yae\) = is the average Yield per hectare of crop 'a' in the component enumeration unit,
- \(Yar\) = is the average Yield of the crop 'a' in the entire region.

\[
\frac{Pae}{Par} = \frac{Ci}{Par} \times 100 \quad \text{II}
\]

Where,
- \(Ci\) = is the crop concentration index.
- \(Pae\) = is the percentage strength of crop 'a' in the component enumeration unit.
- \(Par\) = is the percentage strength of crop 'a' in total harvested area in the entire Region.

Crop Yield and concentration indices thus derived for all the regional units and the crops are ranked separately. Yield and concentration ranks for individual crops are added and thereafter divided by two. Thus
giving the crop Yield and concentration indices ranking co-efficient will be as follows-

\[
\text{Crop Yield and Concentration indices Ranking} = \frac{\text{Crop Yield index ranking of crop 'a'} + \text{index ranking crop 'a'}}{2}
\]

Table No.4.15 gives us an idea of the level of agricultural productivity. This technique helps to identify the crops of good level of productivity in the Parbhani District. The ranking co-efficient for individual crops thus derived are arranged in ascending order and co-efficients are grouped into three efficiency grade viz. High grade, Moderate and low grade for discussing the spatial variations in the region. In similar way, overall ranking co-efficient have been derived by adding the values of former all the crops selected for each Taluka and divided by 'n' where 'n' refers to selected crops. In order to get accurate and average results of productivity level, Yield statistics of five years have been averaged to avoid the annual fluctuation in the level of productivity.
Table No. 4.15
Talukawise productivity of Selected Food Crops in Parbhani District

<table>
<thead>
<tr>
<th>S. No</th>
<th>Tahsil</th>
<th>Rice</th>
<th>Wheat</th>
<th>Jowar</th>
<th>Gram</th>
<th>Tur</th>
<th>Sugarcane</th>
<th>Cotton</th>
<th>Grunn- dant</th>
<th>Overall Productivity</th>
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<td>1</td>
<td>Parbhani</td>
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<td>109.33 99.49 103.61 155.11 100.30 166.91 70.08 101.72 44.93 105.72</td>
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<td>Jutur</td>
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<td>73.35 75.76 89.72 84.75 91.44 107.66 91.04 113.91 78.93 89.31</td>
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<td>101.55 121.72 96.56 71.42 98.01 87.49 65.23 120.11 40.66 89.31</td>
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<td>5</td>
<td>Basmat</td>
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<td>209.51 134.31 97.90 79.48 94.72 97.88 319.16 96.33 279.77 156.60</td>
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<td>Gangakhed</td>
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<td>82.71 88.48 111.59 126.67 123.33 128.05 58.73 81.09 118.29 101.99</td>
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<td>7</td>
<td>Pathri</td>
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<td></td>
<td>48.59 87.13 102.51 99.29 101.18 140.35 69.69 96.44 104.40 94.40</td>
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</tbody>
</table>

2) Computed by Author
Fig. No. 4.25
1) **Rice:**
During the period 1980-85 high level of rice productivity was noticed in Kalamnuri and Basmat tahsils. This part of the region receives relatively higher amount of rainfall. Moderate level of rice productivity is observed in Parbhani, Jintur, Hingoli and Gangakhed tahsils. Low level of rise productivity is found in only Pathri tahsil due to low rainfall (Fig.No.4.25A)

Fig.No.4.25 (B) reveals that during 2000-05 low level of rice productivity is noticed in Parbhani and Pathri tahsils and high level of rice productivity is found in Jintur, Hingoli, Kalamnuri, and Basmat tahsils. Moderate level of rice productivity is observed in only Gangakhed tahsil.

2) **Wheat:**
Low level of wheat productivity is registered in Parbhani, Jintur, Basmat, Gangakhed and Pathri tahsils and Moderate level of wheat productivity is experienced in Hingoli tahsil only during 1980-85. High level of productivity is observed in Kalamnuri tahsil (Fig.No.4.26A).

High level of wheat productivity is observed in Hingoli and Basmat tahsils. Moderate level of wheat
Wheat Productivity
Level of Productivity
1980-1985
(A)

2000-2005
(B)

Fig. No. 4.26
productivity is found in Parbhani, Jintur, Kalamnuri and Pathri tahsils. Gangakhed tahsil have low level of wheat productivity during 2000-05 (Fig.No.4.26B).

3) **Jowar:**
   Tahsils like Jintur, Hingoli, Kalamnuri, Gangakhed and Pathri have registered high level of Jowar productivity during 1980-85 and low level of Jowar productivity is found in only Basmat tahsil. Moderate level of Jowar productivity was noted in Parbhani tahsil of the region (Fig.No.4.27 A).

   Fig.N4.27 (B) reveals that low level of Jowar productivity is observed in Jintur, Hingoli, Kalamnuri tahsils and moderate level of Jowar productivity is experienced in Parbhani, Basmat, Pathri tahsils during the period 2000-05. High level of Jowar productivity is observed in only Gangakhed tahsil of the region.

4) **Gram:**
   High level of gram productivity is found in Parbhani and Gangakhed tahsils. Moderate level of gram productivity in Jintur, Hingoli and pathri tahsils. Kalamnuri and Basmat tahsils recorded low gram productivity during 1980-85 (Fig.No.4.28A).
PARBHANI DISTRICT

Jowar Productivity
Level of Productivity
1980-1985
(A)

2000-2005
(B)

Fig. No. 4.27
Gram Productivity Level of Productivity 1980-1985 (A)

Fig. No. 4.28

2000-2005 (B)
During 2000-05 high level of gram is observed in Parbhani, Kalamnuri, Gangakhed tahsils, Moderate level of gram productivity is found in Hingoli, Basmat and Pathri tahsils. Jintur tahsil recorded low gram productivity (Fig.No.4.28 B).

5) **Tur:**

Jintur, Hingoli, Kalamnuri, Gangakhed and pathri tahsils have noticed high level of Tur productivity. Moderate level of Tur productivity is observed in only Parbhani tahsil and in Basmat tahsil recorded low Tur productivity during 1980-85 (Fig.No.4.29 A).

During 2000-05 high level Tur productivity is observed only Jintur tahsil. Moderate level of Tur productivity is found only in Pathri tahsil and Parbhani tahsil, Hingoli, Kalamnuri, Basmat and Gangakhed tahsils have sown low level productivity (Fig.No.4.29 B)

6) **Mug:**

Tahsils like Parbhani, Jintur, Hingoli, Gangakhed and pathri have registered high level of Mug productivity during 1980-85 and Low level of Mug productivity is found only in Basmat tahsils. Moderate level of Mug productivity was noted in Kalamnuri tahsil of region (Fig.No.4.30A).
Mug Productivity Level of Productivity 1980-1985 (A)

Fig. No. 4.30

INDEX

- Above 120%
- 90 - 120%
- Below 90%

2000-2005 (B)

INDEX

- Above 90%
- 80 - 90%
- Below 80%

Fig. No. 4.30
Low level of Mug productivity is registered in Parbhani, Basmat and Gangakhed tahsils and moderate level of Mug productivity is experienced only in Hingoli tahsils during 2000-05. High level of Mug productivity is observed in Jintur, Kalamnuri and Pathri tahsils (Fig.No.4.30B).

7) Sugarcane:

During 1980-85 only in Basmat tahsil high level of Sugarcane productivity is observed and low level of productivity recorded in Parbhani, Hingoli, Kalamnuri, Gangakhed and Pathri tahsils (Fig.No.4.31A).

Moderate productivity of Sugarcane was found only in Jintur tahsil of the region. Low level of Sugarcane productivity is registered in Jintur and Basmat tahsils and moderate level of Sugarcane is experienced in Parbhani, Hingoli, Kalamnuri and Pathri tahsils during 2000-05. High level of Sugarcane productivity is observed only Gangakhed tahsils (Fig.No.4.31B).

8) Cotton:

During 1980-85 Jintur, Hingoli, Kalamnuri tahsils have high level of Cotton productivity and only in Pathri tahsil has recorded moderate Cotton productivity and low level of Cotton productivity was registered in
PARBHANI DISTRICT

Sugarcane Productivity
Level of Productivity
1980-1985
(A)

2000-2005
(B)

Fig. No. 4.31
PARBHANI DISTRICT

Cotton Productivity
Level of Productivity
1980-1985
(A)

0 IS 30 KM.
Above 120%
100 - 120%
Below 100%

2000-2005
(B)

Above 110%
100 - 110%
Below 100%

Fig. No. 4.32
Parbhani, Basmat and Gangakhed tahsils (Fig. No. 4.32A).

Low level of Cotton productivity is registered in Kalamnuri and Basmat tahsils and moderate level Cotton productivity is experienced in Parbhani, Jintur, Gangakhed and Pathri tahsils during 2000-05. High level of Cotton productivity is noticed only in Hingoli tahsil of the region (Fig. No. 4.32B).

9) Groundnut:
Basmat, Gangakhed and Pathri tahsils have noticed high level of Groundnut productivity and low level of groundnut productivity is registered in Parbhani and Kalamnuri tahsils and moderate level of groundnut productivity is observed in Jintur and Hingoli tahsils during 1980-85 (Fig. No. 4.33A).

During 2000-05 only in Basmat tahsils high level of groundnut productivity is observed and low level of groundnut productivity is observed in Jintur, Hingoli, Gangakhed and Pathri tahsils (Fig. No. 4.33 B), Moderate level of groundnut productivity is experienced in Parbhani and Kalamnuri tahsils of the region.

10) Overall Crop Productivity :-
Overall Productivity
Level of Productivity
1980-1985
(A)

2000-2005
(B)

Fig. No. 4.34
The measurement of overall agriculture productivity is useful to know wreaked areas of the region from the point of view of agricultural production. Further it becalmed useful to the planner to give more attention to improve the productivity of weaker areas by adopting the new techniques devise by scientist “Moreover, in any scheme of removing regional imbalances in agriculture, it of importance to know the areas which are under developed and need more attention to the paid for the advancement of agriculture.” Husain (1979).

Overall crop productivity is observed as follows. The areas of high crop productivity are noted only in Basmat tahsil. Moderate crop productivity is observed in Parbhani and Gangakhed tahsils. Low level of crop productivity is recorded in Jintur, Hingoli, Kalamnuri and Pathri tahsils of the region (Fig.No.4.34A) during the period of 1980-85.

The areas of low crop productivity in noted in Jintur, Gangakhed and Pathri tahsils and moderate level crop productivity is observed in Parbhani, Hingoli, Kalamnuri tahsils. The areas of high crop productivity is noted in Basmat tahsil of the region during 2000-05 (Fig.No.4.34B).
4.14 Summary:-

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.

Out of the total geographical area 4.58 per cent 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.

Area under forest is recorded 3.21 per cent of the region. Above 4 per cent area under forest is observed in Hingoli (6.12%), Jintur (6.27%), Basmat (4.87%), 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 5.63 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 follow 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%).

Parbhani tahsil and Gangakhed tahsil has recorded 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 observing statistical data of cropping pattern we can say or highest take conclusion about it is as follows during 1980-85 highest area under Rice is observed in Basmat and Kalamnuri tahsil and lowest in Pathri tahsil. In 1990-95 and 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 in noticed in Basmat, Hingoli, Jintur and lowest in Gangakhed tahsil.

While observing total Jowar highest area under this crop is recorded in Kalamnuri, Hingoli and Parbhani tahsil in 1980-85. During 1990-95 percentage of area under Jowar is decreased in comparison with 1980-85 but in 2000-05 there is minor 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 is increased.

While observing 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 tahsīl highest area under Mug is recorded in. 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 pulses in 1980-85 in recorded in Parbhani, Pathri, Gangakhed and in 1990-95 in Parbhani, Pathri, Hingoli highest per centage of observed is 2000-05 in Kalamnuri, Hingoli, Jintur and Pathri. Highest area under total pulses in observed. 

Highest area under foodgrains in noticed in Parbhani and Gangakhed tahsil in 1980-85 in 1990-95 and in 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 in 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 is 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 observing volume of changes of cereals in 2000-05 is decreased in comparison with 1980-85. With minor changes the same situation about pulses is 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 cropped 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 cropping 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 shows 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 adopt 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.

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