PART II

LAND UTILIZATION IN
FOURTEEN SELECTED VILLAGES
OF
UPPER GANGA-YAMUNA DOAB
CHAPTER V

THE SELECTED VILLAGES

On the basis of drainage, soil types and the availability of irrigation water, the fourteen selected villages can be regarded as falling into the following five groups:

GROUP I - Includes the villages of Bhaupur, Asrakheri, Amrupur, Dhandaoli, Malmajra and Jatpura. These villages lie in well-drained plains where the soil is mainly loam to clayey-loam and irrigation facilities by wells and canals are available. The location of the selected villages is shown in Fig. 42.

GROUP II - Includes the villages of Salajudi, Dudhli and Meghrajpur. The soil of these villages is mainly sandy loam. Irrigation facilities by canals and wells are available in these villages also.

GROUP III - Includes the villages of Kuri, Chhainsa and Mohammadpur-Gujjar which are situated in the ill-drained region of Upper Ganga-Yamuna Doab. Waterlogging and alkaline formations on the surface of the soil in the relatively low-lying parts is the distinguishing feature of these villages. Irrigation facilities are available in these villages too.

GROUP IV - Includes the village of Nadli-Garunt. This village lies in the dark loam soil of the submontane tract. Irrigation
LOCATION OF SELECTED VILLAGES

BOUNDARY OF THE AREA
VILLAGE
DARK - LOAM
Khadar Sandy Soil
Sandy Loam
Clayey Loam
Clayey

SOURCE: Survey of India maps
One inch to one mile
and soil map (Fig.)
in the village is very difficult owing to very low water
table and steep gradient of the area.

GROUP V - Includes the village of Lajpur-Kalan, this village lies in
the khadar of the Ganga river. The soil of this village
is sandy to silty sand and is not irrigated.

Before dealing with the land utilization of the above mentioned
villages, it would be worthwhile to give some clarification which
will be needed in the following pages.

There are two main agricultural seasons; the kharif or the
season of summer and the rabi or the season of winter crops. The
kharif usually begins in mid-June with the out-break of the monsoon,
while the rabi season starts in the middle of October when the
monsoon has receded. The crops of the kharif season are those
which need a high temperature and a plentiful supply of water, but
the crops of rabi season require cool weather and only a moderate
supply of water.

On the basis of drainage, type of soil and facilities of
irrigation an attempt has been made to ascertain the productivity
of various classes of land. The yield of crop in a field represent
the true agricultural value of the land and is an index for the

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1. In English writings, the kharif season sometimes refered to as
the season of summer crops and sometimes as the season of
autumn crops, because the crops are sown in summer and harvested
in autumn, similarly, the rabi season is sometimes refered as
the season of winter crops and sometimes as the season of spring
crops. In order to avoid the confusion produced by such
references it should be made clear that kharif season denotes
the period during which summer crops occupy the soil (generally
mid June to October), while rabi season denotes the period
during which the winter crops occupy the soil (generally mid
October to March.)
measurement of the productivity of the field as it represents not only the natural fertility of the soil and the prevalent climatic conditions but also is the result of the farming system and farming community.

A number of maps have been drawn by the writer to classify the village fields according to their fertility and productivity. In the course of his field work the writer visited the villages and collected information on soil characteristics, on the availability of irrigation water and on the supply of manures to the crops grown in each field. On the basis of this inquiry the village lands have been classified into four categories:

A ... Good quality land
B ... Medium quality land
BII ... Medium quality land
C ... Poor quality land

The characteristics of each group of land have been mentioned in some detail in the land use study of each village.

Potential Production Units:

In order to determine the potential productivity of the good, medium and poor quality lands, the writer, obtained informations about the productivity of different types of land in each of the selected villages. In order to know the relative productivity and capacity of each type of land, it is necessary to establish some standard value on a mathematical basis. Professor L.D. Stamp

has introduced Potential Production Unit which gives comparative productiveness of different types of land.

In the computation of potential production units in the selected sample villages, the average yield of good quality land is taken as a standard figure constituting 1 P.P.U. The ratio of the yield of other types of land is then obtained from the standard figures and the value is ascertained in terms of P.P.U. For example, if the average yield of 1,000 lb in a particular area is represented by 1 P.P.U., the yield of 2,000 lb per acre in good quality land and 500 per acre in the poor quality land in the same area will be rated as 2 P.P.U.s and 0.5 P.P.U. respectively. In brief, it may be pointed out, in this case, that the good quality land is twice productive and the poor quality land only half than the average productiveness of the area.

The main advantage of P.P.U. lies in the fact that it enables the planners of the area in knowing, where the first class land lies and thus saves such land being mis-used for non-agricultural purposes. The determination of P.P.U. of different land is useful in several aspects, firstly, for the town and country planning it indicates a particular land type on which the development may be carried on without an appreciable loss to agricultural land. For example if it is planned to construct a Factory in 100 acres of good quality land with a rating of 2 P.P.U. the loss will be

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3. For an exposition of the concept of P.P.U. the reference may be made to:

equivalent to 200 P.R.U., while in the poor quality land with a
rating of 0.50 P.R.U., the loss will be 50 P.R.U. Thus it is profit-
able to use poor quality land for construction and non-agricultural
uses rather than good quality land which must be reserved for crop
cultivation purposes. Secondly it exposes a particular land type
which requires immediate attention for the agricultural development.
In the latter case it is not actually the calculation of possible
change which may be brought in agriculture, but is merely an indica-
tion towards the type of development which experience might make
possible in furthering the Potential Production Units.

The Potential Production Unit, is not a static, but it may be
appreciably increased with the increase in the average yield through
its proper care and scientific management. Nevertheless the rela-
tive value of the ratings remain relatively unchanged if the develop-
ment is similar over each type of land. If the development in
agriculture and the consequent improvement yield is brought about
in only one type of land, the ratings are changed and there is also
an increase in the total number of P.R.U.

The author has attempted the use of the concept of Potential
Production Unit in the fourteen villages. The ratings for each type
of land are ascertained on the basis of average yield in each type
of land and its ratio with the average yield of the village. The
multiplication of the actual area with the rating figure gives the
number of each type of land.

p. 12.
CHAPTER VI

LAND UTILIZATION IN SHAUPUR

Location:

The village of Shaupur lies in Saharanpur Tansil of the Saharanpur district. It is situated at 29° 59' 30" N. lat., and 77° 30' E. long., and is about three miles to the west of the city of Saharanpur. It is bounded by the villages of Dabki in the north, Darbali in the east, Nalhera-Saqqal in the south and Milakhni in the west. The total area of the village is about 337 acres (Fig. 43).

The Northern Railway passes to the south of the village at a distance of about two furlongs, further south at a distance of five furlongs passes the Grand-Trunk Road, which joins the city of Saharanpur and Sarsawa, while another road lies to the north east of the village at a distance of about two miles and joins the Saharanpur city and Sultanpur town.

The village lies in a well drained level plain at a height of 293 feet above sea level. The Eastern Yamuna canal flows at a distance of about half a mile in the east (Fig. 43).

1. Village, denotes the dwelling of a rural settlement together with the associated agricultural and other lands. Whenever reference has been made to the site of dwellings the term village settlement has been used.

2. The height is that of Saharanpur which is at a distance of three miles to the east of the village. Since the actual height of Shaupur has not been recorded, it may be taken to be approximately the same as that of Saharanpur, for both the stations lie in an apparently level plain.
LOCATION OF THE VILLAGE BHAUPUR

settlement
railway
metalled road
cart-track
grove

source: survey of India map
No 53 G 9 53 G

the out of Bhaupur has been drawn by the writer

77°30'E Fig. 43
Climate:

Like all the villages of this area, this village too does not possess any climatic records. The data of rainfall for Saharanpur, which is only three miles away, have been given in Tables III and IV, and may be taken as close approximations for this village.

**TABLE III**

**KHARIF SEASON 1960 (SAHARANPUR)**

<table>
<thead>
<tr>
<th>M O N T H S</th>
<th><strong>Total</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>July</td>
</tr>
<tr>
<td>Rainy days in Kharif, 1960</td>
<td>4.00</td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>3.8</td>
</tr>
</tbody>
</table>

3. Rainfall data for 1960-61 have been obtained from Tahsil headquarters of Saharanpur. The figures of average rainfall in these and other subsequent Tables of rainfall are for over sixty years, and have been obtained from the Memoirs of the Meteorological Department, Vol. XXVII, pt. V, pp. 152-153.
TABLE IV

RAVI SEASON 1960-61 (SAHARANPUR)

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the rabi season, 1960-61</td>
<td>-</td>
<td>-</td>
<td>2.84</td>
<td>1.83</td>
<td>1.92</td>
<td>6.59</td>
</tr>
<tr>
<td>Rainy days in rabi, 1960-61</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.15</td>
<td>0.56</td>
<td>1.70</td>
<td>1.50</td>
<td>0.70</td>
<td>4.61</td>
</tr>
</tbody>
</table>

Land Classification:

An attempt has been made in Fig. 44 to classify the village fields according to their fertility and productivity (see p. 106).

The soil of the good quality land (A) is mainly loamy, well drained and irrigated by the canal distributaries of the Eastern Yamuna-Canal. These fields yield two crops a year or are devoted to sugarcane. Of the medium quality lands, the soil of (B1) land is left fallow in the Kharif and is devoted to a grain crop in the rabi season. The soil of (BII) land is clay to stiff clay. It is exclusively devoted to the transplanted rice.
The poor quality lands (c) are those which are unutilized on account of undesirable quantities of salt efflorescence at or near the surface.

Table V shows the area and percentage of different classes of lands, while their distribution is plotted in Fig. 44.

**TABLE V**

**TOTAL AREA OF THE VILLAGE 337.45 ACRES**

<table>
<thead>
<tr>
<th>Land Classification</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>253.75</td>
<td>76.98</td>
</tr>
<tr>
<td>Medium quality land (B1)</td>
<td>48.00</td>
<td>14.25</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>4.00</td>
<td>1.18</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>3.25</td>
<td>0.96</td>
</tr>
<tr>
<td>Land not available for cultivation (4)</td>
<td>23.45</td>
<td>6.63</td>
</tr>
</tbody>
</table>

**Total** .................................. 337.45 100.00

The above Table shows that 77 per cent of the total area is covered by the good quality (A) and about 14 and 1 per cent by the medium quality B1 and BII lands respectively. Nearly 1 per cent is unproductive; while about seven per cent is not available for cultivation.

4. Land not available for cultivation includes: Settlement, Cart-tracks, grove, cemetery, pond and canal distributaries.
Irrigation:

Irrigation in the village is carried on by the distributaries of the Eastern Yamuna-Canal. Another distributary Canal passes through the village and divides it almost into two equal parts from north to south (Fig. 45). The area irrigated in the Kharif and rabi seasons of 1960-61 is shown in Fig. 45.

It will be seen from the rainfall Table III that the total average rainfall from June to October is 31.22 inches, an amount which is adequate for the kharif crops, of which only sugarcane is irrigated. It is only in the event of premature cessation or a long break in the rainfall that irrigation becomes necessary for rice and sugarcane. In the year of inquiry, however, the total rainfall from June to October was 33.12 inches (Table III) and its distribution was fairly even, so that sugarcane, early fodder and cotton had to be irrigated in the months of May and June. Table IV shows that there was no rainfall in the months of November and December (the growing period of the rabi crops). Therefore all fields sown in rabi except gram and gram mixed with wheat were irrigated.

5. The Canal distributary is locally called as raj-baha: means (raj = government + baha = flow) a water channel, excavated by the government.

6. Sugarcane remains in the field throughout the year, since it is sown mostly, in the month of March and harvested in December. As the crop requires high temperature and good supply of water, it has been grouped with the kharif crops.
Good quality lands (A) and medium quality (BII) were irrigated at least once in the year, while (BIII) lands remained unirrigated throughout the year.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 46 to 49, which are based on the writer's field work of the village. The procedure adopted in the preparation of these and other land use maps included in this book was as follows: a base map on a scale of sixteen inches to one mile, showing the fields and their areas was obtained from the Tahsil Headquarters in the districts. The villages were visited by the writer in the Kharif and Rabi seasons of 1960-61, and the use to which each field was being put was recorded on the base map.

The following Table gives a summary of the proportions of village lands devoted to various uses in 1960-61.

**TABLE VI**

**TOTAL AREA OF THE VILLAGE 337.45 ACRES**

<table>
<thead>
<tr>
<th>Use of Land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated Land</td>
<td>310.75</td>
<td>92.09</td>
</tr>
<tr>
<td>Waste land(10)</td>
<td>3.25</td>
<td>0.96</td>
</tr>
<tr>
<td>Settlement</td>
<td>13.13</td>
<td>3.89</td>
</tr>
<tr>
<td>Groves (11)</td>
<td>0.63</td>
<td>0.19</td>
</tr>
<tr>
<td>Cart track</td>
<td>3.44</td>
<td>1.02</td>
</tr>
<tr>
<td>Water-bodies (12)</td>
<td>6.25</td>
<td>1.85</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>337.45</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

7. The base map of Bhaupur showing the fields and their areas in **pucca bighas** (which were converted into acres at the rate of 8 **pucca bighas** equal to five acres) was obtained... Contd...
It will be seen from Table V that more than 92 per cent of the total area of the village is cultivated and seven per cent is under nonagricultural occupations. Waste land, which is about three acres is, less than one per cent of the total area of the village Fig. (46).

A comparison of Figs. 44 and 46 reveals the influence of the quality of land on the size of fields. In general good quality land are small and rectangular, while the fields of medium quality lands are somewhat irregular in shape.

Footnote Contd...

from the Revenue Department of Saharanpur Tahsil. The village was visited by the writer in the kharif season of 1960 and the rabi season 1960-61, and the use to which each field was being put was recorded on the map. From these data Figs. 46 to 49 were prepared.

8. According to the Statistical Descriptive and Historical Accounts of the North Western Provinces of India, part 1, Meerut Division, Vol. II (Allahabad, 1875), p. 213, the New Settlement of the villages of Saharanpur was made in 1870 by H.B. Webster and the staff of Revenue Department. The writer was informed by the Revenue Department of Saharanpur Tahsil that changes in the field boundaries are recorded every year and the base map was up-to-date as regards of boundaries. This was verified by the writer in the course of his field work.

9. Cultivated land includes current fallow lands in the year of inquiry in the Kharif and rabi seasons.

10. Waste land refers to land which lies unutilized due to the presence of salts at or near the surface, in proportions which are injurious for crops.

11. The groves consist mostly of mango tree. The fruit, when its season is on, is an important item in the food of the villagers. Other fruit trees included in the groves are Jaman (Eugenia Jambolana) and Kathal (Artocarpus integrifolia Guala (Paridium guajava).

12. Water-bodies include the ponds, canal distributaries and irrigation channels.
The following Table gives the numbers and size of different fields while Fig. 46 shows their distribution.

TABLE VII

TOTAL NUMBER OF PLOTS 490

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Number of plots</th>
<th>Percentage of the total number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 Acre</td>
<td>432</td>
<td>88.20</td>
</tr>
<tr>
<td>1 to 2 Acres</td>
<td>50</td>
<td>10.20</td>
</tr>
<tr>
<td>Above 2 Acres</td>
<td>8</td>
<td>1.60</td>
</tr>
<tr>
<td>Total</td>
<td>...</td>
<td>490</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.00</td>
</tr>
</tbody>
</table>

The above table shows that 88 per cent of the total number of plots are less than one acre and 10 per cent between one and two acres in size.

The consolidation of holdings which at the time of the writer's visit to the village was under operation, shall be helpful in increasing the size of fields and will save the peasant from the wastage of time and labour in going from one part of his holding to another, situated at some distance.

Land Utilization in the Kharif Season:

The land use in the kharif season 1960 is shown in Fig. 47. The area occupied by each crop is given in Table VIII.
## TABLE VIII

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of tage of gross net cultivated land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain crops</td>
<td>118.70</td>
<td></td>
<td>50.34</td>
<td>59.10</td>
</tr>
<tr>
<td>Rice transplanted</td>
<td>30.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice broadcast</td>
<td>1.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>2.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small millet</td>
<td>3.44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet and Pulses</td>
<td>3.44</td>
<td>1.11</td>
<td>1.30</td>
<td></td>
</tr>
<tr>
<td>Other crops:</td>
<td></td>
<td></td>
<td>34.53</td>
<td>40.90</td>
</tr>
<tr>
<td>Fodder and Millet</td>
<td>49.37</td>
<td>15.87</td>
<td>18.80</td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>57.96</td>
<td>18.66</td>
<td>22.10</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>48.00</td>
<td>15.13</td>
<td>--</td>
<td>15.13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>310.75</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It will be seen from Table VIII that nearly eight-tenths of the net cropped land in the kharif season is devoted to grain crops, and about 22 per cent is occupied by sugarcane.

Rice is the principal grain crop which occupies about 56 per cent of the net cropped area. The presence of clayey loam, an average rainfall of over 31 inches in the wet monsoon months, an average temperature of 80°-90° F in the growing season and facilities of irrigation by canal, make rice the principal crop of the kharif season. About 20 per cent of the output is exported, and is sold in the market of Saharanpur city. The important varieties grown in the village are, locally known as basmati, ram-juwain chakura and mukhmalauti. The straw called as pural is used for cattle fodder in the winter season, and since it is not a nutritious feed, this may be the reason for the poor health of the cattle in the village. Among the other grain crops are maize, pulses and millets. Big-millets (juvr and bajra) are usually consumed as a green fodder.
CROPS OF THE KHARIF SEASON

Rice:

Rice is the staple diet of the villagers of Bhaupur. The cultivation of rice in the village is carried on by the puddle-method which can be divided under two heads: One in which the seeds are sown broadcast and the other when the seeds are sown in nurseries and the seedlings are later on transplanted. In the broadcast method locally called as boiru and bhadei, rice is sown in the third week of June with the help of canal irrigation. The preparation of the field commences one week before the sowing actually takes place. The field is flooded, when water stands three to four inches in the field. After ploughing, the soil is turned over in the puddle, from six to seven times to remove the weeds and to increase the water retaining capacity of the soil. Along with the preparation of field the peasant also improves the quality of seeds. Here in seeds at the rate of 18 lb per acre are soaked in water for about 24 hours after which they are heaped on the ground and are covered with mats.

14. In the puddle method the field is ploughed at the occurrence of heavy rains or by irrigating when there is still water in the plot. After ploughing the field is changed into a muddy-pool with the help of a wooden plank locally called as wahan. By doing so the cultivator improves the water retaining capacity of the soil.
The seeds sprout after twenty four hours and the sprouted seeds are broadcast in the field. Mostly coarse varieties of rice (viz. naura, nakka, dhan, sathi, and kellar-munji) are sown by this method. The crop is harvested in the third week of September. The outturn of the unhusked rice in the year of inquiry was about 15 maunds (1230 lb) per acre.

In the transplantation method rice is initially sown in small plots of well manured lands. For the growth of seedlings seeds are broadcast at the rate of 195 lb in the irrigated puddled field, in the last week of May. After every seven days irrigation water is provided without a break for thrity to forty days. When the seedlings are about a foot in height, they are transplanted in lowlying fields in regular rows. Transplantation takes place generally in the beginning of July. These fields remain under water or they are at least thoroughly wet when the operation is carried on. Thirty days after the date of transplantation, fertilizer generally, ammonium-sulphate is applied at the rate of 50 lb per acre. Although this is an expensive method as it requires more manual labour in the transplantation, the output of the crop cultivated by this method is higher than that of the broadcast method. The crop matures in the second week of October. The yield of the unhusked rice grown by this method was about 20 maunds in the village (about 25 per cent more than that cultivated by the broadcast method).
Millets:

Millets are grown in the relatively high lying fields in the eastern part of the village (Fig. 47). There are two types of millets cultivated in the plain of Upper Ganga-Yamuna Doab: (i) big millets *juar* and *bajra* both of which are tall plants, attaining a height of six to ten feet; (ii) the small millets *sanwa* and *kodon* which reach a height of two to three feet. Both types of millets are cultivated in *Amur*. The seeds of millets are broadcast at the arrival of monsoon rains and the crop is harvested by the middle of October. Millets, however, are generally, consumed as green fodder to the animals. *Juwar* is broadcast at the rate of 50 lb, *bajra* 8 lb. and *sanwan* 15 lb in an acre. The millet gives high yield when the rainfall is scanty, but on the other hand it suffers severely from an excess of rainfall.

Maiz:

Maiz is sown in the middle of June, at the arrival of monsoon rains or by irrigating the fields, in the well drained good quality lands. It needs no irrigation if rainfall in the months of June, July and August is well distributed, but if there are long breaks in the incidence of rainfall, the crop has to be irrigated. The crop matures in September and unlike sugarcane and rice, it is not affected by an early cessation of rainfall in September. Maiz matures earlier than other grain crops in the kharif season.
and thus makes the land available for the rabi crop. Sometimes the crops are harvested when they are still green and are used in the roasted form. Maize occupies very small acreage in the village owing to the labourious process involved in its cultivation. In order to get a good yield of grain the weeds should be cleared off, the cobs after their formation, have to be protected from birds, stray animals and even human beings, and the crop has to be watched regularly till the harvest is ready. The output per acre in the year of inquiry was 700 lb. The stalk of maize provides nutritious fodder if they are cut while green, but as the crop is grown for grains, the stalks are used for fuel.

Pulses:

Among the kharif pulses arhar, urad (mash) and lobia are important. The pulses are usually grown as a sole crop except in some fields in which they are cultivated mixed with millets.

Arhar is sown on the well drained land. It does not require irrigation as its deep roots draw water from great depths. When arhar is mixed with other kharif crops, its growth is slow until the other crop is removed. The plant attains normally, a height of five to six feet with numerous side branches and covers the ground almost completely. The

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15. The botanical names of arhar, urad, and lobia are Gajanus-indicus, Phaseolus-radiatus and Vigna-catjang respectively.
flowering goes on continuously for over two months. The crop is ready for harvest after 10 months. The stalks are used as a fuel which enable the villagers to save some cowdung for manuring. In the year of inquiry the per acre yield of arhar was 8 maunds (640 lb). Other pulses are unimportant in the village and are generally sown mixed with fodder crops in the month of June and are harvested in October.

Sugarcane:

Sugarcane is an important cash crop and occupies the good quality land in the village. After the introduction of fertilizers, high yielding varieties and sugarcane co-operative societies (which facilitate the marketing of the crop) the area devoted to sugarcane in the village under review has been continuously increasing.

The sowing of sugarcane takes place in the Autumn and Spring seasons. The Autumn sowing is known as Asoji-Eikh while the latter is called as boiatsu-eikh. The Autumn sowing takes place in the first week of October and the crop germinates in about three weeks. In the winter season, owing to the low temperatures the growth is slow. In the months of March and

---

16. One maund is equal to about eighty pounds.

17. Asoji-Eikh (Asoj is a Hindi month corresponds to September-October and Eikh stands for sugarcane) means the cane crop sown in the month of October.

The local adage says 'Jiskai ho tota mal ka yoh eikh boiy Asoj ka. The meaning is: Sowing of sugarcane in the month of Asoj (October) is a symbol of prosperity to the cultivator.'
April the growth is relatively quick. The Spring sowing usually takes place in the second week of February. In the spring sown crop there is little growth in the months of March, April and May, owing to the high temperatures and low humidity. With the advent of monsoon the growth is rapid and by the end of July it is difficult to distinguish between the early (Autumn) sown and late (spring) sown crops.

There are two important methods, usually adopted by the cultivators of Upper Ganga-Yamuna Doab in the sugarcane cultivation. These are as follows:

1. the Trench method; and
2. the Flat sowing method.

In the trench method after the harvest of wheat the land is left fallow till the outbreak of monsoon when it is ploughed, or is devoted to leguminous or green manuring crop, which is ploughed in the field. If the land is left fallow, the ploughing of the field is carried on in the months of April and May, with the help of irrigation. The field is again ploughed in the season of general rains. In the middle of October and November, after the sowing of rabi crops, trenches for sugarcane are made. In the well manured field the trenches are dug four feet apart. Each trench is two feet wide and is separated by a ridge of two feet from the next trench. As soon as the trenches are made they are dug with a kassi to

18. kassi is a narrow iron spade with a wooden handle, used for the hoeing of sugarcane crop.
a further depth of about six to eight inches and generally two more hoeings are given before sowing the seed. About 45 mounds of sugarcane are required for an acre, in case the trenches are four feet apart. When the plants are about two feet high the trenches are filled with earth. This operation is advantageous to the young plants as it provides additional fertile soils, stored on the ridges, and gives them stable support. It further helps the germination of new buds which develop on the buried portion of the stem. Although the method gives a high yield, it is generally adopted by those cultivators who have ample quantities of manures and irrigation.

The flat sowing method is simple and requires less labour and capital. Before sowing the land is thoroughly prepared and sometimes more than thirty ploughings with the indigenous plough are given. After ploughing and the levelling the land is ready for sowing. Straight lines three feet apart are made in the field. Along with this canesticks are cut into small pieces or sets, each set containing at least three sound buds. The sets are planted in the furrows which are three to four inches in depth. The sets of sugarcane are sown with their ends touching each other with the buds facing upwards or the sides of the trench. This is believed to help germination and save

19. To break the clods and to pulverise the land, a wooden-beam and a wood-roller, locally called as pataila, maida and suhaga, and uod or lakker respectively are used.
the bud from damage by white ants. About 10,000 sets (= 40 maunds) are required for an acre when the furrows are three feet apart. The main advantage of flat sowing is the scope which it provides for hosing with new implements. Besides, it generally requires few waterings. In the flat sowing method, if the rainfall takes place in winter and there is sufficient moisture in the soil, the land is ploughed and sown without irrigation, but if the soil is dry, a light watering for preparing the land and moistening the seed-bed is given before the sowing takes place.

After the crop is sown, it is repeatedly irrigated till the outbreak of monsoon. In order to retain moisture in the soil and to remove the weeds, hosing of the field after each 20 watering is necessary. In the hot season the fields should be watered at least twice to protect the crop from the intensive heat, and for high yields the fields have to be irrigated five to six times. Whenever long breaks in rainfall occur the crop is irrigated.

In the village of Bhaupur the varieties of sugarcane are Co.312, Co.421 and Co.445. The average yields of these varieties estimated in terms of gur are 45, 47 and 50 maunds respectively. However, Co.445 is better than others as it is generally

20. There is a local saying about the effect of irrigation and hosing on the growth and development of sugarcane: anod kai jama lai beeanch kai badna lai; the meaning is: that for a rapid germination, hosing of cane is very useful, while irrigation helps in the quick growth of the crop.
harvested earlier and has a sound root system which saves the
crop from lodging.

The ratoon crop locally called as mundha is generally,
harvested in November, when it is supplied to the Sugar Factory
of Saharanpur. The peasants, however, start crushing the crop
in the bullock driven mills, locally known as kolhoos and
charkhees, even earlier in order to obtain high price of the
commodity.

Land Utilization in the Rabi Season:

The use of land in the rabi season, 1960-61 is shown in
Fig. 48. The area occupied by each crop in this season is
shown in Table IX. It will be seen from the Table IX that
nearly three-fourths of the net cropped land in the rabi
season is occupied by wheat and gram. Wheat mixed with gram
occupies 43 per cent of the sown area and constitutes the
major crop. Moreover, 24 per cent and a little more than 5 per
cent of the cropped area is devoted to wheat and gram respectively.
Green fodder, locally called as riske and barseem occupies
about 8 per cent of the net cropped land, while 24 per cent
of the gross cultivated land is under continual kharif crops.

21. At the occurrence of violent winds in the month of
September the crop is lodged. The lodging of sugar-
canes reduces the quality of rab (massecuite).
BHAUPUR LAND UTILIZATION
RABI - SEASON 1960-1961
TABLE IX

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Per centage of gross land</th>
<th>Per centage of cropped land</th>
<th>Total per centage of gross land</th>
<th>Total per centage of cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and grain(Goehan)</td>
<td>94.47</td>
<td>31.65</td>
<td>43.47</td>
<td>64.62</td>
<td>83.63</td>
</tr>
<tr>
<td>Wheat</td>
<td>55.22</td>
<td>17.90</td>
<td>24.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>12.15</td>
<td>3.90</td>
<td>5.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>10.90</td>
<td>3.47</td>
<td>4.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas and oats</td>
<td>6.37</td>
<td>2.04</td>
<td>2.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>8.84</td>
<td>2.84</td>
<td>3.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram and barley(Bajhar)</td>
<td>2.49</td>
<td>0.77</td>
<td>1.07</td>
<td>8.28</td>
<td>11.37</td>
</tr>
<tr>
<td>Barley</td>
<td>2.73</td>
<td>0.89</td>
<td>1.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and barley(Goijji)</td>
<td>2.68</td>
<td>0.86</td>
<td>1.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse (lentil)</td>
<td>0.94</td>
<td>0.36</td>
<td>0.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Podder</td>
<td>25.75</td>
<td>8.28</td>
<td>11.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>3.37</td>
<td>1.08</td>
<td>-</td>
<td>1.08</td>
<td></td>
</tr>
<tr>
<td>Continual kharif crops(22)</td>
<td>84.88</td>
<td>26.06</td>
<td>-</td>
<td>26.02</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>310.75</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

22. Continual kharif crops refer to those crops which occupy the land in the kharif and part or the whole of the following rabi season, such crops are: Sugarcane and Pigeon-pea.
Crops of the Rabi Season:

Wheat-Gram:

Wheat mixed with gram is the main crop of the Rabi season in the village, and is the staple diet of the villagers. There are several reasons for sowing wheat as a mixed crop instead of a sole crop. In the first place, the combined outturn of the mixed crops (wheat and gram) is greater than that of a single crop (wheat alone). The outturn of the mixed crop on the good quality land in the year of inquiry was 875 lb per acre while that of wheat was 615 lb (about 30 per cent less). Secondly, the cultivation of mixed wheat and gram is less expensive and involves less labour in the preparation of field for sowing. Further, it requires fewer ploughings, less irrigation and manures as compared to wheat.

The sowing of mixed wheat and gram takes place in the middle of October, immediately after the harvest of rice. The amount of seed, sown is 100 lb per acre. The crop is harvested in the last week of March.

Wheat:

Wheat is cultivated on the good quality (A) and medium quality (B) lands. Before sowing takes place, the soil is intensively ploughed, harrowed and rolled many times to pulverise and to obtain fine tilth. The sowing generally begins in the third week of October at the recession of monsoon,
in each ploughed furrow at the rate of 70 lb per acre.

By the middle of November the crop is irrigated while in December and January, the small amount of rainfall is conducive to the growth of the crop. The rapidly ascending temperatures and clear weather of March helps in harvesting the wheat crop. The crop is generally, harvested in the first week of April. After the harvest the crop is brought to the threshing floor, locally called as khaliyan or paire and is threshed by trampling under the feet of cattle, after which the crop is screened and winnowed before it is stored or sent for sale. The straw of wheat is comfortable and nutritious fodder for livestocks. In the year of inquiry the average yield of wheat was 615 lb per acre.

In the production of wheat, besides the technical difficulties viz. manures, good varieties of seeds, the main problem appears to be the judicious use of irrigation. Over watering is the general practice in the village which is injurious to the crop as it reduces the proportion of grain and increases the length and weight of straw.

Gram:

The cultivation of Gram is less labourious than that of wheat. It receives neither hoeing nor weeding as it possesses the peculiarity of suppressing weed growth. Gram cultivation

23. The cultivator in order to avoid any risk arising from the short supplies of water in the Eastern Yamuna Canal (which is so oftenly occur in the winter season) makes overwatering of wheat crop.

is sown at the rate of 40 lb per acre in the last week of September or in the beginning of October. In the year of inquiry the per acre average yield was 620 lb.

Barley:

The highly manured fields surrounding the dwelling houses called as goira are devoted to barley. Like wheat, barley also requires fine tilth of soil. Barley if cultivated in fields farther from the settlement is sown mixed with other crops. After harvest, the crop is threshed like wheat. The straw of barley is rough and is not a good fodder.

Peas:

Peas are cultivated in the village as a grain crop and partly as a fodder to the animals. They are sown in the middle of October. When the crop is about nine to twelve inches high, it needs to be irrigated but it does not require as much water as wheat and barley. The ends of the stems are nipped off in order that the plants may multiply their offshoots. The yield of peas per acre in the year of inquiry was 810 lb.

Fodder:

Green fodder locally called as barseem and rizka, in the village of Bhaupur occupies eleven per cent of the net cropped land. The stems of the crop are cut from six to ten times and the crop continues to supply fodder from December till May.
The process involved in its cultivation is very simple and less expensive. The seeds of either crop at the rate of 10 lb per acre are sown in the field when rice is still standing, or it may be cultivated by the puddle method. In this method seeds are broadcast in the field after irrigation, when water in the field is less than one inch. Six weeks after from the date of sowing when the plants grow to the height of four inches are cut off so that the plant may multiply its offshoots. These crops on the one hand are nutritious fodder to the cattle, while on the other they help in maintaining the fertility of the soil.

**Mixed Crops:**

Fig. 49 reveals that there are fields in which two or more than two crops differing in their water requirements are sown in the same season. For example millets are sown mixed with arhar or urad, lobiya and moth in the kharif season. While in the rabi season wheat is sown mixed with gram and barley, and barley with peas and oats. Besides these combinations, sugarcane, peas and gram in the month of October are sown in alternate furrows. Mixed cropping has several important advantages both in the irrigated and unirrigated parts. First, in years when the rainfall is normal the output of mixed cropped land per acre is greater than that of single cropped land. Further, in years, when the rainfall is below
the normal, the yields of crops requiring abundant water supply are affected, while those requiring less amount of water remain unaffected, thus the cultivator has the benefit of getting something even under adverse weather conditions. The sowing of sugarcane peas or gram on alternate furrows saves the cultivator from hoeing and watering of the crop in the winter season, while the roots of the leguminous crops enhance the main crop by increasing the fertility of the land.

Secondly, by sowing two crops which matures at different dates (such as millets and pulses) the cultivator maintains his meager reserves of food. It may also be noted that with the help of these mixtures, the cultivator unconsciously maintains the supply of nitrogen in a convenient way on very small holdings. The crops which encourage bacterial action in the soil are the kharif and rabi pulses and barseem. They build up the soil fertility and also add to the food reserves of the villagers.

**Double Cropped Land:**

The fields sown twice in the year of inquiry are shown in Fig. 49. The total area of the double cropped land in the year of inquiry was 212.18 acres or nearly 68 per cent of the gross cultivated land (Fig. 49).
area of the double cropped land would increase greater, if medium quality B1 lands are devoted to fodder and pulses in the kharif.

A comparison of Figs. 44 and 49 shows that the extent of double cropped land is limited to the good quality land. Medium quality B1 land is left fallow in the kharif and BII land is left fallow in the rabi season.

Double cropping on the one hand offers protection to the fields against soil erosion; while on the other it helps in producing more food for the villagers. Therefore, extension of double cropping, particularly on the medium quality lands, with the help of manures is extremely desirable.

25 Rotation of Crops:

Rotation of crops is carried on all lands except those devoted to transplanted rice. On the good quality land which is devoted to sugarcane, a three year rotation is practised in the following order:

<table>
<thead>
<tr>
<th></th>
<th>Kharif season</th>
<th>Rabi Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Sugarcane</td>
<td>26</td>
</tr>
<tr>
<td>Second Year</td>
<td>Sugarcane(ratoon)</td>
<td>Peas</td>
</tr>
<tr>
<td>Third Year</td>
<td>Millets or fodder</td>
<td>Wheat or wheat mixed with gram or gram mixed with peas</td>
</tr>
</tbody>
</table>

25. During the visit to the village in 1960-61, the writer consulted the villagers about the rotation of crops, practised by them.

26. The ratoon sugarcane is harvested in the month of November and the fields which are vacated are devoted to peas.
On the good quality land which is devoted to double cropping, a grain crop in the kharif is followed by another grain or pulse (arhar) crop in the rabi. The choice of the crops is determined by the food requirements of the cultivators' family, and ability of the cultivator to manage and look after the crops. On the good quality land all the peasants, however, do not cultivate two grain crops in successive years. Some of them leave the land fallow in the rabi season and prepare it for sugarcane. Such lands which are left fallow in rabi season, are called pandra.

On the medium quality land (31) the rotation is practised in the following order:

<table>
<thead>
<tr>
<th>Kharif season</th>
<th>Rabi season</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Gram, peas or mixed wheat and gram.</td>
</tr>
<tr>
<td>Maize, Cotton or millets as a sole crop or mixed with pulses</td>
<td>mixed with pulses</td>
</tr>
<tr>
<td>Second Year</td>
<td>Wheat</td>
</tr>
<tr>
<td>Fallow</td>
<td></td>
</tr>
</tbody>
</table>

In the third year rotation of crop begins afresh, and mostly follows the following order:

<table>
<thead>
<tr>
<th>Kharif season</th>
<th>Rabi season</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>Fallow</td>
</tr>
<tr>
<td>Rice broadcast or fodder</td>
<td>Continued in the rabi.</td>
</tr>
<tr>
<td>Second Year</td>
<td>Sugarcane</td>
</tr>
</tbody>
</table>

27. Such land is locally called as ghail, which means land not left fallow.

28. Such fallow land is locally called as bhadwad.
However, many of the cultivators devote the medium quality (III) lands to a green manure crop in the Kharif. The green manure crop is ploughed in the field and the land is then left fallow in the following rabi season, so that the land may recoup its fertility. These lands are devoted to sugarcane in the months of February and March.

On the medium quality (III) lands, devoted to transplanted rice, generally no rotation of crop is practised. However, the fields which are irrigated by canals, one year rotation is practised in the following order:

<table>
<thead>
<tr>
<th>Kharif season</th>
<th>Rabi season</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Rice (Transplanted)</td>
<td>Fodder (barseem or Oat)</td>
</tr>
<tr>
<td>Second Year Rice (Transplanted)</td>
<td>Fodder (barseem or Oat)</td>
</tr>
</tbody>
</table>

The table on the next page shows the totals of various categories of lands as well as the per capita share of the villagers in these lands. Table IX reveals that the per capita land available for cultivation is 0.73 acres. In the kharif and rabi seasons the per capita cropped land is 0.70 and 0.53 acre respectively. In the kharif season the reduction in the per capita share of cultivated land is due to the practice of fallowing, while in the rabi season some arable land remains occupied by kharif crops such as sugarcane and arhar.

Table IX further shows that the per capita double cropped land is 0.21 acre, so that the per capita gross cultivated land (which includes the totals of the kharif and rabi season)
TABLE IX

Total Population of Bhaupur 425

(Area in Acres)

<table>
<thead>
<tr>
<th></th>
<th>Total available</th>
<th>Total cropped</th>
<th>Total croppable</th>
<th>Total cultivated (both Kharif and Rabi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total area of land</td>
<td>337.45</td>
<td>310.75</td>
<td>262.75</td>
<td>223.13</td>
</tr>
<tr>
<td>for the village</td>
<td></td>
<td></td>
<td></td>
<td>(both Kharif and Rabi)</td>
</tr>
<tr>
<td>of cultivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kharif Rabi</td>
<td>522.95</td>
<td>212.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Land per head of population

|                      | 0.790           | 0.730          | 0.620           | 0.525                                   | 1.145          | 0.50 |

is 1.15 acres. Thus the amount of cultivated land supporting one person in Bhaupur is 1.15 acres.

So far as the pressure of population is concerned, about 360 persons (or 85 per cent of the total population) are primary rural and are exclusively dependent upon land; while 15 per cent consists of secondary rural which depends upon

30. In the course of enumeration of the population of Bhaupur and other villages, the occupation of people were also noted. The population was divided into three groups: the primary rural depending exclusively on agriculture; the secondary rural which serves the primary population through ancillary services; and the adventitious population which includes the people who live in rural areas by choice rather than by necessity. The writer did not come across any adventitious population in the village. A similar classification of population was made by Prof. M. Shafi in Land Utilization Survey in Eastern Uttar Pradesh, (Aligarh, 1960), p. 70.
the primary rural population through ancillary services.

Potential Production Units:

The productivity of each type of land is given in Table XI. On the basis of productivity ratings an attempt has been made in this table to assess the potential production units in the village.

TABLE XI

Average Yield I. P. P. U. 1300

<table>
<thead>
<tr>
<th>Type of Land</th>
<th>Area in acres.</th>
<th>Average yield</th>
<th>Average Rating per acre</th>
<th>Total No. of P. P. U. S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good Quality Land (A)</td>
<td>305.20</td>
<td>1800</td>
<td>1.38</td>
<td>421.18</td>
</tr>
<tr>
<td>Medium Quality Land (B1)</td>
<td>131.80</td>
<td>1000</td>
<td>0.77</td>
<td>101.50</td>
</tr>
<tr>
<td>Medium Quality Land (BII)</td>
<td>2.00</td>
<td>600</td>
<td>0.62</td>
<td>1.24</td>
</tr>
<tr>
<td>Poor Quality Land (C)</td>
<td>3.25</td>
<td>00.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Total 442.25 -- -- 523.96

It will be seen from Table XI that 442.25 acres of land in the village are in the present state of technological developments, equal to 524. P. P. U. S. Good quality land of the village is highly productive and one acre is equal to 1.38 P. P. U. S. Since more than three fourths of the total area is
covered by the Good quality land, the increase in the total number of P.P.U.s. is appreciably large. It is only in the medium quality lands that the productivity is lower than the average good farm land. If the productivity of these lands is increased with the help of manures, to the level of good quality land, a number of P.P.U.s. can be added to the total number of existing P.P.U.s.
LA ND UTILIZATION IN A SRAKHERI

Location:

The village of Asrakheri lies in Nakur Tahsil of Saharanpur district. It is situated in 29° 54' N lat., and 77° 19E long., and is bounded by the villages of Padma-Nagli in the north, Malakpur and Fazilpur in the east, Bahirmau in the south and Chak Kishanpur in the west (Fig. 50).

The village lies in a well-drained plain of loamy soil at a height of about 336 feet above sea level. The north and eastern parts of the village are relatively elevated, while the south and western parts are lowlying. The low lying parts in the months of July and August remain generally submerged under water.

The markets of Nakur and Ambahta towns are at a distance of one and three miles in the north west and east respectively. The village with these markets is connected by metalled roads. A metalled road runs through the south west corner of Asrakheri, while another road which joins the towns of Gengoh and Nakur, passes at a distance of about two miles to the west of the village. Thus there is an easy access to the markets of the neighbouring towns.

The height is that of Nakur which is at a distance of about one mile in the north west of the village. Since the actual height of Asrakheri has not been recorded, it may be taken approximately the same as that of Nakur, for both the stations lie in level plain.
LOCATION OF THE VILLAGE ASRAKHHERI

The outline of Asrakhheri has been drawn by the writer.

Source: Survey of India map No 53-5

Fig. 50
Climate:

No climatic data are recorded in the village. The nearest rainfall recording station is that of Nakur, about one mile to the north west of the village. The data of rainfall recorded at the Tahsil headquarters of Nakur, have therefore been given in Tables XII and XIII.

TABLE XII

Kharif Season 1960 (Nakur)

<table>
<thead>
<tr>
<th>Months</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches</td>
<td>1.36</td>
<td>8.30</td>
<td>10.66</td>
<td>1.13</td>
<td>2.01</td>
<td>23.96</td>
</tr>
<tr>
<td>Rainy days in kharif, 1960</td>
<td>2</td>
<td>10</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>4.50</td>
<td>8.90</td>
<td>8.37</td>
<td>5.04</td>
<td>0.52</td>
<td>27.43</td>
</tr>
</tbody>
</table>

Land Classification:
On the basis of fertility and productivity (See page 106), the village fields have been differentiated in Fig. 51.

32. The data of rainfall for the kharif and rabi seasons of 1960-61 were obtained from the headquarters of Tahsil Nakur.
TABLE XIII

RABI SEASON 1960-61 (NAKUR)

<table>
<thead>
<tr>
<th>Months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novem- Decem-</td>
<td>January February March</td>
</tr>
<tr>
<td>ber</td>
<td></td>
</tr>
<tr>
<td>Rainfall in inches in the rabi season 1960-61</td>
<td>1.64</td>
</tr>
<tr>
<td>Rainy days in rabi season, 1960-61</td>
<td>-</td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.17</td>
</tr>
</tbody>
</table>

The soil of good quality land (A) is loamy, locally known as "raunali" and produces two grain crops a year or is devoted to sugarcane.

The soil of medium quality land (B1) is less productive than (A). These lands are usually left fallow in the kharif season and cropped in the rabi season. The soil of (B1) land is clayey which lies in the southern part of the village. These lands are reserved for transplanted rice.

The poor quality land (C) consists of those fields which lie unutilized, due to the presence of injurious salts in the soil.
FIG. 51

ASRA KHERI

LAND-CLASSIFICATION

A-GOOD QUALITY LAND
B1 MEDIUM QUALITY LAND
B2 C-POOR QUALITY LAND
S SETTLEMENT
METALLED ROAD
CART-TRACK
CEMETERY
P POND
G GROVE
WELL
Table XIV shows the different classes of land while their
distribution is plotted in Fig. 51.

**TABLE XIV**

Total area of the Village 242.11 acres

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>125.00</td>
<td>51.60</td>
</tr>
<tr>
<td>Medium quality land (B)</td>
<td>51.00</td>
<td>21.00</td>
</tr>
<tr>
<td>Medium quality land (B II)</td>
<td>5.90</td>
<td>2.50</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>11.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Land not available for cultivation (33)</td>
<td>49.21</td>
<td>20.40</td>
</tr>
<tr>
<td>Total</td>
<td>242.11</td>
<td>100.00</td>
</tr>
</tbody>
</table>

It will be seen from the above table that in Asrakheri about
52 per cent of the total area is covered by the good quality (A)
land, 21 and about 3 per cent by the medium quality (B) and (B II)
lands respectively and about 5 per cent by the poor quality land,
while 20 per cent is under non-agricultural occupations.

**Irrigation:**

Wells constitutes the main source of irrigation. The wells
are generally dug in the good quality land. A comparison of

33. Land not available for cultivation includes, settlement,
  roads, ponds, wells, groves and cemetery.
Figs. 51 and 52 show that six out of seven wells, utilized for irrigation are situated in the good quality land.

Besides, ponds are occasionally utilized to irrigate transplanted rice, in the years of low rainfall. Water from ponds is lifted by the del method. The area irrigated by ponds is, however, confined to their vicinity. In the year of inquiry on account of a fair distribution of rainfall spread over sufficient numbers of days, no irrigation was practised from ponds. The plots irrigated in the kharif and rabi season are shown in Fig. 52.

Table XII reveals that the amount of rainfall in the months of kharif season was about 24 inches and it was distributed over reasonable number of days. Therefore none of the kharif crops except sugarcane was irrigated. The little amount of rainfall that fell in the month of June was particularly useful for the sowing of grain crops (millet, maize and pulses) and for the preparation of fields, to be devoted to transplanted rice. Sugarcane was irrigated three to four times from the date of sowing till the outbreak of monsoon. Moreover, cotton was sown in the months of May by irrigating the field. Table XIII shows that there was no rainfall in the months of November and December, therefore all the rabi crops except gram and lentil were irrigated.

34. In the del method two men stand on opposite sides of the water pit, holding the strings attached, to flattened out the leather or bamboo basket to throw water from the level of the pond to the level of fields.
Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 53 to 56, which are based on the writer’s field work of the village.

The following Table gives a summary of the proportions of the village lands devoted to various uses in 1960-61 Fig. 53.

**TABLE XV**

**Total Area of the Village 242.11 acres**

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acre</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>192.90</td>
<td>79.67</td>
</tr>
<tr>
<td>Waste land</td>
<td>25.31</td>
<td>10.45</td>
</tr>
<tr>
<td>Settlement</td>
<td>6.13</td>
<td>2.52</td>
</tr>
<tr>
<td>Road</td>
<td>6.11</td>
<td>2.51</td>
</tr>
<tr>
<td>Grove</td>
<td>3.00</td>
<td>1.22</td>
</tr>
<tr>
<td>Pond</td>
<td>4.60</td>
<td>1.89</td>
</tr>
<tr>
<td>Cementery</td>
<td>4.06</td>
<td>1.64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>242.11</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

35. The base map showing the fields and their areas in bighas was obtained from the Revenue Department of Tahsil Nakur. The village was visited by the writer in the kharif season 1960 and raht season 1960-61, and the use to which each field was being put was recorded on the base map. From these data Figs. 53 to 56 were prepared.

36. Grove consists of jamun, ber and amrood.
It will be seen from the Table XV that nearly eighty per cent of the total land of the village is cultivated and ten per cent is under non-agricultural occupations, while the remaining 10 per cent is unproductive. The waste land which is about 25 acres, if utilized for grazing purposes or devoted to fuel trees the problems of fodder and fuel can be solved to a large extent. Therefore the reclamation of waste land for these purposes needs investigations.

The following Table gives the number and size of plots, while Fig. 53 shows their distribution.

**TABLE XVI**

<table>
<thead>
<tr>
<th>Size of Plot</th>
<th>Total No. of Plots</th>
<th>Percentage to the total No. of Plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>126</td>
<td>63.00</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>44</td>
<td>22.00</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>30</td>
<td>15.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

An examination of Table XVI reveals that 63 per cent of the total number of plots are less than one acre in area, 22 per cent between 1 and 2 acres and 15 per cent more than two acres.
However, the size of plots in this village is relatively larger as compared to those of village Bhaupur.

Land Utilization in the Kharif Season:

The use of land in the kharif season is shown in Fig. 54 and the area occupied by each crop in this season is given in Table XVI.

It will be seen from Table XVII that sugarcane is the major crop in the kharif season and occupies three fifths of the net cropped land. Forty per cent of the net cropped land is under grain crops. Among the grain crops maize and rice are important, and occupy 26 and 23 per cent of the net cropped land respectively. 37 Maize has been regarded as an extremely soil exhausting crop. The experiment carried at Fusa, show that maize responds vigorously to nitrogenous manuring, and 40 lb of nitrogen per acre in the form of rape-seed cake is a suitable manure for maize. Table XVI further reveals that 25 per cent of the net cropped land in the kharif season is devoted to fodder crops. The main fodder crops are millets mixed with pulses, jujar and bajra. The stems of these crops are chopped and served as a green fodder to the cattle from August to October. About one fourths of the gross cultivated land lies fallow in the kharif season.

Land Utilization in the Rabi Season:

The use of land in the rabi season of 1960-61 is shown in Fig. 55 and the area occupied by each crop is given in Table XVIII.

### TABLE XVII

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of Gross cultivated land</th>
<th>Percentage of Net cropped land</th>
<th>Total Percentage of Gross cultivated land</th>
<th>Total Percentage of Net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>25.80</td>
<td>13.37</td>
<td>18.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice transplanted</td>
<td>23.42</td>
<td>12.13</td>
<td>16.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small-millet</td>
<td>5.58</td>
<td>2.90</td>
<td>3.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse</td>
<td>1.03</td>
<td>0.53</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>45.18</td>
<td>23.47</td>
<td>31.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>34.40</td>
<td>18.34</td>
<td>24.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>3.40</td>
<td>1.76</td>
<td>2.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.02</td>
<td>0.52</td>
<td>0.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>50.92</td>
<td>26.39</td>
<td>26.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>192.90</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
TABLE XVIII

<table>
<thead>
<tr>
<th>Crops</th>
<th>Gross cultivated land</th>
<th>Net Cropped land in Rabi Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>...</td>
<td>162.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>90.87</td>
<td>47.10</td>
<td></td>
<td>56.06</td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>27.78</td>
<td>14.41</td>
<td></td>
<td>17.14</td>
<td></td>
</tr>
<tr>
<td>Wheat and Gram</td>
<td>26.34</td>
<td>13.66</td>
<td></td>
<td>16.25</td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>5.75</td>
<td>2.89</td>
<td></td>
<td>3.55</td>
<td></td>
</tr>
<tr>
<td>Pulse (lentil)</td>
<td>2.97</td>
<td>1.54</td>
<td></td>
<td>1.83</td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Puddar (barseem)</td>
<td>7.13</td>
<td>3.70</td>
<td></td>
<td>4.40</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.26</td>
<td>0.65</td>
<td></td>
<td>0.77</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>11.00</td>
<td>5.69</td>
<td></td>
<td>5.69</td>
<td></td>
</tr>
<tr>
<td>Continuous Kharif crops</td>
<td>19.80</td>
<td>10.36</td>
<td></td>
<td>10.36</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>192.90</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
It will be seen from Table XVIII that 95 per cent of the net cropped land in the rabi season is devoted to grain crops and five per cent to fodder and vegetables. Wheat is the major crop and constitutes the diet of the people. 56 per cent of the net cropped land is devoted to wheat as a sole crop, while 16 per cent is occupied by wheat in combination with gram. Other important grain crops are gram, peas and maseer (lentil).

A comparison of Figs. 54 and 55 shows that the net cropped land in rabi season is greater than that of kharif. It is due to the practice of fallowing over the medium quality (BI) land, in the kharif season.

Double Cropped Land:

The total area sown twice in the year of inquiry is 111.21 acres or 57 per cent of the gross cultivated land Fig. 56. The double cropped area can be extended on the medium quality (BI) lands by cultivating green manure and fodder crops in kharif season.

Land Use and Population:

The Table XVIV shows the totals of various categories of lands in the village and the per capita share of the villagers in these lands.

39. Vegetables in the village are cultivated by a class of people, known as saini.
It will be seen from Table XIX that the per capita share in the cultivated land is 0.96 acre. But in kharif season, owing to the following practice in the medium quality (31) lands, the per capita share in the cultivated land is reduced to 0.71 acre. The per capita cultivated land in the rabi season is higher than that of kharif season. This is mainly, because the proportion of land left fallow and occupied by continual kharif crops in the rabi season is small as compared to the fallow left in the kharif season.

Table XIX further reveals that the per capita share in the double cropped land is 0.55 acre, and thus per capita cultivated land is 1.02 acres. In other words the amount of land supporting one person in Asrakheri is 1.02 acres.

**TABLE XIX**

<table>
<thead>
<tr>
<th>Total Population of Asrakheri</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Area in acres)</td>
<td></td>
</tr>
<tr>
<td>Total area of the village</td>
<td></td>
</tr>
<tr>
<td>Total land cropped</td>
<td></td>
</tr>
<tr>
<td>Net cropped in kharif season</td>
<td></td>
</tr>
<tr>
<td>Net cropped in rabi season</td>
<td></td>
</tr>
<tr>
<td>Total cropped cultivated land</td>
<td></td>
</tr>
<tr>
<td>Double cropped land</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>242.11</th>
<th>192.90</th>
<th>142.00</th>
<th>162.10</th>
<th>304.10</th>
<th>111.21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land per head of population</td>
<td>1.21</td>
<td>0.96</td>
<td>0.71</td>
<td>0.81</td>
<td>1.02</td>
<td>0.55</td>
</tr>
</tbody>
</table>
162 persons (or about 82 per cent of the total population of the village) belongs to the primary rural class and are exclusively dependent upon land. The remaining eighteen per cent population serves the primary rural population and thus indirectly depends upon land.

Potential Production Units:

Table XX shows the productivity of each type of land. On the basis of productivity ratings an attempt has been made to estimate the F.P.U. of various classes of lands in the village of Ashokkheri.

| TABLE XX |
| --- | --- | --- | --- |
| **Average yield** | **1.F.P.U.** | **1,000** |

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in acres</th>
<th>Average yield</th>
<th>Rating</th>
<th>Total No. of F.P.U.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land(A)</td>
<td>125.0</td>
<td>1600</td>
<td>1.60</td>
<td>200.00</td>
</tr>
<tr>
<td>Medium quality Land (BII)</td>
<td>51.0</td>
<td>900</td>
<td>0.90</td>
<td>46.00</td>
</tr>
<tr>
<td>Medium quality Land (BIII)</td>
<td>5.90</td>
<td>800</td>
<td>0.80</td>
<td>4.70</td>
</tr>
<tr>
<td>Poor quality land(C)</td>
<td>11.0</td>
<td>150</td>
<td>0.15</td>
<td>1.50</td>
</tr>
<tr>
<td>Total</td>
<td>192.90</td>
<td>-</td>
<td>-</td>
<td>252.20</td>
</tr>
</tbody>
</table>
It will be seen from Table XX that the total acreage of land in the present state of technological development in Asrakheri is about 193 acres equal to 252 P.P.U.s. The productivity of one acre of the good quality land is 1.60 P.P.U.s, of the medium quality (II) land (III) lands 0.90 and 0.30 respectively while one acre of poor quality (C) land is equal to 0.15 P.P.U. In other words the good quality land (A) is highly productive and medium quality lands are less productive as compared to that of the average farm productivity. However, if the fertility of the medium quality lands is increased to the level of good quality land, the total of existing P.P.U.s may be increased to an appreciable number.
LAND UTILIZATION IN AMRUPUR

Location:

The village of Amrupur is situated in 39° 40'N. lat., and 77° 40'E. long., in Deoband Tahsil of the Saharanpur district. It is bounded by the villages of Noorpur in the north, Shaiadpur in the east, Gunarsi in the south and Isarpur in the west (Fig. 57).

Amrupur lies in a well drained plain of loamy soil. A minor of the Bastan canal distributary traverses the village from north east to south west, while another distributary passes through the north east corner of the village. The unmetalled road which runs between the town of Deoband and the village of San Khandi passes through the village and divides it, almost, into two equal parts from north to south. Thus Amrupur village has an easy access to the market of Deoband which is at a distance of about one mile to the north.

Climate:

No climatic data are recorded in the village. The data of rainfall recorded at the headquarters of Deoband Tahsil, have therefore been given in Tables XXI and XXII.

Land Classification:

The soil of the area in which the village is situated is mainly loamy, locally known as dumat. On the basis of fertility and productivity (See page 106) the village fields have been classified and mapped in Fig. 58.

40. The rainfall data of the kharif and rabi seasons 1960-61 were obtained from the headquarters of Tahsil Deoband.
LOCATION OF THE VILLAGE AMRUPUR

77°40'E

LOCATION OF THE VILLAGE AMRUPUR

source: survey of India map
No. 53 10

The outline of Amrapur has been drawn by the writer.

settlement
railway
metalled road
cart track
grove
waste land
### TABLE XXI

**Kharif Season 1960 (Deoband)**

<table>
<thead>
<tr>
<th>Months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td></td>
</tr>
</tbody>
</table>

| Rainfall in inches in the kharif season, 1960 | 2.90 | 10.21 | 12.50 | 3.69 | 1.90 | 31.30 |
| Rainy days in kharif, 1960                    | 3    | 12    | 11    | 5    | 2    |       |
| Average rainfall in inches                    | 3.70 | 10.20 | 10.00 | 5.6  | 1.4  | 30.90 |

### TABLE XXII

**Rabi Season 1960-61 (Deoband)**

<table>
<thead>
<tr>
<th>Months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov.</td>
<td></td>
</tr>
<tr>
<td>Dec.</td>
<td></td>
</tr>
<tr>
<td>Jan.</td>
<td></td>
</tr>
<tr>
<td>Feb.</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td></td>
</tr>
</tbody>
</table>

| Rainfall in inches in the rabi season, 1960-61 | -    | -    | 2.80 | 2.10 | 1.35 | 5.25 |
| Rainy days in rabi, 1960-61                    | -    | -    | 3    | 2    | 2    |       |
| Average rainfall in inches                     | 0.10 | 0.35 | 2.39 | 1.78 | 1.54 | 6.16 |
AMRUPUR LAND CLASSIFICATION

A. GOOD QUALITY LAND
B. MEDIUM QUALITY LAND
C. POOR QUALITY LAND
SETTLEMENT
CART-TRACK
UNMETALLED ROAD
GROVE
CEMETERY
RAILWAY
CANAL DISTRIBUTARY
POND
The poor quality lands consist of those lands which on account of the poverty of soil and their high salinity, lie unutilized.

Table XXIII gives the percentage of each type of land, while their areal extension is shown in Fig. 53.

It will be seen from Table XXIII that 78 per cent of the total area is covered by the good quality land, 10 and 1 per cent by the medium quality (II) and (III) lands respectively, while 10 per cent is under non-agricultural occupations.

TABLE XXIII

Total area of the Village 273.00 Acres

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>214.94</td>
<td>78.73</td>
</tr>
<tr>
<td>Medium quality land (B)</td>
<td>26.56</td>
<td>9.73</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>2.47</td>
<td>0.90</td>
</tr>
<tr>
<td>Land not available for cultivation (41)</td>
<td>39.03</td>
<td>10.64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>273.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

41. Land not available for cultivation includes settlement, roads, groves, ponds, canal distributaries and cemetery.
Irrigation:

A minor of the Bastain canal distributary, arising from the Deoband branch of Upper Ganga Canal, on its way to the Itlia village, passes through the village of Amrupur and provides irrigation facilities. The area irrigated in the year of 1960-61 is shown in Fig. 59.

Table XXI shows that rainfall in the kharif season was more than 31 inches and it was distributed over sufficient number of days. Therefore none of the kharif crops except sugarcane, cotton and early fodder crops (sown in the month of May) was irrigated.

Table XXII reveals that in the months of November and December (the growing period of rabi crops) there was no rainfall, therefore all the rabi crops except gram were irrigated.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs 60 to 63, which are based on the writer's field work of the village.

Table XXIV gives a summary of the proportions of the village lands devoted to various uses in the year of 1960-61 (Fig. 60).

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42. The base map of the village showing the fields and their areas in bighas was obtained from the Revenue Department of Tansil Deoband, in the district of Saharanpur. The village was visited by the writer twice in the kharif and rabi seasons of 1960-61, and the use to which each field was being put was recorded on the base map. From these data, Figs 60-63 were prepared.
### Table XXIV

**Total area of the Village in acres: 273.00 acres.**

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>241.50</td>
<td>88.46</td>
</tr>
<tr>
<td>Waste land</td>
<td>2.47</td>
<td>0.90</td>
</tr>
<tr>
<td>Settlement</td>
<td>5.53</td>
<td>2.04</td>
</tr>
<tr>
<td>Grove</td>
<td>9.13</td>
<td>3.34</td>
</tr>
<tr>
<td>Road</td>
<td>9.22</td>
<td>3.37</td>
</tr>
<tr>
<td>Waterbodies</td>
<td>3.95</td>
<td>1.45</td>
</tr>
<tr>
<td>Cemetery</td>
<td>1.20</td>
<td>0.44</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>273.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It will be seen from the above Table that about nine-tenths of the total area is under cultivation, about eleven per cent is under non-agricultural occupations, and nearly one per cent is waste land.

The numbers and sizes of different plots is given in Table XXV and their distribution is plotted in Fig. 60.

It will be seen from the Table XXV that 336 plots or 81 per cent of the total number of plots are less than one acre in area, 17 per cent are between one and two acres and only six fields are more than two acres size.
<table>
<thead>
<tr>
<th>Size of Flet</th>
<th>Number of plots</th>
<th>Percentage of the total number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>336</td>
<td>81.16</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>72</td>
<td>17.39</td>
</tr>
<tr>
<td>above 2 acres</td>
<td>6</td>
<td>1.45</td>
</tr>
<tr>
<td>Total</td>
<td>414</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Land Utilization in Kharif Season:

The use of land in the kharif season is shown in Fig. 61. The area occupied by each crop in this season is given in Table XXVI.

It will be seen from Table XXVI that sugarcane which occupies 60 per cent of the sown area is the major crop. The total area occupied by grain crops in this season is only 25 per cent of the cropped land, out of which 22 per cent is occupied by rice. The productive loamy soil, adequate supplies of water by canals and high temperatures ranging between 75° and 100°F from April to September are the conditions favourable for the cultivation of sugarcane and rice.

A significant feature of the crop land use in Amrupur is that pulses which constitutes the diet of the villagers are
### TABLE XXVI

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area/Per cent</th>
<th>Per cent of total gross</th>
<th>Total of gross crop (net)</th>
<th>Total per cent of total net cropped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross cultivated</td>
<td>241.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net cropped in the Kharif Season</td>
<td>214.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice Transplanted</td>
<td>26.90</td>
<td>11.14</td>
<td>12.53</td>
<td></td>
</tr>
<tr>
<td>Rice broadcast</td>
<td>20.00</td>
<td>8.29</td>
<td>9.29</td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>3.15</td>
<td>1.30</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td>4.00</td>
<td>1.65</td>
<td>1.87</td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>123.19</td>
<td>53.08</td>
<td>59.64</td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>32.70</td>
<td>13.54</td>
<td>15.25</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>26.56</td>
<td>11.00</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>241.50</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*not cultivated. Millets are preferably cultivated by the villagers as it is a nutritious fodder during the rainy season. Pulses are, however, imported in the village from the market of Deoband town.*
Land Utilization in the Rabi Season:

The use of land in the rabi season of 1960 is shown in Fig. 62. The area occupied by each crop in this season is given in Table XXVII.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percent of Gross Cultivated Land</th>
<th>Percent of Net Cropped Land</th>
<th>Total Percentage of Gross Cultivated Land</th>
<th>Total Percentage of Net Cropped Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>48.92</td>
<td>20.26</td>
<td>44.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and gram</td>
<td>25.60</td>
<td>10.60</td>
<td>23.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>15.94</td>
<td>6.61</td>
<td>14.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>7.40</td>
<td>3.06</td>
<td>6.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>1.59</td>
<td>0.66</td>
<td>1.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse(lentil)</td>
<td>0.25</td>
<td>0.10</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>9.10</td>
<td>3.77</td>
<td>8.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>9.31</td>
<td>4.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continual</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eharif crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
It will be seen from Table XXVII that 93 per cent of the net cropped land in the rabi season is occupied by grain crops. Wheat is the major crop in this season, occupying 45 per cent of the net cropped land as a sole crop and another 24 per cent in combination with gram. Gram as a sole crop occupies about 15 per cent of the cropped land. Gram has been regarded as an important leguminous crop. The plant of gram utilizes nitrogen from the air as much as 50 to 100 lb per acre per year. If the whole crop is ploughed into the field the nitrogen supply of the soil is increased to the extent of the entire amount of nitrogen fixed by the plants.

A comparison of Tables XXVI and XXVII reveals that the net cropped area in the rabi season is nearly half that of kharif season. It is because sugarcane, the continual kharif crop remains in the field at the sowing time of rabi crops.

Double Cropped Land:

The double cropped land in Amurpur is shown in Fig. 63. The total area cropped twice in the year of 1960-61 was 82.24 acres or 34 per cent of the gross cultivated land. 32 per cent of the gross cultivated land which remained occupied by sugarcane is also capable of producing at least two crops a year. Thus about 56 per cent of the total arable land can produce two good crops of grains a year.

Land Use and Population:

Table XXVIII shows the totals of various categories of land in the village as well as the per capita share of the villagers in these lands.

It will be seen from Table XXVIII that the per capita land available for cultivation is 0.75 acre, but in the kharif and rabi seasons the per capita share in the land is reduced to 0.65 and 0.33 acres respectively. In the kharif season the reduction in the per capita cultivated land is due to the practice of falling, while in the rabi season about 51 per cent of the gross cultivated land remains occupied by sugar-cane.

**TABLE XXVIII**

<table>
<thead>
<tr>
<th>Total Population of the Village</th>
<th>330</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Area in Acres)</td>
<td></td>
</tr>
<tr>
<td><strong>Total area available for land</strong></td>
<td>273.00</td>
</tr>
<tr>
<td><strong>Total cropped land</strong></td>
<td>241.50</td>
</tr>
<tr>
<td><strong>Crop for the kharif season</strong></td>
<td>214.94</td>
</tr>
<tr>
<td><strong>Crop for the rabi season</strong></td>
<td>108.80</td>
</tr>
<tr>
<td><strong>Double cropped land</strong></td>
<td>323.74</td>
</tr>
<tr>
<td><strong>Land per head of population</strong></td>
<td>0.83</td>
</tr>
<tr>
<td></td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td>0.25</td>
</tr>
</tbody>
</table>
The previous Table further shows that the per capita land sown twice in the year of review is 0.25 acre, the gross total of the per capita cultivated land being 0.98 acre. In other words the amount of land supporting one person in Amrupur is 0.98 acre.

Agriculture is the main occupation of the people and 225 persons (78 per cent of the population) belong to the primary rural and entirely depend upon land while 32 per cent of the population consists of secondary rural which serves the primary rural group and thus indirectly depends upon land.

Potential Production Units:

The productivity of each type of land is given in Table XXIX, and on the basis of productivity ratings an attempt has been made to assess the Potential Production units of different classes of land in the village of Amrupur.

<table>
<thead>
<tr>
<th>Type of Land</th>
<th>Area in acres</th>
<th>Average yield</th>
<th>Rating</th>
<th>Total Number of P.F.U.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land</td>
<td>214.94</td>
<td>1700</td>
<td>1.41</td>
<td>265.07</td>
</tr>
<tr>
<td>Medium quality land</td>
<td>26.56</td>
<td>1000</td>
<td>0.83</td>
<td>22.04</td>
</tr>
<tr>
<td>Poor quality land</td>
<td>24.7</td>
<td>150</td>
<td>0.12</td>
<td>0.30</td>
</tr>
<tr>
<td>Total</td>
<td>243.97</td>
<td></td>
<td></td>
<td>235.41</td>
</tr>
</tbody>
</table>
The Table XXIX shows that in Amrupur 243.97 acres of land are under plough. These are equal to 285.41 P.P.U.s. In other words, taking as a whole one acre of land in this village is equal to 1.16 P.P.U.s. The productivity of good quality land, which is about 90 per cent of the land in the present state of technological development, is fairly high and one acre of good quality land is equal to 1.41 P.P.U.s. It is in the medium and poor quality lands where the productivity is below the average farm yield. A number of additional P.P.U.s however, can be obtained if the productivity of B1 land increased to the level of average farm land; and in the good quality land if the new agricultural techniques applied.
LAND UTILIZATION IN DHANDAOLI

Location:

The village of Dhandaoli lies in Budhana Tahsil of Muzaffarnagar district. It is situated in 29° 21' N. lat. and 77° 30 'E long., and is bounded by the villages of Adampur in the north, Faldi in the east, Umarpur in the South, while its western boundary is formed by the perennial stream of Hindan which separates Dhandaoli from the village of Baharmpur (Fig. 69).

The bed of the Hindan river is deep and its channel is well-defined. It carries little water in the dry months but in the wet monsoon season at the time of heavy rainfall the Hindan overflows its bank, so that the western part of Dhandaoli is inundated. The volume of water in the river increases with the onset of monsoon and in the months of July and August it discharges 44 upto 26,000 cubic feet per second. The river is navigable during the rainy season but when it is in spate, crossing by boat is dangerous.

Dhandaoli suffers from lack of means of communications. A metalled road which joins the town of Budhana with Muzaffarnagar passes to the east of the village at a distance of three miles. Dhandaoli with the metalled road is connected by a cart-tarack. The water table varies from 6 to 10 feet in the western, and between 15 to 20 feet in the eastern part of the village.

LOCATION OF THE VILLAGE DHANDAQLI

Source: - Survey of India map

No 53 6

the outline of DhandaQLi has been
drawn by the writer

Fig. 64

Settlement

grove

metalled road

cart-track

broken-land

77° 30'E

29° 23'

29° 25'

29° 23'

29° 25'

77° 35'E

77° 30'E
Climate:

No climatic data are recorded in the village. The data of rainfall recorded at the headquarters of Tahsil Budhana, about seven miles to the west of the village, have therefore been given in Tables XXX and XXXI.

**TABLE XXX**

**KHARIF SEASON 1960 (BUDHANA)**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the kharif season, 1960-61</td>
<td>7.72</td>
<td>9.29</td>
<td>7.68</td>
<td>2.30</td>
<td></td>
<td>23.94</td>
</tr>
<tr>
<td>Rainy days in kharif, 1960</td>
<td>1</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>2.79</td>
<td>7.92</td>
<td>7.63</td>
<td>5.18</td>
<td>0.65</td>
<td>24.17</td>
</tr>
</tbody>
</table>

**TABLE XXXI**

**RABI SEASON 1960-61 (BUDHANA)**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the rabi season 1960-61</td>
<td>-</td>
<td>-</td>
<td>1.30</td>
<td>0.78</td>
<td>0.54</td>
</tr>
<tr>
<td>Rainy days in rabi, 1960-61</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.07</td>
<td>0.22</td>
<td>0.91</td>
<td>0.90</td>
<td>0.23</td>
</tr>
</tbody>
</table>

45. The data of rainfall for the kharif and rabi seasons of 1960-61 were obtained from the headquarters of Budhana Tahsil of the Muzaffarnagar district.
Land Classification:

The land of Dhandaoli can be divided into the khadar and the bhangar. Along the bank of Hindan river, stretches the khadar tract which covers about one third of the total area of the village. The low level of khadar land is in conformity with the principle that as a river gets older, more and more of the deposits are found to be of a younger age and as the bed of the river sinks lower, these younger deposits come to occupy a level lower than that occupied by the earlier ones. The khadar is liable to inunduation almost every year at the occurrence of heavy rainfall. The older deposits are known as bhangar. The general level of the bhangar land in Dhandaoli, is five to ten feet above the highest and twenty to thirty-five feet above the lowest levels of the river. Owing to the relatively elevated position, the bhangar is, however, not flooded by the river.

The soil of bhangar is productive loam and varies from brown to dark brown in colour while the soil of the khadar along the strips of the river is sandy and in the depressions silty to clayey.

On the basis of fertility and productivity (see page 106) the village fields have been classified in Fig. 65.

The soil of the good quality land (A) is clayey loam and is cropped twice a year or it is devoted to sugarcane.

DHANDAOLI
LAND CLASSIFICATION

A. GOOD QUALITY LAND
B. MEDIUM QUALITY LAND
C. POOR QUALITY LAND
S. SETTLEMENT CART-TRACK POND WELL
P. CEMETERY

FIG. 65

IRRIGATION - CHANNEL
The soil of the medium quality (III) lands are left fallow in
the kharif and are cropped in the following season. The medium
quality (III) lands range between silt to stiff clay and are devoted
to transplanted rice.

The soil of poor quality land is unproductive owing to the
presence of loose coarse sand and accumulation of excessive salts
at the surface.

The distribution of various types of land is shown in Fig. 65,
while their areal extension and percentage to the total area is
given in table XXXII.

**TABLE XXXII**

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in acres</th>
<th>Percentage of the total area of the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>360.17</td>
<td>56.69</td>
</tr>
<tr>
<td>Medium quality land (III)</td>
<td>154.15</td>
<td>24.27</td>
</tr>
<tr>
<td>Medium quality land (III)</td>
<td>4.41</td>
<td>0.70</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>96.54</td>
<td>15.19</td>
</tr>
<tr>
<td>Land not available for cultivation (47)</td>
<td>20.10</td>
<td>3.15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>635.37</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

47. Land not available for cultivation includes, settlement,
ponds cart-tracks, groves, cemetery, well and grove.
Tab. XXXII reveals that 57 per cent of the total area consists of good quality land, 25 per cent is covered by the medium quality (B) and (BII) lands and 15 per cent is unproductive; while three per cent is under non-agricultural occupations and is not available for cultivation.

Irrigation:

No irrigation is practised in the khadar land. In the bhangar land, canal and wells are the main sources of irrigation. A minor known as Falra minor, arising from the Deoband Branch of the Upper Ganga canal passes to the east of Dhamadaoli at a distance of about two furlongs (Fig. 64) and commands about 163 acres of the eastern part of the village. In the central and southern parts, wells are utilized for irrigation. The relatively high water table i.e. 15 to 20 feet and loamy soil favour the construction of cheap wells.

It will be seen from Table XXX that the total rainfall in the kharif season was 21 inches and in each month it was spread over sufficient number of days. Number of kharif crops, except sugarcane, was therefore irrigated. Table XXXI shows that there was no rainfall in the months of November and December. The rabi crops, with the exception of gram fields, were therefore irrigated.

A comparison of Figs. 65 and 66 shows that out of the seven wells utilised for irrigation, five are located in the good quality land and two in the medium quality (B) land.
Land Utilization:

The land utilization of the village in the year of 1960-61 is shown in Figs. 67 to 70, which are based on the writer's field work of the village.

Table XXXIII gives a summary of the proportions of village lands devoted to various uses in 1960-61 (Fig. 67).

**TABLE XXXIII**

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>518.73</td>
<td>81.64</td>
</tr>
<tr>
<td>Waste land</td>
<td>96.54</td>
<td>15.19</td>
</tr>
<tr>
<td>Settlement</td>
<td>5.10</td>
<td>0.80</td>
</tr>
<tr>
<td>Cart-track</td>
<td>3.00</td>
<td>0.47</td>
</tr>
<tr>
<td>Groves</td>
<td>2.00</td>
<td>0.32</td>
</tr>
<tr>
<td>Cemetery</td>
<td>9.00</td>
<td>1.42</td>
</tr>
<tr>
<td>Pond</td>
<td>1.00</td>
<td>0.16</td>
</tr>
</tbody>
</table>

Total | 635.37 | 100.00 |

48. The base map showing the fields and their areas in *bighas* was obtained from the headquarters of Tahsil Budhana in the district of Muzaffarnagar. Dhandaoli was visited by the writer in the kharif season of 1960 and the rabi season of 1960-61, and the use to which each field was being put was recorded on the base map. From these data Figs. 67 to 70 were prepared.

49. Groves consist of mangoes, Jamun (*Fugia-Jambolana*) and Sheesha (*Dalbergia sissoo*).
It will be seen from Table XXXIII that about 82 per cent of the total area is cultivated, about 15 per cent of the total land is unproductive; while about three per cent is under non-agricultural occupations.

A comparison of Figs. 65 and 67 shows a close relation between the quality of land and the size of fields. The fields of the good quality land are small while those of the medium quality lands are relatively large.

Table XXXIV gives the numbers and size of the plots and their distribution is shown in Fig. 67.

**TABLE XXXIV**

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Number of plots</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>452</td>
<td>69.54</td>
</tr>
<tr>
<td>1.01 to 2 acres</td>
<td>156</td>
<td>24.00</td>
</tr>
<tr>
<td>2.0 to 3 acres</td>
<td>35</td>
<td>5.38</td>
</tr>
<tr>
<td>above 3 acres</td>
<td>7</td>
<td>1.08</td>
</tr>
<tr>
<td>Total</td>
<td>650</td>
<td>100.00</td>
</tr>
</tbody>
</table>

It will be seen from the above table that the size of 70 per cent of plots is less than one acre, 24 per cent between one and
two acres and only six per cent are more than three acres in size.

Fig. 68 illustrates the use of land in the kharif season of 1960. The area occupied by each crop is given in Table XXIV.

It will be seen from Table XXIV that grain crops occupy 59 per cent of the cropped land in the kharif season. Millets, which is sown in 35 per cent of the cropped land is the major crop. But generally, nine-tenth of the millet crop is devoted to the cattle as green fodder and only one tenth is harvested.

Sugarcane is an important cash crop. It occupies 28 per cent of the cropped land. In the irrigated loamy soil, it yields about 3100 lb of raw sugar in an acre. The results obtained from the experiments carried at Muzaffarnagar Experimental Farm (situated about nine miles to the north east of Bhandaoli) reveal that green manure, e.g., indigo plus Nitrate Soda at two maunds per acre gives a very high outturn of sugarcane per acre. While mixture of Sulphate of Ammonia and oil cakes at the rate of 60 to 225 lb per acre is necessary to secure a normal crop.

Table XXXV further shows that ten acres or three per cent of the cropped land is occupied by indigenous cotton. But the


51. Burns, W., Technological Possibilities of Agricultural Development in India (Lahore, 1944), p. 30.

52. Indigenous cotton is a short staple crop of inferior quality which is locally known as kapes.
DHANDAOLI LAND UTILIZATION KHARIF SEASON 1960

- RICE - TRANSPANTED
- RICE - BROADCAST
- MAIZE
- PULSES
- FODDER
- WASTE LAND
- SETTLEMENT
- CART-TRACK
- POND
- WELL
- CEMETERY
- IRRIGATION CHANNEL
- SUGARCANE
- SUGARBEET
- VEGETABLES
- PLUMS
- LITCHI
- MANGO
- CHERRY
- SUGARCANE
<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grain Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice transplanted</td>
<td>18.00</td>
<td>3.47</td>
<td>4.92</td>
<td></td>
<td>41.17</td>
</tr>
<tr>
<td>Rice broadcast</td>
<td>6.00</td>
<td>1.16</td>
<td>1.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>40.66</td>
<td>7.34</td>
<td>11.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulses</td>
<td>14.69</td>
<td>2.63</td>
<td>4.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td>4.92</td>
<td>0.95</td>
<td>1.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet and fodder</td>
<td>129.53</td>
<td>24.92</td>
<td>35.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>102.70</td>
<td>19.30</td>
<td>28.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>21.72</td>
<td>4.20</td>
<td>5.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarbeet</td>
<td>16.40</td>
<td>3.17</td>
<td>4.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>9.96</td>
<td>1.94</td>
<td>2.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>154.17</td>
<td>29.72</td>
<td></td>
<td></td>
<td>29.72</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>518.75</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
quality and yield per indigenous cotton is not satisfactory and therefore, its cultivation requires improvement. On the basis of experiments carried at Muzaffarnagar Farm, it was advocated by the agricultural authorities that sowing of C 255 in rows at one and a half feet apart and spacing the plants at 9 to 12 inches is the most suitable method of cotton cultivation in the district of Muzaffarnagar.

The cultivation of sugarbeet which occupies more than four per cent of the cropped land is another significant crop in the village. The presence of sandy loam and adequate supplies of water by wells are the factors which promote its cultivation. The lack of good means of transportation is a drawback in the sale of sugar-beets. The greater part of the total output (i.e. about 90 per cent) is however, sold in the market of Shahpur town, which lies four miles south of the village.

Land Utilization in the Rabi Season:

The use of land in the rabi season 1960-61 is shown in Fig. 69. The area occupied by each crop in this season is given in Table XXXVI.

It will be seen from Table XXXVI that nearly 92 per cent of the cropped land is devoted to grain crops. Wheat is the major crop and occupies about 30 per cent of the sown area as a sole crop. Mixed with gram it further occupies 25 per cent of the cultivated land. Gram and peas are sown in 20 and 12 per cent.

DHANDAOLI LAND UTILIZATION RABI SEASON 1960-1961

FIG. 59

WHEAT DRY FALLOW WASTE LAND SETTLEMENT CART TRUCK CEMETERY WELL POND
PEAS GRAM PULSES FODDER蔬菜 CONTINUOUS KHARIF
FALLOW WASTE LAND SETTLEMENT CART TRUCK CEMETERY WELL POND

IRRIGATION: CHANNEL CART TRACK CEMETERY WELL POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELL POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

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IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

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IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

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IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM

IRRIGATION: CHANNEL CART TRACK CEMETERY WELC POND STREAM
TABLE XXXVI

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>132.21</td>
<td>25.49</td>
<td>29.64</td>
<td>78.72</td>
<td>91.51</td>
</tr>
<tr>
<td>Wheat and gram</td>
<td>111.87</td>
<td>21.57</td>
<td>25.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>1.15</td>
<td>0.23</td>
<td>0.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley and peas</td>
<td>7.00</td>
<td>1.35</td>
<td>1.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>89.18</td>
<td>17.20</td>
<td>19.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>51.37</td>
<td>9.90</td>
<td>11.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse (lentil)</td>
<td>15.50</td>
<td>2.98</td>
<td>3.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td>7.26</td>
<td>8.49</td>
</tr>
<tr>
<td>Mustard</td>
<td>0.69</td>
<td>0.12</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>36.81</td>
<td>7.09</td>
<td>8.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.27</td>
<td>0.05</td>
<td>0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pallow</td>
<td>4.41</td>
<td>0.85</td>
<td>-</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Continual kharif crops</td>
<td>69.29</td>
<td>13.17</td>
<td>-</td>
<td>13.17</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>518.75</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

54. Mustard is locally known as **Sarsoon** and its botanical name is *Brassica Campestris*.
of the cropped land respectively. Peas and gram are occasionally given to animals in the months of February and March as green fodder.

A comparison of Tables XXXV and XXXIII shows that the net cropped land in the rabi season is greater than that of kharif. It is because of the fact that in the kharif season the sandy loam owing to its low productivity is left fallow, and is cropped in the following season.

Double Cropped Land:

The double cropped land in the village is shown in Fig. 70. The total area in Dhandaoli cropped twice in the year of 1960-61 was 282 acres or nearly 56 per cent of the gross cultivated land. It will be seen from a comparison of Figs. 60 and 65 that the area under double cropping is restricted mainly to the good quality land. Since an appreciable acreage of good quality land is devoted to sugarcane which occupies the fields for almost the whole of the year, the area under double cropping is further reduced. The soil of medium quality (B1) land is less productive and without adequate manures does not yield two crops a year. The (BII) lands are left fallow in the rabi season.

Land Use and Population:

The table XXXVII shows the totals of various categories of lands in the village as well as the per capita share of the villagers in these lands.
DHANANDOLI
DOUBLE-CROPPED
1960-1961

- WHEAT
- BARLEY
- MAIZE
- PULSES
- FODDER
- VEGETABLE
- SUGARCANE
- SUGAR
- COTTON
- CORN
- MUG
- PEA
- PEAS
- FODDER
- VEGETABLE
- WHEAT
- CORN
- MUG
- PEA
- PEA
- PULSES
- FODDER
- VEGETABLE
- SUGARCANE
- SUGAR
- COTTON
- CORN
- MUG
- PEA
- PEAS
- FODDER
- VEGETABLE
- WHEAT
- CORN
- MUG
- PEA
- PULSES
- FODDER
- VEGETABLE
- SUGARCANE
- SUGAR
- COTTON
- CORN
- MUG
- PEA
- PULSES
- FODDER
- VEGETABLE
- WHEAT
- CORN
- MUG
- PEA
- PEAS
- FODDER
- VEGETABLE
- SUGARCANE
- SUGAR
- COTTON
TABLE XXXVII

Total Population of the village 653 (Area in acres)

<table>
<thead>
<tr>
<th>Total area of the village</th>
<th>Total available land</th>
<th>Cropped land in the kharif season for cultivation</th>
<th>Total cultivated land (both kharif and rabi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Net</td>
<td></td>
<td>Double</td>
</tr>
<tr>
<td></td>
<td>635.37</td>
<td>518.75</td>
<td>364.54</td>
</tr>
<tr>
<td></td>
<td>446.05</td>
<td>810.63</td>
<td>281.88</td>
</tr>
</tbody>
</table>

Land per head of population 0.91 0.79 0.56 0.68 1.24 0.42

It will be seen from Table XXXVII that the gross cultivated land per head is 0.79 acre, but owing to the practice of following the per capita net cropped land in the kharif season is reduced to 0.56 acre, while the continuation of sugarcane brings the per capita net cropped land in the rabi season to 0.68 acre. Thus the per capita net cropped land in the kharif and rabi seasons taken together is 1.24 acres, which means that the amount of cultivated land supporting one person is 1.24 acres.

The significance of the pressure of population can be appreciated if the occupations of people are taken into account. It may be mentioned that 600 persons (about 92 per cent of the total population) belong to primary rural group and depend exclusively upon land, while 8 per cent of population consists of
secondary rural group, which serves the primary rural and thus indirectly depends on lands.

Potential Production on Units:

Table XXXVIII shows the productivity of each type of land. On the basis of productivity ratings an attempt has been made to estimate the P.P.U.s of various classes of lands in the village of Dhandaoli.

**Table XXXVIII**

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in acres</th>
<th>Average Yield</th>
<th>Rating</th>
<th>Total number of P.P.U.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>360.17</td>
<td>1,800</td>
<td>1.50</td>
<td>504.00</td>
</tr>
<tr>
<td>Medium quality land(BI)</td>
<td>154.15</td>
<td>1,000</td>
<td>0.83</td>
<td>127.93</td>
</tr>
<tr>
<td>Medium quality land(BII)</td>
<td>4.41</td>
<td>900</td>
<td>0.75</td>
<td>3.31</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>96.54</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>615.39</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
<td><strong>635.24</strong></td>
</tr>
</tbody>
</table>

It will be seen from the above table that the total acreage of land under cultivation in Dhandaoli is about 615 acres, equal to 635.24 P.P.U.s. The productivity of the good quality land is 1.50 P.P.U.s, of the medium quality (BI) and (BII) lands 0.83 and
0.75 P.F.U.s respectively. But the poor quality land is unproductive. In other words the good quality land (A) is one and a half times more productive than the average farm land, while the productivity of the medium quality lands is less than that of the average farm land. The productivity of (B1) lands which cover about one fourth of the total arable land if increased up to the standard of good quality land a number of P.F.U.s can be obtained. Besides, the unproductive land which covers about one sixth of the total area requires investigations in order to be reclaimed.
LAND UTILIZATION IN MALMAJRA

Location:

The village of Malmajra lies in Sardhana Tahsil of Meerut district. It is situated in 29° 5' 30" N lat., and 77° 22' E long., in a well-drained fertile plain. At a distance of about four miles to the north of the village, the Krishni-nadi, a tributary of the Hindon river flows in a well-defined channel. The Bijwara Distributary of the Eastern Yamuna-Canal passes through the south west corner of the village. This Distributary irrigates about 60 per cent of the gross cultivated area of the village.

It will be seen from Fig. 71 that an unmetalled road which runs between Daula and Kandhla, passing along the Bijwara distributary, connects the village of Malmajra with the Binauli-Baraut Road. This metalled road passes two miles to the north of the village from east to west. Besides, there are a number of cart-tracks in the area which join the village with the neighbouring villages.

The village of Binauli, where market is held on every Wednesday is three miles, while Baraut, the famous mandi (market) of raw-sugar is eight miles to the west of the village. Malmajra is thus favourably located as regards the means of communications and access to the markets. The watertable varies between 20 and 25 feet below the surface.
LOCATION OF THE VILLAGE MALMAJRA

Source: survey of India No 53G

The outline of Malmajra has been drawn by the writer.
Climate:

No climatic data are recorded in the village. The data of rainfall recorded at Sardhana, which is situated at a distance of about thirteen miles to the east of the village, have therefore been given in Tables XXXIX and XL and may be taken as close approximations for the village.

**TABLE XXXIX**

**KHARIF SEASON 1960 (SARDHANA)**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td></td>
</tr>
</tbody>
</table>

Rainfall in inches in the Kharif season, 1960:

- 1.75
- 9.65
- 10.00
- 2.10
- 0.30
- 23.30

Rainy days in Kharif, 1960:

- 2
- 12
- 13
- 3
- 1

Average rainfall in inches:

- 2.68
- 3.12
- 7.91
- 5.32
- 0.64
- 24.67

---

**TABLE XL**

**RABI SEASON 1960-61 (SARDHANA)**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td></td>
</tr>
<tr>
<td>Feb. March</td>
<td></td>
</tr>
</tbody>
</table>

Rainfall in inches in the rabi season, 1960-61:

- -
- -
- 1.16
- 0.85
- 0.40
- 2.41

Rainy days in rabi, 1960-61:

- -
- -
- 2
- 2
- 1
- -

Average rainfall in inches:

- 0.09
- 0.42
- 0.98
- 0.90
- 0.57
- 2.96

55. The rainfall data for the Kharif and Rabi seasons of 1960-61 were obtained from Tahsil headquarters of Sardhana.
Land Classification:

The soil of the area in which the village is situated is fertile loam and is called locally as seota. On the basis of fertility and productivity (see page 106) the village fields have been classified and mapped in Fig. 72.

The soil of the good quality land (A) is loamy. About eight tenths of the total cultivated land consist of good quality land. Usually, two grain crops and one fodder crop can be obtained in a year from the good quality lands, but these lands are preferably devoted to sugarcane (the predominant cash crop of the village) which gives higher returns to the cultivator in comparison to grain and fodder crops.

The soil of medium quality land (B) is sandy loam in texture and is less productive than (A). These lands are left fallow in the kharif season or an early maturing fodder crop is sown in the month of April and May with the help of irrigation. After the harvest, the fields are left fallow to recoup fertility until the sowing of rabi crop takes place. Irrigation in these lands is carried on by wells (Fig. 73).

The poor quality lands (C) consist of those lands which lie unutilized, on account of the presence of excessive salts in the soil resulting from the overwaterings of the crops.

56. The fodder crop consists of millets mixed with moong (Phaseolus - Mango) and moth (Phaseolus acuminatifolius). These pulses belong to the early maturing variety.
The following Table shows the area and percentage of different classes of land while their distribution is plotted in Fig. 72

**TABLE XXXI**

Total Area of the Village 380.91

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>297.10</td>
<td>77.98</td>
</tr>
<tr>
<td>Medium quality land (B)</td>
<td>63.00</td>
<td>16.53</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>3.19</td>
<td>0.84</td>
</tr>
<tr>
<td>Land not available for cultivation (57)</td>
<td>17.62</td>
<td>4.63</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>380.91</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The above table shows that 78 per cent of the total area is covered by the good quality, and about 17 per cent by the medium quality lands. The poor quality land (C) which is less than one per cent of the total area is quite insignificant and negligible.

**Irrigation:**

The village is well irrigated by the Bijwara Distributary, a branch of the Eastern Yamuna-Canal, and by the wells dug by the

---

57. Land not available for cultivation includes settlement, groves, pond, road, irrigation channels and cemetery.
cultivators on the Co-operative basis. In the relatively level and lowlying fields the water to the crops is supplied from the canal by the flow method while in the elevated, uneven fields water is lifted from the canal distributary or are irrigated by wells.

The area irrigated in the kharif and rabi seasons of 1960-61 is shown in Fig. 73. Table XXXIX reveals that the total amount of rainfall between June and October was 24 inches and was distributed over adequate number of days. Therefore, grain and fodder crops were not irrigated. But sugarcane was irrigated several times in the hot weather months as well as in October and November. The watering of sugarcane, before its cutting increases the per acre yield of sugar, and therefore irrigation in early winter months is usually provided. In the rabi season during the first two months, i.e. November and December there was no rainfall (Table XI) while in January, February and March it was less than three inches. All the rabi crops except gram and lentil were, therefore irrigated.

Land Utilization:

The use of land in the village of Malmajra is shown in Figs. 74 to 77 which are based on the writer's field work of the village.

58. The base map showing the field and their areas in bighas was obtained from the Revenue Department of Sardhana, Tahsil. The village was visited by the writer in the kharif season of 1960 and the rabi season 1960-61 and the use to which each field was being put was recorded on the base map. From these data Figs. 74 to 77 were prepared.
The following table gives a summary of the proportions of the village lands of Malmajra devoted to various uses in 1960-61.

**TABLE XXXII**

Total area of the village 380.91 acres

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>360.10</td>
<td>94.53</td>
</tr>
<tr>
<td>Waste land</td>
<td>3.19</td>
<td>0.84</td>
</tr>
<tr>
<td>Settlement</td>
<td>9.52</td>
<td>2.50</td>
</tr>
<tr>
<td>Road</td>
<td>4.53</td>
<td>1.19</td>
</tr>
<tr>
<td>Cemetery</td>
<td>2.00</td>
<td>0.53</td>
</tr>
<tr>
<td>Grove</td>
<td>0.94</td>
<td>0.25</td>
</tr>
<tr>
<td>Waterbodies</td>
<td>0.63</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Total 380.91 100.00

It will be seen from Table XXXII that about 95 per cent of the total area in the village is arable. About four and a half per cent is not available for cultivation and only three acres (less than a per cent of the total area) are unproductive.

59. Waterbodies include ponds, canal distributary and irrigation channels.
A comparison of Figs. 72 and 74 reveals that the size of plots in the good quality lands is relatively small as compared to that of the medium quality lands. The small size of the plots will be more clearly visible from the fact that there are 778 plots in the total area of 381 acres of Malmajra.

The number and size of different plots is given in Table XXXIII while their distribution is shown in Fig. 74

**TABLE XXXIII**

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Number of plots</th>
<th>Percentage of the total Number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below one acre</td>
<td>724</td>
<td>93.06</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>43</td>
<td>6.17</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>6</td>
<td>0.77</td>
</tr>
<tr>
<td>Total</td>
<td>778</td>
<td>100.00</td>
</tr>
</tbody>
</table>

It will be seen from the above table that 93 per cent of the total number of plots are less than one acre in size and 6 per cent are between one and two acres. There are only 6 fields are above two acres in area. The law of inheritance is mainly responsible for the sub-division and fragmentation of the holdings. However, the size of plots in the village has been reduced to such microscopic
size that it entails considerable wastage of money and material of the cultivator.

The only measure that appears to promise relief from the evils that arise from the fragmentation of land is consolidation of holdings. By this process, all the land of one cultivator may be grouped into one plot or into a few plots of different types of soil.

Land Utilization in the Kharif Season:

The land utilization in the kharif season of 1960 is shown in Fig. 75. The area occupied by each crop in this season is given in Table XXXIV.

<table>
<thead>
<tr>
<th>Table XXXIV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross cultivated land</td>
</tr>
<tr>
<td>Net cropped land in the kharif season</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of cultivated land</th>
<th>Total percentage of cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>23.88</td>
<td>6.64</td>
<td>7.80</td>
<td>9.59</td>
<td>11.40</td>
</tr>
<tr>
<td>Rice</td>
<td>9.25</td>
<td>2.56</td>
<td>3.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balrush-millet</td>
<td>1.78</td>
<td>0.49</td>
<td>0.58</td>
<td>75.30</td>
<td>88.60</td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder and Millet</td>
<td>124.00</td>
<td>33.44</td>
<td>40.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>4.90</td>
<td>1.36</td>
<td>1.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>2.97</td>
<td>0.83</td>
<td>0.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>139.26</td>
<td>38.67</td>
<td>45.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>54.06</td>
<td>15.01</td>
<td>15.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It will be seen from the above Table that 11 per cent of the net cropped land is under grain crops in the kharif season, while 89 per cent is devoted to sugarcane, fodder, cotton and vegetables. Maize, rice and bulrush-millets are the only grain crops grown in this season.

Sugarcane is the major crop of the season and occupies 46 per cent of the net cropped land. The writer in the course of his field work obtained information regarding the supply of manures and fertilizers, and came to know that almost the entire amount of manures and available fertilizers were exclusively supplied to sugarcane. In order to obtain a good crop of sugarcane, manure containing about 100 to 120 lb. of nitrogen per acre is required. The most suitable combinations of nitrogenous manures for sugarcane, in the absence of green manures are: Castor-cake; Castor-cake plus Ammonium-sulphate; farmyard manure plus Ammonium-sulphate, and farmyard manure alone. In these combinations Castor-cake is superior to rest of manures and fertilizers.

Along with manures it is imperative that on average land the cultivator should be absolutely certain of obtaining water

60. There is a local adage about the effect of manure on the output of sugarcane: Gobar maili neem ki khali ya say eikhoo dooni phali. The meaning is that if neem cakes (Azadirachta) and cowdung are applied to the sugarcane crop, the output shall be increased twice.

at least once in 21 days from the middle of May till the monsoon breaks — say about the last week of June. It means, two waterings on the average soil of the Meerut division. In the light soil, watering of the crop should be made after every 15 days.

In the village of Malmajra a considerable acreage of sugar-cane is sown in the month of Asoj. But there is no particular advantage in sowing the crop in this month, except that it matures early. On the other hand, sowing in this month is more expensive, since the crop requires more water, additional labour for clearing the weeds for a longer period of time. The chances of double cropping are also reduced as the crop remains standing in the field for more than a year.

In normal years, in a well manured and irrigated field, the individual cane stalk attains a height up to 16 feet and measures 12 lb in weight. About 80 per cent of the total output is sold to the Baghat Sugar Factory while the rest is crushed and converted into raw sugar for daily use.

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62. Division, is an administrative unit. Meerut division includes the districts of Dehradun, Saharanpur, Muzaffarnagar, Meerut and Bulandshahr. The present study covers the entire Meerut division excluding the district of Dehradun.


64. Asoj is a Hindi month corresponds to the September and October.
Mixed fodder and millets is another important crop cultivated in Malmajfa. It occupies 41 per cent of the net cropped land. Millets are grown for fodder and are generally sown with the onset of monsoon. Cotton and vegetables are cultivated in a small acreage of the cropped land. Pulses are generally not cultivated in the village and are imported from the neighbouring towns.

Land Utilization in the Rabi Season:

The use of land in the rabi season of 1960-61 is shown in Fig. 76. The area occupied by each crop in this season is given in Table VI.

A comparison of Figs. 75 and 76 shows that the net cropped land in the rabi season is less as compared to that of the kharif season.

It will be seen from Table VI that about nine-tenths of the net cropped land in the rabi season is occupied by grain crops. Mixed wheat and gram is the major crop, and it is sown over 43 per cent of the net cropped land.

A comparison of Figs. 72 and 76 shows that 80 per cent of wheat is sown on the medium quality land. Wheat as a sole crop occupies 24 per cent of the cropped land. Peas and gram are cultivated in the fields vacated by rice, where the soil is relatively heavy loam.

Eleven per cent of the total cropped land in this season is occupied by green fodder (barseem and risa) the valuable and
and nutritious fodder). About 26 per cent of the gross cultivated land is under continual kharif crops.

### TABLE VI

<table>
<thead>
<tr>
<th>Crops</th>
<th>Gross Cultivated Land land</th>
<th>Net cropped in the Rabi Season.</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat and gram</td>
<td>94.47</td>
<td>31.63</td>
<td>43.47</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>55.22</td>
<td>17.90</td>
<td>24.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>12.15</td>
<td>3.90</td>
<td>5.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>10.90</td>
<td>3.47</td>
<td>4.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas and Oats</td>
<td>5.37</td>
<td>2.04</td>
<td>2.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>8.84</td>
<td>2.80</td>
<td>3.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram and Barley</td>
<td>2.40</td>
<td>0.70</td>
<td>1.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>2.78</td>
<td>0.89</td>
<td>1.22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and Barley</td>
<td>2.68</td>
<td>0.86</td>
<td>1.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse (lentil)</td>
<td>0.94</td>
<td>0.36</td>
<td>0.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.28</td>
<td>11.37</td>
</tr>
<tr>
<td>Fodder</td>
<td>25.75</td>
<td>3.28</td>
<td>11.37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>3.37</td>
<td>1.08</td>
<td>1.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continual kharif crops</td>
<td>30.33</td>
<td>26.02</td>
<td>-</td>
<td></td>
<td>26.02</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>360.10</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Following are the important fodders and their concentrates given to the cattle in different parts of a year in the village of Malmajra.

**Fodder Calendar**

<table>
<thead>
<tr>
<th>Months</th>
<th>Dry fodder</th>
<th>Green fodder</th>
<th>Concentrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>April to mid June</td>
<td>Gram and wheat stalk (<em>bhosa</em>)</td>
<td>Barseem, <em>Rizka</em></td>
<td>Gram and Guar Maize and Moth</td>
</tr>
<tr>
<td>Mid June to September</td>
<td>Wheat stalk (<em>bhosa</em>)</td>
<td>Guar, Bajra guar</td>
<td>Groundnut cake</td>
</tr>
<tr>
<td>October to March</td>
<td><em>Rural, Gaola</em> and <em>chari</em></td>
<td>Barseem, <em>Maitha, Mustard, and Urad</em></td>
<td>Cotton seed, peas and Murela</td>
</tr>
</tbody>
</table>

**Rotation of Crops:**

Besides the rotation of crops generally practised in this village is different from that of Bhaupur mentioned on page 142. For example in the cotton growing fields the following rotation is carried out:

65. Information about the fodder calendar were obtained by the writer during the course of his visit to the village. Almost the same fodders and concentrates are fed to cattle in other irrigated villages of the area under study.

66. Wheat straw trodden into small pieces and used as cattle fodder in the hot weather months is locally known as *bhosa* or *bhug*.

67. The green leaves of the harvested cane are called as *gaola*.

68. The English name of *urad* is black-gram.
(A) Kharif Rabi
First Year Sugarcane Continued
Second Year Cotton Gram
Third Year Sugarcane Sugarcane

(B) First Year Sugarcane Continued
Second Year Cotton Gram
Third Year Sugarcane Continued

In the good quality lands following are important rotations:

(C) Kharif Rabi
First Year Sugarcane Continued
Second Year Guar, or early maize Gram or wheat
mixed with gram
Third Year Fallow Asoji, Eikh (Sugarcane)

(D) First Year Sugarcane Continued
Second Year Fallow Sani rain Wheat or barley
Third Year Sani green manure Sugarcane (Asoji)

Double Cropped Land:

The fields cropped twice in the year of inquiry are shown in Fig. 77.

The total area cropped twice in the year of inquiry was 212.18
acres or about 68 per cent of the gross cultivated land. About
25 per cent of the gross cultivated land which remained occupied
by sugarcane is also capable of producing at least two crops a year.
In other words it can be said that 94 per cent of the total arable land can produce two good grain crops in a year.

**Land Use and Population:**

**TABLE IVL**

Total population of the village 584

(Area in Acres)

<table>
<thead>
<tr>
<th>Total area of the village</th>
<th>Total available land for cultivation</th>
<th>Net cropped land in kharif season</th>
<th>Net cropped land in rabi season</th>
<th>Total cultivated land (both in kharif and rabi)</th>
<th>Double cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>381.91</td>
<td>360.10</td>
<td>306.04</td>
<td>255.71</td>
<td>561.75</td>
</tr>
<tr>
<td>Land per head of population</td>
<td>0.65</td>
<td>0.62</td>
<td>0.52</td>
<td>0.44</td>
<td>0.96</td>
</tr>
</tbody>
</table>

69. The total population of the village is about 400. About one third of the total cultivated land is cultivated by the people of the neighbouring villages. During the course of his inquiry the author came to know that about 184 persons of the neighbouring villages are directly and indirectly depending upon the land of this village. Thus the total population supported by the land of Malmajra is 584.
It will be seen from the Table IVL that the per capita gross cultivated land is 0.62 acre, but in the kharif and rabi seasons this figure is reduced to 0.52 and 0.44 acre respectively. The reduction in the per capita share during the kharif season is on account of the practice of fallowing of the medium quality lands, while the reduction in the rabi season is due to the presence of continual kharif crops.

Table IVL further reveals that per capita double cropped land is 0.35 acre which means that the amount of cultivated land supporting one person in Malmajra is 0.95 acre.

Here again, one finds the problem of population on land repeating itself. Its significance can be understood from the fact that 525 persons (about 90 per cent of the total population) belong to primary rural population, depending exclusively upon land while 10 per cent of the population is secondary, which serves the primary rural population through essential and ancillary services.

Potential Production Units:

On the basis of average yields of different qualities of lands the potential production units have been computed and are given in Table III.

The Table III shows that in Malmajra 365.29 acres of land are cultivated. These are equal to 524.10 P.P.U; in other words on the whole one acre of land is equal to 1.44 P.P.U.s. The productivity of 297.10 acres which consist of good quality land (A)
### TABLE III

**Average yield I.F.U. 1300**

<table>
<thead>
<tr>
<th>Land type</th>
<th>Area in acres</th>
<th>Average yield per acre in lb.</th>
<th>Rating</th>
<th>Total No. of F.U.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land</td>
<td>297.10</td>
<td>2,100</td>
<td>1.60</td>
<td>475.36</td>
</tr>
<tr>
<td>Medium quality land</td>
<td>63.00</td>
<td>1,000</td>
<td>0.77</td>
<td>48.50</td>
</tr>
<tr>
<td>Poor quality land</td>
<td>3.19</td>
<td>100</td>
<td>0.07</td>
<td>0.24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>363.29</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
<td><strong>524.10</strong></td>
</tr>
</tbody>
</table>

is remarkably high and one acre of good quality land is equal to 1.60 F.U.s. But the productivity of medium and poor quality lands is very low. If with the adequate supply of manures, the medium and poor quality land be improved upto the standard of good quality land a number of F.U.s. can be added. In the good quality lands the small size of plots is the main drawback for the introduction of new agricultural techniques.
LAND UTILIZATION IN JATPURA

Location:

The village of Jatpura which lies in Bulandshahr Tahsil of the Bulandshahr district is situated in 28° 21' E lat., and 77° 56' E. long. It is bounded by the villages of Mukimpur in the north, Rasulpur in the east, Chunauri in the south and Yoqubpur in the west (Fig. 78).

Jatpura is located in a well-drained plain of loamy soil. In the south west of Jatpura, at a distance of about two miles, meanders the East Kali-nadi.

A metalled road which runs between the city of Bulandshahr and Shikarpur towns passes through Jatpura and divides it into almost two equal parts, while another metalled road passes about four miles to the north of Jatpura, with this road the village is connected by a cart-track (Fig. 78). The water-table varies between 18 and 25 feet.

Climate:

No climatic data are recorded in the village. The nearest rainfall recording station is Bulandshahr, about five miles to the west of the village. The data of rainfall recorded at Bulandshahr have therefore been given in Tables III and II.

70. The data of rainfall for the kharif and rabi seasons of 1960-61 were obtained from the headquarters of Tahsil Bulandshahr.
LOCATION OF THE VILLAGE JATPURA

The outline of Jatpura has been drawn by the writer.

Source: Survey of India Map No 53H/15

Fig. 78
### TABLE III

**Kharif Season 1960 (Bulandshahr)**

<table>
<thead>
<tr>
<th>Month</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>1.04</td>
</tr>
<tr>
<td>July</td>
<td>10.14</td>
</tr>
<tr>
<td>August</td>
<td>8.00</td>
</tr>
<tr>
<td>September</td>
<td>1.45</td>
</tr>
<tr>
<td>October</td>
<td>0.56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>21.19</td>
</tr>
</tbody>
</table>

- Rainfall in inches in the kharif season, 1960-61.
- Rainy days in kharif 1960-61.
- Average rainfall in inches.

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall in inches</th>
<th>Rainy days</th>
<th>Average rainfall in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>1.04</td>
<td>2</td>
<td>3.60</td>
</tr>
<tr>
<td>July</td>
<td>10.14</td>
<td>9</td>
<td>8.10</td>
</tr>
<tr>
<td>August</td>
<td>8.00</td>
<td>6</td>
<td>7.02</td>
</tr>
<tr>
<td>September</td>
<td>1.45</td>
<td>2</td>
<td>4.28</td>
</tr>
<tr>
<td>October</td>
<td>0.56</td>
<td>1</td>
<td>0.79</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>21.19</td>
<td></td>
<td><strong>23.87</strong></td>
</tr>
</tbody>
</table>

### TABLE II

**Rabi Season 1960-61 (Bulandshahr)**

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall in inches</th>
<th>Rainy days</th>
<th>Average rainfall in inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>November-Dec</td>
<td>0.40</td>
<td>2</td>
<td>0.02</td>
</tr>
<tr>
<td>December</td>
<td></td>
<td></td>
<td>0.11</td>
</tr>
<tr>
<td>January</td>
<td>0.35</td>
<td>2</td>
<td>0.64</td>
</tr>
<tr>
<td>February</td>
<td>0.85</td>
<td>2</td>
<td>0.83</td>
</tr>
<tr>
<td>March</td>
<td></td>
<td>2</td>
<td>0.46</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.60</td>
<td></td>
<td><strong>1.93</strong></td>
</tr>
</tbody>
</table>

- Rainfall in inches in the rabi season, 1960-61.
- Rainy days in rabi 1960-61.
- Average rainfall in inches.
Land Classification:

The soil of the area in which the village is situated in mainly clayey loam (Fig. 39). On the basis of fertility and productivity (see page 106). The village fields have been classified and mapped in Fig. 79.

The soil of the good quality land is clayey-loam. These lands, either yield two grain crops a year or are devoted to sugarcane. The soil of the medium quality land (BII) is sandy loam and is less productive than A. These lands are, generally left fallow in the kharif season or are devoted to a green manure or early fodder crop. The soil of (BIII) land is stiff-clay and these lands are entirely reserved for transplanted rice.

The poor quality lands consist of those lands which, on account of the poverty of soil, lie unutilized.

The area and percentage to the total area of the village of each type of land is given in Table L and their distribution is shown in Fig. 79.

Table L shows that seven-tenth of the total area consist of good quality land and one fifth of the medium quality BII and BIII lands; while four per cent of the total area is unproductive.

Irrigation:

A Tube-well located in the north of the settlement is the main source of irrigation in the village. It was drilled in 1951, by the Government of Uttar Pradesh. At present about 60 per cent of
The arable land of Jatpura is irrigated by this well. In addition to this there are five wells constructed by the cultivators which are utilized for irrigation.

The crops and the area irrigated in the village varies from year to year. There are several factors (viz. total amount of rainfall, its distribution, cost of irrigation and water requirements of crops under different physical conditions) which determine the amount of area to be irrigated. The area irrigated in the year 1960-61 is shown in Fig. 80

An examination of Table III shows that the total amount of rainfall in the kharif season was 21 inches which is below the normal rainfall. Moreover the distribution of rainfall was uneven.

71. Land not available for cultivation includes, settlement, roads, groves, ponds, wells and cemetery.
as about 13 inches out of the total rainfall received in the kharif season was spread over 13 days in the month of July and August. In the months of September and October, there was a serious deficiency of rainfall for crops like rice and sugarcane. The excessive rainfall in July and August damaged the millets and pulses, while drought conditions in September adversely affected the output of maize, rice and sugarcane. Irrigation to sugarcane and maize was, however, provided in September, wherever irrigation facilities were available. Table II shows that there was no rainfall in November and December, all the rabi crops except gram, were therefore irrigated.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 81 to 84 which are based on the writer's field work of the village.

Table II gives a summary of the proportions of the village lands devoted to various uses in 1960-61 (Fig. 81).

It will be seen from the Table II that nine-tenth of the total area is cultivated, about 6 per cent is under non-agricultural occupation, while 4 per cent is unproductive.

72. The base map showing the fields and their areas in bighas was obtained from the Revenue Department of Bulandshahr Tahsil. The village was visited by the writer in the kharif and rabi season 1960-61. The use to which each field was being put was recorded on the base map. From these data Figs. 81 to 84 were prepared.
### TABLE LI

**Total Area of the Village** 407.28

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>364.08</td>
<td>89.40</td>
</tr>
<tr>
<td>Waste land</td>
<td>17.55</td>
<td>4.31</td>
</tr>
<tr>
<td>Settlement</td>
<td>9.67</td>
<td>2.37</td>
</tr>
<tr>
<td>Roads</td>
<td>4.93</td>
<td>1.21</td>
</tr>
<tr>
<td>Cemetery</td>
<td>0.69</td>
<td>0.16</td>
</tr>
<tr>
<td>Grove</td>
<td>7.13</td>
<td>1.75</td>
</tr>
<tr>
<td>Pond</td>
<td>3.23</td>
<td>0.80</td>
</tr>
</tbody>
</table>

The number of plots, their areas, and percentage to the total number of plots are given in Table LII; while Fig. 81 shows their distribution.

Table LII shows that nearly 52 per cent of the total number of plots are below one acre in size, 36 per cent are between one and two acres, and only 12 per cent are above two acres. It can be said that the sizes of plots in Jatpura in general, are small and require consolidation of holdings for improvements.

73. Roads include, metalled road and cart-tracks.

74. The grove consists of mango (*Mangifera indica*), guava (*Psidium-gurgiva*) jamun (*Eugenia Jaakelna*), adu (in English known as peach), kathal (*Arctocarpus-integrafolia*) and shisham (*Dalbergia sissoo*).
TABLE LII

<table>
<thead>
<tr>
<th>Size of plots</th>
<th>Number of plots</th>
<th>Percentage of the total number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>202</td>
<td>51.50</td>
</tr>
<tr>
<td>1.01 to 2 acres</td>
<td>145</td>
<td>36.25</td>
</tr>
<tr>
<td>2.01 to 3 acres</td>
<td>35</td>
<td>3.75</td>
</tr>
<tr>
<td>3.01 to 4 acres</td>
<td>10</td>
<td>2.50</td>
</tr>
<tr>
<td>above 4 acres</td>
<td>03</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>400</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Land Utilization in the Kharif Season:

The use of land in the kharif season of 1960 is shown in Fig. 82. The area occupied by each crop is given in Table LIII.

Table LIII shows that 50 per cent of the net cropped land is under grain crops and the remaining 50 per cent is occupied by sugarcane, fodder and cotton. Maize is the principal grain crop and occupies 19 per cent of the cropped land. Millets which occupy 3 per cent as a sole crop and another 18 per cent in combination with fodder, is mostly given to the cattle in the season of general rains.

Sugarcane is an important cash crop and occupies 46 per cent of the net cropped land. It is mostly cultivated in the good
JATPURA
LAND UTILIZATION
KHARIF SEASON
1960

RICE
MAIZE
Millet
BULrushMillet
FOODER
PULSES
COTTON
SUGARCANE
VEGETABLES
SETTLEMENT
ROAD METALLED
G R O U P E N
CEMETERY

FALLOW
WASTE LAND
POND
WELL
IRRIGATION CHANNEL

FIG 82
**TABLE LIII**

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>51.31</td>
<td>14.08</td>
<td>11.42</td>
<td>36.15</td>
<td>50.09</td>
</tr>
<tr>
<td>Millet and Pulses</td>
<td>22.34</td>
<td>6.13</td>
<td>7.22</td>
<td>81.04</td>
<td></td>
</tr>
<tr>
<td>Rice (Transplanted)</td>
<td>11.06</td>
<td>3.22</td>
<td>3.22</td>
<td>4.20</td>
<td></td>
</tr>
<tr>
<td>Bulrush millet</td>
<td>3.22</td>
<td>0.87</td>
<td>0.87</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td>Millet and Fodder</td>
<td>50.47</td>
<td>13.85</td>
<td>13.85</td>
<td>18.18</td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane 75</td>
<td>127.10</td>
<td>34.90</td>
<td>34.90</td>
<td>45.82</td>
<td>49.91</td>
</tr>
<tr>
<td>Fodder</td>
<td>4.05</td>
<td>1.15</td>
<td>1.15</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>5.96</td>
<td>1.63</td>
<td>1.63</td>
<td>2.15</td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td>1.25</td>
<td>0.36</td>
<td>0.36</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>86.72</td>
<td>23.82</td>
<td>-</td>
<td>23.82</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>364.08</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

75. Fodder consists of millets mixed with pulses and _guara_ (Cyanopsis psoralioides) crops.
quality land and receives the best care of the cultivator. Cotton occupies two per cent of the sown area and the output is consumed locally by the cultivators. Besides, 0.45 per cent of the cropped land is occupied by vegetables (potatoes). The yield per acre of potatoes in the year of inquiry, in the village was 3,200 lb per acre. The low yield per acre is mainly due to the inadequate supply of manures to the crop. It is estimated that potato fields require 200 maunds of cow-dung plus twenty maunds of castor-cake per acre. The yield obtained from a field manured at the above mentioned rate was 10,944 lb per acre in Uttar Pradesh.

In the village of Jatpura, where the loamy soils are adequately irrigated, and easy access to the neighbouring markets is available by metalled roads, the area under vegetables can be increased appreciably. But cultivation of vegetables is known as a less remunerative pursuit and is practised by a caste of people known as bahar.

Land Utilization in the Rabi Season:

The use of land in the rabi season 1960-61 is shown in Fig. 53. The area occupied by each crop in this season is given in Table LIV.

It will be seen from Table LIV that almost the entire cropped land in the rabi season is occupied by grain crops. Mixed cropping is significant feature in the crop land use and generally wheat and barley are sown in combination with peas and gram. By adopting the practice of mixed cropping the cultivator unconsciously

76, Burns, W., Technological Possibilities of Agricultural Development in India (Lahore, 1944), p. 105.
### TABLE LIV

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>84.78</td>
<td>23.36</td>
<td>40.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas and Barley 77</td>
<td>39.59</td>
<td>10.68</td>
<td>18.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and Gram 24.40</td>
<td>6.71</td>
<td>11.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas 78</td>
<td>19.22</td>
<td>5.28</td>
<td>9.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley and gram 18.59</td>
<td>5.16</td>
<td>8.34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley 8.96</td>
<td>2.50</td>
<td>4.22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley and wheat 5.53</td>
<td>1.53</td>
<td>2.62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram 5.31</td>
<td>1.46</td>
<td>2.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lentil 1.90</td>
<td>0.52</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops:</td>
<td></td>
<td></td>
<td></td>
<td>0.20</td>
<td>0.33</td>
</tr>
<tr>
<td>Fodder 0.69</td>
<td>0.20</td>
<td>0.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow 8.05</td>
<td>2.18</td>
<td>2.18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continual kharif crops 147.14</td>
<td>40.42</td>
<td>40.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>364.08</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

77. Mixed wheat and gram are locally called as gochan.
78. Barley mixed with gram is called as bajther, while mixed wheat and barley are known as gachi.
maintains the fertility of the soil. Wheat is the staple diet of the villagers and occupies about 40 per cent of the cropped land as a sole crop while over 14 per cent is cultivated in combination with gram and barley. In the year of inquiry the yield per acre of wheat in Jatpura was 350 lb. The yield can be increased appreciably if neem cakes castor-cakes and mahua cakes are applied at the rate of 400 lb. per acre.

Peas and gram are other important crops cultivated in the village in this season. About 50 per cent of the total amount of peas produced in the village are fed to the cattle in the months of January and February.

Double Cropped Land:

The double cropped area in the village is shown in Fig. 34. The total area cropped twice in the village was 122.19 acres or about 33 per cent of the gross cultivated land. The low percentage of the double cropped land in Jatpura is due to the cultivation of sugarcane and arhar which remain in the field during the rabi season, and partly owing to the following practice on the medium quality land.

Land Use and Population:

Table LV shows the total of various classes of land as well as the per capita share of the villagers in these lands.

79. A Summary of Important Results arrived at or Indicated by the Agricultural Stations in the United Provinces During the year 1934-35 (Allahabad, 1937), p. 7.
### TABLE LV

<table>
<thead>
<tr>
<th>Total Population of Jatpura</th>
<th>548</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Area in Acres)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total area of the village</th>
<th>Total available land</th>
<th>Net cropped land in the kharif season</th>
<th>Net cropped land in the rabi season</th>
<th>Total cultivated land</th>
<th>Double cropped land of kharif and rabi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>407.28</td>
<td>364.08</td>
<td>277.36</td>
<td>208.91</td>
<td>286.27</td>
</tr>
</tbody>
</table>

Land per head of population | 0.74 | 0.66 | 0.42 | 0.38 | 0.62 | 0.22 |

It will be seen from the above table that the per capita cultivated land available in the village is 0.66 acre, but in the kharif and rabi seasons, the per capita net cropped land is reduced to 0.42 and 0.38 acre respectively. The decrease in the kharif season is due to the practice of fallowing, while in the rabi season it is due to the continuation of kharif crops (sugarcane) in that season.

Table LV further shows that the per capita double cropped land in the village is 0.22 acre and thus the per capita total cultivated land is 0.80 acre. In other words, the amount of land supporting one person in Jatpura is 0.80 acre.

425 persons (78 per cent of the total population) belong to the primary rural group and are exclusively dependent upon land.
while 22 per cent of the population is secondary rural and serves the primary population and thus indirectly depends upon land.

Potential Production Units:

Table LVI shows the productivity of each class of land. An attempt has been made in this Table to estimate the total number of P.F.U.s on the basis of productivity rating.

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in acres</th>
<th>Average yield per acre</th>
<th>Rating</th>
<th>Total number of P.F.U.s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>284.08</td>
<td>1500</td>
<td>1.50</td>
<td>426.12</td>
</tr>
<tr>
<td>Medium quality land (BI)</td>
<td>54.00</td>
<td>800</td>
<td>0.80</td>
<td>43.20</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>26.00</td>
<td>600</td>
<td>0.60</td>
<td>15.60</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>17.55</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>381.63</td>
<td>-</td>
<td>-</td>
<td>484.92</td>
</tr>
</tbody>
</table>

It will be seen from the above Table that in Jatpura 381.63 acres of land in the present state of development are equal to 484.92 P.F.U.s. In other words, on the whole one acre of land is equal to 1 P.F.U. The good quality land (A) which covers about three-fourths of the total area under cultivation is fairly productive. One acre of this land is equal to 1.20 P.F.U.s. It is, however, in the medium quality BI and BII lands where productivity
is less than the average farm land that 1 acre is not equal to 1 P.P.U. The reclamation of the poor quality land and additional supplies of manures on the medium and good quality lands may increase the existing number of P.P.U.s to an appreciable extent and which means greater carrying capacity of the land.
CHAPTER VII

LAND UTILIZATION IN SALAJUDI

Location:

The village of Salajudi lies in Muzaffarnagar Talsil in the district of Muzaffarnagar and is situated in 29° 26' N. lat., and 77° 44' E. long. It is bounded by the villages of Bibipur in the north, Shehnagar in the east, Bahadarpur in the south and Sindhaoli in the west (Fig. 85).

The village is situated in a tract of sandy loam at a height of about 760 feet above sea level. To the west of the village, at a distance of about two miles, there is a route of Northern Railway which joins the city of Muzaffarnagar with those of Saharanpur in the north and with Khatauli in the south (Fig. 85). A metalled road running between the town of Jansath and Muzaffarnagar city passes to the north of the village at a distance of about one furlong and joins Salajudi with Muzaffarnagar. Thus the village is very well served by the existing means of communications and the villagers have an easy access to the markets of the neighbouring cities.

Climate:

No climatic data are recorded in the village. The data of rainfall recorded at Muzaffarnagar Talsil headquarters, four miles to the north west of the village, have therefore been given in

---

1. The height is that of Muzaffarnagar which lies about four miles to the north west of the village. Since the actual height of Salajudi has not been recorded it may be taken to be approximately the same as that of Muzaffarnagar for both lie in a level plain.
LOCATION OF THE VILLAGE SALAJUDI

Settlement

metalled road

unmetalled road

Railway

cart-track

grove

broken land

Source: Survey of India map No. 53

The outline of Salajudi has been drawn by the writer.
Tables LVII, LVIII and may be considered as the close approximations for this village.

**TABLE LVII**

**Kharif Season 1960 (Muzaffarnagar)**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>2.63</td>
</tr>
<tr>
<td>July</td>
<td>11.28</td>
</tr>
<tr>
<td>August</td>
<td>10.19</td>
</tr>
<tr>
<td>September</td>
<td>3.73</td>
</tr>
<tr>
<td>October</td>
<td>0.88</td>
</tr>
</tbody>
</table>

Rainfall in inches in the kharif season, 1960.

<table>
<thead>
<tr>
<th>Rainy days in kharif, 1960.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 9 8 5 1</td>
</tr>
</tbody>
</table>

Average rainfall in inches.

<table>
<thead>
<tr>
<th>Average rainfall in inches.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.45 9.38 8.57 5.57 0.63</td>
</tr>
</tbody>
</table>

**TABLE LVIII**

**Rabi Season 1960-61 (Muzaffarnagar)**

<table>
<thead>
<tr>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novem-</td>
</tr>
<tr>
<td>ber.</td>
</tr>
</tbody>
</table>

Rainfall in inches in the rabi season, 1960-61.

<table>
<thead>
<tr>
<th>Rainy days in rabi, 1960-61.</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 1 2 2 2</td>
</tr>
</tbody>
</table>

Average rainfall in inches

<table>
<thead>
<tr>
<th>Average rainfall in inches.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.11 0.48 1.21 1.07 0.68</td>
</tr>
</tbody>
</table>

2. The data of rainfall for the kharif and rabi seasons of 1960-61 were obtained from the headquarters of Tahsil Muzaffarnagar.
Land classification:

The soil of the area where Salajudi is situated is sandy loam to sandy and is characterized by the occurrence of sandy undulations. The eastern part of the village is relatively elevated and consists of sandy soil locally called bhur or Bhudda. The western part is a level area, where the soil is fairly productive alluvium. On the basis of fertility and productivity (See page 106) the village fields have been classified and mapped in Fig. 36.

The soil of good quality land is loamy with little admixture of sand. These lands are devoted mostly to Sugarcane. Although the land can yield two good harvests of grain crops a year, the villagers prefer to grow sugarcane, since because of the proximity of the Musaffarnagar market, sugarcane fetches good price.

The soil of the medium quality land is sandy and less productive than (A). It is left fallow in the kharif season and is devoted to wheat or barley in the rabi.

The poor quality lands consist of coarse sand which lie unutilized.

Table LIX shows the acreage and percentage to the total area of the various classes of lands while their distribution is shown in Fig. 36.

Table LIX shows that 67 per cent of the total area in the village consists of good quality land, 24 per cent of medium quality and three and a half per cent is covered by the poor quality lands;
TABLE LIX

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in acres</th>
<th>Percentage of the total area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>704.90</td>
<td>67.39</td>
</tr>
<tr>
<td>Medium quality land (B1)</td>
<td>247.00</td>
<td>23.62</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>36.75</td>
<td>3.51</td>
</tr>
<tr>
<td>Land not available for Cultivation (3)</td>
<td>57.25</td>
<td>5.48</td>
</tr>
<tr>
<td>Total</td>
<td>1045.90</td>
<td>100.00</td>
</tr>
</tbody>
</table>

while the remaining is under non-agricultural occupations. In Salajudi the percentage of medium quality land which is 247 acres (or 24 per cent of the total area) is highest as compared to those villages described in the previous Chapter (Fig. 36).

Irrigation:

Irrigation in the village is practised by Canals. A canal distributary and two minors, rising from the Upper Ganga Canal traverse the village from west to east and from north to south respectively; while a minor stream known as the Nara-drain divides the village into two parts from north east to south west. The land lying to the east of this drain is undulated and is not irrigable by the canals. In this area the sandy soil affords little possibilities for the construction of cheap and durable well. Consequently

3. Land not available for cultivation includes, settlement, grove, roads, waterbodies and cemetery.
the crops of the eastern part remain entirely dependent upon monsoon. The western half of the village is a level plain and is well irrigated by the canals (Fig. 37).

The fields irrigated in the kharif and rabi seasons of 1960-61 are plotted in Fig. 37.

Table LVII shows that the total rainfall in the kharif season was 30 inches and it was well distributed. None of the kharif crops except sugarcane and cotton (sown in the month of May) was, therefore, irrigated. Table LVIII reveals that there was no rainfall in November, while in December it was less than a half inch. Therefore, all the rabi crops, wherever irrigation was possible, were irrigated.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 88 to 91 which are based on the writer's field work of the village.

Table LX gives a summary of the proportions of the village lands devoted to various uses.

It will be seen from Table LX that 91 per cent of the total land is cultivated five and a half percent is under non-agricultural

---

4. The base map showing the fields and their areas in bighas was obtained from the headquarters of Tahsil Muzaffarnagar. The bighas were converted into acres at the rate of 8 bighas equal to 5 acres. Salajudi was visited by the writer in the kharif season 1960 and the rabi season 1960-61, and the use to which each field was being put was recorded on the base map. From these data Figs. 88 to 91 were prepared.
SALAJUDI
LAND UTILIZATION
1960-1961

FIG. 88
### TABLE LX

**Total Area of the Village** 1045.90 acres

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land 5</td>
<td>951.90</td>
<td>91.01</td>
</tr>
<tr>
<td>Waste land</td>
<td>36.75</td>
<td>3.51</td>
</tr>
<tr>
<td>Settlement 6</td>
<td>9.14</td>
<td>0.88</td>
</tr>
<tr>
<td>Road 7</td>
<td>12.50</td>
<td>1.20</td>
</tr>
<tr>
<td>Grove</td>
<td>2.71</td>
<td>0.26</td>
</tr>
<tr>
<td>Cemetery 8</td>
<td>1.87</td>
<td>0.19</td>
</tr>
<tr>
<td>Water-bodies</td>
<td>21.03</td>
<td>2.06</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1045.90</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Uses: While about 37 acres or three and a half per cent is waste land. The waste land lies unutilized owing to the coarse and sandy soil.

Table LXI shows the size of different plots and their percentage to the total number of plots.

It will be seen from the Table LX that 42 per cent of the total number of plots are below one acre, 50 per cent between 1.01 to

5. Waste land includes unused land and poor sandy bhur which is left fallow for more than last five years.

6. Road includes, un-metalled roads and cart-tracks.

7. Grove consists of mangoes guava, jamun and sheesham trees.

8. Water-bodies, consist of ponds, canal distributaries, minors and drain.
TABLE LXI

Total Number of Plots 685

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Area in acres</th>
<th>Percentage to the total Number of Plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>285</td>
<td>42.00</td>
</tr>
<tr>
<td>1.01 to 2 acres</td>
<td>300</td>
<td>44.00</td>
</tr>
<tr>
<td>2.01 to 3 acres</td>
<td>40</td>
<td>6.00</td>
</tr>
<tr>
<td>3.01 to 4 acres</td>
<td>35</td>
<td>5.00</td>
</tr>
<tr>
<td>above 4 acres</td>
<td>25</td>
<td>3.00</td>
</tr>
<tr>
<td>Total</td>
<td>685</td>
<td>100.00</td>
</tr>
</tbody>
</table>

3 acres and only eight per cent above 3 acres. The size of plots in Salajudi is, however, relatively large as compared to size of the villages described in the previous chapter. The cultivation on very small and fragmented holdings entails waste in a variety of ways. The cultivator cannot afford to use up-to-date machinery and tools. He cannot even dig a well on the field because it is not worthwhile to sink a well on a field which is just a fragment.

Land Utilization in the Kharif Season:

The use of land in the kharif season 1960 is shown in Fig. 89. The area occupied by each crop in this season is given in Table LXII.
Table LXII shows that about 50 per cent of the net cropped land in this season is occupied by grain crops and 50 per cent by sugarcane fodder and cotton. Rice which occupies 17 per cent of the net cropped land is the major grain crop of the kharif season. Rice is not a staple diet of the villagers and therefore more than 21 per cent of the total output is exported. The amount obtained by the export of rice is used to purchase the articles of daily use in the month of October, when there is no other source of income to the villagers.

Millet occupies about 19 per cent of the cropped land, and are generally given to the animals in the months of August, September and October. Sugarcane is the cash crop and is sown over 46 per cent of the sown area. The important *gur-mandi* of Muzaffarnagar, which is only 4 miles to the north west of the village is an encouraging factor for the cane cultivation in the village.

A comparison of Figs. 56 and 59 show a remarkable influence of the soil on the crop land use pattern. Sugarcane and rice being the important crops, occupy the irrigated good quality land, while bulrush-millet, *sawan* and fodder are cultivated in the medium quality lands, where the soil varies from sandy to sandy loam.

45 per cent (about 428 acres) of the total cultivated land is left fallow in the kharif season. The practice of fallowing aims at the recuperation of the fertility of the soil but in observing this practice the cultivate exposes his fields to sheet erosion. An

9. The raw sugar market at Muzaffarnagar, locally known as *gur-mandi* is the biggest sugar market in Western Uttar Pradesh.
TABLE LXII

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Cultivated land</td>
<td>...</td>
<td>951.90 acres</td>
<td></td>
</tr>
<tr>
<td>Net Cropped land in the Kharif Season</td>
<td>...</td>
<td>524.34 acres</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops:</td>
<td></td>
<td></td>
<td>27.79</td>
</tr>
<tr>
<td>Rice Transplanted</td>
<td>58.13</td>
<td>6.11</td>
<td>11.09</td>
</tr>
<tr>
<td>Rice Broadcast</td>
<td>30.00</td>
<td>3.15</td>
<td>5.72</td>
</tr>
<tr>
<td>Bulrush-millet</td>
<td>49.75</td>
<td>5.23</td>
<td>9.48</td>
</tr>
<tr>
<td>Pulses</td>
<td>8.68</td>
<td>0.91</td>
<td>1.66</td>
</tr>
<tr>
<td>Small millet and pulses</td>
<td>1.75</td>
<td>0.19</td>
<td>0.34</td>
</tr>
<tr>
<td>Millet</td>
<td>100.75</td>
<td>10.58</td>
<td>19.22</td>
</tr>
<tr>
<td>Millet and Sanwan</td>
<td>3.34</td>
<td>0.35</td>
<td>0.64</td>
</tr>
<tr>
<td>Sabush millet and fodder</td>
<td>12.15</td>
<td>1.27</td>
<td>2.32</td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td>27.30</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>244.81</td>
<td>25.72</td>
<td>46.68</td>
</tr>
<tr>
<td>Cotton</td>
<td>1.71</td>
<td>0.18</td>
<td>0.33</td>
</tr>
<tr>
<td>Sun-hemp</td>
<td>10.37</td>
<td>1.10</td>
<td>1.97</td>
</tr>
<tr>
<td>Fodder</td>
<td>2.90</td>
<td>0.30</td>
<td>0.55</td>
</tr>
<tr>
<td>Fallow</td>
<td>427.56</td>
<td>44.91</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>951.90</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
appropriate method of increasing the fertility of the soil is to raise some early maturing legumes, like moong (Phaseolus mungo) and moth (Phaseolus aconitifolius). The moong type, a variety developed in Uttar Pradesh has the special advantage of maturing in about sixty five days. If the crop is sown in the beginning of the rainy season (in the 3rd week of June), it can easily harvest by the last of August, i.e. about two months before the actual sowing of rabi crops take place.

Land Utilization in the Rabi Season:

The use of land in the rabi season 1960-61 is shown in Fig. 90. The area occupied by each crop is shown in Table LXIII.

The significance of the grain crops in the rabi season can be seen from the fact that more than 96 per cent of the net cropped land is occupied by the grain crops. The main staple diet of the villagers is wheat barley and gram. Wheat, barley and peas, collectively occupy 78 per cent of the net cropped land. Wheat is the major crop and it occupies 59 per cent of the net cropped land as a sole crop, while in seven and four per cent of the net cropped land is sown in combination with gram and barley respectively. It will also be seen from Table LXIII that barley occupies greater acreage than that of peas and gram. It is because barley gives

TABLE LXIII

Gross Cultivated land: 951.90
Net Cropped land in the rabi season: 597.53

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>354.56</td>
<td>37.25</td>
<td>59.34</td>
<td></td>
<td>98.35</td>
</tr>
<tr>
<td>Barley</td>
<td>62.68</td>
<td>6.59</td>
<td>10.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>48.87</td>
<td>5.25</td>
<td>8.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and gram</td>
<td>39.94</td>
<td>4.20</td>
<td>6.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram and barley</td>
<td>29.87</td>
<td>3.14</td>
<td>5.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and barley</td>
<td>25.93</td>
<td>2.72</td>
<td>4.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas and barley</td>
<td>15.06</td>
<td>1.58</td>
<td>2.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse (lentil)</td>
<td>9.75</td>
<td>1.02</td>
<td>1.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.65</td>
</tr>
<tr>
<td>Fodder</td>
<td>9.87</td>
<td>1.04</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>62.18</td>
<td>6.53</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continual kharif crops</td>
<td>292.19</td>
<td>30.70</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>951.90</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
higher yield in the sandy loam than that of peas and gram. The output of barley in the village is 300 lb per acre. The yield per acre can be increased by the cultivation of improved varieties and additional supplies of manure and fertilizers. The experiments relating to the varieties of barley carried in Uttar Pradesh show that P.21, C.251 and C.225 yield higher than that of other varieties. The manurial taste carried at Kaili in the district of Muzaffarnagar reveal that phosphate alone or combined with Ammonium-sulphate or potassium sulphate or both Ammonium plus Potassium Sulphate give better results. About 6 per cent of the gross cultivated land is left fallow to be devoted to sugarcane in the month of February and about 30 per cent is under continual kharif crops (sugarcane).

Double Cropped Land:

The double cropped land in the village is shown in Fig. 52 the total area cropped twice in the year of inquiry was 170 acres or about 16 per cent of the total area.

Land Use and Population:

Table LXIV shows the totals of various classes of lands as well as the per capita share of the villagers in these lands. The table reveals that the per capita land available for cultivation in the village is 0.92 acre, but in the kharif and rabi seasons, the per capita net cropped land is reduced to 0.51 and 0.53 acre respectively. The reduction in the per capita share in the kharif season is due to the practice of fallowing, while in the rabi season about 40 per cent of the gross cultivated land remains occupied by kharif crops.
**TABLE LXIV**

<table>
<thead>
<tr>
<th>Total</th>
<th>Total area available of the able village land for cultivation.</th>
<th>Net cropped land in the kharif season.</th>
<th>Net cropped land in the rabi season.</th>
<th>Net cropped land (both seasons)</th>
<th>Double cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>1036</td>
<td>1045.90</td>
<td>951.90</td>
<td>524.34</td>
<td>597.53</td>
<td>1121.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.01</td>
<td>0.92</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Land per head of population: 1.01, 0.92, 0.51, 0.58, 1.08, 0.16

The above Table further reveals that the per capita share in the double cropped land is 0.16 acre, so that the per head total cultivated land supporting one person in the village of Salajudi is 1.08 acres.

In this village 850 persons (about 82 per cent of the total population) consist of primary rural group and exclusively depend upon land, while eighteen per cent of population is secondary rural and serves the primary population, and thus indirectly depends upon land.

12. The total population of Salajudi is 550 persons and about 54 per cent of the total area is under their occupations. The remaining percentage of the total area is cultivated by the villagers of Bahaderypur and Shornagar (the neighbouring villages). The writer enquired that about 486 persons of these villages are depending on the land of Salajudi, thus the total population depending on the land of Salajudi is 1036 persons.
Potential Production Units:

Table LXV shows the productivity of each type of land and on the basis of productivity ratings an attempt has been made to assess the Potential Production Units of different types of land in Salajudi.

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in acres</th>
<th>Average yield per acre in lb.</th>
<th>Rating</th>
<th>Total number of P.F.U.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>704.90</td>
<td>1200</td>
<td>1.26</td>
<td>838.17</td>
</tr>
<tr>
<td>Medium quality land (BI)</td>
<td>247.00</td>
<td>850</td>
<td>0.90</td>
<td>222.00</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>36.75</td>
<td>700</td>
<td>0.74</td>
<td>27.20</td>
</tr>
<tr>
<td>Poor quality (C)</td>
<td>57.25</td>
<td>100</td>
<td>0.10</td>
<td>5.70</td>
</tr>
<tr>
<td>Total</td>
<td>1045.90</td>
<td></td>
<td></td>
<td>1143.07</td>
</tr>
</tbody>
</table>

The above Table reveals that about 1046 acres of land is cultivated in Salajudi which is equal to 1143 P.F.U.s. The productivity of one acre of good quality land is 1.26 of the medium quality BI, BII lands is 0.90 and 0.74 respectively. In other words the productivity of good quality land is fairly high, while that of the medium quality land is slightly less than the average farm land. It is in the poor quality land where the productivity is very low i.e. 0.10 P.F.U. As a whole, in Salajudi, one acre of land is equal to
more than one P.P.U.s. But the existing P.P.U.s can be increased
upto large extent, if the yield of medium and poor quality lands is
increased to the level of average farm land. The main reason for
the low productivity of the medium and poor quality lands is the
inadequate water supplies. Therefore any scheme to provide water
to the unirrigated lands shall be useful in raising the total number
of P.P.U.s in the village.
LAND UTILIZATION IN DUDHILI

Location:

The village of Dudhli is situated in 29° 6' N. lat and 77° 51' E long., in Mawana Tahsil of the Meerut district. It is bounded by the villages of Bhainsa in the north, Mawana Khurd in the east, Nagli-Isha in the south and Pahadpur in the west (Fig. 92).

The eastern part of the village is high-lying and well drained while the central and southern parts are low-lying. These parts are submerged under water whenever the rainfall is heavy.

The Meerut-Mawana Road passes at a distance of about two furlongs to the south-east of the village and joins the village with the city of Meerut and Mawana town.

Climate:

No climatic data are recorded in the village. The nearest rainfall recording station is Mawana, about six miles to the east of Dudhli. The data of rainfall recorded at Mawana Tahsil headquarters have therefore been given in Tables LXVI and LXVII.

TABLE LXVI

KHARIF SEASON 1960 (MAWANA)

<table>
<thead>
<tr>
<th>MONTHS</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June</td>
<td>July</td>
<td>August</td>
<td>September</td>
<td>October</td>
</tr>
<tr>
<td>Rainfall in inches in the kharif season 1960</td>
<td>2.44</td>
<td>10.62</td>
<td>10.35</td>
<td>4.26</td>
<td>1.75</td>
</tr>
<tr>
<td>Rainy days in kharif, 1960</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>3.49</td>
<td>9.00</td>
<td>8.20</td>
<td>5.15</td>
<td>2.05</td>
</tr>
</tbody>
</table>

13. The rainfall data for the kharif and rabi seasons 1960-61 were obtained from the headquarters of Tahsil Mawana.
LOCATION OF THE VILLAGE DUDHLI

Source: survey of India

The outline of Dudhli has been drawn by the writer.

Fig. 92
TABLE LXVII

RAVI SEASON 1960-61 (MAWANA)

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novem-December</td>
<td>January</td>
</tr>
<tr>
<td>Rainfall in inches in the rabi season, 1960-61</td>
<td>-</td>
</tr>
<tr>
<td>Rainy days in rabi season 1960-61</td>
<td>-</td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Land classification:

On the basis of fertility and productivity (see page 106) the village fields have been classified in Fig. 93.

The soil of good quality land (A) is loamy and yields at least two crops a year or is devoted to sugarcane. The medium quality land (BI) consists of sandy loam and is less productive than A. The BI land is generally left fallow in the kharif or is devoted to early maturing fodder crop. The soil of BII lands is clayey and these lands are devoted to transplanted rice.

The Table LXVIII shows the area and percentage to the total area of each type of land; while their distribution is shown in Fig. 93.
### TABLE LXVIII

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in Acre</th>
<th>Percentage of the total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>311.20</td>
<td>81.77</td>
</tr>
<tr>
<td>Medium quality land (B1)</td>
<td>18.59</td>
<td>4.85</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>26.81</td>
<td>7.11</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>12.00</td>
<td>3.29</td>
</tr>
<tr>
<td>Land not available for Cultivation(14)</td>
<td>11.40</td>
<td>2.98</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>333.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It will be seen from Table LXVIII that about 82 per cent of the total area consists of good quality land, 5 and 3 per cent of the medium quality B1 and BII lands respectively and 3 per cent is waste land, while 3 per cent is under non-agricultural uses.

**Irrigation:**

Irrigation in the village is practised by canal and wells. A minor of the Akbarpur Canal Distributry traverses the eastern part of the village and provides water to about 60 per cent of the gross cultivated land. In the western part of the village irrigation by Canal, owing to the relatively elevated level of the land is not possible, the cultivators, therefore, have dug wells on the good quality land in this part of the village.

14. Land not available for cultivation includes, settlement, water-bodies, grove, cart-track, cemetery and wells.
DUDHIL
IRRIGATION
1960-1961

IRRIGATED IN Kharif
IRRIGATED IN Rabi
UNIRRIGATED
WASTE LAND
SETTLEMENT
CART - TRACK

CANAL DISTRIBUTARY
WELL
GROVE
The area irrigated in the kharif and rabi seasons of 1960-61 is shown in Fig. 94. Table LXII shows that there was 29 inches of rainfall in the kharif season, and it was spread over sufficient number of days. None of the kharif crops except sugarcane and early fodder was therefore irrigated.

Table LXVII reveals that there was no rainfall in November and December. The rabi crops with the exception of gram, were therefore irrigated.

Land Utilization:

The land use of Duhalli in 1960-61 is shown in Figs. 95 to 98. The mapping is based on the writer's field work of the village.

The following Table gives a summary of the proportions of the village lands devoted to various uses in the year of inquiry.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>359.00</td>
<td>93.73</td>
</tr>
<tr>
<td>Waste land</td>
<td>12.00</td>
<td>3.29</td>
</tr>
<tr>
<td>Settlement</td>
<td>5.00</td>
<td>1.31</td>
</tr>
<tr>
<td>Cemetery</td>
<td>0.40</td>
<td>0.11</td>
</tr>
<tr>
<td>Grove</td>
<td>3.00</td>
<td>0.76</td>
</tr>
<tr>
<td>Water bodies</td>
<td>3.60</td>
<td>0.80</td>
</tr>
<tr>
<td>Total</td>
<td>383.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

15. The base map showing the fields and their areas in bighas was obtained from the headquarters of Tehsil Mawana. Duhalli was visited by the writer in the kharif and rabi seasons of 1960-61.
It will be seen from Table LXIX that 94 per cent of the total area is cultivated, 3 per cent is unproductive and 3 per cent is under non-agricultural occupations.

Table LXIX show the size of plots and their percentages to the total number of plots, while Fig. 95 shows their distribution. It will be seen from the following Table that 71 per cent of the total number of plots are below one acre in area, 22 per cent are between one and two acres and 7 per cent are above two acres.

**TABLE LXIX**

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Number of plots</th>
<th>Percentage of the total Number of plots.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>425</td>
<td>71.00</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>133</td>
<td>22.00</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>42</td>
<td>7.00</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Land Utilization in the Kharif Season:

The use of land in the kharif season is shown in Fig. 96. The area occupied by each crop in this season is given in Table LXXXI

footnote contd...

...and the use to which each field was being put was recorded on the base map. From these data Figs. 95 to 98 were prepared.

16. Water-bodies include, pond, canal distributary and irrigation channels.
<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice transplanted</td>
<td>65.00</td>
<td>18.16</td>
<td>19.24</td>
<td>35.69</td>
<td>26.10</td>
</tr>
<tr>
<td>Rice broadcast</td>
<td>6.00</td>
<td>1.66</td>
<td>1.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td>35.31</td>
<td>9.83</td>
<td>10.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet and fodder</td>
<td>6.28</td>
<td>1.75</td>
<td>1.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small millet</td>
<td>2.16</td>
<td>0.60</td>
<td>0.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulses and fodder</td>
<td>10.59</td>
<td>2.81</td>
<td>2.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small millet and pulses</td>
<td>0.65</td>
<td>0.18</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulses</td>
<td>2.56</td>
<td>2.70</td>
<td>0.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>195.75</td>
<td>54.52</td>
<td>58.01</td>
<td>59.31</td>
<td>73.90</td>
</tr>
<tr>
<td>Cotton</td>
<td>4.46</td>
<td>1.23</td>
<td>1.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dhaincha</td>
<td>2.78</td>
<td>0.78</td>
<td>0.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sun-hemp</td>
<td>1.34</td>
<td>0.38</td>
<td>0.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>5.03</td>
<td>1.40</td>
<td>1.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>21.59</td>
<td>6.00</td>
<td>-</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>359.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table LXXI shows that 36 per cent of the cropped area is occupied by grain crops and 64 per cent by sugarcane fodder, cotton and manure crops. Rice is the major grain crop and occupies 20 per cent of the sown area. In the years of deficient rainfall the success of rice crop entirely depends upon the availability of canal water. The experiments conducted to find out the quantity of water required for rice in combination with different manures, reveal that 40 to 45 inches of water is adequate for the rice crop when castor-cake and Niciphos are applied in the field.

Sugarcane is the important cash crop in the village and occupies about 58 per cent of the cropped area. More than three-fourth of the output of sugarcane is sold to the Mawana Sugar Factory, while one fourth is crushed by indigenous method to prepare gur for daily use.

Land Utilisation in the Rabi Season:

The use of land in the rabi season of 1960-61 is shown in Fig. 97. The area occupied by each crop in this season is shown in Table LXXII. It will be seen from Table LXXII that more than 90 per cent of the cropped land in the rabi season is occupied by grain crops. The rabi cereals constitute the diet of the villagers (Table CXXXI B). Peas wheat, gram and barley are the major crops cultivated in the season.

17. A Summary of Important Results Arrived at or Indicated by the Agricultural Stations in the United Provinces, During the year 1934-35 (Allahabad, 1936), p 8.
DUDHLI
LAND UTILIZATION
RABI SEASON

WHEAT 1960-1961
BARLEY
GRAM
PEAS
PULSES
OAT
FODDER
FALLOW
CONTINUOUS
KARIF
CROPS

SETTLEMENT
WASTE LAND
CART TRACK
CANAL DISTRIBUTION
WELL
GROVE
### TABLE LXXII

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of Gross Cultivated Land</th>
<th>Percentage of Net Cropped Land</th>
<th>Total Percentage of Gross Cultivated Land</th>
<th>Total Percentage of Net Cropped Land</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grain Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>42.97</td>
<td>11.69</td>
<td>31.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and Gram</td>
<td>29.12</td>
<td>8.13</td>
<td>21.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>27.03</td>
<td>7.58</td>
<td>19.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>10.93</td>
<td>3.07</td>
<td>7.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas and Oat</td>
<td>8.96</td>
<td>2.50</td>
<td>6.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>4.09</td>
<td>1.17</td>
<td>2.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lentil</td>
<td>1.56</td>
<td>0.45</td>
<td>1.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Crops</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>13.34</td>
<td>3.77</td>
<td>9.66</td>
<td>3.77</td>
<td>9.66</td>
</tr>
<tr>
<td>Fallow</td>
<td>12.81</td>
<td>4.64</td>
<td>-</td>
<td>4.64</td>
<td></td>
</tr>
<tr>
<td>Continual Kharif</td>
<td>208.11</td>
<td>58.00</td>
<td>-</td>
<td>58.00</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>359.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

A comparison of Figs. 96 and 97 reveals that the net cropped land in the rabi season is nearly half of that of the kharif season.
The striking shortage of area in the rabi season is due to the fact that about sixtenth of the gross cultivated land is under sugarcane and is not available for rabi crops.

Double Cropped Land:

The double cropped land in the village is shown in Fig. 98. The total area cropped twice in the year of inquiry was 116.41 acres or 34.40 per cent of the gross cultivated land. The double cropped land in the village is restricted in the good quality land, which is generally devoted to sugarcane. The medium quality lands are left fallow in either of the seasons.

Land Use and Population:

Table LVII shows the totals of various categories of lands as well as the per capita share of the villagers in these lands. It will be seen from this Table that the per capita land available for cultivation is 0.78 acre. In the kharif season the per capita cropped land is 0.73 acre; while in the rabi season the per capita share is only 0.30 acres.

The Table LXXIII further reveals that the per capita share in the double cropped land is 0.25 acre so that the per head total cultivated land increases from 0.78 acre to 1.03 acres. In other words the amount of land supporting one person in Dudhli is 1.03 acres. As far as the occupational structure of the population is concerned 332 persons (about 72 per cent of the total population) belong to
DUDHLI
DOUBLE CROPPED
1960-1961

- Rice Transplanted
- Rice - Broadcast
- Sugarcane
- Cotton
- Pulses
- Millet
- Small Millet
- Bulrush Millet
- Sun-Hemp
- Dhaicha
- Fodder

FIG 38
TABLE LXXIII

Total population of the Village 460
(Area in Acres)

<table>
<thead>
<tr>
<th>Total area available of land in acres</th>
<th>Total cropped land in acres</th>
<th>Net cropped land in acres</th>
<th>Total cultivated land in season</th>
<th>Double cropped land (both kharif and rabi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>388.00</td>
<td>359.00</td>
<td>337.41</td>
<td>138.00</td>
<td>475.41</td>
</tr>
</tbody>
</table>

Land per head of population: 0.83 0.78 0.73 0.30 1.03 0.25

primary rural group and depend exclusively on land while 28 per cent is secondary rural which serves the primary rural group and thus indirectly depends on land.

Potential Production Units:

An attempt has been made in Table LXXIV to estimate the total number of P.P.U.s, on the basis of productivity ratings of different types of lands. The table shows that in Duhli about 369 acres of land are cultivated which are equal to 415.14 P.P.U.s. The productivity of the good quality land is about one and a half time of that of the average farm land and since more than 84 per cent of the total area under cultivation consists of the good quality land the total number of P.P.U.s is remarkably high. One acre of medium
TABLE LXXIV

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in acre</th>
<th>Average yield</th>
<th>Ratings</th>
<th>Total number of P.P.U.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>311.20</td>
<td>1200</td>
<td>1.33</td>
<td>413.90</td>
</tr>
<tr>
<td>Medium quality land (B1)</td>
<td>18.59</td>
<td>800</td>
<td>0.88</td>
<td>15.40</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>26.81</td>
<td>700</td>
<td>0.77</td>
<td>20.64</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>12.00</td>
<td>100</td>
<td>0.10</td>
<td>1.20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>368.60</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
<td><strong>451.14</strong></td>
</tr>
</tbody>
</table>

Quality A1 and AII land is equal to 0.88 and 0.77 P.P.U. In other words the productivity of good quality land is fairly high and that of the medium quality land is below the average farm land.
LAND UTILIZATION IN MEGHRAJPUR

Location:

The village of Meghrajpur is situated in 28° 54' N lat., and 71° 54' E long., in Mawana Tahsil of the Meerut district. It is bounded by the villages of Bhattipur in the north, Hasanpur in the east, Nagla-Hal in the south and Mau-Khas in the west (Fig. 99).

Meghrajpur lies in a well drained plain at a height of about 717 feet. The Chhoyia-nadi, a seasonal stream, flows through the south west corner of the village. In the wet monsoon months this stream provides an outlet for draining the surplus water. In the years of excessive rainfall the Chhoyia-nadi overflows its banks and inundates the south-western part of the village (Fig. 99).

A metalled road running between the town of Garhmukteswar and the city of Meerut passes through the northern part of Meghrajpur and joins the village with the markets of Garhmukteswar and Meerut, which are about 12 and 9 miles in the East and west respectively. Besides, there is a metalled road which divides the village from north to south and connects Meghrajpur with Bhattipur village where market is held on every saturday.

Climate:

No climatic data are recorded in the village. The nearest rainfall measuring station is Meerut, which lies about nine miles to

---

18. The height is that of Mau-Khas which is only three furlongs to the west of the village. Since the actual height of Meghrajpur has not been recorded it may be taken to be approximately the same as that of Mau-Khas, for both the villages are close and lie in an apparently level plain.
LOCATION OF THE VILLAGE MEGHRAJPUR

settlement
road metalled
cart-track
grove
waste land
lake

source: survey of India map No 53 H 13

The outline of Meghrajpur has been drawn by the writer.
the west of the village. The rainfall data recorded at Meerut have therefore been given in Tables LXXV and LXXVI.

**TABLE LXXV**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rainfall in inches in the kharif season, 1960</th>
<th>120</th>
<th>10.91</th>
<th>8.60</th>
<th>3.34</th>
<th>1.20</th>
<th>25.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy days in kharif, 1960</td>
<td>2</td>
<td>10</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches.</td>
<td>1.90</td>
<td>9.00</td>
<td>6.20</td>
<td>4.50</td>
<td>2.00</td>
<td>23.60</td>
</tr>
</tbody>
</table>

**TABLE LXXVI**

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rainfall in inches in the rabi season, 1960-61</th>
<th>0.10</th>
<th>2.03</th>
<th>1.10</th>
<th>0.19</th>
<th>3.42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainy days in Rabi, 1960-61</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Average Rainfall in inches.</td>
<td>0.18</td>
<td>0.20</td>
<td>1.28</td>
<td>0.93</td>
<td>0.36</td>
</tr>
</tbody>
</table>

19. The rainfall data for the kharif and rabi seasons of 1960-61 were obtained from the Tahsil headquarters of Meerut.
MEGHRAJPUR LAND CLASSIFICATION

A - GOOD QUALITY LAND
B - MEDIUM QUALITY LAND
C - POOR QUALITY LAND
SETTLEMENT
CART-TRACK (METALLED)
ROAD
WELL

POND
STREAM
IRRIGATION-CHAKNAS

Z

500 M
Land Classification:

The village of Meghrajpur lies in the plain where the soil varies from coarse sandy on the elevated parts to loamy in the lowlying areas. On the basis of fertility and productivity (see page 106) the village fields have been classified and mapped in Fig. 100.

The soil of the good quality land (A) is light loam. These lands are cropped at least twice in a year or are devoted to sugarcane.

The soil of the medium quality land is sandy to sandy loam and is less productive than (A). These lands are left fallow in the kharif season and are devoted to wheat in the following rabi season.

The poor quality lands are coarse sand and lie unutilized because cultivation of crops in these lands without adequate supply of water and manures in uneconomic.

The various classes of land are shown in Fig. 100, while their area in acres and percentage to the total area of the village are given in Table LXXVII.

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>519.48</td>
<td>83.65</td>
</tr>
<tr>
<td>Medium quality land (B)</td>
<td>70.12</td>
<td>11.28</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>2.50</td>
<td></td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>2.50</td>
<td>0.44</td>
</tr>
<tr>
<td>Land not available for</td>
<td>29.10</td>
<td>4.63</td>
</tr>
<tr>
<td>cultivation(20)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

20. Land not available for cultivation includes, settlement, grove, wells, cart-tracks, cemetery and water-bodies.
It will be seen from Table LXXVII that 84 per cent of the total area is covered by the good quality land, eleven per cent by the medium quality and less than one per cent by the poor quality lands while about five per cent is under non-agricultural uses.

Irrigation:

Irrigation in Meghrajpur is carried on by wells. At present there are ten wells, and all these wells are located in the good quality land (see Figs. 100 and 101). In the eastern part of the village where the soil is coarse sandy, there is no wells.

The area irrigated in the kharif season 1960 and rabi season 1960-61 is shown in Fig. 101. It will be seen from Table LXXV that in the kharif season the total rainfall was more than 25 inches and it was well distributed. Kharif crops except sugarcane were therefore irrigated. Table LXXVI reveals that there was no rainfall in November, while in December it was quite negligible. All the kharif crops except gram, were therefore irrigated.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 102 to 105. The mapping is based on the writer’s field work of the village.

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21. The local adage says: *Jaith bhuldaya - Kumba buldaya*. The meaning is: If there is a thundering and rain in the month of May, there will be a drought in the following rainy season.

22. The base map showing the fields and their areas was obtained from the Revenue Department of Mawana Tahsil of the Meerut district. The village was visited by the writer in the kharif season 1960, and the rabi season, 1960-61, and the use to which each field was being put was recorded on the base map. From these data Figs. 102 to 105 were prepared.
The following Table gives a summary of the proportions of the village lands devoted to various uses in 1960-61 (Fig. 102).  

**TABLE LXXVIII**  
Total Area of the Village 621.70

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>590.10</td>
<td>94.95</td>
</tr>
<tr>
<td>Waste land</td>
<td>2.50</td>
<td>0.44</td>
</tr>
<tr>
<td>Settlement</td>
<td>10.15</td>
<td>1.66</td>
</tr>
<tr>
<td>Pond</td>
<td>2.50</td>
<td>0.44</td>
</tr>
<tr>
<td>Road</td>
<td>15.45</td>
<td>2.46</td>
</tr>
<tr>
<td>Cemetery</td>
<td>1.00</td>
<td>0.17</td>
</tr>
</tbody>
</table>

**Total**  
| 621.70 | 100.00 |

It will be seen from Table LXXVIII that 95 per cent of the total area is cultivated, about five per cent is not available for cultivation while 25 acres or less than one per cent is unproductive.

In Table LXXIX an attempt has been made to show the numbers and sizes of plots, while their distribution is given in Fig. 102.

It will be seen from Table LXXIX that 54 per cent of the total number of plots are less than one acre in size and only 2 per cent are of more than four acres in area.

23. Road includes metalled roads and cart-tracks.
TABLE LXXIX
Total Number of Plots 550

<table>
<thead>
<tr>
<th>Size of Plot</th>
<th>Number of plots</th>
<th>Percentage of the total number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>300</td>
<td>54.55</td>
</tr>
<tr>
<td>1.01 to 2 acres</td>
<td>185</td>
<td>33.64</td>
</tr>
<tr>
<td>2.01 to 3 acres</td>
<td>40</td>
<td>7.28</td>
</tr>
<tr>
<td>3.01 to 4 acres</td>
<td>130</td>
<td>2.35</td>
</tr>
<tr>
<td>Above 4 acres</td>
<td>12</td>
<td>2.18</td>
</tr>
<tr>
<td>Total</td>
<td>550</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Land Utilization in the Kharif Season:

The use of land in the kharif season of 1960 is shown in Fig. 103. The area occupied by each crop is shown in Table LXXX. This Table shows that sugarcane which occupies 57 per cent of the cropped land is the major crop in kharif. The presence of well-drained light loamy soil, facilities of irrigation, means of transport are the 24 favourable factors for the cultivation of sugarcane. In the northern and eastern part of the village where the soil is sandy (Fig. 100) millet and fodder are sown. A significant feature of land use in this season is the high percentage of the cropped area devoted to fodder which indicates the concern of the cultivators for their cattle.

24. The local adage says: *Jisky ho tota malke won eikh boi gunalke* Mean: Those who are poor cultivators should sow sugarcane after following the good quality land, the practice will give them high yield of sugarcane and wealth.
About 70 acres or 12 per cent of the gross cultivated land in this season is fallow. The cultivation of green manuring crops like sun-hemp and dhaincha may be useful in building the fertility of the soil. Sun-hemp produces about 200 to 250 mounds of green matter excluding roots and adds about 60 to 70 lb of green material per acre within a short period of about seventy five days and adds to the soil about eighty pounds of nitrogen per acre. Sun-hemp may serve a dual purpose: the stalk may be used for fibre and for fuel and the rest of the plant as green manure. With adequate water supply the tops and leaves decompose within three to four weeks after flowering and the field is ready for the sowing of next crop in October.

**TABLE LXXX**

<table>
<thead>
<tr>
<th>Gross Cultivated land</th>
<th>...</th>
<th>590.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cropped land in the Kharif season</td>
<td></td>
<td>519.98</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross</th>
<th>Percentage of net cropped land</th>
<th>Total Gross land</th>
<th>Total net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>25.46</td>
<td>4.31</td>
<td>4.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulrush-millet</td>
<td>34.00</td>
<td>5.76</td>
<td>6.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td>15.56</td>
<td>2.64</td>
<td>3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mullet and bulrush</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td>75.22</td>
<td>85.36</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>300.37</td>
<td>50.90</td>
<td>57.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>4.06</td>
<td>0.68</td>
<td>0.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>159.47</td>
<td>23.64</td>
<td>26.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>70.12</td>
<td>11.89</td>
<td>-</td>
<td>22.89</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>590.10</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
LAND UTILIZATION
KHARIF-SEASON
1960
MEGHRAJPUR
SUGARCANE
COTTON
MAIZE
Millet
FODDER
FALLOW
WATERED
LAND
IRRIGATION-CHANNEL
POND
STREAM
WELL
SETTLEMENT
ROAD
Cemetery
M.31
Land Utilization in the Rabi Season:

The use of land in the rabi season of 1960-61 is shown in Fig. 104. The area occupied by each crop is shown in the following table.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of Gross Cultivated Land</th>
<th>Total Percentage of Gross Cultivated Land</th>
<th>Total Percentage of Net Cropped Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>246.62</td>
<td>41.83</td>
<td>73.03</td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>10.00</td>
<td>1.69</td>
<td>3.02</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>15.62</td>
<td>2.64</td>
<td>4.69</td>
<td></td>
</tr>
<tr>
<td>Peas and fodder</td>
<td>43.65</td>
<td>7.39</td>
<td>12.67</td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>22.19</td>
<td>34.76</td>
<td>6.59</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>12.81</td>
<td>2.17</td>
<td>2.17</td>
<td></td>
</tr>
<tr>
<td>Continual kharif crops</td>
<td>239.21</td>
<td>40.52</td>
<td>40.52</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>590.10</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>


26. Fodder includes millets mixed with pulses or millets mixed with guar.
MEGHRAJUR
LAND UTILIZATION
RABI - SEASON
1960-1961

WHEAT
BARLEY
PEAS
PULSES
FODDER
WELL
FALLOW
WASTE
SETTLEMENT
IRRIGATION-CHANNEL
CART-TRACK
ROAD
METALLIZED
Cemetery
WATER
STREAM

Fig 104
It will be seen from Table LXXXI that more than 93 per cent of the net cropped land in the rabi season is devoted to grain crops. Wheat is the major crop. It occupies 73 per cent of the cropped land. Other grain crops sown in this season are peas, barley, and fodder. Mixed cropping is the significant characteristic feature of the rabi season.

A comparison of Tables LXXX and LXXXI shows that the net cropped area in the rabi season is about three-fifths to that of the kharif season. The small area available for cultivation in the rabi season is mainly due to the fact that about 20 per cent of the gross cultivated area in the rabi season remains occupied by the continual kharif crops (sugarcane).

Double Cropped Land:

The total area cropped twice in the year of inquiry was 268.18 acres or 41 per cent of the gross cultivated land. The double cropped area is shown in Fig. 105.

A comparison of Figs. 100 and 105 shows that the extent of double cropped land is limited by the good quality land. The medium quality land which is less productive, is generally, not sown twice a year.

Land Use and Population:

Table LXXXII shows the totals of various classes of land as well as the per capita share of the villagers in these lands.

It will be seen from Table that per head of population share in the gross cultivated land is 0.90 acre, but in the kharif and rabi
MEHRRAJPUR
DOUBLE-CROPPED
1960-1961

SUGARCANE
COTTON
MILLET
MAIZE
FOODER
WHEAT
BARLEY
PULSES
FOSS
seasons this figure is reduced to 0.79 and 0.52 acre respectively in the kharif season the reduction in the per capita cultivated land is due to the practice of falling while in the rabi season an appreciable acreage of the cultivated land remains under continual kharif crops.

Table LXXXII further shows that taking the kharif and rabi crops together, the total of per capita share in the cultivated land is 1.31 acres.

**TABLE LXXXII**

<table>
<thead>
<tr>
<th>Total Population of the Village</th>
<th>655</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Area in Acres)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total area of the village</th>
<th>Total land available for cultivation</th>
<th>Net land in kharif season</th>
<th>Net land in rabi season</th>
<th>Total cultivated land (both kharif and rabi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>621.70</td>
<td>590.10</td>
<td>519.98</td>
<td>338.03</td>
<td>858.06</td>
</tr>
<tr>
<td>Land per head of Population</td>
<td>0.949</td>
<td>0.900</td>
<td>0.794</td>
<td>0.516</td>
</tr>
</tbody>
</table>
Potential Production Units:

Table LXXXIII shows the productivity ratings of various types of land. On the basis of productivity ratings an attempt has been made in Table LXXXIII to calculate the total number of P.F.U.'s, in the village of Meghrajpur.

**TABLE LXXXIII**

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in Acres</th>
<th>Average yield in lb.</th>
<th>Rating</th>
<th>Total number of P.F.U.'s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land</td>
<td>519.98</td>
<td>1300</td>
<td>1.25</td>
<td>650.00</td>
</tr>
<tr>
<td>Medium quality land</td>
<td>70.12</td>
<td>800</td>
<td>0.76</td>
<td>67.30</td>
</tr>
<tr>
<td>Poor quality land</td>
<td>2.50</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>592.60</strong></td>
<td>-</td>
<td>-</td>
<td><strong>717.30</strong></td>
</tr>
</tbody>
</table>

The above Table shows that in the village of Meghrajpur about 593 acres of land are cultivated and are equal to 717.30 P.F.U.'s. The productivity of good quality land is 1.25 P.F.U.'s per acre, while that of medium quality land is 0.76 P.F.U per acre.

The medium quality land which is left fallow in the kharif season, if cultivated twice a year with the help of additional irrigation facilities and adequate manures, a number of P.F.U.'s can be increased.
CHAPTER VIII

LAND UTILIZATION IN KURI

Location:

The village of Kuri lies in Hapur Tahsil of Meerut district. It is situated in 28° 48' N. lat., and 77° 46' E. long., and is bounded by the villages of Khaspur and Atara in the north, Pakharpur in the east, Kaili in the south and Gangadhi in the west.

The village of Kuri lies in an ill-drained plain, characterized by _usuq_ formations (Fig. 106). The _usuq_ lands are marked by highly irregular boundaries and are impregnated with incrustation of salts.

A metalled road and a route of the Northern Railway exist at a distance of about three furlongs and one mile respectively. The important grain market of Hapur which is accessible by the metalled road is four miles to the south of Kuri.

Climate:

No climatic data are recorded in the village. The data of rainfall for Hapur which is about four miles in the south, have therefore been given in Tables LXXXIV and LXXXV and may be taken as close approximations for this village.

Land Classification:

The soil of the area in which the village is situated is mainly clayey. On the basis of fertility and productivity (see page 106) the village fields have been classified and mapped in Fig. 107.

---

1. The data of rainfall for the kharif and rabi seasons of 1960-61 were obtained from the headquarters of Hapur Tahsil.
LOCATION OF THE VILLAGE KURI

- settlement
- lake
- Railway
- metalled road
- cart_track
- grove
- waste_land

Source: Survey of India map

The outline of Kuri has been drawn by the writer.

Fig. 106
### Table LXXXIV

**Kharif Season 1960 (Hapur)**

<table>
<thead>
<tr>
<th>Months</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the kharif season, 1960</td>
<td>0.48</td>
<td>12.50</td>
<td>12.50</td>
<td>0.12</td>
<td>4.44</td>
<td>29.84</td>
</tr>
<tr>
<td>Rainy days in kharif, 1960</td>
<td>2</td>
<td>10</td>
<td>11</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches.</td>
<td>3.36</td>
<td>8.17</td>
<td>6.91</td>
<td>3.97</td>
<td>1.64</td>
<td>23.92</td>
</tr>
</tbody>
</table>

### Table LXXXV

**Rabi Season 1960-61 (Hapur)**

<table>
<thead>
<tr>
<th>Months</th>
<th>Novem-</th>
<th>Decem-</th>
<th>Janu-</th>
<th>Febru-</th>
<th>March-</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the rabi season, 1960-61</td>
<td>-</td>
<td>-</td>
<td>1.38</td>
<td>0.60</td>
<td>1.00</td>
<td>2.98</td>
</tr>
<tr>
<td>Rainy days in rabi, 1960-61</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.11</td>
<td>0.37</td>
<td>0.92</td>
<td>1.11</td>
<td>0.54</td>
<td>3.05</td>
</tr>
</tbody>
</table>
The soil of the good quality land (A) is light clay. These lands yield two crops a year or are devoted to sugarcane. The medium quality lands are less productive than (A) and yield only one crop in either of the seasons. The poor quality lands consist of those lands which on account of the poverty of the soil and their high salinity, lie unutilized.

The following table gives a summary of the proportions of the various types of land while their distribution is mapped in Fig. 107.

**TABLE LXXXVI**

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in Acres</th>
<th>Percentage of the total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land A</td>
<td>194.76</td>
<td>71.51</td>
</tr>
<tr>
<td>Medium quality land B</td>
<td>59.00</td>
<td>21.66</td>
</tr>
<tr>
<td>Poor quality land C</td>
<td>8.50</td>
<td>3.12</td>
</tr>
<tr>
<td>Land not available for cultivation (2)</td>
<td>10.13</td>
<td>3.71</td>
</tr>
<tr>
<td>Total</td>
<td>272.39</td>
<td>100.00</td>
</tr>
</tbody>
</table>

It will be seen from the above table that 72 per cent of the total area consists of good quality land (A), 22 per cent is converted by medium quality and three per cent by poor quality lands.

2. Land not available for cultivation includes settlement, pond, road, wells and cemetery.
while nearly 4 per cent is not available for cultivation.

Irrigation:

Wells locally known as *rahat* are the main source of irrigation in Kuri. There are five wells utilized for irrigation. The area irrigated in the kharif and rabi seasons of 1960-61 is shown in Fig. 108. It will be seen from Table LXXXIV that in the first three months of the kharif season (i.e. June to August) the amount of rainfall was 25 inches and was spread over a reasonable number of days. Irrigation for the kharif crops in these months was, therefore, not provided. In the month of September there was a long break in rains, so maize and sugarcane were irrigated in this month. Table LXXXV shows that there was no rainfall in the months of November and December, therefore all the rabi crops except grain were irrigated.

Land Utilization:

The use of land in the kharif season of 1960-61 is shown in Figs. 109 to 112, which are based on the writer's field work of the village. The area occupied by each crop in this season is shown in Table LXXXVII.

---

3. The map showing the fields and their areas in *bighas* was obtained from the headquarters of Napur Tahsil in the district of Meerut. The village was visited by the writer in the kharif season 1960 and the rabi season 1960-61 and the use to which each field was being put was recorded on the base map. From these data Figs. 109 to 112 were prepared.
KURI
LAND UTILIZATION
1960-1961

[Map of Kuri with various land use symbols]

- CULTIVATED LAND
- WASTE LAND
- SETTLEMENT
- ROAD (UNMETALLED)
- CART-TRACK
- WELL
- POND
TABLE LXXXVII

Total Area of the Village (Area in Acres) 272.39

<table>
<thead>
<tr>
<th>Use of Land</th>
<th>Area in Acres</th>
<th>Percentage of the total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>253.76</td>
<td>93.17</td>
</tr>
<tr>
<td>Waste land</td>
<td>3.50</td>
<td>3.12</td>
</tr>
<tr>
<td>Settlement</td>
<td>6.56</td>
<td>2.40</td>
</tr>
<tr>
<td>Pond</td>
<td>2.37</td>
<td>0.87</td>
</tr>
<tr>
<td>Cart-track</td>
<td>1.00</td>
<td>0.37</td>
</tr>
<tr>
<td>Cemetery</td>
<td>0.20</td>
<td>0.07</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>272.39</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It will be seen from the above Table that 93 per cent of the total area in the village is cultivated, three per cent is unproductive, while four per cent is under non-agricultural occupations.

The size and number of plots are given in Table LXXXVIII and their distribution is shown in Fig. 109.

It will be seen from Table LXXXVIII that 83 per cent of the total number of plots are less than one acre, 13 per cent between one and two acres and only 4 per cent are above 2 acres in area.

The small size of plots is one of the main hindrances in the introduction of modern agricultural implements. Consolidation of
KURI
LAND UTILIZATION
KHARIF SEASON 1960

SUGARCANE
MAIZE
BULRUSH - MILLET
PULSES
FODDER
COTTON
FALLOW
SETTLEMENT
ROAD (UNMETALLED)
CART - TRACK
CEMETERY
POND
WELL
**TABLE LXXXVIII**

Total number of plots 400

<table>
<thead>
<tr>
<th>Size of plots</th>
<th>Number of plots</th>
<th>Percentage of the total number of plots.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below one acre</td>
<td>331</td>
<td>82.75</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>53</td>
<td>13.25</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>16</td>
<td>4.00</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Holdings which has been initiated in parts of Upper Ganges-Yamuna Doab will go a large way in overcoming the drawbacks of small size of fields and scattered holdings.

**Land Utilization in the Kharif Season:**

The use of land in the kharif season of 1960 is shown in Fig. 110. The area occupied by each crop is given in Table LXXXIX.

It will be seen from Table LXXXIX that sugarcane is the principal crop and occupies nearly 64 per cent of the cropped land.

Grain crops occupy 20 per cent of the sown area. Among grain crops maize, pulses and Jhurush-millet are important.

**Land Utilization in the Rabi Season:**

The use of land in the rabi season, 1960-61 is shown in Fig. 111. The area occupied by each crop in this season is given in Table LXXX.
### TABLE LXXXIX

Gross Cultivated land: 253.76

Net Cropped land in the Kharif Season: 191.51

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Gross Cultivated Land (Acres)</th>
<th>Percentage of Gross Cultivated Land (%)</th>
<th>Total Percentage of Gross Cultivated Land (%)</th>
<th>Total Percentage of Net Cropped Land (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>21.63</td>
<td>8.23</td>
<td>10.93</td>
<td>27.07</td>
</tr>
<tr>
<td>Bulrush-millet and pulses</td>
<td>8.00</td>
<td>3.14</td>
<td>4.18</td>
<td></td>
</tr>
<tr>
<td>Bulrush-millet</td>
<td>12.62</td>
<td>4.97</td>
<td>6.58</td>
<td></td>
</tr>
<tr>
<td>Millet and fodder</td>
<td>10.31</td>
<td>4.06</td>
<td>5.38</td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td>55.00</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>121.65</td>
<td>47.96</td>
<td>63.54</td>
<td>72.93</td>
</tr>
<tr>
<td>Cotton</td>
<td>1.50</td>
<td>0.58</td>
<td>0.81</td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>16.40</td>
<td>6.46</td>
<td>8.58</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>62.49</td>
<td>24.60</td>
<td>24.60</td>
<td></td>
</tr>
</tbody>
</table>

Total: 253.76 100.00 100.00 100.00 100.00
KURI LAND UTILIZATION RABI - SEASON 1960-1961

WHEAT
PEAS
BARLEY
FOODER
FALLOW
CONTINUAL-KHARIF CROPS
SETTLEMENT
CEMETERY
CART-TRACK
ROAD - UNMETALLED
POND
WELL
TABLE LXXX

Gross Cultivated land.          ... 253.76
Net Cropped land in the Rabi Season 116.58

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>102.53</td>
<td>40.79</td>
<td>38.80</td>
<td>45.12</td>
<td>93.23</td>
</tr>
<tr>
<td>Peas</td>
<td>6.75</td>
<td>2.67</td>
<td>5.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas and Barley</td>
<td>2.84</td>
<td>1.11</td>
<td>2.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and Grain</td>
<td>0.81</td>
<td>0.32</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>0.59</td>
<td>0.23</td>
<td>0.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>2.06</td>
<td>0.82</td>
<td>1.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>20.00</td>
<td>7.88</td>
<td>7.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continual Kharif crops</td>
<td>117.18</td>
<td>46.18</td>
<td>46.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>253.76</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The above Table reveals that 93 per cent of the cropped land in the rabi season is devoted to the grain crops. Wheat is the major crop and is sown in 89 per cent of the net cultivated area.
Other grain crops sown in this season are peas, barley and grain, but these crops are generally sown in combination to each other.

A comparison of Figs. 110 and 111 shows that the cropped area in the rabi season is remarkably low as compared to that of the kharif season. The striking reduction in area is mainly because of the sugarcane which continues to occupy the field in the rabi season.

Double Cropped Land:

The total of the land cropped twice in the year was 54.33 acres or 20 per cent of the gross cultivated land (Fig. 112). Double cropping can be extended on the medium quality lands by cultivating early maturing leguminous crops in the kharif season.

Land Use and Population:

Table LXXVI shows the totals of various categories of lands in the village and the per capita share of villages in these lands.

It will be seen from Table LXXVI that the per capita share of cultivated land in the village is 0.39 acre, but in the kharif and rabi seasons the per capita cultivated land is reduced to 0.67 and 0.41 respectively. The decrease in the per capita share in the kharif season is due to the practice of fallowing of the medium quality land, while in the rabi season the reduction is due to the continual kharif crops.

This Table further shows that the per capita double cropped land in the village is 0.19 acre and thus the per capita total
TABLE LXXXI

Total Population of Kuri. 285
(Area in Acres)

<table>
<thead>
<tr>
<th>Total Area available</th>
<th>Total Land in Village</th>
<th>Net Land for Cultivation</th>
<th>Net Cropped Land in Rabi Season</th>
<th>Total Double Cropped Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>272.39</td>
<td>253.76</td>
<td>191.51</td>
<td>116.50</td>
<td>308.09</td>
</tr>
</tbody>
</table>

Land per head of population:

|                      | 0.955      | 0.89       | 0.67       | 0.41       | 1.08       | 0.19       |

Cultivated land is 1.08. In other words, the amount of land supporting one person in the village is 1.08 acres.

245 persons (about 86 per cent of the total population) in Kuri village belong to primary rural group and are exclusively dependent upon land while 14 per cent of the population is secondary rural which serves the primary rural population and depends upon them.

Potential Production Units:

On the basis of productivity ratings of each type of land, the potential production units have been computed in Table VIIIC.
TABLE VIIIC

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in Acres</th>
<th>Average yield per lb</th>
<th>Rating</th>
<th>Total number of P.P.U.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land</td>
<td>191.27</td>
<td>1100</td>
<td>1.26</td>
<td>241.00</td>
</tr>
<tr>
<td>Medium quality land</td>
<td>62.49</td>
<td>750</td>
<td>0.85</td>
<td>43.00</td>
</tr>
<tr>
<td>Poor quality land</td>
<td>8.50</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>262.26</strong></td>
<td>-</td>
<td>-</td>
<td><strong>284.00</strong></td>
</tr>
</tbody>
</table>

The above Table shows that in kuri about 262.26 acres of land are in the present state of technological developments equal to 284 P.P.U.s. The productivity of good quality land is 1.26 P.P.U. per acre, and that of medium quality land is 0.85 P.P.U., while the poor quality land is quite unproductive. The reclamation of poor quality land and addition supplies of manures on the medium and good quality lands are necessary to obtain increased numbers of P.P.U.s.
LAND UTILIZATION IN CHAINSA

Location:

The village of Chainsa is located in 28° 32' N. lat., and 77° 41' E. long., in Sikandrabad Tahsil of the B Mulandshahr district. It is bounded by the villages of Kalaunda in the north, Lather in the east, Dayanagar and Senthli in the south and Chohlas in the west (Fig. 113).

The village is situated at a height of 672 feet above sea level, in an ill-drained plain of clayey soil. The area in which Chainsa lies, is characterized by usar formations (Fig. 113). There are two seasonal streams (locally called as khallang) which traverse the village from west and south towards east. In the wet monsoon months these seasonal streams provide an outlet for draining the surplus water. The south-western part of Chainsa is relatively low-lying, gets submerged under water during heavy rains.

The village is not served by any noteworthy means of communications. There is a cart-track which joins the village with an unmetalled-road, running between the town of Dadri and the village of Kalaunda. During the rainy season when the rainfall is heavy the clayey soil becomes sticky and renders communication difficult.

1. The height is that of Sikandrabad Tahsil which lies about six miles to the south east of the village. Since the actual height of the village has not been recorded, it may be taken to be approximately the same as that of Sikandrabad for both (the village and Sikandrabad), lie in a level plain.
LOCATION OF THE VILLAGE CHAINSA

Source: Survey of India
Map No 53 H/10

The outline of Chainsa has been drawn by the writer.
Climate:

No climatic data are recorded in the village. The data of rainfall recorded at the headquarters of Tahsil Sikandrabad, about six miles to the south east of the village, have therefore been given in Tables LXXXIII and LXXXIV.

TABLE LXXXIII

Kharif Season 1960 (Sikandrabad)

<table>
<thead>
<tr>
<th></th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>October</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the kharif season 1960.</td>
<td>1.47</td>
<td>7.26</td>
<td>13.04</td>
<td>1.00</td>
<td>3.31</td>
<td>26.08</td>
</tr>
<tr>
<td>Rainy days in kharif, 1960.</td>
<td>2</td>
<td>8</td>
<td>12</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>2.62</td>
<td>7.18</td>
<td>7.11</td>
<td>4.65</td>
<td>0.53</td>
<td>22.09</td>
</tr>
</tbody>
</table>

TABLE LXXXIV

Rabi Season 1960-61 (Sikandrabad)

<table>
<thead>
<tr>
<th></th>
<th>November</th>
<th>December</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the rabi season, 1960-61</td>
<td>-</td>
<td>-</td>
<td>0.69</td>
<td>0.75</td>
<td>0.36</td>
<td>1.78</td>
</tr>
<tr>
<td>Rainy days in rabi, 1960-61</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.02</td>
<td>0.42</td>
<td>0.75</td>
<td>0.77</td>
<td>0.47</td>
<td>2.43</td>
</tr>
</tbody>
</table>

5. The data of rainfall for the kharif and rabi season of 1960-61 were obtained from the headquarters of Sikandrabad Tahsil.
Land Classification:

The soil of the area in which the village is situated is clayey (Fig. 39). On the basis of fertility and productivity (see page 106) the village fields have been classified in Fig. 114.

The soil of the good quality land (A) is light clay, and these lands yield two crops in a year.

The soil of the medium quality land (B1) is sandy clay and is less productive than (A). These lands are left fallow in the kharif season or are devoted to an early fodder crop. The soil of the (B1) lands is heavy clay and these lands are entirely devoted to transplanted rice.

The soil of the poor quality land is unproductive. On account of the accumulation of salts at or near the surface. The main cause of salt formation is, because the constant flooding of the surface causes the soil particles to settle to a condition of close packing and to produce a gummy substance known as 'Colloids.' The supply of oxygen from the air is cut off and a new soil flora which obtains its oxygen from substratum is established so that the easiest source of oxygen - the nitrates - is soon exhausted. The final result of the chemical change is the accumulation of 6 soluble salts.

Table VC shows the various classes of land; while their distribution is shown in Fig. 114.

It will be seen from Table LXXXXV that about 63 per cent of the total area is covered by the good quality land, 17 per cent

TABLE LXXXXV

Total Area of the Village ... 876.90

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>548.10</td>
<td>62.53</td>
</tr>
<tr>
<td>Medium quality land (3I)</td>
<td>144.80</td>
<td>16.50</td>
</tr>
<tr>
<td>Medium quality land (3II)</td>
<td>10.00</td>
<td>1.13</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>133.46</td>
<td>14.04</td>
</tr>
<tr>
<td>Land not available for Cultivation (F)</td>
<td>50.54</td>
<td>5.80</td>
</tr>
<tr>
<td>Total</td>
<td>876.90</td>
<td>100.00</td>
</tr>
</tbody>
</table>

by the medium quality and 14 per cent by the poor quality lands, while about 6 per cent is not available for cultivation.

Irrigation:

Canal and wells are the important sources of irrigation in the village. A canal distributary of the Upper Ganga Canal traverses the northern part of Chainsa and irrigates about 46 per cent of the cultivated land. In those parts, where, owing to high level of the land watering by canal is not possible, wells are utilized for irrigation.

The area irrigated in the kharif and rabi seasons of 1960-61 is shown in Fig. 115. It will be seen from Table LXXXXIII that

7. Land not available for cultivation includes settlement, groves, cart-tracks, wells, drains, cemetery and Canal distributary.
the total rainfall in the first three months of the kharif season was over 22 inches. None of the kharif crop except sugarcane and cotton were therefore irrigated. Table LXXXIV shows that there was no rainfall in November and December, while in January and February it was below the normal rainfall. All the rabi crops, except gram and lentil, were therefore irrigated.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 116 to 119. The mapping is based on the writer's field work of the village.

**TABLE LXXXVI**

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>702.90</td>
<td>30.15</td>
</tr>
<tr>
<td>Waste land</td>
<td>123.46</td>
<td>14.04</td>
</tr>
<tr>
<td>Settlement</td>
<td>18.83</td>
<td>2.22</td>
</tr>
<tr>
<td>Grove</td>
<td>1.16</td>
<td>0.13</td>
</tr>
<tr>
<td>Cart-track</td>
<td>1.17</td>
<td>0.13</td>
</tr>
<tr>
<td>Cemetery</td>
<td>2.38</td>
<td>0.26</td>
</tr>
<tr>
<td>Water-bodies</td>
<td>27.00</td>
<td>3.07</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>876.90</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

8. The base map showing the fields and their areas in bighas was obtained from the Tahsil headquarters of Sikandrabad. The village was visited by the writer in the kharif and rabi seasons of 1960-61 and the use to which each field was being put was recorded. On the base map. From these data Figs. 115 to 119 were prepared.

9. Water-bodies includes ponds, canal distributary and the seasonal streams.
Table LXXXVI shows that 80 per cent of the total area is arable and about 6 per cent is under non-agricultural occupations, while 14 per cent (about 124 acres) is unproductive. There are two major blocks of waste land which lie in the south-western and northern portions of the village. In the rainy season these lands are covered with patches of grass while in the hot weather season they are covered with crust of saline efflorescence.

Besides the methods of reclamation of waste land described on page 74-75, a practical method of reclamation is that the waste land should be enclosed with earth embankments on contour lines, so as to hold as much water as possible. In the enclosed field indigenous grasses should be sown. These grasses afterwards should be ploughed in the field. By doing so the texture of the soil will be improved and the land will be available for the sowing of rice.

The following Table shows the size and numbers of the plots, while their distribution is mapped in Fig. 116.

**TABLE III.C**

| Total Number of Plots | ... 1138 |

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>No. of plots</th>
<th>Percentage of the total Number of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>950</td>
<td>84.00</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>160</td>
<td>14.00</td>
</tr>
<tr>
<td>above 2 acres</td>
<td>24</td>
<td>02.00</td>
</tr>
<tr>
<td>Total</td>
<td>1138</td>
<td>100.00</td>
</tr>
</tbody>
</table>

It will be seen from Table IIIC that 950 plots (or 84 per cent of the total number of plots) are less than one acre in area, 14 per cent are between 1 and 2 acres and only 2 per cent are more than two acres in size.

Land Utilization in the Kharif Season:

The use of land in the kharif season is mapped in Fig. 117. The area occupied by each crop in this season is given in the following Table.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of Gross Cultivated Land</th>
<th>Percentage of Net Cropped Land</th>
<th>Total Gross Cultivated Land</th>
<th>Total Net Cropped Land in the Kharif Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet</td>
<td>112.75</td>
<td>16.09</td>
<td>20.21</td>
<td>702.90</td>
<td>558.10</td>
</tr>
<tr>
<td>Maize</td>
<td>87.53</td>
<td>12.40</td>
<td>15.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>8.12</td>
<td>1.15</td>
<td>1.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet and Pulses</td>
<td>51.75</td>
<td>7.35</td>
<td>9.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millets and fodder</td>
<td>7.14</td>
<td>1.01</td>
<td>1.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>9.22</td>
<td>1.31</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>15.46</td>
<td>2.20</td>
<td>2.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>266.13</td>
<td>37.89</td>
<td>47.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>144.80</td>
<td>20.59</td>
<td>20.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>702.90</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>
It will be seen from Table IIIC that 48 per cent of the cropped land is occupied by grain crops and 52 per cent by sugarcane, fodder and cotton. Millets, maize and pulses are the major crops of this season. Maize is sown generally, with the help of irrigation on the well drained soil, in the month of May. In the month of July when the crop grows three to four feet in height, it is harvested and is given to animals. Maize plants have relatively rapid growth and constitute nutritious fodder. The dry straw of maize is, however, inferior to that of millet, and therefore, stronger of green maize fodder is more valuable. A good way for storing the green maize fodder is by making it into silage.

Table IIIC further shows that 47 per cent of the sown area is occupied by sugarcane and 2 per cent is under cotton. Cotton locally called as kapas is consumed locally, while three-fourths of sugarcane yield is exported.

Land Utilization in the Rabi Season:

The use of land in the rabi season of 1960-61 is shown in Fig. 118. The area occupied by each crop in this season is given in Table 1C.

It will be seen from Table 1C that 37 per cent of the cropped land is occupied by grain crops and 13 per cent by fodder crops.

11. The method of preparing silage is to store pieces of green stems and leaves in a ditch which is later on filled with earth. This process helps the fodder (silage) to be maintained in the nutritious form.
CHAINSA LAND UTILIZATION RABI SEASON 1960-1961
TABLE 10

Gross Cultivated land. \[\ldots\] 702.90

Net Cropped land in the Rabi Season 515.00

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grain Crops</strong></td>
<td></td>
<td></td>
<td>61.89</td>
</tr>
<tr>
<td>Wheat</td>
<td>151.50</td>
<td>21.55</td>
<td>30.30</td>
</tr>
<tr>
<td>Peas</td>
<td>176.00</td>
<td>25.57</td>
<td>35.20</td>
</tr>
<tr>
<td>Barley</td>
<td>81.50</td>
<td>11.60</td>
<td>16.30</td>
</tr>
<tr>
<td>Wheat and barley</td>
<td>19.13</td>
<td>2.72</td>
<td>3.83</td>
</tr>
<tr>
<td>Wheat and gram</td>
<td>3.31</td>
<td>0.47</td>
<td>0.65</td>
</tr>
<tr>
<td>Gram</td>
<td>1.00</td>
<td>0.14</td>
<td>0.20</td>
</tr>
<tr>
<td>Pulse (lentil)</td>
<td>2.38</td>
<td>0.34</td>
<td>0.48</td>
</tr>
<tr>
<td><strong>Other Crops</strong></td>
<td></td>
<td></td>
<td>9.25</td>
</tr>
<tr>
<td>Oat and fodder</td>
<td>45.00</td>
<td>6.40</td>
<td>9.00</td>
</tr>
<tr>
<td>Barseem</td>
<td>20.18</td>
<td>2.88</td>
<td>4.04</td>
</tr>
<tr>
<td>Fallow</td>
<td>55.15</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td><strong>Continual kharif crops</strong></td>
<td>167.75</td>
<td>23.86</td>
<td>23.86</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>702.90</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Wheat and peas are the major crops. Wheat occupies 30 per cent of the cropped area as a sole crop, while over 5 per cent...
is cultivated in combinations with barley and gram. About 35 per cent of the sown area was devoted to peas.

Table 10 further shows that peas occupy greater area than that of barley and gram. On the clayey soil the yield of barley is less as compared to that of peas, while the crop of gram, when cultivated on the clayey soil, shows a poor growth, owing to the poor aeration of the soil.

Double Cropped Land:

Fig. 119 shows the area cropped twice in the year of 1960-61. About 335 acres (or 27 per cent of the gross cultivated land was sown twice in the year. The double cropped land, however, can be increased on the medium quality land (B1) (which occupies 17 per cent of the total area) by cultivating green manure and early fodder crops in the kharif season.

Table C shows the totals of various categories of lands in Chausa and the per capita share of the villagers in these lands. The Table shows that the per capita cultivated land available in Chausa is 0.50 acre, but in the kharif and rabi seasons the per capita cultivated land is reduced to 0.40 and 0.35 acre respectively. The reduction in the per capita share in the kharif season is due to the falling practice while in the rabi season the reduction is caused by the continual kharif crops, which occupy the land for the part or whole of the rabi season.

Table C further shows that the per capita land cropped twice in the year is 0.25 acre, the total of per capita gross cultivated
TABLE C

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Area</th>
<th>Total Cultivated</th>
<th>Net Cultivated</th>
<th>Total Double</th>
<th>Double Cultivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Cropped of the Village Land</td>
<td>876.90</td>
<td>702.90</td>
<td>558.10</td>
<td>1058.10</td>
<td>355.20</td>
</tr>
<tr>
<td>Cultivated Land for Kharif Rabi Season</td>
<td>0.62</td>
<td>0.50</td>
<td>0.40</td>
<td>0.75</td>
<td>0.25</td>
</tr>
<tr>
<td>Cultivated Land for Rabi Season</td>
<td>0.50</td>
<td>0.40</td>
<td>0.35</td>
<td>0.75</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Land per head of population: 0.75 acre. In other words, the amount of land supporting one person in Chainsa is 0.75 acre.

In this village, 1,130 persons (about 80 per cent of the total population) belong to the primary rural group and are exclusively dependent upon land, while 20 per cent is secondary rural and serves the primary rural population and thus indirectly depends upon land.

Potential Production Units:

Table CI shows the productivity ratings of different types of land. On the basis of productivity ratings, an attempt has been made in the Table CI to estimate the total number of P.R.U's in the village of Chainsa. Table CI shows that in Chainsa about 716 acres of cultivated land are equal to 710.22 P.R.U's. The productivity of the good quality land (A) is 1.25 P.R.U's per acre and that of
<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in Acres</th>
<th>Average Yield</th>
<th>Rating</th>
<th>Total Number of P.P.U.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>519.98</td>
<td>1250</td>
<td>1.25</td>
<td>650.00</td>
</tr>
<tr>
<td>Medium quality land (BI)</td>
<td>70.12</td>
<td>750</td>
<td>0.75</td>
<td>52.60</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>2.50</td>
<td>650</td>
<td>0.65</td>
<td>1.62</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>123.46</td>
<td>50</td>
<td>0.05</td>
<td>6.00</td>
</tr>
<tr>
<td>Total</td>
<td>716.06</td>
<td>-</td>
<td>-</td>
<td>710.22</td>
</tr>
</tbody>
</table>

The medium quality BI and BII land is 0.75 and 0.65 P.P.U. per acre respectively, while the productivity of the poor quality land is very low and 123 acres of land are equal to only 6 P.P.U.s. In this village if waste land is reclaimed and the productivity of medium quality increased to the level of good quality land, a number of P.P.U.s can be added in the existing P.P.U.s.
LAND UTILIZATION IN MOHAMMADPUR-GUJAR

Location:

The village of Mohammadpur-Gujar is situated in 28° 29' N. lat., and 77° 35' E. long., in Sikandrabad Tahsil of Bulandshahr district. It is bounded by the villages of Dhanari and Usmanpur in the east, Dongarpur in the south and Dankaur in the north and west (Fig. 120).

Mohammadpur-Gujar lies in a lowlying plain about two miles to the east of Dankaur, at a height of 659 feet above sea level. The khadar of Yamuna stretches to the west of Dankaur and is characterised by extensive waste land, swamps, backwaters and lakes. The khadar tract is liable to inundations and in the years of exceptionally heavy rains the area is submerged under water.

It will be seen from Fig. 120 that Mohammadpur-Gujar lies close to the metalled road that runs from the town of Dankaur to Bilsapur. In the south and west, Mohammadpur-Gujar, with the neighbouring villages is connected by cart tracks. During the rainy season, when the khadar land submerged under water the village remains isolated from the south and west, and the metalled road provides the only outlet to the markets.

Climate:

No climatic data are recorded in the village. The data of rainfall recorded at Dankaur, about two miles to the west of the village, have

12. The height is that of Dankaur, which is within the distance of two miles to the west of the village. Since the actual height of Mohammadpur-Gujar has not been recorded, it may be taken to be approximately, the same as that of Dankaur, for both, the village and the town of Dankaur, lie in an apparently level plain.
LOCATION OF THE VILLAGE MOHAMMADPUR GUJAR

The outline of Mohammadpur gujar has been drawn by the writer.

Source: - survey of India map

Fig. 110
therefore been given in Tables CII and CIII and may be taken as the close approximation for this village.

TABLE CII

KHARIF SEASON 1960 (DANKAUR)

<table>
<thead>
<tr>
<th>M O N T H S</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td></td>
</tr>
<tr>
<td>September</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td></td>
</tr>
</tbody>
</table>

| Rainfall in inches in the kharif season, 1960. | 1.43 8.27 10.02 3.00 2.13 24.85 |
| Rainy days in kharif season, 1960.             | 2 9 10 5 3 |
| Average rainfall in inches.                    | 2.46 7.58 7.74 4.53 0.42 22.73 |

TABLE CIII

RABI SEASON 1960-61 (DANKAUR)

<table>
<thead>
<tr>
<th>M O N T H S</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td></td>
</tr>
<tr>
<td>January</td>
<td></td>
</tr>
<tr>
<td>February</td>
<td></td>
</tr>
<tr>
<td>March</td>
<td></td>
</tr>
</tbody>
</table>

| Rainfall in inches in the rabi season, 1960-61 | - - 0.70 0.40 0.30 1.40 |
| Rainy days in rabi, 1960-61                    | - - 2 2 1 |
| Average rainfall in inches.                    | 0.03 0.31 0.50 0.60 0.40 1.84 |

13. The rainfall data of the kharif and rabi seasons (1960-61) were obtained from the rainfall measuring Station of Dankaur.
Land Classification:

The soil of the area where the village is located is inferior clay to poor sandy clay. On the basis of fertility and productivity (see page 106) the village fields have been classified and mapped in Fig. 121.

The soil of the good quality land is cultivated to obtain two grain crops a year or is devoted to sugarcane.

The soil of medium quality land is less productive than (A) It is left fallow in the kharif and cropped in the following rabi season. The soil of (BII) lands is heavy clay and is reserved for rice cultivation.

The poor quality land (C) consists of those clays which are unproductive on account of the presence of injurious salts in their soils.

The distribution of various classes of land is shown in Fig. 121, while their area and percentage to the total area is given in Table CIV.

Table CIV shows that 59 per cent of the total area consists of good quality land, 26 per cent of medium quality and 10 per cent is unproductive, while 4 per cent is not available for cultivation.

Irrigation:

Irrigation in the village is carried on by canal and wells. Water is lifted from the wells by rahaq and by chadag. The northeastern part of the village is irrigated mainly, by a distributary of Upper Ganga-Canal. In the southern and western parts wells
TABLE CIV

Total Area of the Village 515 Acres

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in Acres</th>
<th>Percentage of the total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>305.20</td>
<td>59.25</td>
</tr>
<tr>
<td>Medium quality land (3I)</td>
<td>131.80</td>
<td>25.59</td>
</tr>
<tr>
<td>Medium quality land (3II)</td>
<td>2.00</td>
<td>0.39</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>55.60</td>
<td>10.80</td>
</tr>
<tr>
<td>Land not available for cultivation (14)</td>
<td>20.20</td>
<td>3.97</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>515.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

constitute the principal source of irrigation.

The area irrigated in the kharif and rabi seasons of 1960-61 is shown in Fig. 122. It will be seen from Table CII that rainfall in the kharif season was about 25 inches and was well distributed. Therefore, none of the crops in the kharif season except sugarcane, cotton and early fodder crop was irrigated. Table CIII shows that there was no rainfall in the months of November and December, are

14. Land not available for cultivation includes settlement, wells, ponds and cart-tracks.
all the rabi crops except gram and rapessed were, therefore, irrigated. It may, however, be noted that in the years of deficient rainfall or in case of late arrival of monsoon, when the necessity for irrigation is greatest, the existing wells used for irrigation are not adequate to meet the demand. In such years, the sugarcane crop is adversely affected. Therefore, drilling of tube-wells or more wells in the village is highly desirable.

Land Utilization:

The land use of the village in 1960-61 is shown in Figs. 125 to 126 which are based on the writer’s field work of the village.

The following Table gives a summary of the proportions of the village lands devoted to various uses in 1960-61, Fig. 126.

<table>
<thead>
<tr>
<th>Use of Land</th>
<th>Area in Acres</th>
<th>Percentage of the total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>439.00</td>
<td>85.24</td>
</tr>
<tr>
<td>Waste land</td>
<td>55.30</td>
<td>10.79</td>
</tr>
<tr>
<td>Settlement</td>
<td>9.30</td>
<td>1.80</td>
</tr>
<tr>
<td>Cart track</td>
<td>10.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Pond</td>
<td>0.90</td>
<td>0.17</td>
</tr>
</tbody>
</table>

| Total         | 515.00        | 100.00                       |

15. The base map showing the fields and their areas in bighas was obtained from the Revenue Department of Sikandarabad Tahsil. The village was visited by the writer in the kharif 1960 and in the rabi season 1960-61, and the use to which each field was being put was recorded on the base map. From these data Figs. 125 to 126 were prepared.
It will be seen from Table CV that 85 per cent of the total area of the village is cultivated and three per cent is under non-agricultural occupations, while about eleven per cent (nearly 56 acres) is unproductive. Table CV further shows that no portion of the village land is occupied by groves which are often the source of fuel supply. In the absence of fire wood, the practice of burning cattle dung is common in the village. Reclamation of the waste land for the purpose of establishing groves, therefore needs investigation.

Table CVI gives the number and size of different fields while Fig. 123 shows their distribution.

**Table CVI**

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Total No. of plots</th>
<th>Percentage of total No. of plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>638</td>
<td>87.2</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>86</td>
<td>11.7</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>3</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>732</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It will be seen from the above Table that the size of the fields in general, is very small. The fragmentation and subdivision of holdings has their origin in a desire to provide an automatic method of securing a mathematically accurate partition of
a holding amongst the heirs. Thus if a father had four sons and he dies leaving four isolated fields of one acre each, the sons will not prepare to take one field each but one fourth of each field. So that each acre will be divided into four equal parts. This happens specially when lands are of different qualities and are situated in different localities. Thus fragmentation is accentuated by the expansion of cultivation over the waste, by purchase and sales, and by extinction of families in default of direct heirs and division of their property amongst a large number of distant relatives.

Land Utilization in the Kharif Season:

The use of land in the kharif season 1960 is shown in Fig. 124. The area occupied by each crop is shown in Table CVII. It will be seen from this Table that seven-tenths of the net cropped land in the kharif season is devoted to grain crops. Millet, maize and bulrushmillet are the major crops grown in this season.

It is significant that the acreage under sugarcane cultivation (i.e. 15 per cent of the cropped land) is fairly low in Mohammadpur-Gujar village as compared to the rest of the selected villages. One of the reasons of low acreage under cane cultivation is the problem of marketing of the crop as there is no sugar factory and sugar-mandi (market) in the area where the village is situated; and if raw sugar (jaggery) is sold in a distant market it is not remunerative. Secondly, the soil, being poor, does not give good

MOHAMMADPUR GUJAR LAND UTILIZATION

KHARIF SEASON 1960

MAIZE
MILLET
RICE
BULRUSH
PULSES
COTTON
SUGARCANE
FODDER
FALLOW
SETTLEMENT
CART-TRACK
WASTE LAND
POND
WELL
IRRIGATION CHANNEL
TABLE CVII

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of Gross Cultivated Land</th>
<th>Percentage of Net Cropped Land</th>
<th>Total Percentage of Gross Cultivated Land</th>
<th>Total Percentage of Net Cropped Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>41.94</td>
<td>9.55</td>
<td>13.69</td>
<td></td>
<td>64.57</td>
</tr>
<tr>
<td>Millet</td>
<td>24.03</td>
<td>5.47</td>
<td>7.87</td>
<td></td>
<td>69.58</td>
</tr>
<tr>
<td>Rice</td>
<td>1.47</td>
<td>0.36</td>
<td>0.49</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Bulrush-millet</td>
<td>1.19</td>
<td>0.27</td>
<td>0.38</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Pulses</td>
<td>0.47</td>
<td>0.10</td>
<td>0.15</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Millet and Pulses</td>
<td>44.84</td>
<td>10.13</td>
<td>14.17</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>46.37</td>
<td>10.68</td>
<td>15.35</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Cotton</td>
<td>6.09</td>
<td>1.38</td>
<td>1.65</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Fodder</td>
<td>41.11</td>
<td>9.37</td>
<td>13.42</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Fallow</td>
<td>131.80</td>
<td>30.00</td>
<td>-</td>
<td></td>
<td>48.57</td>
</tr>
<tr>
<td>Total</td>
<td>439.00</td>
<td>100.00</td>
<td>100.00</td>
<td></td>
<td>100.00</td>
</tr>
</tbody>
</table>
yield, while maize which occupies 14 per cent of the cropped land matures in September and enables the cultivator to grow a rabi crop on the same land.

Fodder is also an important crop of the kharif season. It occupies 13 per cent of the net cropped land. The high percentage of the fodder is because of the gowals, who by tradition keep dairy cattle and sell milk and clarified butter (locally known as shee) to the market of Dankaur and Bilaspur towns.

It will be seen from Table CVII that 30 per cent (132 acres) of the total cultivated land, in the year of inquiry was fallow in the kharif season. The fallow land, however, can be devoted to leguminous plants like pulses or to the green manuring crops.

Land Utilization in the Rabi Season:

The use of land in the rabi season 1960-61 is shown in Fig. 125. The area occupied by each crop in this season is given in Table CVIII.

A comparison of Figs. 124 and 125 reveals that the area cultivated in the rabi season is greater than that in the kharif season. One of the reasons is that about one third of the land in the village is covered by the medium quality, which is left fallow in the kharif season and is devoted to grain crops or to toria in rabi season.

---

18. A class of people who are known doodria 'milkman' by cast.
19. There is little consumption of the butter in the village because of the difficulty it from deterioration, so that immediately after it is heated and clarified and the resultant product is known as shee. The clarified butter (shee) is sold in the market of Dankaur.
TABLE CVIII

Gross Cultivated land.  ...  439.00 acres
Net Cropped in the Rabi Season  368.00 acres

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of Gross Cultivated Land</th>
<th>Percentage of Cropped Land</th>
<th>Total Percentage of Gross Land</th>
<th>Total Percentage of Cropped Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>107.74</td>
<td>24.66</td>
<td>29.27</td>
<td>64.82</td>
<td>76.67</td>
</tr>
<tr>
<td>Peas</td>
<td>99.71</td>
<td>22.82</td>
<td>27.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>61.31</td>
<td>14.06</td>
<td>16.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley and Peas</td>
<td>5.78</td>
<td>1.39</td>
<td>1.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>3.27</td>
<td>0.79</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and Gram</td>
<td>2.40</td>
<td>0.59</td>
<td>0.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse(lentil)</td>
<td>1.37</td>
<td>0.33</td>
<td>0.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and Barley</td>
<td>0.65</td>
<td>0.16</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td>19.64</td>
<td>22.33</td>
</tr>
<tr>
<td>Fodder 20</td>
<td>6.06</td>
<td>1.39</td>
<td>1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rape-seed</td>
<td>79.96</td>
<td>18.09</td>
<td>21.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables and Tobacco</td>
<td>0.75</td>
<td>0.15</td>
<td>0.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>2.00</td>
<td>0.45</td>
<td>-</td>
<td>0.45</td>
<td></td>
</tr>
<tr>
<td>Continual kharif Crops.</td>
<td>69.00</td>
<td>15.09</td>
<td>-</td>
<td>15.09</td>
<td></td>
</tr>
</tbody>
</table>

Total                      | 439.00        | 100.00                              | 100.00                    | 100.00                        | 100.00                          |

20. Rapeseed is locally called *toria* or brown-mustard. Its botanical name is *Brassica-napus*. 
It will be seen from Table CVII that barley and peas are the major crops in the rabi season and occupy about six-tenths of the net cropped land. Twenty two per cent of the net cropped land in rabi is devoted to rape-seed, which grow favourably in the light clay soil. This is a cash crop and is sold in the market of Bankaur. The cash thus obtained is utilized in clearing the arrears of Land Revenue and for purchasing the articles of daily use.

Research at Fasa, the Agricultural Institute shows that if in the usual rotation in which rapeseed follows wheat in the next rabi season, the yield of Toria increases considerably if the land is green manured with guer (cyamopsis psoralicoides). The results obtained from the trials conducted in the Punjab reveal that 40 lb of Nitrogen if applied in the form of Ammonium-sulphate (half at sowing and half at flowering), substantially increases the yield. The average per acre yield under such manuring being 1,025 lb against 700 lb in the non-manured area.

The cultivation of vegetables is carried on over a negligible area of the cropped land. With the help of manures the area under vegetables can be increased to an appreciable extent, particularly in the good quality lands where irrigation to the crops is provided by canal.

21. A little amount of the output of rapeseed is devoted to the bullocks in the rainy and winter seasons.
22. Land Revenue is locally called as malgajari and lagen.
23. Burns, W. Technological Possibilities of Agricultural Develop-
ment in India, (Lahore, 1944), p 73.
Double Cropped Land:

The total area cropped twice in 1960-61 is 236 acres or 54 per cent of the gross cultivated land. Since the extension of double cropped land is determined by the fertility of the soil and availability of water to the crops, the area of medium quality (BI) land can be brought under double cropping by the application of manures and additional water supplies.

Land Used and Population:

The following Table shows the various categories of lands in the village and the per capita share of the villagers in these lands.

**TABLE CIX**

<table>
<thead>
<tr>
<th>Total Population of the Village</th>
<th>645</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Area in Acres)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total area available of the village</th>
<th>Total land in cultivation season</th>
<th>Net cropped land</th>
<th>Net cropped land in the rabi season</th>
<th>Total cultivated land</th>
<th>Double cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>506.94</td>
<td>439.00</td>
<td>307.00</td>
<td>365.00</td>
<td>675.20</td>
<td>236.20</td>
</tr>
</tbody>
</table>

| Land per head of population        | 0.787                           | 0.680            | 0.480                             | 0.575                | 1.055               | 0.368               |
Table CIX reveals that the per capita cultivated land available in the village is 0.68 acre but in the kharif and rabi seasons the per capita cultivated land is reduced to 0.48 and 0.58 acre respectively. The reduction in the per capita cultivated land in the kharif season is due to the practice of falling, while in the rabi season the reduction is caused by the continual kharif crops, e.g. sugarcane and pulses. The increase in the per capita share in rabi cropped land shows that cropped area in the rabi season is greater than that of kharif.

The Table CIX further shows that the per capita share in the land cropped twice is 0.37 acres. In other words the amount of land supporting one person is 1.06 acres.

Not less than 580 persons (90 per cent of total population) belong to the primary rural group and depend exclusively on land while 10 per cent of the total population is secondary rural which serves the primary rural, and thus indirectly depends on land.

Potential Production Units:

In the Table No. CIX an attempt has been made to assess the potential production units on the basis of average yields of different qualities of land.

It will be noticed from Table CIX that in Mohammadpur-Gujar 494.80 acres of land in the present state of developments, are equal to 468.08 P.P.U.s or 1 acre is equal to about 1 P.P.U. The productivity of the good quality land, in which one acre is equal to 1.21 P.P.U.s is fairly high. But in the BI and BII quality lands one acre is equal to 0.74 and 0.63 P.P.U. respectively. It
TABLE CX

Average Yield 1 P.F.U. 950

<table>
<thead>
<tr>
<th>Type of Land</th>
<th>Acreage</th>
<th>Average yield in lb.</th>
<th>Rating</th>
<th>Total Number of P.F.U.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>305.20</td>
<td>1150</td>
<td>1.21</td>
<td>369.29</td>
</tr>
<tr>
<td>Medium quality Land (B)</td>
<td>131.80</td>
<td>700</td>
<td>0.74</td>
<td>97.53</td>
</tr>
<tr>
<td>Medium quality Land (BII)</td>
<td>2.00</td>
<td>600</td>
<td>0.63</td>
<td>1.26</td>
</tr>
<tr>
<td>Poor quality Land (C)</td>
<td>55.80</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>444.40</strong></td>
<td>-</td>
<td>-</td>
<td><strong>466.08</strong></td>
</tr>
</tbody>
</table>

may also be noted that 56 acres of land which are affected by alkaline formations are unproductive.

In the village, if the waste land is reclaimed and the productivity of medium quality land is improved by the modern techniques of cultivation, a number of P.F.U.'s can be added in the existing P.F.U.'s.
CHAPTE R IX

LAND UTILIZATION IN PADLI-GARUNT

Location:

The village of Padli-Garunt is situated in 30° 21' N.
lat., and 77° E., long., in Saharanpur Tahsil of the Saharanpur
district. It is bounded by the villages of Hussainpur and
Ismailpur in the north, Dostpur Hatimpur in the east, Poohas
and Tatarpur in the south and Sikandarpur-Matka in the west
(Fig. 127).

Padli-Garunt lies in the submontane tract locally called
as ghar which is formed by debris derived from the Siwaliks
and is covered by forests shrubs and grasses.

The tract is drained by a number of boulder strewn
torrents locally known as raog. These torrents remain dry
during the greater part of the year but attain large dimension
at the time of heavy rains. A torrent known as the Panjna
nadi, arising from the Siwaliks (Siwaliks lie about five miles
to the north east of the village) by a narrow outlet widens
on its way, and passes through the village of Padli-Garunt.
Nearly fifty per cent of the total area of the village has
been converted by the torrent into sand which is useless
from the agricultural point of view.

Padli-Garunt is accessible by a cart-track, which crossing
the Panjna-nadi joins the village with the Saharanpur-Chakrata
LOCATION OF THE VILLAGE PADLI GARUNT

Source: survey of India map No. 53F

The outline of Padligarunt has been drawn by the writer.
Road, which runs to the east of Fadli-Garunt at a distance of about two miles (Fig. 127). Occasionally at the time of heavy rains in the Sivalikes the torrent overflows and isolates the village from the east. The crossing of the torrent at the time of flood is dangerous, owing to its high velocity.

Fadli-Garunt is situated at a height of 1169 feet above sea level and the water level is below 150 feet. There is only one well in the village. It was constructed at a cost of Rs 10,000/- in 1951. Prior to the construction of this well water was supplied from the Eastern Yamuna-Canal which lies 3 miles to the west of the village.

Climate:

No climatic data are recorded in the village. The nearest rainfall recording station from the village is Naishahr, about three miles to the north of the village. The data of rainfall recorded at Naishahr, have therefore been given in Tables CXI and CXII and may be taken as the close approximations for this village.

TABLE CXI

KHARIF SEASON 1960 (NAISHahr)

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>2.69</td>
</tr>
<tr>
<td>July</td>
<td>13.37</td>
</tr>
<tr>
<td>August</td>
<td>16.10</td>
</tr>
<tr>
<td>September</td>
<td>9.91</td>
</tr>
<tr>
<td>October</td>
<td>2.68</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>44.75</td>
</tr>
</tbody>
</table>

Rainfall in inches in the kharif season, 1960

<table>
<thead>
<tr>
<th>Rainy days in kharif, 1960</th>
<th>3</th>
<th>10</th>
<th>13</th>
<th>7</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average rainfall in inches</td>
<td>4.23</td>
<td>15.13</td>
<td>14.45</td>
<td>6.49</td>
<td>0.68</td>
</tr>
</tbody>
</table>

1. The height is that of Qasimur which is at a distance of two miles to the north west. Since the actual height of the
### TABLE CXII

RABI SEASON 1960-61 (NAISHAHR)

<table>
<thead>
<tr>
<th>Month</th>
<th>November-December-January-February-March</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the rabi season, 1960-61</td>
<td>0.56 2.84 1.10 0.98</td>
<td>5.48</td>
</tr>
<tr>
<td>Rainy days in rabi, 1960-61</td>
<td>2 4 3 3</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.10 0.50 1.75 1.77 0.90</td>
<td>5.12</td>
</tr>
</tbody>
</table>

**Land Classification:**

The soil of the area where Padli-Gurant lies is rich alluvial of a peculiar dark colour, resting on the bed of boulders and stones. In the area irrigation is not possible owing to the rapid slope. However, in the year of normal rainfall the soil gives high agricultural returns.

On the basis of the field work done by the writer, an attempt has been made to classify the village fields according to their fertility and productivity (Fig. 128).

The soil of good quality land (A) is light loam (locally called as sem). It is light dark in colour, and yields two crops in a year or is devoted to sugarcane. The fields lying contd...

village has not been recorded, the height of Qasimpur may be taken as the close approximation for Padli-Gurant.

2. The data of rainfall for the kharif and rabi season 1960-61 were obtained from the headquarters of Naishahr.
PADLI GARUNT

LAND CLASSIFICATION

A-GOOD QUALITY LAND
B-MEDIUM QUALITY LAND
C-POOR QUALITY LAND
SETTLEMENT CART-TRACK SEASONAL STREAM POND
to the west of the village are covered by this soil.

The soil of the medium quality land is sandy-loam and is less productive than (A). These fields are left fallow in the kharif season or are devoted to groundnut mixed with arhar.

The poor quality lands (C) lie unutilized on account of the coarse sandy nature and presence of shrubs. The following Table shows the area and percentage to the total area of different classes of land, while their distribution is plotted in Fig. 128.

<table>
<thead>
<tr>
<th>Land Classification</th>
<th>Area in Acres</th>
<th>Percentage of the total Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>150.35</td>
<td>35.40</td>
</tr>
<tr>
<td>Medium quality land (B1)</td>
<td>56.00</td>
<td>13.19</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>198.13</td>
<td>46.86</td>
</tr>
<tr>
<td>Land not available for cultivation (3)</td>
<td>20.15</td>
<td>4.75</td>
</tr>
</tbody>
</table>

Total | 424.63 | 100.00 |

It will be seen from the above Table that 35 per cent and 13 per cent of the total area is covered by the Good and medium quality lands respectively and about 5 per cent is not available for cultivation while 47 per cent is unproductive.

3. Land not available for cultivation includes, settlement, pond, well, stream and cart-tracks.
Irrigation:

No irrigation is practised in the village. The crops in the kharif as well as in the rabi season are exclusively dependent on rainfall which in normal years is heavier than the southern parts of the plain of Upper Ganga-Yamuna Doab. (Fig. 15).

It will be seen from Table CXXI and CXXII that rainfall in the kharif and rabi seasons was 45 and 5 inches respectively, and it was well distributed. Therefore, all the crops of kharif and rabi seasons gave a good yield. In the years of deficient rainfall, rice and sugarcane are adversely affected.

Land Utilisation:

The land use of the village in 1960-61 is shown in Fig. 129 and the mapping is based on the writer's field work of the village. The following Table gives a summary of the proportions of the village lands devoted to various uses in 1960-61.

<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated land</td>
<td>206.35</td>
<td>48.59</td>
</tr>
<tr>
<td>Waste land</td>
<td>198.13</td>
<td>46.66</td>
</tr>
<tr>
<td>Settlement</td>
<td>10.64</td>
<td>2.51</td>
</tr>
<tr>
<td>Cart track</td>
<td>9.00</td>
<td>2.12</td>
</tr>
<tr>
<td>Pond</td>
<td>0.51</td>
<td>0.12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>424.63</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

4. The base map showing the fields and their areas in bighas was obtained from the Revenue Department of Saharanpur Tahsil of Saharanpur district. The village was visited by the writer in the kharif season 1960 and the rabi season 1960-61 and the use to which each field was being put was recorded on the base map.
It will be seen from the Table CXIV that about 49 per cent of the total area is cultivated and nearly five per cent is devoted to non-agricultural purposes, while about 47 per cent of the total area is unproductive owing to the erosive action of the Panjna torrent. If the flood water could be stored in small tanks or reservoirs and be released in times when water is badly needed by the crops, the land will be saved from the menace of erosion on the one hand and on the other hand the water will be properly utilized for irrigation purposes. Besides, the planting of quick growing trees along the banks of the torrent further help soil conservation. The trees will constitute a source of fuel to the villagers.

Table CXIV shows the number and size of different plots and their percentage, while their distribution is given in Fig. 129.

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Number of plots</th>
<th>Percentage of the total Number of plots.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>331</td>
<td>82.75</td>
</tr>
<tr>
<td>1 to 2 acres</td>
<td>53</td>
<td>13.25</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>16</td>
<td>4.00</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.00</td>
</tr>
</tbody>
</table>
Table CXXV shows that most of the fields are very small in size and are not suitable for large scale mechanization.

Land Utilization in the Kharif Season:

The use of land in the kharif season 1960-61 is shown in Fig. 130. The area occupied by each crop is given in Table CXXVI.

<table>
<thead>
<tr>
<th>TABLE CXXVI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Cultivated land</td>
</tr>
<tr>
<td>Net cropped land in the kharif season</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>58.67</td>
<td>28.43</td>
<td>31.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>26.46</td>
<td>12.83</td>
<td>14.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet and Pulses</td>
<td>25.46</td>
<td>12.33</td>
<td>13.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet and Fodder</td>
<td>12.30</td>
<td>5.96</td>
<td>6.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulrush millet fodder.</td>
<td>5.56</td>
<td>2.70</td>
<td>3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>30.25</td>
<td>14.66</td>
<td>16.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundnuts and Pulses</td>
<td>11.81</td>
<td>5.72</td>
<td>6.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundnuts</td>
<td>15.46</td>
<td>7.49</td>
<td>8.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>20.38</td>
<td>9.88</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>206.35</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>180.00</td>
</tr>
</tbody>
</table>
It will be seen from Table CXVI that 69 per cent of the net cropped land in the kharif season is under grain crops. Maize occupies one third while rice and millets mixed with pulses each occupy about 14 per cent. The importance of maize among the grain crops in the kharif season is mainly due to the well drained loamy soil of the village.

Sugar cane and groundnuts are the cash crops in the village. About one sixth of the net cropped land is devoted to sugarcane. In the absence of irrigation facilities, the success of sugarcane entirely depends upon adequate and well distributed rainfall. Groundnuts are sown in 8 per cent of the cropped land as a sole crops and over six per cent mixed with pigeonpea ('aghar'). It is sown in the month of June and harvested in November and December. Groundnuts like other leguminous crops manufacture their own nitrogen by means of the bacteria on their roots. Therefore, by its cultivation the cultivator unconsciously maintains the fertility of the soil. When groundnuts are sown as a sole crop, it leads to the soil erosion on the slopy lands. About 50 per cent of the total output of sugarcane and the entire output of the groundnuts are sold in the market of Faizabad town which is at a distance of three miles from the village.

Land Utilization in the Rabi Season:

The use of land in the rabi season 1960-61 is shown in Fig. 131. The area occupied by each crop is given in Table CXVII.
PADLI GARUNT
LAND UTILIZATION
RABI SEASON
1960-1961

FIG. 131
### TABLE CXVII

**Gross Cultivated land** 206.35

**Net Cropped in the rabi season** 110.02

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total % of gross cultivated land</th>
<th>Total % of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat and gram</td>
<td>56.53</td>
<td>27.39</td>
<td>51.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>43.73</td>
<td>21.19</td>
<td>39.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>5.37</td>
<td>2.60</td>
<td>4.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>2.53</td>
<td>1.22</td>
<td>2.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td>1.88</td>
<td>0.91</td>
<td>1.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>11.70</td>
<td>5.67</td>
<td>-</td>
<td>5.67</td>
<td></td>
</tr>
<tr>
<td><strong>Continual Kharif Crops</strong></td>
<td>84.61</td>
<td>41.02</td>
<td>-</td>
<td>41.02</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>206.35</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

A comparison of Tables CXVI and CXVII shows that the net cropped area in the rabi season is about two fifth of that of the kharif season. This is due to the fact that about forty per cent of the gross cultivated land is under continual kharif crops and is not available for rabi crops.
Wheat and gram are the major crops in the rabi season and are sown either as a sole crop or mixed with each other. Wheat mixed with gram occupies 51 per cent of the net cropped land. In the absence of irrigation the cultivators resort to mixed cropping as there always remains the risk of total failure of crops. Wheat as a sole crop occupies about forty per cent of the net cropped land. Peas and barley which occupy about 2 and 5 per cent of the sown area are given to milk cattle in the months of January and February, and thus these two cereals are generally not the source of caloric intake in the village. Six per cent of the gross cultivated land has been left fallow which will be devoted to sugarcane in the 5 months of Phagun and Chait, while 41 per cent is under continual kharif crops. Some suitable combination which are not practised in the village appear to be: millet mixed with urad and groundnuts with arhar. At present the villagers cultivate bulrush millet with fodder. If the parts of the waste lands are properly converted into grazing ground by planting nutritious grasses, the villagers can sow urad (Phaseder radiatus) with millet. Urad being leguminous crop will enrich the fertility of the soil and provide the cultivator with pulses. Similarly groundnuts which are sown as a sole crop can be cultivated with arhar and may yield similar advantages to the cultivator.

5. Phagun and Chait are the Hindi months, corresponds to February and March.
Double Cropped Land:

The double cropped land in the village is mapped Fig. 132. The total area cropped twice in 1960-61 is 89.64 acres or 43 per cent of the gross cultivated land. The low percentage of the double cropped land is due to the fact that sugarcane occupies about two fifth of the gross cultivated land in the rabi season.

6 Rotation of Crops

In Padli-Garunt following rotations of crops are generally practised which are different from those carried on in the irrigated villages of Upper Ganga-Yamuna Doab described on page 141. On the good quality land the following rotation of crops is practised:

1. Kharif Season
   - First Year: Sugarcane
   - Second Year: Fodder (Millet and Lobiya)
   - Third Year: Rice

2. Rabi Season
   - Continued in the Rabi
   - Gram
   - Mixed wheat and gram and peas.

RABI SEASON
   - Wheat or wheat mixed with gram or barley (Jo)
   - Continued in the rabi

In relatively lowlying fields the rotation usually practised in the village is given on the following page.

6. During the course of his field work the author consulted the cultivators of the village and obtained information regarding the rotation of crops practised by them.
Land Use and Population:

Table CXVIII shows the totals of various categories of lands in the village and the per capita share of the villagers in these lands.

It will be seen from Table CXVIII that the per capita gross cultivated land is 1.05 acres, but in the kharif and rabi seasons this figure is reduced to 0.95 and 0.56 respectively. In the kharif the reduction in the per capita land is due to the practice of fallowing of the medium quality BI lands, while in rabi season the great reduction is due to the presence of continual kharif crops (Sugarcane, groundnuts and arhar).

Table CXVIII further shows that the per capita double cropped land is 0.46, so that the per capita total cultivated land (which includes the totals of the kharif and rabi seasons) is 1.50 acres. Thus the amount of cultivated land supporting one person in Padli-Garunt is 1.50 acres.

The significance of the pressure of population on land can be fully appreciated if the occupations of the villagers are considered. 181 persons (or about 92 per cent) of the total population are primary rural and are exclusively dependent upon land while 8 per cent consist of secondary rural population which depends upon the primary rural population through ancillary services.
### TABLE CXVIII

<table>
<thead>
<tr>
<th>Total area of the village</th>
<th>Total land available for cultivation</th>
<th>Net cropped land in the kharif season</th>
<th>Net cropped land in the rabi season</th>
<th>Total cultivated land</th>
<th>Double cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>426.63</td>
<td>206.35</td>
<td>185.97</td>
<td>110.02</td>
<td>295.99</td>
</tr>
<tr>
<td>Land per head of population</td>
<td>2.16</td>
<td>1.05</td>
<td>0.95</td>
<td>0.56</td>
<td>1.50</td>
</tr>
</tbody>
</table>

Potential Production Units:

On the basis of average yields of different qualities of lands the potential production units have been computed and are given in Table CXIX.

### TABLE CXIX

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in Acres</th>
<th>Average yield per acre in lb.</th>
<th>Rating</th>
<th>Total Number of P.F.U.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land</td>
<td>150.35</td>
<td>1.000</td>
<td>1.33</td>
<td>200.00</td>
</tr>
<tr>
<td>Medium quality land</td>
<td>56.00</td>
<td>700</td>
<td>0.93</td>
<td>52.00</td>
</tr>
<tr>
<td>Poor quality land</td>
<td>198.13</td>
<td>100</td>
<td>0.13</td>
<td>25.76</td>
</tr>
<tr>
<td>Total</td>
<td>304.48</td>
<td>-</td>
<td>-</td>
<td>277.76</td>
</tr>
</tbody>
</table>
Table CXIX shows that in Padli-Garunt 304.48 acres of land are in the present state of technological developments, equal to 277.76 P.P.U.s. The productivity of good quality land is 1.33 P.P.U.s per acre and that of medium quality land is 0.85 P.P.U.; while one acre of poor quality land is equal to 0.43 P.P.U. In other words, the productivity of the good quality land is fairly high and that of medium quality land is below the average farm land, while the productivity of poor quality land is negligible. Since nearly 50 per cent of the total arable land consists of poor quality land, the total number of P.P.U.s is very low. On the whole one acre of land is equal to 0.90 P.P.U. which lowest amongst the selected villages.

The reclamation of poor quality land for agricultural purposes seems the only solution to increase the total number of P.P.U.s.
CHAPTER X

LAND UTILIZATION IN LADPUR-KALAN

Location:

The village of Ladpur-Kalan lies in Roorkee Tahsil in the district of Saharanpur. It is situated in 29° 30' N. lat., and 77° 59' E. long., and is bounded by the villages of Makarpur in the north, Makhiali in the east, Bainpur in the south and Dahiya in the west (Fig. 133).

Ladpur-Kalan is situated in the khadar of Ganga. The khadar is separated from the bhanger by ravines and broken grounds (Fig. 133). A stream known as Solani-nadi which is a hill torrent in its Upper course attains appreciable size in the khadar and making bends and loops flows in a tortuous course about one furlong to the west of the village. The breadth and velocity of the river which varies according to the season depends upon the nature of the bed of the river and its bank. In the dry season the breadth of the stream at Ladpur-Kalan shrinks 20 yards but in the rainy season it swells to as much as two furlongs. The lowlying depressions, swamps, lakes and former backwaters on both sides of the village are the probable courses of the Solani. The river has changed its course from time to time. At present it is gradually shifting towards east. It is probable that the junction of the Solani and Ratmau (a stream flowing to the north-west of the village) which is at present about six miles to the south east of the village was formerly at Ladpur-Kalan
LOCATION OF THE VILLAGE LADPUR-KALAN

The outline of Ladpur-Kalan has been drawn by the writer.

Source: Survey of India Map No. 53G13

Fig. 133
or perhaps even further north west (fig. 133). The Solani-nadi in the rainy season overflows its banks, inundating generally, the western parts of this village. Attempts have been made by the villagers to save this and other adjacent villages from the floods of Solani and Ratnau by constructing embankments, running for several miles close to the left bank of Solani, but these embankments prove ineffective when the river is in spate (Fig. 133).

Ladpur-Kalan is not served by any noteworthy means of communication. The Northern Railway passes at a distance of two miles to the south west of the village, but the nearest railway station (Landhawra) is not less than three miles to the west of the village and is accessible by a cart-track. In the rainy season, when Solani-nadi overflows, the cart-track is submerged under water and it becomes dangerous to cross the river at the time of floods. Ladpur-Kalan in the rainy season remains isolated from the neighbouring markets. The important markets of Roorkee and Manglaur are about seven and eight miles respectively to the north west and west of the village.

The existing poor means of communication produces an indirect set-back to efficient cultivation of the land. The markets of Roorkee and Manglaur being far away, consumes fairly valuable time of the cultivators and also keeps the bullocks occupied in transporting village produce, at a time when they need it most for preparing the land for rabi sowing.

1. Manglaur is an important market of indigenous sugar in Upper Ganga-Yamuna Doab.
Climate:

In the village no climatic data are recorded. The rainfall data recorded at the headquarters of Roorkee Tahsil, about seven miles to the west of the village, have therefore been given in Tables CXI and CXIII and may be considered as the close approximations for this village.

TABLE CXI

KHArif SEASON 1960 (ROORKEE)

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>September-October</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the kharif season, 1960</td>
<td>2.10</td>
<td>10.80</td>
<td>12.33</td>
<td>3.89</td>
<td>1.63</td>
</tr>
<tr>
<td>Rainy days in kharif, 1960</td>
<td>4</td>
<td>12</td>
<td>13</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>3.08</td>
<td>11.10</td>
<td>12.80</td>
<td>6.2</td>
<td>1.20</td>
</tr>
</tbody>
</table>

TABLE CXXI

RABI SEASON 1960-61 (ROORKEE)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall in inches in the rabi season, 1960-61</td>
<td>-</td>
<td>-</td>
<td>2.90</td>
<td>1.06</td>
<td>0.70</td>
<td>4.66</td>
</tr>
<tr>
<td>Rainy days in rabi, 1960-61</td>
<td>-</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Average rainfall in inches</td>
<td>0.19</td>
<td>0.56</td>
<td>1.70</td>
<td>1.60</td>
<td>0.60</td>
<td>4.64</td>
</tr>
</tbody>
</table>

2. The rainfall data of kharif and rabi seasons 1960-61 were obtained from the headquarters of Tahsil Roorkee.
Land Classification:

The soil of the khadar in which the village is situated varies from sandy to silty clay (Fig. 39). On the basis of fertility and productivity (see page 106) the village fields have been classified and mapped in (Fig. 134). The soil of the good quality land (A) consists of silty-sand and silty-loam. These lands are usually devoted to sugarcane or are cropped twice a year.

The soil of the medium quality land (BII) is sandy. These lands are left fallow in the kharif season and are devoted to grain crops in the following rabi season. The medium quality land BII is devoted to transplanted rice in the kharif and are left fallow in the rabi season.

The poor quality land (C) is unutilized on account of the poor nature of the soil.

The following table gives a summary of various classes of land while their distribution is shown in Fig. 134.

<table>
<thead>
<tr>
<th>Classification of land</th>
<th>Area in Acres</th>
<th>Percentage of the total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>330.10</td>
<td>84.15</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>20.10</td>
<td>5.12</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>1.90</td>
<td>0.48</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>1.30</td>
<td>0.33</td>
</tr>
<tr>
<td>Land not available for cultivation (3)</td>
<td>38.90</td>
<td>9.91</td>
</tr>
</tbody>
</table>

Total Area of the Village 392.30 Acres.

3. Land not available for cultivation includes, settlement, cart-tracts, grove, wells and ponds.
It will be seen from Table CXXII that 84 per cent of the total area consists of good quality land, five and a half per cent of medium quality land; while about ten per cent is not available for cultivation. The poor quality land (C) which is 1.30 acres (or 0.33 per cent of the total area) is quite insignificant and negligible.

**Irrigation:**

No irrigation is carried on in the village. In the khadar the water table is so elevated that the subsoil remains almost saturated throughout the year, and therefore irrigation to the crops is generally not provided.

**Land Utilization:**

The use of land in the kharif season of 1960 is shown in Figs. 136 to 138 which are based on the writer's field work of the village. Table CXXII gives a summary of the proportions of the village lands devoted to various uses in 1960-61 (Fig. 135).

It will be seen from Table CXXIII that nine-tenths of the total area of the village is cultivated more than nine and a half per cent is devoted to non-agricultural uses and only 1.33 acres (or 0.33 per cent) is unproductive. The area under grove is small. It is perhaps due to the high water table which makes the growth and development of the trees difficult.

---

4. The base map showing the fields and their areas in bighas was obtained from the headquarters of Tahsil Roorkee of the Saharanpur district. Ladpur-Kalan was visited by the writer in the kharif season 1960 and rabi season 1960-61 and the use to which each field was being put was recorded on the base map. From these data Figs. 135 to 138 were prepared.
<table>
<thead>
<tr>
<th>Use of land</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivated Land</td>
<td>352.30</td>
<td>90.02</td>
</tr>
<tr>
<td>Waste Land</td>
<td>1.30</td>
<td>0.33</td>
</tr>
<tr>
<td>Settlement</td>
<td>25.40</td>
<td>6.47</td>
</tr>
<tr>
<td>Cart track</td>
<td>9.00</td>
<td>2.31</td>
</tr>
<tr>
<td>Pond</td>
<td>2.50</td>
<td>0.59</td>
</tr>
<tr>
<td>Grove</td>
<td>1.40</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>392.30</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
Like all the other villages the size of fields in Laidpur-Kalan is small and needs improvement. The areas of plots and their percentage to the total number of plots is given in Table CXXIV, while Fig. 135 shows their distribution.

**TABLE CXXIV**

<table>
<thead>
<tr>
<th>Size of plot</th>
<th>Number of plots</th>
<th>Percentage of the total number of plots.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 acre</td>
<td>485</td>
<td>68.88</td>
</tr>
<tr>
<td>1 acre to 2 acres</td>
<td>175</td>
<td>25.92</td>
</tr>
<tr>
<td>Above 2 acres</td>
<td>35</td>
<td>5.20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>675</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

The above Table shows that 95 per cent of the total number of plots are less than two acres and the remaining five per cent are above two acres in area. There are 675 plots in the area of 392 acres.

**Land Utilization in the Kharif Season:**

The use of land in the kharif season of 1960 is shown in Fig. 136. The area occupied by each crop is given in Table CXXV.
### TABLE GXXV

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage of gross cultivated land</th>
<th>Total percentage of net cropped land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice transplanted</td>
<td>60.00</td>
<td>17.04</td>
<td>18.07</td>
<td>26.98</td>
<td>28.61</td>
</tr>
<tr>
<td>Rice broadcast</td>
<td>4.00</td>
<td>1.13</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small millet</td>
<td>30.00</td>
<td>8.53</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulrush millet</td>
<td>1.00</td>
<td>0.28</td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td>67.31</td>
<td>71.33</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>198.00</td>
<td>56.24</td>
<td>58.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Millet Fodder</td>
<td>38.00</td>
<td>10.79</td>
<td>11.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>1.00</td>
<td>0.28</td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>20.10</td>
<td>5.71</td>
<td>-</td>
<td>5.71</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>352.10</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The above Table indicates that only 29 per cent of the net cropped land is occupied by grain crops, while sixty per cent is occupied by sugarcane and the remaining 6 per cent by fodder crops.
Rice is the major grain crop and rice is mostly cultivated by the transplanting method. Other grain crops sown in the village are big and small millets.

The influence of the quality of land on the crop pattern can be appreciated by a comparison of Figs. 133 and 136. Sugarcane and rice being important crops are cultivated mostly in the good quality land. Bulrush-millet is sown in the medium quality lands where the soil is sandy.

About six per cent of the gross cultivated land is left fallow in the kharif season.

Land Utilization in the Rabi Season:

The use of land in the rabi season 1960-61 is illustrated in Fig. 137. The area occupied by each crop in this season is shown in Table CXXVI.

A comparison of Figs. 136 and 137 reveals that the net cropped area in the rabi season is two fifths to that of the kharif season. The restriction in sown area in the rabi season as compared to the kharif is due to the presence of sugarcane (a continual kharif crop) in the fields at the time of rabi sowing. It will be seen from Table CXXVI that wheat occupies 40 per cent of the net cropped land as a sole crop while over 16 per cent is cultivated in combination with gram and over three per cent mixed with barley. About one fourth of the net cropped land is

5. The local adage says: Chhidda boi a gehun chana chiddi boi a k opas jis ka chhidda eikh rab g ava us ki nanoddo ass.
The meaning is that the seeds of mixed wheat gram and cotton should be sown at a distance so that the plants of these crops may multiply their offshoots which is necessary for a high output. But if the sugarcane is sown at an appreciable distance from one plant to another, the cultivator should give up the hope of a good outturn of sugarcane.
LADPUR KALAN
LAND UTILIZATION
RABI SEASON
1960-1961

LAND UTILIZATION
WHEAT
GRAM
BARLEY
OAT
PULSES (LAVIL)
FODDER
FALLOW
WASTE LAND
SETTLEMENT
CART - TRACK
WELL
POND
CONTINUAL KHALIF
CYPUS

LADPUR KALAN
LAND UTILIZATION
RABI SEASON
1960-1961
TABLE CXXVI

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area in Acres</th>
<th>Percentage of gross cultivated land</th>
<th>Percentage of net cropped land</th>
<th>Total percentage net gross cultivated land.</th>
<th>Total percentage net cropped land.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>52.00</td>
<td>14.78</td>
<td></td>
<td>39.78</td>
<td></td>
</tr>
<tr>
<td>Lentil (masoor)</td>
<td>33.00</td>
<td>9.37</td>
<td></td>
<td>25.24</td>
<td></td>
</tr>
<tr>
<td>Wheat and Gram</td>
<td>24.00</td>
<td>8.81</td>
<td></td>
<td>18.31</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>4.50</td>
<td>1.27</td>
<td></td>
<td>3.44</td>
<td></td>
</tr>
<tr>
<td>Peas and Barley</td>
<td>7.00</td>
<td>1.98</td>
<td></td>
<td>5.36</td>
<td></td>
</tr>
<tr>
<td>Wheat and Barley</td>
<td>3.50</td>
<td>1.00</td>
<td></td>
<td>2.68</td>
<td></td>
</tr>
<tr>
<td>Gram</td>
<td>0.70</td>
<td>0.20</td>
<td></td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Other Crops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fodder</td>
<td>6.90</td>
<td>1.70</td>
<td></td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>Fallow</td>
<td>1.90</td>
<td>0.54</td>
<td></td>
<td>0.54</td>
<td></td>
</tr>
<tr>
<td>Continual</td>
<td>193.50</td>
<td>61.35</td>
<td></td>
<td>61.35</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>352.10</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

devoted to masoor. The silty soil containing high moisture, is favourable for its growth. Among other crops sown in the rabi season are barley, peas and fodder, but the area under these crops is very small.
Double Cropped Land:

The double cropped land in the village is shown in Fig. 138. The total area cropped twice in the year of inquiry was 110.60 acres or 28 per cent of the gross cultivated land. It will be seen from a comparison of Figs. 134 and 138 that the area under double cropping is restricted to the good quality land. The area under double cropping in further reduced owing to the cultivation of sugarcane which remains in the field in the rabi season.

Land Use and Population:

Table CXXVII shows the totals of various classes of land as well as the per capita share of the villagers in these lands. The Table reveals that the per capita cultivated land available in the village is 0.82 acre. In the kharif season the per capita net cropped land is reduced to 0.77 acre. This reduction is due to the following practice of medium quality (BI) lands.

Table CXXVII further shows that the per capita double cropped land is 0.28 acre and thus the per capita total cultivated land is 1.10 acres or the amount of land supporting one person in Ladpur-Kalan is 1.10 acres.

So far as the nature of occupations of the population is concerned, 390 persons (or 89 per cent of the total population) belong to the primary rural group and are exclusively dependent upon land while 11 per cent of the population is secondary rural which serves the primary group and thus indirectly depends upon land.
### TABLE CXXVII

**Total Population of the village.** 428
*(Area in Acres)*

<table>
<thead>
<tr>
<th>Total area of the village</th>
<th>Total available land for cultivation</th>
<th>Net cropped land in the kharif season</th>
<th>Net cropped land in the rabi land during the kharif season</th>
<th>Total double cropped land on both kharif and rabi land</th>
</tr>
</thead>
<tbody>
<tr>
<td>392.30</td>
<td>352.10</td>
<td>332.00</td>
<td>120.70</td>
<td>462.70</td>
</tr>
<tr>
<td>Land per head of population</td>
<td>0.917</td>
<td>0.823</td>
<td>0.78</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Potential Production Units:**

The productivity of each type of land is shown in Table CXXVIII on the basis of productivity ratings an attempt has been made to estimate the potential production units in the village.

Table CXXVIII reveals that about 307 P.R.U.s in the village are available from about 353 acres of arable land. The good quality land which covers about 330 acres (or 94 per cent of the total arable land) is fairly productive and one acre is equal to 1.18 P.R.U.s. It is in the medium and poor quality lands where the productivity is below the average farm land.
## TABLE CXXVIII

Average yield 1.5 P.U. ... 850

<table>
<thead>
<tr>
<th>Type of land</th>
<th>Area in Acres</th>
<th>Average yield per acre in lb.</th>
<th>Rating</th>
<th>Total number of P.P.U.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good quality land (A)</td>
<td>330.10</td>
<td>1000</td>
<td>1.18</td>
<td>289.52</td>
</tr>
<tr>
<td>Medium quality land (B1)</td>
<td>20.10</td>
<td>700</td>
<td>0.82</td>
<td>16.50</td>
</tr>
<tr>
<td>Medium quality land (BII)</td>
<td>1.90</td>
<td>6100</td>
<td>0.79</td>
<td>1.50</td>
</tr>
<tr>
<td>Poor quality land (C)</td>
<td>1.30</td>
<td>150</td>
<td>0.17</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>353.40</strong></td>
<td></td>
<td></td>
<td><strong>307.73</strong></td>
</tr>
</tbody>
</table>