Part II

PATTERNS OF LAND USE
The main land use categories found in this district are as under:

1. Arable land*.
2. Groves** and orchards.
3. Waste land or banjar*.
4. Land agriculturally unproductive**.
5. Land under water.

* The arable includes tilled land, fallows and market gardens. Besides the actually cropped area, tilled land includes land prepared for sugarcane and seedlings' (rice) area not resown with other crops. When a field is thrown out of cultivation but the character of land is not changed so as to require an alteration in the entry, the entry for three successive years is 'new fallow' and, thereafter, for the next two successive years it is 'old fallow'; in the sixth year it is recorded as culturable waste, or 'banjar' vide the Land Records Manual, U.I. (1958), rt. 1, Ch. V, p. 45, para A97(ii), g. Formerly, the limit of the old fallow was for three years and in the seventh year the fallow land was treated as culturable waste; vide the Land Records Manual, U.I. (1944), rt. 1, Ch. V, p. 48, para 1C1. 

** Trees on a specific piece of land are recorded as 'groves' if they are planted, therein, in such numbers that they preclude, or when full grown will preclude, the land or any considerable portion thereof from being used primarily for any other purpose; vide the Land Records Manual, U.I. (1944), rt. 1, Ch. V, p. 46, para 98(1). But land occupied by crops such as tea bushes, betel plants, plantains and papa-ya is returned as cultivated; vide ibid., p. 47, para A96, Explanation (2).

† All fallow land of over 5 years' standing, and all land which is capable of cultivation but has never been brought under cultivation is treated as 'banjar'; vide the Land Records Manual, U.I. (1958), rt. 1, Ch. V, p. 45, para A97(ii), f.

** Includes settlements, roads, etc.
MAIN TYPES OF LAND USE
CHANGING PATTERN IN SAMPLE VILLAGES

OUTER CIRCLE SHOWS PRESENT LAND USE
INNER CIRCLE SHOWS OLD LAND USE. DATA BASED ON
LAND SETTLEMENT VOLUMES FOR THE YEARS 1871-1970 EXCEPTING
RAMNAGAR WHERE DATA RELATES TO 1891-92 A.D.

TOTAL DISTT. (PRESENT LAND USE)
INDEX

FIG. 23
Fig. 23* shows the present and old percentages of the area under the main types of land use in the sample villages. None of the sample villages has any forest or grassland. The arable is the predominant type of land use. Nearly 85% of the total area of the district falls in this category. Groves and orchards cover 1.0%, wasteland or banjar 7.5%, water 3.5% and under settlements, roads, etc., 3.6%. The official data for the district as a whole, shows about 1.0% land under forests and grasslands. But, actually, the Gram Samaj owned trees and the road-side trees and plants belong to the forest department (vice Appendix, 11 Five Year Distt. Plan).

Excepting the low lying areas subject to frequent floods, everywhere the arable amounts to more than 75% of the total area of the villages. The banjar land has been reclaimed in most cases. Land under water is, generally, on the decrease, but the land agriculturally unproductive is on the increase. Areas under groves and orchards have decreased in most villages, but they have shown a considerable progress in the suburbs of the urban centres.

Trends of the Arable Land

The actually cultivated land amounts to nearly

* This figure is based on the Appendix table XX which shows the main types of land use as percentages of the total areas in the sample villages, at two stages, present and old and thus indicates the trends of the same.
TRENDS OF ARABLE LAND
IN SAMPLE VILLAGES

ARABLE LAND AS PERCENTAGE OF
TOTAL ARE A PLOTTED
IN THREE STAGES

FIG. 24
79% of the total area of the district. 2.5% is described as land prepared for the next sugarcane sowings and 3% remains fallow. These categories of idle land form part of the cultural practices followed in the district. They form part of the arable land.

Figure 24 shows the trends of the arable land in the sample villages. It indicates a general increase in the arable land almost everywhere. Since the arable includes the fallows which have decreased much in the recent years, the trend of the actually cultivated land is still more towards the rise. The ratio of the actually cultivated area to the total area of the district has considerably enhanced since 1883 A.D., when it was about 69% only. During the first half of the twentieth century the normal cultivated area was between 72% to 73% of the total area. The post-independence, rather the post-Zamindari Abolition period has, however, seen a rapid rise of cultivation as is clear from the Table 12.

* The land prepared for the next sugarcane sowings has averaged 36,559 acres and the land in which rice sappings were grown, but, were not followed by any other crop, amount to 124 acres in the years 1953-55.
** The graphs in this figure have been prepared by plotting the arable areas of the respective villages at three stages, viz., the settlement years 1872-74, 1939-41 and the latest records.
### Table 12

**Progress of Cultivation**

<table>
<thead>
<tr>
<th>Year</th>
<th>Area cultivated (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1882-83</td>
<td>1,004,416*</td>
</tr>
<tr>
<td>1892-93</td>
<td>1,017,297**</td>
</tr>
<tr>
<td>1903-04</td>
<td>1,061,366**</td>
</tr>
<tr>
<td>1954-55</td>
<td>1,156,527^</td>
</tr>
<tr>
<td>1956-57</td>
<td>1,164,978*</td>
</tr>
</tbody>
</table>

**Fallow**

Old fallows have been gradually reduced, while in the years 1903-05 they amounted to 71,768 acres, their average in the years 1953-58 has been 2,476 acres only.

The new or current fallows, on the other hand, have shown some increase. In the years 1903-05, they amounted to 31,431 acres whereas their average, in the years 1953-58, is 42,498 acres. The reduction of old fallows owes first to the fact that formerly their limit extended up to six years, now it extends up to five years, after which they are transferred to the category of cultivable waste or 'bandar'. Secondly, formerly, their larger extent owed partly to the prevailing grain rents or mal-treatment of tenants by the zamindars that sapped the interest of the tenants in the marginal areas. The figures for the years 1953-58 are based on the Sadar Manungo's Milan khasras for the years. For the years 1903-05 are based on Hevill, H.H., *Op. cit.* pp. 27, 28 and 30.

- ^ Based on Sadar Manungo's Milan khasras for the respective years.
land, which produced insufficiently after a few years and was left fallow. With the abolition of zamindari the peasants have now begun to take keener interest in their holdings and they seldom allow any land to lie fallow for a long period. The zamindars would not allow the tenants to acquire occupancy or hereditary rights so that some of the land used to lie fallow also as a result of the ejectments of the tenants.

Factors influencing the progress and distribution of Arable

A. Influence of Physiographic Conditions:

The distribution of arable land is related in the first instance to the physiographic conditions. Favourable soils and a well-drained piece of land free from water-logging afford a great attraction to the cultivator though we may find, sometimes, good rabi crops growing even in the actual beds of the streams from where water has receded. This owes to the fertile silt deposits of the khadars.

Though the percentage of the cultivated to the total land varies from tract to tract and from village to village, in the upland villages, situated at some distance from the towns and having few other activities in addition to cultivation, it is usually the highest. Thus the sample villages Serli (96.5%), Naglia Kothair (91.7%), Hizam Nagla
and Bahladpur (94.3%) have more than 90% of their total land as cultivated (Fig. 25b). All of them are situated on the central uplands more than two miles away from any town. In contrast, Daulat Bagh Ahtmali (48.6%), Birpur Baryar (34.5%), Bhagwanpur Khadar (36.7%) and Matena Mustehkam Old (48.1%) have less than 50% of their land as cultivated. All of them lie in the khadar areas (Fig. 25a).

In the upland situations the difference is not so great and the ratio of the area under cultivation is high even in the bhurlands, e.g., Bagarhpur Chhoya has 80.6% and Chaki Khera 81.5% of their total area under cultivation. In the Thakurdwara tahsil, too, the ratio is very high, e.g., Tikhunti has 86.2% and Ramnawala 82.4% area as cultivated. Some of the better khadar villages are not far behind, e.g., Machharya has 73.2% and Matena Kew Mustehkam has 77.7% area under cultivation.

The proportion of the cultivated area remains lowest in tahsil Hasanpur which includes the wide Ganga khadar tract and the great bhurlands. The relative precarious nature of the bhur and khadars renders the existence of considerable areas as fallows so that Hasanpur leads all other tahsils in this respect owing to the vastness of its bhur and Ganga khadar tracts. Next in order comes Moradabad tahsil with its wide Ramganga valley. The third position is occupied by Thakurdwara owing to its precarious uplands and Ramganga khadar.
FACTORS OF LAND USE

(A) SITUATION IN KHADAR
MATENA OLD & NEW
1955-56

(B) SITUATION IN UPLANDS & DISTANCE FROM LARGER SETTLEMENTS

SEMLI
NAGLA KATHAIR
HAUZ BADESRA
KHIDMATPUR
1955-56

(C) IMPACT OF THE EXTENSION OF IRRIGATION, SETTLEMENT & ROADS

CHAKI KHERA
1955-56
1872-75
1874-75
The following table compares the extent of cultivation in various tahsils in the years 1903-05 and 1954-55.

Table 13

<table>
<thead>
<tr>
<th>Tahsil</th>
<th>1903-05</th>
<th>1954-55</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basanpur</td>
<td>60.19</td>
<td>64.80</td>
<td>3.61</td>
</tr>
<tr>
<td>Thakurdwara</td>
<td>69.47</td>
<td>80.00</td>
<td>10.53</td>
</tr>
<tr>
<td>Moradabad</td>
<td>70.65</td>
<td>76.87</td>
<td>6.22</td>
</tr>
<tr>
<td>Amroha</td>
<td>82.53</td>
<td>85.23</td>
<td>2.70</td>
</tr>
<tr>
<td>hilari</td>
<td>84.03</td>
<td>86.42</td>
<td>2.39</td>
</tr>
<tr>
<td>sambhal</td>
<td>86.85</td>
<td>86.74</td>
<td>0.11</td>
</tr>
<tr>
<td>Total Distt.</td>
<td>75.39</td>
<td>78.80</td>
<td>3.41</td>
</tr>
</tbody>
</table>

These figures show that in the tahsils of the central bangar uplands, particularly Batehr, cultivation has been quite stable, but in the khadar and bhur tracts as in Thakurdwara, Moradabad and Basanpur it has been quite unstable and in recent years it has shown a rapid rise. Fig. 25A shows the influence of khadar situation on the land use. Fig. 25B shows that of the situation in the central uplands. It also shows that in these uplands the distance from the larger settlements has a bearing on the extent of the arable. The comparatively reduced arable area and a larger area devoted to other types of land use in hauz badehra as well as haglia kathair than that in semli is partly due to the relative proximity of the sambhal and bahoi towns in the case of the former villages.

** Based on Sadar panunço's bilan ahasra for the year.
Influence of rainfall

The climatic influence, more truly the influence of rainfall on tillage, is exhibited in the following ways:

(i) **Regional contrasts in cultivation:** In this area having high temperatures even a difference of 10 inches in the average annual rainfall is sufficient to create regional contrasts in agricultural land-use and crop production, e.g., the rice cultivation in the northeast and the millet cultivation in the west of the district. This fact will be brought out more clearly while discussing the crop patterns.

(ii) **Fluctuation of tillage:** The actually tilled area varies considerably from year to year owing to the vagaries of rainfall. Even abnormal changes, after every few years are associated with the rainfall fluctuations as may be seen from Fig. 26 as well as from the following table:

<table>
<thead>
<tr>
<th>Year A.D.</th>
<th>Rainfall (inches)</th>
<th>Cultivated Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1892-93</td>
<td>1,017,297</td>
<td></td>
</tr>
<tr>
<td>1896-97</td>
<td>940,935</td>
<td></td>
</tr>
<tr>
<td>1902-03</td>
<td>1,084,225</td>
<td></td>
</tr>
<tr>
<td>1907-08</td>
<td>912,000</td>
<td></td>
</tr>
<tr>
<td>1909-10</td>
<td>1,112,468</td>
<td></td>
</tr>
<tr>
<td>1913-14</td>
<td>1,057,068</td>
<td></td>
</tr>
<tr>
<td>1914-15</td>
<td>1,120,484</td>
<td></td>
</tr>
<tr>
<td>1915-16</td>
<td>934,713</td>
<td></td>
</tr>
<tr>
<td>1945-46</td>
<td>1,134,639</td>
<td></td>
</tr>
<tr>
<td>1948-49</td>
<td>1,115,690</td>
<td></td>
</tr>
<tr>
<td>1951-52</td>
<td>1,155,827</td>
<td></td>
</tr>
</tbody>
</table>

From the figures in the table above it is clear that the amount of rainfall controls the area under plough. The years of decreased cultivated area are usually marked by lesser rainfall, e.g., 1907-08 which had only 21.38" and 1918-19 which had only 26.39" of rainfall. The years of higher cultivation are characterised by a higher rainfall, e.g., 1914-15 which got 44.34" and 1945-46 which got 49.33". Fig. 26 illustrates this fact graphically.

(a) The Influence of Drought: Drought immediately results in the quitting of cultivation where means of irrigation are not available. Thus the year 1907-08, which received 21.38", in 21 days, as against the normal yearly rainfall of 39.90", saw a 33% decrease in the net sown area as compared to the normal. Divided among the three main seasons this rainfall amounted to 19.15" against the normal of 29.53" during the period of April 1 to August 31; 0.02" against the normal of 6.80" during the period of September 1 to October 31 and 2.21" against the normal of 3.57" during the period of November 1 to March 31.

The same thing was repeated in the year 1918-19 when the district received only 26.39" of rainfall in 32 days. It was distributed as 20.91" from April 1 to August 31; 0.56" from September 1 to October 31 and 4.92" from November 1 to March 31. This year saw a decrease of 12.2% in the net sown area as compared to the normal**.

* This figure is based on the data given in the Distt. Census Handbook (p. cit., pp. 226-247).
** Figures based on Ibid.
Rainfall: A higher amount of rainfall and more evenly distributed through the season is on the other hand highly beneficial to cultivation as shown below:

Table 15

<table>
<thead>
<tr>
<th>Year</th>
<th>Yearly rainfall (inches)</th>
<th>No. of rainy days</th>
<th>Increase in the net sown area over normal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1906-07</td>
<td>42.48</td>
<td>46</td>
<td>2.4</td>
</tr>
<tr>
<td>1909-10</td>
<td>41.49</td>
<td>48</td>
<td>5.0</td>
</tr>
<tr>
<td>1910-11</td>
<td>40.86</td>
<td>53</td>
<td>4.3</td>
</tr>
<tr>
<td>1914-15</td>
<td>44.34</td>
<td>50</td>
<td>5.8</td>
</tr>
<tr>
<td>1916-17</td>
<td>48.44</td>
<td>50</td>
<td>5.4</td>
</tr>
<tr>
<td>1917-18</td>
<td>47.66</td>
<td>60</td>
<td>3.2</td>
</tr>
<tr>
<td>1921-22</td>
<td>53.56</td>
<td>46</td>
<td>1.3</td>
</tr>
<tr>
<td>1933-34</td>
<td>53.04</td>
<td>56</td>
<td>2.8</td>
</tr>
<tr>
<td>1936-37</td>
<td>57.03</td>
<td>60</td>
<td>2.2</td>
</tr>
<tr>
<td>1942-43</td>
<td>47.35</td>
<td>50</td>
<td>4.7</td>
</tr>
<tr>
<td>1945-46</td>
<td>49.33</td>
<td>47</td>
<td>6.6</td>
</tr>
<tr>
<td>1946-47</td>
<td>47.17</td>
<td>54</td>
<td>5.3</td>
</tr>
<tr>
<td>1948-49</td>
<td>58.31</td>
<td>48</td>
<td>1.0</td>
</tr>
</tbody>
</table>

It appears that normal rainfall and normal cultivated area go side by side and a slightly higher amount of rainfall is beneficial to cultivation in this area.

(c) Influence of a succession of wet years: A succession of wet years, however, causes saturation in the soil and, therefore, reduces the extent of cultivation. The relative decrease shown in the cultivated area in the year 1948-49 (table 15 above) may be due to this factor, since the rainfall had been quite heavy from 1945-46 onwards. The concentration of heavy rainfall in a few days also adversely affects the net sown area. The figures in the following

* Ibid.
Further illustrate these facts?

Table 16

<table>
<thead>
<tr>
<th>Year</th>
<th>Rainfall (inches)</th>
<th>Rainy days</th>
<th>Decrease in net sown area below normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1922-23</td>
<td>50.15</td>
<td>52</td>
<td>0.1</td>
</tr>
<tr>
<td>1923-24</td>
<td>31.82</td>
<td>48</td>
<td>0.1</td>
</tr>
<tr>
<td>1924-25</td>
<td>43.49</td>
<td>43</td>
<td>0.2</td>
</tr>
<tr>
<td>1925-26</td>
<td>45.10</td>
<td>51</td>
<td>3.6</td>
</tr>
<tr>
<td>1926-27</td>
<td>31.46</td>
<td>40</td>
<td>3.0</td>
</tr>
<tr>
<td>1927-28</td>
<td>51.13</td>
<td>50</td>
<td>2.6</td>
</tr>
<tr>
<td>1928-29</td>
<td>22.50</td>
<td>24</td>
<td>3.8</td>
</tr>
</tbody>
</table>

It is clear from these figures that a high rainfall for some years at a stretch leads to decreased cultivation in general. Moreover, whenever the rainfall is received in a lesser number of days, the amount remaining is insufficient high, the effect appears to be the same, e.g., 1928-29.

(iii) Extent of new fallows: The vagaries of rainfall have also a direct bearing on the extent of new fallows. Distinct from the current fallows, which form part of the yearly crop rotations, the new fallows, generally, owe to the unfavourable rainfall for some years at a stretch. In areas unprotected by irrigation, these fallows may result in the case of drought. In the depressions liable to be water-logged, the fallows are left in the case of a wet cycle; otherwise, they denote a longer rest period given to the land, which has reduced some harvests at a stretch or some inconvenience of the peasant who has not been able
to cultivate the land. Of all the sample villages, Bagarpur Chheliya, in the Hasanpur bhur, showed the maximum of new fallow (11.2% of its total area in the year 1955-56). Chaki Khera, an adhek village overlooking the bagad nadi, followed with 7% of its total area as new fallow. Both these villages are liable to be damaged by heavy rains.

(iv) Character of the Agricultural Year: The agricultural year begins with the onset of the monsoonal rains and it has three parts, namely -

1. The kharif harvest season,
2. The rabi harvest season, and
3. The zaid harvest season.

The agricultural activities follow the under-noted rhythm:

<table>
<thead>
<tr>
<th>Month</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>June-July</td>
<td>Sowing of kharif crops.</td>
</tr>
<tr>
<td>Dec.-Jan.-Feb.</td>
<td>Irrigation and weeding of rabi and sowing of zaid crops.</td>
</tr>
<tr>
<td>March-April</td>
<td>Rabi harvest, threshing and winnowing.</td>
</tr>
<tr>
<td>May-June</td>
<td>Sugarcane, sowing in the irrigated areas and harvesting of zaid crops.</td>
</tr>
</tbody>
</table>

(v) Predominance of the Kharif Harvest: Kharif and rabi are the two major harvests. Since the rainfall is concentrated in the kharif harvest season, of the two major
harvests the former usually covers larger area than the latter as is clear from the figures in the table below:

Table 17

<table>
<thead>
<tr>
<th>Year A.D.</th>
<th>Kharif</th>
<th>Rabi</th>
<th>Zaid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880-81</td>
<td>523,442</td>
<td>514,220</td>
<td>3,314</td>
</tr>
<tr>
<td>1903-04</td>
<td>631,369</td>
<td>534,025</td>
<td>H.A.</td>
</tr>
<tr>
<td>1954-55</td>
<td>682,744</td>
<td>637,343</td>
<td>5,560</td>
</tr>
<tr>
<td>1957-58</td>
<td>727,891</td>
<td>635,990</td>
<td>5,630</td>
</tr>
</tbody>
</table>

% increase since 1880-81

Aharif covers a larger area in almost all parts of the district. In the recent years the extension of the facilities of irrigation in the uplands, has also promoted the enlargement of its area through the cultivation of sugarcane which requires irrigation in this season.

(vi) Fluctuation of the Rabi Harvest: The rabi harvest is subject to considerable fluctuations since it depends so much on the character and duration of the summer and winter rainfalls in the unirrigated tracts. For example, in the year 1899-1900, when the monsoon ceased prematurely and left the soil dry, the area under rabi was only 423,308 acres*, since then facilities for irrigation have been

# Based on Sadar Namunno's Milan Ahasras for the respective years.
## Fevill, H.R., Ibid. p.30.
greatly extended and we find a significant increase in the rabi harvest, which was 637,343 acres in 1954-55 and out of that 187,749 acres were irrigated*. In the khadar tracts, where the prospects of kharif are always doubtful owing to the annual floods, however, rabi is usually the major harvest.

(vii) Insignificance of the zaid harvest: The zaid harvest is of little general importance, since it is raised in the dry hot season when crops require more water. Moradabad and Hasanpur tahsils have the major share in it, since on the silts of the Ramganga and the Ganga rivers melons are grown in large quantities in this season. Near Moradabad, Sambhal and other large towns, vegetable cultivation is important. Sambhal is also noted for tobacco, which too is cultivated as a zaid crop. But, like rabi, the zaid crops also depend much on the facilities of irrigation. Since it is raised in the dry and hot period, the increase of the zaid harvest in the recent years may be related to the availability of irrigation. In the year 1954-55, thus about 77% of the total zaid harvest was irrigated.

(viii) Extent of Irrigation and Production of Superior Crops: That the extent of irrigation and the production of superior crops are badly controlled by the nature and distribution of rainfall is clearly shown by Fig. 26.

* Based on Sansungo's Milan Ahsara for the year
Since most of the central upland is relatively dry, a higher amount of rainfall is extremely beneficial. It extends the area under wheat, which is the predominant foodgrain of these uplands. Conversely, a low rainfall reduces the area under wheat which then needs irrigation on an increased scale. These facts are clear from the following table:

Table 18

<table>
<thead>
<tr>
<th>Year</th>
<th>Yearly Rainfall (inches)</th>
<th>Number of Rainy Days</th>
<th>Acres under Wheat</th>
<th>Wheat acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>1906-07</td>
<td>42.48</td>
<td>46</td>
<td>31,556</td>
<td>31,193</td>
</tr>
<tr>
<td>1907-08</td>
<td>21.35</td>
<td>32</td>
<td>249,427</td>
<td>95,214</td>
</tr>
<tr>
<td>1908-09</td>
<td>31.33</td>
<td>35</td>
<td>319,158</td>
<td>28,727</td>
</tr>
<tr>
<td>1909-10</td>
<td>41.49</td>
<td>46</td>
<td>350,412</td>
<td>26,155</td>
</tr>
<tr>
<td>1910-11</td>
<td>46.86</td>
<td>53</td>
<td>362,362</td>
<td>17,677</td>
</tr>
<tr>
<td>1911-12</td>
<td>46.64</td>
<td>60</td>
<td>345,846</td>
<td>77,615</td>
</tr>
<tr>
<td>1912-13</td>
<td>47.66</td>
<td>60</td>
<td>345,459</td>
<td>34,187</td>
</tr>
<tr>
<td>1913-14</td>
<td>26.39</td>
<td>32</td>
<td>280,569</td>
<td>89,755</td>
</tr>
<tr>
<td>1914-15</td>
<td>39.56</td>
<td>44</td>
<td>335,550</td>
<td>28,503</td>
</tr>
<tr>
<td>1915-16</td>
<td>39.68</td>
<td>37</td>
<td>341,351</td>
<td>78,585</td>
</tr>
</tbody>
</table>

The cultivation and irrigation of wheat are closely related to the autumnal and winter rainfall as shown by Fig. 26. On the other hand, if the summer monsoon rain is less than the normal, the extent of rice-cultivation is badly affected. Thus in the year 1910-11, when from April 1 to August 31 it rained only 23.29 inches as compared to the normal of 29.53 inches, the total rice area accounted to only 95,614 acres against the quinquennial average (1906-07 to 1910-11) of 109,069 acres. In the year 1918-19 when from

April 1 to August 31 it rained only 20.91 inches within 24 days, the extent of irrigated rice rose abnormally to 5966 acres. In the previous year it had amounted to only 871 acres when the rain had amounted, in this season, to 27.34 inches in 39 days.

(ix) **Fluctuation in Crop Yields:** The vagaries of rainfall have a controlling hand not only in the extent of net sown area, in the cultivation of superior crops, etc., but also in the crop-yields. Thus, for example, the monsoon of 1907 did not set in till late in July with the result that the sowings for the kharif were considerably delayed. Again, no rain was received between the 28th of August, 1907 and 10th January, 1908. Then, Amroha and the bhur tracts of Hasanpur were most affected and suffered severely. In the former, the out-turn was about five annas in the rupee, and in the latter it was only very slightly better. Taking the district as a whole, the proportion of the total yield to the normal for each of the main kharif crops was estimated in November, 1907, as follows:**

Table 19

<table>
<thead>
<tr>
<th>Crop</th>
<th>% of actual yield</th>
<th>Crop</th>
<th>% of actual yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bajra</td>
<td>60</td>
<td>Early Rice</td>
<td>30</td>
</tr>
<tr>
<td>Jwar &amp; Chari</td>
<td>45</td>
<td>Late Rice</td>
<td>15</td>
</tr>
<tr>
<td>Maize</td>
<td>35</td>
<td>Cotton</td>
<td>75</td>
</tr>
<tr>
<td>Urd &amp; Moong, Both</td>
<td>60</td>
<td>Sugarcane</td>
<td>60</td>
</tr>
</tbody>
</table>

**Ibid.  
** Moradabad, **Supplementary Notes & Statistics to Vol.XVI of the District Gazetteers of the U.P., Allahabad, 1914, p.5-7.**
Though all the crops yield much less than normal in such a season, it is clear from the above figures that rice suffers most from the long breaks in the monsoons.

C. Influence of Cultural Conditions:

The extent and distribution of the arable land is also related to the cultural conditions. Although the control of physiography, climate and soils seems to be dominant, yet the influence of cultural improvements is there. Since the last quarter of the 19th century, the cultural conditions have undergone much change. Considerable increase in population and extension of settlement, development of the means of communication, transport and irrigational facilities, establishment of the sugar mills, peaceful and settled political conditions, improved tenancy laws etc., have created suitable conditions for the extension of the area under cultivation and their influence is also visible on the use of the arable.

Some of the effects of the progress of the means of transport and communication, irrigational facilities and the growing pressure of population on the extension of cultivation have already been noted in the relevant sections in chapter II. Fig. 25C provides some cartographical evidence of the same. It indicates that while in Abinutpur
the provision of canal irrigation has facilitated the extension of both cultivation and settlement, in Chaki Kheda the extension of the means of communications, and tube well irrigation has produced the same results. Both these villages used to be uninhabited, formerly, and much of their areas used to lie as wastelands.

(i) Positive influence of irrigational facilities:

Since 1976-81, the total irrigated area in the district has increased 4.6 times (from an average of 53,364 acres to 4,35,963 acres). The irrigated area in the kharif harvest has increased 2.6 times, that in the rabi harvest 7.7 times and that in the zaid harvest 6.8 times. Although the average total cropped area has also increased substantially (1.35 times), yet the unirrigated area has increased comparatively much less (1.15 times). Evidently, therefore, the increase in the total cropped area is mainly due to the extension of irrigation, which has been beneficial in many ways as noted below:

(a) It has made cultivation more stable in the precarious parts, the risk of crop failures, owing to drought, having been greatly reduced.

(b) It has made the kharif harvest surer by providing protection against the failure of monsoon.

(c) It has facilitated the cultivation of more land during the dry hot season, when
cultivation is possible mainly through irrigation. (d) It has enabled the extension of rabi cultivation during the dry winter season so that, since 1878-81, the average annual acreage of wheat has increased by about 1.36 times. The cultivation of potatoes and vegetables has also increased greatly.

(e) The cultivation of sugarcane on a large scale would not have been possible without the provision of irrigation. Since 1878-81, the average annual acreage of sugarcane has increased by about 3.5 times. The quality of sugarcane has also much improved.

(f) The provision of irrigation facilities has rendered it possible to grow better crops like wheat, potatoes and sugarcane where, formerly, barley, bajra or jowar used to be grown so that cultivation has become more lucrative.

Table 20 below compares the percentages of the average areas irrigated during the years 1950-56 and 1878-81. Table 21 compares the shares of the harvests in the irrigated areas in the same years. A glance at table 20 shows that all harvests have shared in the progress of the irrigated areas. But table 21 shows that the relative share of these harvests in the irrigated cropland is more in favour of the rabi. In the kharif irrigation does not hold that much of relative importance now as it held
formerly. This owes to the fact that the kharif harvest has always been adjusted to the rainy season conditions of soil moisture. The rabi and the zaid harvests suffered from the dryness of their seasons, but with the provision of irrigation facilities they have benefitted much more than the kharif harvest which needs irrigation mostly in the case of drought and sugarcane cultivation.

Table 20

<table>
<thead>
<tr>
<th>Class of Area</th>
<th>1878-81</th>
<th>1953-58</th>
<th>1878-81</th>
</tr>
</thead>
<tbody>
<tr>
<td>Let sown area</td>
<td>1.4</td>
<td>20.4</td>
<td>-</td>
</tr>
<tr>
<td>Double cropped area</td>
<td>10.7</td>
<td>19.1</td>
<td>13.8</td>
</tr>
<tr>
<td>Total cropped area</td>
<td>5.3</td>
<td>25.0</td>
<td>20.7</td>
</tr>
<tr>
<td>Rabi area</td>
<td>4.3</td>
<td>6.2</td>
<td>19.8</td>
</tr>
<tr>
<td>Kharif area</td>
<td>19.4</td>
<td>78.1</td>
<td>58.3</td>
</tr>
</tbody>
</table>

Table 21

<table>
<thead>
<tr>
<th>Harvest</th>
<th>1878-81</th>
<th>1953-58</th>
<th>1878-81</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabi</td>
<td>38.8</td>
<td>64.4</td>
<td>25.6</td>
</tr>
<tr>
<td>Kharif</td>
<td>60.0</td>
<td>33.2</td>
<td>26.2</td>
</tr>
<tr>
<td>Zaid</td>
<td>1.2</td>
<td>1.8</td>
<td>0.6</td>
</tr>
</tbody>
</table>

(11) Positive influence of improvement in Accessibility and settlement: A reference to the map of accessibility (Fig. 21) would show that excepting

* Figures for 1953-58 are based on Sadaq Wajungo's Milan Khasras for these years. Those for 1878-81 are based on Fisher F., op. cit., pp. 40-41. N.A. means not available.
Thakurdwara and the southern part of Hasanpur all other parts of the district have benefitted much by the development of the means of communication. Similarly, they have gained by the extension of settlement and increase of population. As the cultural influence extends, more and more land is brought under the plough till the limit of available land is reached. The earlier settled area is the less likelihood would be of the extension of tillage, there. Thus, Sambhal, the oldest settled parganah of the district, has shown only 0.09% increase in its land under tillage since the beginning of this century. But, all other tahsils have gained much more; Bilari records 1.89%, Amroha 2.70%, Hasanpur 4.61%, Koradabad 6.22% and Thakurdwara 10.53% increase in the cultivated area in the same period.

In the recent years the rapid rise in tilled area is partly also due to the greater craving for cultivable land shown by the tenants on being assured of their rights in the land. It also is due partly to the rehabilitation of some refugees from west Pakistan in parts of the district, which were lying idle, previously. The extraordinary rise in tillage in Thakurdwara tahsil, in particular is related to this factor. Many refugee families from west Pakistan have been rehabilitated in the uplands of this tahsil. Village Hanjawala, for example, had only
0.5% of its total land under tillage in the year 1940-41 and the banjar covered the rest of it. It was deserted in the early part of this century owing to some incidents of decoy related to the activities of Sultan dacoit. Its lands were reverted to a scrub jungle. The zamindar could not induce any tenant to clear the jungle and bring the land under cultivation, again. It was after the partition of the country when some batches of refugees were rehabilitated there, that the jungle was cleared. These refugees have now brought under cultivation almost all available land in the village and in the year 1955-56, the proportion of tilled area has increased to 82.4%.

(iii) Decline of the arable due to Cultural Influences: Wherever road, railway, canal or building construction has taken place, some of the arable land has been used in that construction, e.g., at Lahadpur and Chaki Akra. The consolidation of holdings is also reducing the extent of the arable land by allotting some land for certain new cultural demands of the villages, e.g., Ranchayat dhur, ahalyan, etc. In the suburban situations the arable land has declined recently owing to the urban expansion. Thus, the cultivated area in bauz-badesra (51.4%) and baulat bagh bustehkan (62.2%) lying in the suburbs of the large towns of Sambhal and Goradabad respectively is much restricted (See Fig. 25b).

* Based on personal enquiries from old persons at Thakurdwara.
Agrarian structure

The system of land tenure, the terms on which land is held and cultivated, the size and distribution of holdings, etc., also have their influence on the use of the arable land and on the agricultural productivity since the land system may either provide incentives and opportunities for development or otherwise.

Land tenure

Under the British rule, the non-tilling zamindars held the greater part of land while the majority of the actual tillers comprised the tenants cultivating scattered, small and high rented holdings. The first land settlement in the district was made at the end of 1802 by Collector Leycestor*. The right to collect the rent and pay revenue was leased to the highest bidder who could furnish the requisite security and the tahsildars received a percentage of the collections in lieu of salary. Frequent auctions raised the demands of revenue and that made the sales alarmingly frequent. The smaller landholders, such as the Thagas of Isanpur, the Rajputs of Kradabad and Thakurdwara, etc., suffered severely. In 1850, when the people could not pay the rents, almost the whole parganah of Thakurdwara was sold, while in the

* This account is based on Leuill, H.M., Op.cit., pp.118-123.
ten years ending with 1837, no fewer than 174 estates changed hands there. At every successive settlement the land revenue demand was raised and in consequence of non-payment of it the land used to be transferred or sold. Thus, at the beginning of the twentieth century in 1904-05, the district contained 8,308 mahals or zamindaris, exclusive of mills or areas held free of revenue. The zamindari mahals embraced 70% of the total area and the various coparcenary estates 21.13%. The remainder included the many small revenue free plots and the numerous milks or resumed murfis. Some land-owners were quite large indeed, e.g., the Raja of Sahaspur who owned 73 villages in the district, his ancestors had added to the estate by money-lending and also by the reward for their loyalty in the mutiny days. The Raja of Najaula also owned 62 villages, in the early days of the British rule.

Tenancy

Cultivation has been carried on by the tenants mostly. Only 9.48% of the total area included in the holdings was cultivated by the proprietors as 'air or ahudkash' and 0.65% was rent free. The remainder was in the hands of the tenants; 52.14% was held by occupancy tenants, 36.77% by tenants-at-will, and 1.03% by proprietary tenants. Proprietary cultivation ranged from * Ibid. pp. 87-89.  
** Ibid. pp. 102.
over 12% in Sambhal to 6.18% in Amroha tahsil where the Sayyids seldom devoted any attention to farming. Bilari tahsil had (59.13%) the highest ratio of cultivation in the hands of occupancy tenants, while Goradabad had 55.01%, Sambhal 53.59%, Amroha 51.8%, Thakurdwara 49.78% and Hasanpur 44.72%. The average area held by each tenant was 6.77 acres, ranging from 4.77 acres in the Goradabad tahsil to 6.36 acres in Bilari, 6.44 acres in Sambhal, 6.67 acres in Thakurdwara, 8.3 acres in Amroha and 8.72 acres in Hasanpur. A very considerable area was sublet.

Abolition of Zemindaris

The landlords, as a body, were naturally unwilling to allow fresh occupancy rights to accrue, owing to the great difference between the rents paid by the occupancy tenants and those paid by the tenants-at-will, coupled with the extreme difficulty of obtaining enhancements of the former rents. In Amroha, the landlords, in some cases deliberately set themselves to extirpate occupancy rights by every possible device. But the proportion of occupancy area was lower in the more precarious tracts such as Thakurdwara and Hasanpur, due to the fact that in a year of stress many tenants abandoned their holdings and rights.

Excessive rents, insecurity of tenure and indebtedness had crippled the initiative of the tenants. They had no resources to improve the land and to invest in the improved seeds, improved implements and new techniques which might better their lot. Measures of the reform of land tenure were, therefore, deemed necessary to remove the defects in the institutional framework and evolve a system which would promote a better utilization of land. Moreover, they were aimed at correcting the social injustices and remove disparities in wealth and income. Ever since the development of the social consciousness for land reform various measures have been adopted in that direction. Particularly, after Independence, the national government has dealt with this problem keenly. The five Year Plan has recommended a five point programme as noted below:

(i) abolition of intermediaries;  
(ii) measures for reducing rents, conferring on tenants permanent rights over the land subject to the landlord's right to resume certain areas for his personal cultivation; and enabling him to acquire its ownership on payment of a reasonable price;  
(iii) fixation of ceiling on land holdings and distribution of surplus lands;

(iv) consolidation of holdings and prevention of fragmentation; and
(v) development of co-operative farming and co-operative village management.

Land is a state subject and the responsibility for implementing land reforms rests with the state Governments. The Uttar Pradesh Government has passed a series of legislative measures in order to give security of tenure, help in the creation of economic holdings and to reduce the debts of the agriculturist to an amount which he can afford to pay. Examples of such measures are the U.P. Encumbered Estates Act (1934), the Usurious Loans Act (1918, amended in 1934), the U.P. Agriculturists Relief Act (1934), the U.P. Debt Redemption Act (1940), the U.P. Regulation of Agricultural Credit Act (1940), the U.P. Consolidation of Holdings Act (1939), the U.P. Zemindari Abolition and Land Reforms Act (1950).

The U.P. Zemindari Abolition and Land Reforms Act* provides for three main classes of tenure-holders, viz., the zemindars, zirars, and asans and one minor class, the adivasis. The zemindars, in so far as their sir and khudkasht land is concerned, have become dhumi-dars** without paying for these rights. The present day

*This Act extends to the whole of U.P. except the areas which on the 7th day of July, 1949 were included in a municipality or a notified area or a town area vide, subsection(2) of Sec.1 of the Act.
tenants have attained the status of Sirdars* and can acquire the bhumidhari rights by paying ten times the annual rent into the Zamindari Abolition Fund**. Sirdari has been conferred on all tenants with a right of occupancy. A Sirdar will have a permanent and hereditary interest in his holding but will not be allowed to use it for purposes other than those connected with agriculture or horticulture or animal husbandry. Asami rights have been conferred on tenants or sub-tenants of grove lands, tenants' mortgagees and a few others. Neither the Sirdars nor the Asamis had to pay for the rights acquired by them. Adhivasis are tenants of Sirdars and sub-tenants. They were given rights to continue to hold land for five years from the commencement of the Act and could become Bhumidhars by paying 15 times the rent after the expiry of the period***.

One of the fundamental principles underlying the new land tenure system is that none of the tenure holders, except the disabled Bhumidhars or Sirdars are free to let out land. The bhumidhar is free to transfer his holding to any one provided the latter's holding does not exceed 30 acres by any such transfer. There is no limit on the sir or khudkasht land which any of

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* Ibid.
** Ibid., Section, 134(a).
† Sections 143 and 144 grant the right of the 'bumidhar' to the use of his holding for industrial, residential or other non-agricultural purposes.
*** Ibid., Sections 133, 206, 235.
†† Ibid., Sections, 156-157.
††† Ibid., Section, 154. According to a later provision 12½ acres is the maximum limit.
present tenure-holders can have. In future, no one can hold a holding exceeding 30 acres and none can purchase more land if he has already got 64 acres. Sub-division of holdings will be permitted only if parts so subdivided are not less than the economic holding of 64 acres. If partition of such a holding is sought there shall be a sale and only a redistribution of the proceeds, thereof, allowed. The waste land, grazing grounds, forests, etc., would belong to the Gran ranchayats for the common benefit of the village community. Since the individual cultivator does not possess the means to bring about improvements in his land and use better methods of cultivation, the Act also provides for two types of co-operative farming, viz.,

(a) Small farms of 30 acres or more, constituted by voluntary agreement by ten or more cultivators, and

(b) Co-operative farms comprising all uneconomic holdings in a village. If two-thirds of the holders of uneconomic holdings apply for registration of such farms the remaining one-third will have to join compulsorily.

* Ibid., section, 176.
** Ibid., section, 117.
† Ibid., section, 295.
‡‡ Ibid., sections, 299, 300, 304.
PATTERN OF HOLDINGS

(UPTO 1.0 ACRE)

1.1-3.0 ACRES

3.1-6.0 ACRE

6.1-12.0 ACRE

ABOVE 12.0 ACRE

(Based on Khetraisation of the villages)

FIG. 27
Land Holdings

Figure 27 shows the distribution of agricultural holdings in nine villages taken for the detailed study, which has shown that 34.8% holdings are just up to one acre each, 20.9% holdings are 1 to 3 acres each, and 37.2% holdings are 3 to 12 acres each. Only 7.0% holdings are above 12 acres vide Table XXI in the Appendix.

The present distribution of holdings owes to the historical and economic factors that have worked in the past. Larger holdings usually belong to the old zamindars, jagirdars and their havildars. But in many cases, the money-lenders have also acquired large holdings by lending money to the extravagant landlords. Thus the Sayyids of Amroha lost much of their land to the money-lenders. It was through money-lending that some of the non-agriculturist castes appeared on the agricultural scene as landlords. In some cases, these jagirdars, landlords, etc., were wise enough to retain large holdings for themselves at the time of the Zamindari Abolition. But much of the land has passed into the hands of the tillers since the abolition of zamindari, because the former zamindars were mostly sleeping owners of land. The tenants of old have become the owners of land in their possession, subject to certain provisions.
FIG. 28

FRAGMENTATION OF HOLDINGS
VILL. BAHADURPUR
YEAR 1953-54

MEDIUM & SMALL HOLDINGS

EACH TINT REPRESENTS A SEPARATE HOLDING

FRAGMENTATION & TRUNCATION OF HOLDINGS DUE TO RAILWAY & ROAD CONSTRUCTION

FIG. 28
of the U.P. Zamindari Abolition and Land Reforms Act, 1950 as amended up-to-date. Their holdings are numerous but small and scattered in general, since they core of the exploited class. In village Bahadurpur, for example, 80.5% residents of the village hold only 13.7% of its gross area, whereas a single family of Sheikhs holds about 115 acres or nearly one-third of the total area of the village. But, the fragmentation and truncation of holdings has also been imposed by the roads and railways which have been constructed without regard to the maintenance of the holdings. Fig. 28 shows a few samples of the nature of holdings in village Bahadurpur in the year 1953-54 and makes the above points clear.

**Consolidation of Holdings**

Many evils the arable farming have been due to the scattered nature of the land holdings and their consolidation appeared to be the only possible solution. So the State Government adopted a scheme of the consolidation of holdings which has been completed in tahsil Bilari and partly in tahsil Sambhal.

In an area of old tenancy, various factors were to be taken into account to introduce any change in the present pattern of the distribution of land, peacefully and democratically. Thus in the consolidation operations,
carried out in bilari tahsil, the following procedure was adopted. The whole land of a village was assessed in three classes or 'blocks' basing the classification mainly on the undernoted factors:

(a) Distance from the basti;

(b) Number and types of crops grown in each field;

(c) The facilities for irrigation; if the field had been irrigated for at least one year out of the last four years it was termed as 'wet', otherwise it was termed as 'dry'.

(d) The soil assessment of the previous land settlement was not changed excepting by 20 per cent at the most.

(e) The effects of tree-shade forbidding the growth of crops, of water-flow causing soil-erosion, etc., were also taken into account. A list of especially good and bad plots was prepared, and at the time of consolidation such plots were allotted to the original holders as far as possible.

Of the three blocks of land, thus determined in each village, block I is the land near to the basti. It has better facilities of irrigation and grows a larger number of and a better type of crops. Block II is the land next to block I as regards its distance from basti, its facilities of irrigation and cultivation of the
number and types of crops. Block III is the remaining land which suffers from the greatest distance from basti, unirrigability, etc.

While allotting land the smallest holder was allotted first of all and, if he was dislocated from his original piece of land, he was given land nearer the basti with a view to providing him the extra advantage of being able to watch his fields from his nearby residence more carefully. Since the holdings have been spread over different classes of land and since consolidation could not change the class of land, except by 20 per cent, where otherwise unadjustable, the net result has been to allot a holder, sometimes, more than one piece of land, one piece in each block. Thus, many land holders got pieces of land in more than one block according to the characteristics of their original fields. But, effort was made to allot the chaks in such a manner as the whole holding remains more or less contiguous. The areas of public utility, such as the commons, paths, etc., if brought under cultivation after 8th August, 1946 by any tenant, were expunged from his holding. Only such land as was cultivated on or before that date was allotted in the consolidated holdings*.

To take an example from village Bahadurpur where consolidation of holdings has been carried out, there are now three chaks of Block 1, 55 chaks of Block 11 and 15 chaks of Block III. The number of holders holding one chak each is 37, of those holding two chaks each is 15 and of those holding three chaks each is two. The number of private holdings enumerated in the *khatauni* of the village has increased by 15% over that in 1953-54. In addition, the consolidation has made provision for certain requirements, e.g., compost pits, animal shed, 'khalyan', panchayatghar, etc., so that now there are 46 plots of land with an area of 47.88 acres (15% of the total area of the village) which are not available for cultivation. These new requirements provided by the consolidation have meant an increase of 22.6% in the agriculturally unproductive land over that in 1953-54.

Fig. 29 shows the pattern of consolidated holdings in this village. The deduction of area for non-agricultural needs has meant the reduction of the size of holdings so that the land holders have now smaller holdings than previously. The balance is unfavourable to the small holders.

The larger land holders, however, have benefited most by the consolidation of holdings since their plots of land of the various types have now been grouped together.
in comparatively larger chaks. They can, therefore, select crops more suitable for each type of chak and can grow them on a larger scale and with a commercial bias, if desirable. This is of particular significance in the neighbourhood of sugar mills as in Bahadurpur where the raising of sugarcane for sale to the hills is a profitable pursuit. The increase in the number of holdings at the time of their consolidation is, however, a strange coincidence. It has been mainly due to the fact that the large Sheikh holding in this village, held formerly as a single holding, has been split up among its various partners. The big land holders are afraid of the new acts of legislation and are seeking to evade the agricultural income tax, the ceiling on holdings, the transfer of land to the actual tillers, etc., by subdividing their farm holdings among their relatives, though only in name, the farm being still managed as a single unit by one of the family members.

**The Field Layout**

All agricultural holdings are divided into a number of fields or plots for the purpose of cultivation. The field pattern varies from place to place owing to various factors, e.g., topographical details, nature of crops, etc. Fig. 30* shows some of the field patterns found in various parts of the district. The fields are generally

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* The figure is based on village maps showing field boundaries on the scale of 16" to the mile.
quadrangular in form excepting where the superimposition of roads and railways has cut them obliquely and thus given their parts triangular shapes, e.g., Fig. 30(6). The shapes of the fields around the ponds and along the streams, however, become more irregular. Where they have been cut inside a meander, they are arcuate, e.g., the fields in Fig. 30(2) and (5). Where they have been carved out of a pond they are of varying shapes and sizes (Fig. 30(4). The rice fields carved out of the jhadda tracts of Thakurdwara are generally small and irregular to a degree (Fig. 30(7). But the greatest contrast is presented by the isolated field pattern developed in the banjar tracts of the Ganga khadar (Fig. 30(1) and the well out fields over the fertile and flat tracts of the central uplands (Fig. 30(3 & 6). The sugarcane and wheat fields in the latter tracts are generally large and, more or less, rectangular in form. The fields in the suburban localities, however, are both small and large. They are very tiny where devoted to vegetable cultivation, but they are large where devoted to the orchards (Fig. 30(8). The same field pattern is found on the outskirts of the large and medium-sized villages (Fig. 30(9).

An overwhelming majority of fields is of small size. Fig. 31 shows graphically the percentage of plots of various sizes in the sample villages*. On an average**

* Appendix table XXII gives the relevant data.
** Calculated on the basis of the size of plots given in village khasras of the sample villages.
SIZE OF PLOTS
IN SAMPLE VILLAGES

INDEX

PERCENTAGE OF PEAS

UP TO 0.5 ACRES

0.51 - 0.75

0.76 - 1.00

1.01 - 1.50

1.51 - 2.00

2.01 - 3.00

ABOVE 3.00

FIG. 31
71% plots are just up to one acre each, 20% are between 1 and 2 acres each and 5% are between 2 and 3 acres each. But, less than 4% are above 3 acres each. Actually, 10 out of these twenty sample villages have a negligible number of plots above 3 acres each whereas only one village, namely Hammrawala, has more than 20% of its plots described as such. This village as already noted, has been recently reclaimed from a scrub jungle by the refugees from West Pakistan.

Plots in the suburban localities are tiny as a rule. Thus, Hauz Ladesra (a suburb of Sambhal town) has 55.4% of its plots just up to 0.25 acre each and 23.4% plots just between 0.26 to 0.50 acre. Baulat Bagh (a suburb of Moradabad town) has, similarly, 50.9% of its plots just up to 0.25 acre each and 25.9% more just between 0.26 to 0.50 acre each. This owes to the fact that these plots are generally devoted to market gardening for which all work is done with hands and small implements.

Another area where more than one-third of the plots are just up to 0.25 acre each, is the diluvial tract where small plots of land have been reclaimed within the vast wastelands, the farmers tending their fields from the neighbouring villages. Thus, Bhagwanpur Khadar lying in the Ganga Khadar tract has 34.2% of its plots just up to 0.25 acre each and 20.1% more plots between 0.26 and 0.50 acre each.
In the north-east, Machharya, in the Gangan khadar and Tikhunti, in the trans Ramganga tract have respectively 52.2% and 49.2%, of their plots just up to 0.50 acre each. Both of them are rice growing villages and rice cultivation needs small fields, in general.

Latifpur in the Ban-Gangan Doab and Habri Gandu in the Ari Valley have respectively 49.07% and 49.1%, of their plots up to 0.50 acre each. This owes to the slightly undulating topography of these areas.

The few large sized plots (above 3 acres) are generally found in inferior tracts. Thus, Bannawala in the Thakurdwara upland has the maximum number (24.5%) of them. Katena old and new Mustehkm with 5.8% and Bhirpur Baryar with 4.9% are located in the Ganga and Ramganga khadars respectively. Pahladpur with 5.9% and Chaki Bhera with 6.4% represent adhek (partly slope and partly khadar) tracts, Hizam Bagla with 5.1% are semi with 5.9% an udla and panmer region and Lagarpur Chhola with 2.3% marks a situation in the Hasampur bhur.

Role of Villages

Villages form the nuclei of the activities concerning agricultural land-use in this area. The whole district is parcelled into more than 3,000 villages, about 570 of which are uninhabited. The latter lie in the river beds,
usually. Generally, the village areas are larger in the inferior parts of the district, e.g., the bhurlands, the khadars and the Thakurdwara uplands as may be seen from fig. 32. In the neighbourhood of the towns the villages become very small in size. The form of the villages reflects topographical controls. It is most irregular where they are bound by streams. But, they have more or less geometrical forms over the central uplands while the villages around Sambhal town, the old provincial headquarter, have a radial pattern and their size increases with distance from the town. It may be related to the greater care of the land nearer the town.

But, all land of a particular village is not necessarily tilled by its inhabitants only. Generally, some land in each village is shared for tillage by the inhabitants of the neighbouring villages.

* This figure has been based on the One-inch tahsil maps showing village boundaries published by the Board of Revenue, Allahabad, in 1911.

1 & 4 show patterns of villages in the Thakurdwara uplands.
2 shows a radial pattern of villages around Sambhal.
3 shows pattern of villages in the Katehr Langer.
5 & 8 show patterns of villages in the Ganga khadar.
6 shows a pattern of smaller villages surrounding a larger one, generally with a fortress, found in the bhurlands.
7 shows a pattern of villages in the Ramganga khadar.
9 shows the pattern of large sized polygonal villages found in the inferior bhurlands.
Formerly, the zamindars had much to do with the pattern of land-use in their zamindaris, many of which used to spread over more than one village. But, now the present owners themselves are responsible for the use of their land-holdings. Only in certain cases, where the farms are large and are worked through hired labour that the non-tilling owner may have any say in the use of his lands.

Generally, each land holder tries to be self-sufficient with regard to the essential products of agriculture if his land resource is enough and there is a general tendency for the villages to be self-sufficient in that respect. It seems to be due to traditional influences. But, the economic considerations in some cases, e.g., sugarcane cultivation in the vicinity of sugar mills, outweigh and an imbalance results, i.e., the countryside depends for the essential foodstuffs on the town markets, while growing cash crops for sale. There is little co-operation or collective effort with regard to the agricultural activities in the villages or for the disposal of agricultural produce in the markets. Everything is determined by the family needs and the resourcefulness of the peasants.

The Method of Tillage

The method of tillage is age old. The small holdings and small fields forbid the use of agricultural
machinery on a large scale. Most of the work is done with country-made implements. The census of 1951 enumerated a total of 155,011* ploughs in the district out of which 150,819 or about 97 percent were desi wooden ploughs while the improved iron ploughs numbered only 4,792. The number of tractors was 56 only. Of the twenty villages studied by the author only two had a tractor each.

In addition to the ploughs, there are some more country-made implements (mostly wooden). The most important of these is the 'natain' used for levelling the tilled fields. The harvest is reaped with the sickles in hands. Threshing is done by much hand work with small implements. Threshing is done by treading the bullocks on the reaped and dried harvest, while winnowing is done in the age-old manner by throwing up the threshed grain and straw in the gentle breeze of the post-harvest periods.

Much labour is used on the small pieces of land to get a sufficient return. Actually, horticulture like activity is carried on by the Bachenas in their tiny holdings near the settlements. Some larger land holders concerned with sugarcane production use tractors in their farms. But, the first is the norm, the second an exception. The main interest of the normal small peasants lies in the growing of sufficient food-grains and pulses for their families.

** cf. plate XIX
XIX. Threshing by treading bullocks on harvest

XX. A poor peasant's bullock reduced to skeleton
and sufficient fodder for their animals. Locally, activities such as market-gardening and fruit-gardening are also carried on, on a small scale, near the towns.

Much more labour is required at the time of harvest than otherwise so that extra hands are employed from amongst the landless labourers. Cane cultivation, in particular, requires much extra labour both for the sowing and the cutting operations. In some of their activities such as threshing, the farmers co-operate with one another, but most work is done separately.

The greatest possible contrast exists between the careless tillage of the bhur and the skilful intensive cultivation of the Baghbans in the suburbs of Sambhal, Chandausi, Moradabad, etc. Here, it must be noted that the traditional characteristics of the people, generally denoted by their caste, are quite important regarding the nature of their work and industry. The Baghbans of Hasanpur, for example, have by persistent labour succeeded in working up even the bhur into a soil of considerable fertility.

Livestock

Kale cattle provide the power for drawing the ploughs, patelas and carts. The working bullocks number 311,279, nearly two for each plough in 1951; but most of

these bullocks are very poor physically, presenting (Plate XX) ghastly appearance of mere skeletons. Some of them are sold for fifty rupees per pair, while a good pair costs about one thousand rupees. The inferior bullocks are used by the poorer peasants and they are lost after a season or so. With the help of their weak bullocks and wooden ploughs the poor peasants, who form the majority, are just able to scratch the earth. They cannot plough deep enough.

The total number of cattle and buffaloes has been increasing since 1930, when it was 759 thousands. In 1951, it was 825 thousands showing an increase by about 9 percent. The number of working bullocks has increased by 1.6% and that of working buffalo-bullocks by about 8% since 1935*. Since animals are employed in this district mainly to work the ploughs and carts, the increase in the number of working animals suggests an increase in the number of these things. Thus, the number of ploughs has increased by 17.3% and that of carts by 51.5% since 1935. The average net cultivated area per plough amounted to 7.4 acres in 1951 as against 8.2 acres in 1930, and the average net cultivated area per pair of working cattle was 6.8 acres in 1951 as against 7.5 acres in 1935.

* All figures in this account are based on Ibid.

horses, donkeys, mules and camels, who do much of the work as transport animals, numbered 9,908; 4,588;
946 and 340, respectively, in 1951. But the number of horses and ponies has decreased by about 6.6% and that of the donkeys by about 33.5% since 1935.

Dairy farming has little place in the agriculture of this area while the aim of animal breeding is to get some cheap livestock for the ploughs and carts in future. In all, per thousand of human beings, the cows and buffaloes in milk number 34 and 37 respectively, in view of the fact that their milk yields are very low, the per capita daily share of milk is almost negligible. Buffaloes are kept mainly for their milk produce, yield of which is comparatively higher than that of the cows. Thus of the total number of buffaloes in 1951, breeding buffaloes amounted to 46.7%, while of the cattle only 19.6% were breeding cows, while the number of breeding buffaloes has increased by 30.7% since 1935, the number of breeding cows has decreased by 1.2% since then.

Sheep numbered 19 thousands and goats 37 thousands in 1951. Their numbers have decreased by about 22% and 48% respectively since 1935. It has gone down considerably during the period of the Second World War, when they must have been exported to provide flesh to the armies. Pig rearing for pork and poultry, on the other hand, have shown an increase by about 5% and 36.3% respectively. They are kept by the lower castes for additional income.

* Since 1944.