Part III

Problems and Planning
Chapter VIII
PROBLEMS OF LAND USE

The problems of land use arise from both physical and cultural conditions. Those of the physical environment are related to the soils, rainfall and drainage, all of which are far from ideal. Those of the cultural environment include the historical, economic, psychological and technological conditions.

Soil Problems

The soils of the district are not so very indifferent. But their fertility has been exploited for thousands of years and without necessary replenishment so that, at present, they require a lot of curing and manuring. Their proper chemical and physical analysis is urgently needed to understand their potentialities in various tracts for various types of produce and for the most suitable crop rotations.

As shown by the soil survey in the Geohara zone and Kosi khadar (see Appendix II), only the upper few inches of the soils have acquired the qualities of good tilth. The thickness of the upper cultivable layer, generally varies from 3" to 10". The subsoil still retains the properties of a transported debris. In many of the sample villages the writer found that if the soil is turned up more than six to nine inches an under-formed soil horizon locally known as 'plauta' appears. It is infertile and requires a long fallow period to be cultivable. The surface soil is highly active. But, human interference has resulted in the destruction of the plant cover and exploitation of soil fertility. This has meant
the destruction of the organic matter from the soil and shattering of its granular qualities.

In addition, the soils are subject to considerable erosion by running water and winds. The bhurlands, the river banks and the khadars are the main areas suffering from various types of soil erosion. Wind action results in the erosion and deflation of finer particles from the lighter soil of the bhurlands, in particular, and from the uncovered soils in general. The Ganga and the Namganga rivers and their tributaries do a lot of erosion during floods. In the adhek or scarp villages along the streams as well as in the undulating bhurlans and in the uplands of Thakurdwara, the slopes facilitate downward movement of the loose and uncovered soils. As erosion carries away the top layers of soil, rainwater finds it more and more difficult to percolate into it and thus leads to gully erosion. Owing to the lack of manures and organic contents, the uncovered soil scums easily to such a flow of water. It is estimated that about 4,000 acres are suffering from erosion in the district.

In places, soils are also suffering from water-logging and reh-infection. The Udla and Panmar tracts regularly suffer from excessive soil moisture after the heavy monsoon downpours. The depressions in the open khadars of the rivers as well as those in the uplands have many areas suffering from reh-infection.

In general, the soils of the district show an exhaustion of nitrogenous matter and where it is added artificially
they respond well in the form of enhanced yields. In other words they are hungry for manures and fertilisers. Moreover, the light soils of the area are thirsty for irrigation water, where these things are provided they yield much better than the heavier soils as has been shown by the crop-cutting trials in the Rachah area, noted in the foregoing.

Problems of Weather and Climate

The variability and unreliability of the monsoonal rainfall, which comes in pulsatory downpours leading to much scorching of the fields at one time and drought conditions at the other, are of course major problems. Much has been said about them in the section on climate. Illustrations of the vagaries of rainfall have been given in appendix tables III to X and figs. 17 & 26 and a glance over them clearly shows the urgency of the problem. Just to give an example at this place, within the five years 1953-58, the rainfall at Amrcha has fluctuated from 5.55 inches to 24.01 inches in July, from 4.49 inches to 12.51 inches in August and from 5.96 inches to 27.17 inches in September, while the October rainfall has been nil in one year and as much as 16.73 inches in another. How can the peasants adjust their crop patterns and agricultural activities to such fluctuations in rainfall? The normal cultivation is upset by these vagaries of rainfall. Thus, for example, the late start of the monsoon in 1952, as also in the previous year, damaged the early rice crop at Shalipur Bazar. But, in July, the rain was quite heavy, so the peasants sowed late rice in a much wider area: some of them sowed rice in combination with jowar also so as to ward off against a total
loss of the harvest should the monsoon cease abruptly.

A year of drought and long breaks in the monsoon on the other hand, render the porous soils of the district thirsty for water. Wheat and sugarcane need adequate water supply at proper time. People run after irrigation water which, however, cannot be obtained simultaneously for all the fields, owing to its limited provision. Under such conditions the corruption on the part of the operators of tube wells and canal water supplies puts many farmers to great hardships. Fields distant from the source of water supply suffer much. Standing crops are scorched by the burning sun. The next sowing would again require a preliminary watering, which may not be within the means of the poor farmers. The yields remain poor even in the case of crops which are saved somehow. Only the drought-resisting crops such as bajra can be depended upon. The vagaries of weather keep the farmer in suspense from day to day, week to week, month to month and season to season, if he does not, independently, possess sufficient means of irrigation to provide against a dry period and proper drainage facilities to carry away surplus rain water in a wet period.

No long term planning of agriculture is possible under these conditions since both weather and climate are undependable and unforeseeable factors whereas the peasant, in most cases, is ill-equipped to face their vagaries. As an expert in agriculture suited to his local conditions, therefore, the peasant sticks to only such crops and to such varieties
thereof as can withstand the vagaries of weather. He is helpless against nature owing to the poverty of his resources which could give him control over the same.

The problem of floods

related to the vagaries of rainfall in the frequency of floods which are caused by the heavy downpours occurring locally or in the catchment areas of the streams. Figure 7 shows the areas suffering from floods. The problem of floods may be illustrated with reference to the tahsil of Kasupur which includes a large tract of the Ganga watershed. In 1955, this tahsil was affected by flood with varying intensity from 18th July to 20th July, in 9th September and 24th September.

This flood was caused by the logging of rain water and the rise in the Ganga level. 156 villages were affected to a considerable extent. Maize, bajra, paddy and sugarcane were hit hard. The areas of crops damaged are given below:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area (Gross)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugarcane</td>
<td>8,740</td>
</tr>
<tr>
<td>Maize</td>
<td>5,801</td>
</tr>
<tr>
<td>Bajra</td>
<td>6,413</td>
</tr>
<tr>
<td>Paddy</td>
<td>5,210</td>
</tr>
<tr>
<td>Other crops</td>
<td>2,585</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,622</strong></td>
</tr>
</tbody>
</table>

The assessment of losses by the floods is as under:

<table>
<thead>
<tr>
<th>Area with % loss</th>
<th>Total Area Affected by Flood</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot; 50% &quot;</td>
<td>8,226</td>
</tr>
<tr>
<td>&quot; 75% &quot;</td>
<td>6,481</td>
</tr>
<tr>
<td>&quot; 100% &quot;</td>
<td>12,682</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,611</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Houses Fallen Fully</th>
<th>Total Number of Villages Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot; partly &quot;</td>
<td>178</td>
</tr>
<tr>
<td>&quot; partly &quot;</td>
<td>1,102</td>
</tr>
<tr>
<td>&quot; partly &quot;</td>
<td>9,617</td>
</tr>
<tr>
<td>&quot; partly &quot;</td>
<td>429</td>
</tr>
</tbody>
</table>

Official Field report dated 10-10-55

The flood relief expenditure incurred by the Government was as under:

- Gratuity relief including cash, grains, clothes, etc.: Rs. 4,285/-
- Boats hired: Rs. 294/-
- Bhooma and hay: Rs. 700/-
- Vine for various purposes: Rs. 174,500/-
- Reimission of land revenue in 1955-56: Rs. 75,063/-

As we have seen in chapter 1, the rivers often change their courses in their khadars, owing to the abnormal variation in the volume of their discharge, how these khadars can be stabilised and made more suitable for cultivation is a point worth investigation since they occupy considerable tracts, comprising some of the best soils in the area.

Defective drainage

It has been pointed out in the foregoing (Chapter 1) that the drainage in many parts of the district is defective to a degree and much harm is being done by its defects in such areas as the Dola and Harmaar tracts, the thurlands and the reh-infected areas of the south-west. In the former tracts, wherever more than average rainfall has been going on for some four years, one has to ford on foot a number of pools of water while to avoid some more he has to pass through the cozing fields. In such a scenario the upstanding hump ridges alone provide a stable passage and cultivation over them is better than in the depressions. The sinuous courses of the Chhitia nullahs which carry the excess of rain water from the thurlands, report of the half Tahsildar incharge, dated 13-4-56.
and the cultivation of their beds are partly responsible for retarding the normal flow of drainage. But, the defective layout of the rail tracks has also resulted in the ruin of large tracts of countryside where they have been laid along the contours without providing sufficient culverts beneath them. On their uphill-side the obstructed waters flooded the areas as is shown by Fig. 9. On the downhill side, the breaches in the tracks and the consequent tremendous discharge of water cause extensive soil erosion and damage to crops. The civil administration is usually worried about these things but the railway administration pays little heed excepting when a breach has actually occurred. It is concerned only with the track and not with the area through which it passes.

Problems of Irrigation.

The adequate provision of the means of irrigation is a great protective factor safeguarding and stabilizing arable farming in this sub-tropical area having a long dry period and the risk of the failure of monsoonal rainfall. But, so far, only 30% of the cultivated land in this district is

*In this respect the most striking observations have been made regarding the floods of 1910-12. In 1910, there were heavy floods along the Heila and Sangesa in July, August and October and the Kohilkhund and Amaun railway embankment for a few miles up from Kharadabad held up the water for a considerable time resulting into heavy damage to human life, cattle and other property. Ultimately the embankment gave way at a number of places. The pent-up waters, thus suddenly relieved, tore over the country to the east and among other things swept away the bridge over the Rudiya Heila. However, even after this mishap, the railway administration did not care as much for the provision of sufficient number of waterways under this embankment, as far the increasing of its height and width with a view to making it strong enough to withstand any floods however great. Vide Uttar Pradesh District Gazetteers, Supplementary Notes and Statistics to Vol. XVI, Allahabad, Allahabad, Govt., Press, 1914 pp. 1-2.*
Irrigation is insufficient or lacking in many parts, particularly in the bhurlands where the soil remains thirsty for water and the cultivation of better crops like wheat, sugarcane and market garden produce cannot be developed owing to the shortcoming of soil moisture. Only drought-resisting crops like bajra and barley can be grown extensively. As a matter of fact, there is no possibility of intensive cultivation anywhere in the district without the provision of irrigation. Single cropping is the general rule. Double cropping is done on less than 16% of the net cultivated area and out of that only 10.7% is irrigated.

However, irrigation becomes unnecessary during wet years in such areas as the Udla & Panmar tracts. For example, the tube well No. 25 Amroha group irrigated but 116 acres in the year 1954-55 as shown by its history-chart (Table XVIII). It worked for 1,507 hours consuming 10,650.4 units of electricity. It discharged 22,626,264 gallons of water or 186,613 gallons for each acre irrigated. This tube well has been constructed anew recently, since the old one had become useless owing to silting. Now, leaving aside the question of profit or loss to the state by constructing and working such tube wells, the issue worth consideration is whether this additional spread of water (22 million gallons in 1954-55 and about 30 million gallons in 1955-56) was desirable on the lands of an area which had been under the sway of a wet cycle as shown by the rainfall record (Table IV). In the months of August, September and October 1955, the total rainfall had been 40.83 inches. According to

*Average figures for the years 1953-55 based on Sadar Ganungo's Kila. Mahara for these years.
tradition, formerly, peasants used to do a preliminary watering in the rabi fields, where now water oozes out. The water-table used to be at 15 to 20 feet below ground level in the wells in the south of the village where this year they overflowed.

Such is the state of affairs with regard to irrigation inspite of the fact that the government is keen on extending its facilities and the people are anxious to get water supply. This owes to many factors both physical and economic. First, the unreliable rainfall of the area renders irrigation unnecessary when there are heavy showers or there is more than the normal rainfall. The means of irrigation built at high costs by the state, thus, appear to be superfluous. In the case of the tube-wells there is another problem. During the rains, in general, and when there is heavy rainfall, then in particular, water-table rises and there is risk of damage to the machinery of the tube wells. Hence excess water from them must be thrown out even when it is raining outside or water is standing in the fields. This artificial addition of water may lead to the water-logging or salination resulting from the heavy showers, but it must be thrown out with a view to saving the costly machinery from damage.

Secondly, canal water cannot be carried over many of its parts where topography is undulating, e.g., parts of the bhurlands of the west and the uplands of Thakurdwara. The terai canals of the north-east, are unreliable. Water-lifting from ponds and streams can be worthwhile only near the sources
of water supply. Ordinary wells can provide irrigation for a small area. Hence, the tube-wells have become the most important means of irrigation in this area. But, with them problem is of machinery which has to be imported from abroad. In the case of tubewells, it is very difficult to ensure regular and timely water supply owing to the mechanism involved. A slight defect in the pumping plant or in the engine may upset all the programme of irrigation and cause damage to the crops which require timely watering. These difficulties and the high costs of tube well irrigation and the non-availability of cheap mechanical operators discourage its use by many a farmer and the construction of private tube wells by others. People have, therefore, quite recently constructed a large number of masonry wells in the tube well areas, e.g., in village Kshalipur Kalan. Irrigation is available in this village from various sources such as the State tube well No.25, Aricha Group, persian wheels, kucha wells, etc. Its progress is clear from the following table:

Table 34

<table>
<thead>
<tr>
<th>Irrigation (acres) at Kshalipur Kalan*</th>
<th>1975-76</th>
<th>1955-56</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area irrigated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By tube well</td>
<td>*</td>
<td>12.38</td>
</tr>
<tr>
<td>By wells</td>
<td>21.70</td>
<td>30.11</td>
</tr>
<tr>
<td>By other sources</td>
<td>8.51</td>
<td>0.26</td>
</tr>
<tr>
<td>Total</td>
<td>30.21</td>
<td>43.25</td>
</tr>
<tr>
<td>Unirrigated area</td>
<td>69.79</td>
<td>56.75</td>
</tr>
</tbody>
</table>

It is clear from the above figures that 80 years back 30.21% of the cultivated area in this village was irrigated by wells and other means. Now, 31.37% of the cultivated area in irrigated by them though the wells have gained at the expense of other means. The State tube well has added only 12.88% area. It commands 612 acres in this village but irrigates only 78.04 acres in the whole year.

Thirdly, there is the factor of irrigation costs. The charges for the state tube wells are based on the volume of water supplied at the wells. The actual charges paid per acre of watering by the tube well vary considerably between the fields which are near the wells and those which are away from them since water is taken along earthen channels. They come much higher in a light sandy soil than in a good firm loam. When less water is required, the tube well irrigation may be economical as compared to canal irrigation, where the farmer pays according to the area irrigated whether he takes less water or more. The tube wells cannot be worked by the ordinary peasant himself. He has to depend on the State or some richer land owners for the construction of the tube wells and on their employees, the operators, for the working of the same. Should they be inefficient or corrupt his whole cultivation may be jeopardized when it needs timely water supply which is not provided. A shallow and slow watering by the Persian wheels is sufficient to grow a good crop in normal years. Hence, their popularity as seen in Akaliqpur Kalan where 13 Persian wheels
have been constructed in the tube well commanded area since 1941-42.

**Heavy pressure of population on land**

Density of population per square mile in India is 303, in U. & 557 and in Moradabad district 717. The increase of population in this district is extraordinary: 39.3% in the last 50 years. That in Uttar Pradesh has been 30%. About 67 percent people in this district live on agriculture. As many as 31,043 persons are cultivators of land wholly or mainly unowned and their dependents while 39,554 persons are cultivating labourers and their dependents. Together they constitute about 6% of the rural population.

In addition, livestock also live, here mostly on the products of agriculture. The grazing available for them being small and seasonal it is the cultivated area which bears the major portion of the burden of supporting the livestock. For every thousand human beings there are 345 cattle, 152 buffaloes, 11 sheep, 22 goats, 44 poultry and 17 other animals. Most of the present animals are more of a burden on the soil. If better breeds replace the inferior ones a lesser number can provide the same service as is obtained, at this time, from this large animal populace. It, however, provides a good deal of manure which may, profitably, be used to fertilize the soils if not burnt as fuel. They also provide the hides, skins,

*All figures are based on the Census of 1951.*
hooves and horns which supply the raw materials for a number of small-scale industries of the district.

**Problems of the Agrarian Structure**

The agrarian structure in the district is characterised by the prevalence of a large number of small scattered and uneconomic holdings, high rents and taxes, a heavy burden of debt on the peasants, great pressure of primary rural population and over stocking of livestock in relation to the arable land, labour-intensive cultivation and inefficient methods of farming. These conditions are associated with a low standard of living, lack of education and ignorance about the new techniques of agriculture, resulting in pessimism and superstitious fatalism.

The abolition of Zamindari was more or less completed during the First Five Year Plan period. The cultivated land was turned over to the tillers. The waste land and grazing grounds held by the Zamindars have been put under the charge of the village panchayats, but the Zamindari abolition has not by itself solved the problem. It has exposed many more problems. There is much unsatisfied land hunger among the poorer rural people. Big holdings are, however, few in this area. If they are properly managed and intensively cultivated, raising surplus produce for the urban population, they need not be disturbed. The compulsory fragmentation of a well-managed large holding or slicing it for distributing land to the
Poor tillers does not sound a wise policy. It is a well known fact that given the means of investment and technological knowledge the large farms can be worked with the help of machines, more economically and can be made to yield much higher per capita produce than the small farms.

Actually, the great problem of the area is the smallness and scatteredness of the overwhelming majority of the land holdings. The extent to which the incentive of ownership of land can be effective is limited by the general economic conditions of the people. If the scope for advancement through the incentive of ownership is to be widened some means will have to be found of overcoming the many disabilities of small-scale cultivation. It would not be out of place, here, to cite the case of Mexico where land, previously owned and operated by large estates, was distributed among the farm labourers. The holdings became too small. Shortage of credit proved to be a major obstacle to the increase of farm production. New forms of co-operative and collective farms had, therefore, to be introduced to overcome the disadvantages of small-scale production. The Mexican experience has shown that if the agrarian reform is to be successful in economic terms, it must form part of a general scheme of agricultural development, involving the provision of credit facilities, the organization of production cooperatives etc. It is also significant in that the land reform is not likely to provide full employment opportunities where the total population is increasing at a rapid rate. If the new owner's
farm is of uneconomic size, if he is unable to obtain credit on favourable terms or unable to obtain cheap fertilizers and equipment and unable to get larger share in the selling price of his product, he will be unable to invest in his farm holding and must inevitably again fall into debt. Whether the reform of land tenure system is likely to create a framework for productive investment or technological advance depends, therefore, to a great extent on the other measures that can be taken at the same time to improve the economic and social condition of the farm population.

We have already noted that whereas in this district about 35% holdings are up to one acre each and 21% 1 to 3 acres each, only 7% holdings are above 12 acres each. They have been in a continuous process of sub-division owing to the growing pressure of population and the indebtedness of the cultivators and other economic pressures resulting in the sale and transfer of land.

The consolidation of holdings also faces many difficulties, e.g., the cultivator does not take to consolidation without much inducement and, sometimes, even considerable pressure and coercion have to be used. There are defects in the records about rights to lands in many cases and a slight mishandling results in litigation. Then, the consolidation does not necessarily promise to give the cultivator an economic holding. It can merely bring the cultivator's scattered fields into compact blocks. The microregional variety

in local soils and topography as between various parts of each village makes it all the more difficult. It renders impossible the consolidation of all plots of a cultivator in a single block. If it is done, the cultivator would not like it due to the fact that he would prefer to have plots of various soil types in his holding with a view to raising a variety of crops for the subsistence of his family and animals and, if possible, for earning some cash as well. Hence where consolidation of holdings has been carried out many cultivators have been allotted more than one chak for each holding. In some cases the distances between these chaks are considerable so that the purpose of the consolidation has been only partially achieved (cf. Fig. 19).

Further, the consolidation has a concomitant effect in the reduction of land holdings, slightly, since it provides for some new paths as between the adjoining blocks of land, certain new requirements like the graveyards, khalyes, panchayat ghar etc., and for the probable extension of the settlement are in the near future. As stated in the foregoing it also takes away any area of public utility brought under cultivation by a farmer with a view to increasing his farm. The sum total of all these actions is the reduction of the small land holders still smaller.

If the lands thus taken away from the farmers and turned over to the gram panchayat be used properly and the income from them utilized in the common interest of the villagers, then the loss to individual peasants may be
compensated. But, as things are at present, these gram panchayat lands are left vacant to suffer from the onslaught of the agents of erosion and thus become sores in the body of the village organism.

Land Taxation

Land revenue, taxes on agricultural produce and the taxation of agricultural income are directly related to land use. Land revenue is one of the oldest taxes. It is assessed periodically on the presumed value of the farm land. This method is defective since it is not based on the actual farm output and local prices, which vary from time to time. The assessment is made for a certain year and the tax liability thus determined remains current for a period of many years. If the prices of the agricultural produce fell in the inter-settlement period the burden of land revenue is increased and vice versa. The taxation of agricultural produce is assessed on the basis of the produce marketed. Sometimes the same product is taxed repeatedly on its way to the actual consumer as it moves through various markets and through the hands of various dealers. Thus, the cost margin between the producer and the consumer is much widened and discourages regional specialization in production.

Both these taxes are detrimental to the interests of small farmers since they are levied at flat rates. The lack of consideration for the economic status of the individual
and the number of his dependents makes these taxes bear relatively heavier on small peasants. The high burden of these taxes on them becomes a factor of their indebtedness and leads to the land being mortgaged and sold, partly or wholly. So long as the tenancy prevails, the landlords are often able to shift the burden of taxation on the tenants in the form of higher rents.

Taxes on consumption also affect, for the most part, articles of mass consumption so that the lower income groups have to bear their burden heavily. The combined burden of taxes on land, marketed farm produce and consumers' articles falls more heavily on the rural population than on the town dwellers in the same income group*. The present tax system often taxes the visible agricultural produce more heavily than the invisible commercial or industrial profits, while the concealment of assets or incomes is much easier in non-farm industries. In addition, the expenditure per capita on social amenities and educational facilities is greater in urban areas than in rural areas. Thus rural tax payer receives less in return for what he pays in the form of taxes than does the town dweller.

Level of Technology

The level of technology is too low. The method of tillage is age-old using the wooden plough, hoe and sickle, clumsy wooden cart driven by cattle, threshing the stalks of

* Ibid. p.45.
Plate XXXII.

XXXII. Cattle dung being prepared into cakes for fuel
grain by treading or striking against a hard ground and
winnowing by the gentle breeze. All these things the farmer
learns from his parents and from some older people of the
village by practice. He uses very little fertilizers. He
burns the dung cakes*, which practice owes partly to his low
economic position and the lack of fuel in the countryside.
His approach is dogmatic and his way of life is traditional.
He resists any encroachment on his beliefs so that it needs
persistent efforts on the part of the planners to make him
like new things by showing him their comparative advantage over
the old ones. Then, the poor peasants have an apathetic
pessimism, which the clouds and floods have dinned into
their minds.

Technology, too, has its problems. We learn it
from abroad, where the geographical conditions are totally
different from ours. Then we go to the countryside as
preachers of what we have borrowed and not as experimentalists.
It is easy to be allured and impressed by the fact that machin­
es, in every walk of life, have become the order of the day
in economically powerful countries like the U.S.A. and the
U.S.S.R. But, mechanised farming may be a success in the new
and vast countries where the holdings are large, human labour
is scarce and dear and much capital is available with the
farmers. In the shallow soils of this monsoonal area deep
ploughing might lead to loss of moisture in areas of light
rainfall or sandy soils. It might lead to excessive moisture

* Plate XXXII shows the preparation of dung cakes by the women.
and water logging in humid areas and clayey soils. Moreover, as things are at present a light plough is all that the farmer's bullocks can draw and that he can carry on his shoulders to and from his scattered fields. Moreover, mechanised farming is a device to raise the produce per capita of farm population. In the area under study there is already the problem of unemployment and under-employment. Hence, measures have to be adopted to increase the per acre yields simultaneous with the provision of employment to the maximum number of the rural people.

Within their means, however, the farmers are using more and more improved implements. In 1951, the number of improved iron ploughs had increased by about 1181% since 1935 (from 374 to 4,792). Cane crushers worked by power had increased by about 410% in the same period (from 39 to 199). Tractors had increased by 367% (from 12 to 56), oil engines by 45.7% (from 46 to 67) and electric pumps by 185% (from 92 to 262). The cane crushers worked by bullocks had decreased by 65% (from 5,467 to 1,925) in this period*. Thus we can see the limits within which the new implements are making their entry into the agricultural activities of the area.

**Lack of Capital and Resources**

Economically, the overwhelming majority of the tillers of land are poor and lacking the means of investing any thing in their land as we have seen in the discussion of the carrying capacity of land. They live under debt, hardly making

their both ends meet. Hence, there is no chance of their saving any sum for improvements. The lack of capital with them means the lack of new implements, better seeds, fertilizers, manures, etc., and the lack of education necessary for learning new things. It also means the lack of storage capacity. So they play in the hands of the moneylender-tradesman and lose their land by and by. Under the zamindari system the zamindar was considered to be a blood-sucker. But, the abolition of zamindari has not been wholly beneficial to the small-holder. In order to acquire the proprietary rights over his holding the tenant has to pay much money to the government who stood for compensation to the zamindars. Whereas some of the zamindars were compassionate towards their tenants the government must treat all alike. The well known rampant corruption and bribery have put additional burden on the ignorant people who have been brought into direct dealings with the bureaucracy.

Other Problems

One of the major problems, is that the common people are not alive to the idea of social and economic planning. They hold to the age-old ideas of personal property, personal efforts, personal gains and personal sufferings. Their horizon of thinking is very much limited within the sphere of their small families, the joint family system having been liquidated by historical and economic factors. Milleniums of despotic rule and centuries of landlordism have suppressed their social consciousness and have rendered them suspicious of the governmental professions. The rulers' role in the realization of taxes and the treatment of the peasants at the
hands of the bureaucracy are responsible for the wide gulf between the state and the masses.

While the present farmers are predominantly uneducated, the new generation having been schooled in the towns begins to dislike the rural environment. Generally, the parents themselves send their sons to the schools in the hope that they would, one day, become deputy collectors, tahsildars, munsifs, kotwals, etc. The sons, having imbibed similar ideas and having spent leisurely years at school, do not want to return to the plough. In fact, they are rendered misfit for that job, since handling a plough needs a regular practice, while the farming technique is captured only by a long practice. Our school education does not promote the love and respect for the manual labour and the rustic life, which are necessary for being good farmers in this country. So the problem arises as how to introduce new ideas and new techniques into the countryside, when the present farmers shirk to respond to them easily and the new generation does not like to return to the soil.

AGRICULTURAL INEFFICIENCY

The net result of the various adverse factors in this district is that the agriculture is quite inefficient*. For the measurement of agricultural efficiency there are two entirely different approaches, viz.,

(a) One regards efficiency as indicated by output per unit area.
(b) The other regards it in terms of output per man-hour employed. Of course, the first is more important for the subsistence level. But the accurate assessment of efficiency is far from simple. Making some allowance for quality, the higher the output per unit area, the greater the efficiency of farming.
Low Per Acre Yields

In the Moradabad district the average per acre yield for rabi cereals is 375 kg. and that for the rice is 152.1 kg. The relative positions of various tracts in regard to the per acre output of various foodgrains are given in table XXXI. A glance over it shows that though they vary from tract to tract, the yields are very low everywhere in the district.

Actually, yields show great differences in different countries of the world owing to the differences in their physical and cultural conditions. Thus in 1955, for example, the world average yield of wheat was 468 kg. per acre. But, in India it was 287 kg. per acre, while in U.K. it was 1340 kg., in West Germany 1152 kg., in France 912 kg., in Egypt 908 kg. and in Japan 888 kg. The world average yield of rice in that year was 728 kg. per acre. In India it was 355 kg. per acre, while in Italy 2040 kg., in Japan 1524 kg., in U.S.A. 1372 kg. and in Communist China 988 kg.*

Evidently the per acre yields in the Moradabad district stand in no comparison with those of the countries cited above.

Low Yields per Head of Rural Population

Refering to the sample studies, in the Moradabad district, the total rural population amounts to 650 persons

* All figures in this paragraph are based on Fertiliser Statistics, 1957 pub. The Fertiliser Association of India, New Delhi, July 1958. Those for India are for the year 1955-56, p.87. Those for Communist China are for the year 1954, while the others are for the year 1955,pp.161 & 164. One hectare is equal to 2.5 acres.
per square mile, while the average carrying capacity of food-grain land is roughly 563 persons per square mile. Thus about 115 persons are engaged in the production of food-grains sufficient for only 100 persons.

**Contrast with Some better Farmed Countries**

(A) **United Kingdom**

By way of contrast let us look at the conditions in the U.K. The 1940-41 Farm Survey in England and Wales showed that the average full-time land-holding was just under 100 acres of improved land (crop and grass). Such a holding is commonly run by the farmer, his wife and one other adult worker. With dependents this can be equated to 7 persons or a total of 45 per square mile. This is the 'Primary Rural Population'. The 'Secondary Rural Population' which serves the primary group is almost exactly half that. Thus the 'total rural population' amounts to 68 persons per square mile. Taking the carrying capacity of land at one person per acre or 640 persons per square mile of improved land we can say that only about 11% of the total rural population is engaged in actual agricultural production in England and Wales.

Naturally such a farm is tilled and harvested with the help of agricultural machinery. Thus in the year 1948 for every 73 acres of arable land and 46 acres of permanent grassland, there was one tractor; roughly each farm holding had its own tractor**. The average consumption of fertilizers per acre of agricultural land in the U.K. in 1955-56, amounted to 46.3 lbs.

divided as 13.7 lbs. Nitrogen, 18.2 lbs. Phosphoric Acid (P2O5) and 14.4 lbs. Potash (K2O). For almost two centuries agriculture has been of second rate importance in the British economy, which was based on Empire. Industry was paramount. Foodstuffs and raw materials were imported from abroad. During the world war II, Britain was faced with an acute food problem. A careful land use survey carried out just before the war, under the direction of Prof. L. D. Stamp had prepared ground for a scientific and efficient use of the land resources. This made it possible to increase the area of the arable land from 13 million in 1937-39 to 19 million acres in 1943-47. The permanent grassland shrank, simultaneously, from 18 to 12 million acres.

The British are a meat and milk fed people. So they devote much land to cattle rearing besides importing large quantities of dairy produce and animal products from elsewhere. The number of cattle was increased from 8.7 to 9.6 million between 1937-47. They have harnessed science and technology to the service of the nation and this finds its proper place in agricultural operations also. They have been using horses for drawing the ploughs and coaches. But the horses are less necessary under mechanization. Excepting that the climate is equable and conducive of active life and greater effort, the high humidity and low temperatures restrict the cultivation to a limited number of crops. There were large swamps in many parts which had to be drained. The physical environment is particularly unfavourable in Scotland and Wales.

* Ibid.
where wide areas are reserved for hunting grounds, sheep pastures, and the like.

The achievement of the high per acre yields under such conditions has been possible through the application of scientific crop rotations, much fertilizers and careful investment with the aim of getting as high incomes from the agricultural industry as possible. The patriotic approach of saving the country from the food crises, simultaneous with the keen governmental interest, under duress, to raise the home output of foodgrains, have been contributary factors. The high yields per head of farm population are due to the large farms worked by machinery and to the few people dependent on agricultural occupations.

(B) Netherlands & Denmark

There are three main soil regions in Netherlands: sand dunes along the coast, polderland in the western part of the country and sandy and peaty lands in the east. The interior of the country used to be heathland on sand with many lakes and peat bogs. Sandy soils were reclaimed with marls and fertilizers. From the bogs, peat was extracted, the sand at its bottom was enriched with marls and clays carried from a distance, and all kinds of necessary fertilizers were added until they developed a rich soil. In 1955-56, the average consumption of fertilizers per acre of agricultural land in Netherlands was 179.1 lbs divided as 71.3 lbs Nitrogen,

Denmark has average yields of most crops superior to almost any other country excepting Netherlands her neighbour. Vast areas were under heath; moors and marshes were frequent. The temperature averages are somewhat lower than in Netherlands. They are 32° F. in January and 62° F. in Summer. Dunes, marshes and heathland have had to be conquered in the same manner as in Netherlands, cattle being put on the reclaimed territory, where forage crops are raised in the fields. Permanent grassland has very little role to play here.

The average consumption of fertilizers per acre of agricultural land in Denmark in 1955-56 has been 98.6 lbs per acre divided as 25.0 lbs Nitrogen, 28.3 lbs Phosphoric Acid and 45.3 lbs Potash.

In all these countries, of western Europe, besides these artificial fertilizers, much organic manures are available from the animal dung and vegetative refuse since animal husbandry and dairy farming are among their main agricultural activities and the dung is not used as a fuel. The urban sewage is also properly utilised. Hence the soil gets sufficient replenishment for its high yields. The achievement of high per acre yields has also been partly possible through the application of business attitude, science and technology to agriculture, developing suitable crop rotations, etc. The spread of

cooperative organizations for production, processing, and marketing has organized, helped and controlled rural production, offering the small farms most of the advantages of the large scale enterprise in Denmark and Netherlands. Nearly three-fourth of all farms are less than 14 acres each in Denmark*. Both these countries export dairy and meat products, but import large quantities of foodgrains, fertilizers and raw materials.

(C) Japan

If we take an example from the Far East, Japan stands out first, where roughly, each acre of the agricultural land yields 6 to 7 S.N.U. Japan has the highest average yield of brown rice per acre in Asia. This has been achieved through the use of improved seeds and fertilizers. Strains of rice have been evolved to resist cold weather and bright sun. On an average 800 lbs of fertilizers and manures are applied to every acre in Japan**. They are switching over from Ammonium Sulphate to Urea. Large quantities of organic manure such as compost, green manure and night soil are also used. The night soil is collected by the farmers themselves, in tanks and diluted with water. They use the diluted stuff as a manure.

Owing to the mountainous and volcanic nature of the country only 15% of the total area is cultivated. The major part of the arable land is devoted to the raising of crops. Paddy is grown on 56

** The average consumption of artificial fertilizers per acre of agricultural land is 176.4 lbs divided as 76.0 lbs Nitrogen, 45.1 lbs Phosphoric Acid and 53.3 lbs Potash according to fertiliser Statistics, 1957, Op.Cit. p.72.
per cent of the cultivated area. 44% of the total cultivated area yields more than one crop a year. The average farm holding was 2.17 acres in 1952. The farm population in 1950 numbered 37.8 million. Before 1947, 70 percent of the total farm families were pure or part tenants and among them 25 percent had no land at all. As a result of the land reforms introduced in 1947, the number of tenants has been reduced from 70 to 9 percent. The maximum holding was fixed at 7.5 acres.

In Japan (area 92 million acres, population 90 millions in 1966), only 51% of the population is dependent on land. The rest are occupied with manufacturing consumer goods. Women young and old, are as good bread winners as men. The Japanese are naturally sea-faring and their dietary is heavily weighted with fish. The agricultural technique in Japan is adapted to small and narrow strips owing to its mountainous character and steep slopes. The rainfall is more or less evenly distributed throughout the year. It varies from 40 to 120 inches in different parts of the country. The streams are well channelled and harnessed by holding water up between well-built banks and breaking the force of the current by placing dams across them. Thus erosion is prevented and the hillsides are terraced and irrigated for cultivation*. The government of Japan does not charge for the irrigation water supplied to the farmers. In the case of rice, the governmental revenue is

* The facts in this section are based on (a) Report of the Indian Delegation to China (and Japan) on agrarian cooperative, Govt., of India, Planning Commission, New Delhi, 1957, pp. 99 to 119. (b) Report on agriculture and cottage and small scale industries in Japan by Dr. J. C. Kumarappa, issued by the Ministry of Commerce and Industry, Govt., of India, New Delhi.
collected in kind based on actual production. Agriculture is subject to income tax after allowing for the full cost of production and living needs of the family. 50% of the prefectural (Provincial) taxes in Japan are spent on education.

Japanese use increasingly large number of mechanical appliances such as electric or diesel motors, threshing machines and power hulling machines. But work in cultivation processes such as seeding, planting, weeding and reaping still depend mostly on hand labour. There were, in 1953, 34,974 small tractors i.e., one for 386 acres of cultivated land.

The use of animal power has also increased since the world war II. Most farmers, however, still use small spikes and spades to turn and till the soil by their own physical effort. Most of the farmers and their women draw their carts. The Japanese are not a milk drinking or meat eating people, so they are saved from the depredations of sheep, goats and stray cattle, nor do they need protection against wild animals as there are none. Hence they do not require fencing of their fields. The few animals that are in Japan are stall-fed and well looked after. Cooperative farming has not been seriously attempted in Japan. But, Japan has a highly developed cooperative structure in the field of credit, marketing and supply. More than 95% of the total farm households are members of cooperative societies. 96% of the surplus rice and 85% of the surplus wheat and barley are marketed through cooperatives. Government is the sole purchaser of rice in Japan. It enters into contract with every farmer whereby he is required to deliver a specified quantity of rice before the due date. The State pays to the farmer in advance 20
percent of the value of his estimated crop. The Japanese farmer does not sell paddy. He sells brown or unpolished rice. Thus the cost/packing, transportation and warehousing is reduced by about 50%. After threshing he uses a small husking machine which is either owned by him or by his neighbour or his cooperative. Grain is packed in rice straw bags which are made by the farmers without much expense during their leisure. Every bag adds at least Rs.1/- to the farmer's income.

The well distributed and dependable rainfall with hills spreading throughout the country has facilitated the development of electric power which is available for industrial purposes at about quarter of an anna per kw.h. On the basis of this power the dispersal of industries in cottages has become quite easy. Mostly small scale units located in the countryside do much of the manufacturing work. People are disciplined and patriotic. They love simplicity and country made goods. Large capital is not available. The grade of earnings between the highest and the lowest is generally in the ratio of 3:1. The purchasing power being more evenly distributed, there is a large demand for consumers goods from the internal market.

(D) China

In Communist China the pressure on land is as high as in Japan. The availability of cultivated land per agricultural household is about 2.6 acres in China as against 2.2 acres in Japan*. Of the total population of China about 87% reside

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The land reform measures adopted by the Communist government resulted in the re-distribution of land among the tillers. The next step was the organisation of the agrarian cooperatives. By pooling their land, labour and implements, the cooperatives, with the liberal credit provided by the state, achieved rapid and astonishing results in the construction of irrigation works, latrines for the collection of manures, etc., and increasing the double cropped area as well as irrigated area. High yielding crops such as maize and potatoes were substituted for small grain crops on a very large area. They have done all this without using large machines such as tractors, etc., and without using much of the chemical fertilisers. By 1962, each mou (0.16 acre) of land will get only 3.3 lbs (or each acre will get about 21 lbs) of chemical fertilizers. The main method of increasing production is to raise per acre yield by such means as irrigation, water conservancy works, more organic manure to the soil, ameliorating the soil, improved seeds, use of new type of farm tools and preventing plant disease and insect pests. This approach has already shown satisfactory results. The per acre average yields in 1955 were: paddy 1063 kg., and wheat 348 kg. as compared to 766 kg. and 280 kg. respectively in 1949. Yet by 1955, many of the cooperatives were in their infancy.

The cooperatives have mobilized the immense manpower in China. Both piece work and guarantee output systems are adopted by the cooperatives. In addition prizes are awarded to

* Ibid. p.85.
** Ibid. p.83.
^ Ibid. p.84.
individuals or teams doing exceptionally good work in improving production skill and management. The state is the sole buyer of all important items of agricultural produce. The purchase prices are announced well before crops are sown. Contracts are entered into with the Agricultural Producers' Cooperatives to purchase a definite quantity of good grains. Purchases of industrial crops like cotton, jute, tea, etc., take place through the Ministry of Agricultural Purchases. A system of forward contracts has been introduced and 25 to 30 per cent of their estimated value is advanced to the cooperatives. Thus, the market and prices are assured. This is also true of the fruits and vegetables. The cooperatives, therefore, plan production on a basis which does not fail by the operation of market forces and the cultivators can concentrate on the task of raising the output. The Chinese farmers excel in the art of converting all sorts of waste into manure. The cooperatives organize a drive for collection of manure and its rational application. Green leaves, other rubbish, pig-manure, silt from tanks, mud from rivers, urine earth from lavatories, all are utilized in large quantities.

With a view to fostering production the state announced in 1952 that the rate of agricultural tax will be maintained for three years at the level prevalent in that year (when it ranged between 15 and 22% of the gross produce). The

** Ibid. pp. 61-63.
/// Ibid. pp. 74-76.
tax is paid most in kind. Lands newly reclaimed and additional crops raised by developing irrigation facilities by a cooperative are not subject to taxation for three years*. To provide credit facilities to the cultivators, the state has organized credit cooperatives which charge an interest of 5.76 per cent per annum on productive loans for farm equipment, permanent improvements, seeds and fertilizers**. Arrangements have also been made to ensure regular supply of means of production through supply and marketing cooperatives.

CONCLUSION FROM THE COMPARISON

This comparative review of the conditions in the Khorogabad district and in some of the better farmed countries has shown that the agricultural efficiency is greatly dependent on the human approach, the use of technology and machines in agriculture, application of fertilizers and manures to the soil, size of farms, land tenure and management, cooperation in farming activities, credit facilities, governmental assistance, etc. A nearer approach to the conditions in this district is found in the Far East rather than in western Europe, where even 10-20 acre farms are considered to be small, the use of agricultural machines and artificial fertilizers is very large, the attitude to agriculture has a commercial and industrial bias and the produce is mainly meant for export to the industrial areas and urban centres which can pay high prices for the same.

* ibid. p.64.
** ibid. p.67.
While Japan has tried to follow the western democracies and has stuck to individual enterprise in agriculture, China has adopted socialism and cooperativisation of agriculture on the patterns found in the Soviet Union. Thus, in the Moradabad district the system of land tenure and management and the size of farms is more akin to that found in Japan. But, Japan is far ahead in the use of technology, application of fertilizers and cooperation in credit and marketing of agricultural produce. The assured prices and market provided by the state in Japan and the patriotic consciousness and the disciplined way of the life of the Japanese people make all the greater difference. Hence the question arises as to how much efficiency the uneducated and small farmer in the Moradabad district can achieve in the conditions as they are available, here. This leads one to the question of the planning of land use.