INTRODUCTION

Of all the problems that India is facing today, the increasing pressure of population over the limited resources of agricultural land is very acute. Agriculture still plays a significant role in the economy of the country. During the past 15 years India's population has gone up at the rate of 9 million per year which will be doubled in the subsequent years by 1990. Therefore, if the future need of food is considered in terms of minimum requirements for every 10 million annual increase of population, India would need a minimum of 3.7 million tonnes of cereals to feed the extra mouths being born every year. Thus if 1961 is taken as base year, India should increase her production to the extent of 32.5 million tonnes of foodgrains by the end of Fourth Five Year Plan.

If India's foodgrains production continues to grow at the rate of 2.3 per cent per year, per capita local supply will decline due to even faster growth rate of population. It would create a gap of 42.8 million tonnes of foodgrains supply to meet the demand of 50 Kilograms per person in 1986.

In India agriculture besides providing food for 48 million people, also contributes 48 per cent of the national income, and over 70 per cent of her population directly depends upon

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1. In 1951 India's population was 36,09,50,365 which increased to 43,90,72,562 in 1961 at the growth rate of 2.14 per cent. In 1965 there were 487 million people which will be 975 million by the end of 1981 i.e., two for every one Indian living today.
Moreover, it provides the bulk of the export commodities like jute, sugar, fibre, lac, tobacco, and tea, and it also forms the basis for various industries including trade and commerce.

In the First Five Year Plan about one-third of the total investment was allotted to agricultural development, whereas in the Second and Third Five Year Plans about 20 and 23 per cent respectively of the total investment in public sector was earmarked for the development of agriculture.

But in spite of the best efforts of the planners, the production of foodgrains could not keep pace with the increasing population. The productivity of the agricultural land is quite low as compared to other countries of the world, although the carrying capacity of land is considerable and it can feed five times of India's population, if it is coaxed well. All that needs to be done is to raise uniformly the food production efficiency of the lands. And, this can be done with the help of better planning of land for which an inventory of existing land resources is the first step. The objective of all the agricultural planning

1. The national income of India through various sources is as follows:

<table>
<thead>
<tr>
<th>Sources</th>
<th>1955-56</th>
<th>1960-61</th>
<th>1965-66</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Agriculture including animal husbandry, forestry, and fisheries</td>
<td>51.3</td>
<td>51.4</td>
<td>48.1</td>
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<tr>
<td>(b) Mining including small enterprises</td>
<td>16.1</td>
<td>19.9</td>
<td>20.9</td>
</tr>
<tr>
<td>(c) Commerce including trade and transport</td>
<td>17.7</td>
<td>18.0</td>
<td>19.5</td>
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<tr>
<td>(d) Other sources</td>
<td>15.3</td>
<td>10.7</td>
<td>11.5</td>
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2. India, 1962, p.177.
should, therefore, be to record the existing land use on maps which would form a basis for the assessment of use or misuse of land. The need of the day is to carry on field to field survey throughout the country and to assess the impact of physical conditions of relief, drainage, climate and soil on the nature and extent of existing agricultural land use. With the comparative study of the physical conditions and their possible effects on the type of land use, it may be possible to ascertain the quality and character of the present land use i.e., whether the land is under possible use or is being misused.

But India is a vast country with a diversified pattern of land use. The socio-economic problems related to agriculture are closely interlinked and are characteristics of all parts of the country. In view of the local variations in physical condition, land use pattern and socio-economic problems, it is not possible to formulate any single plan for their solution, since a plan, however well-thoughtout and suitable for one region, may be quite unsuitable for the other. Each region has its own unique personality and as such its problems should be studied in relation to its local environment besides being related to the country as a whole. The importance of such a regional study in respect of their local environment and their impact on agriculture has led the writer to select Ghaghara-Rapti Doab for its comprehensive study.
Ghaghara-Rapti Doab, comprising the southern portion of the districts of Bahraich, Gonda, Basti, and Gorakhpur, lies in the north-eastern part of Uttar Pradesh. It extends over 26°15' to 28°25' N. lat., and 81°2' to 83°45' E. long. and is bounded on the north and east by river Rapti, while on the south and west are the districts of Azamgarh, Faizabad, Barabanki and Lakhimpur (Fig.1).

Structurally the region lies in the Ganga plain which is filled by alluvium brought down and deposited by rivers. The plain has a gentle slope with an average gradient of about one metre to 20 kilometres from north to south and south-east.

From the viewpoint of physiography, the whole region represents an almost level appearance and is remarkable homogeneous in character. The land surface at places is varied by several depressions and elevations. These depressions are formed by the river valleys and the natural drainage lines. On the basis of alluvial deposits, the region may be divided into two parts: Khadar and bhangar. The former is confined to the flood plain of the rivers and their tributaries, while the latter invariably occupies the higher ground above the flood level of the rivers.

The region enjoys a sub-humid climate having three well-marked seasons i.e., cold season, hot season, and the season of rains. During winter the temperature is low and the averages for December and January—the coldest months—are 16.6° C. and 15.7° C. respectively. The summer is extremely hot and temperature rises up to 38° C. in May and June. Very often cyclonic rain is received during the cold weather while the summer months from March to Mid. June are dry except occasional sporadic showers.
The monsoon bursts in the middle of June and continues till the end of September. From agricultural viewpoint it is the most important agricultural season of the year, as more than 90 per cent of the total rainfall is received in this season. The rainfall is very uncertain and its variability ranges between 11 and 25 per cent.

The soil of the region is alluvium and is divided into two broad divisions i.e., new alluvium and old alluvium. It differs considerably in its structure, texture and consistency and ranges from sand to clayey loam.

The Ghaghara-Rapti Doab is essentially an agricultural region where every nine out of ten persons is engaged in agricultural activities directly or indirectly. The region enjoys almost the lowest degree of agricultural efficiency in whole of Uttar Pradesh. About 80 per cent of its total area is cultivated and 10 per cent is under groves and pastures and thus about nine-tenths of the total area is culturable. Here the agricultural year is divided into two main divisions viz., kharif and rabi. The kharif season corresponds with the cold weather season, while the rabi season is in conformity with cold weather season. The principal crops of kharif season are rice, millets, maize, sugarcane, and pulses, while the dominant crops of rabi season are wheat, barley, peas, wheat and barley, gram and lentil. The per hectare yield of various crops is low as compared to other

parts of the country. The heavy pressure of population on land has resulted in an encroachment on land which is needed for fodder and pasture. All over the area under review, a small portion of the arable land is devoted to cash crops or such crops which provide raw material to the industries, and land is mostly given to grain crops in order to meet the food requirements of the population.

The total population of the region in 1951 was 4,655,959 which has increased to 5,680,270 in 1961 at the growth rate of 2.2 per cent. About 85 per cent of the population resides in rural areas and depends on agricultural produce. The density of rural population is over 1100 persons per sq.kilometre in the south-eastern part of the region and between 550 and 900 in other parts of the area. About 35 per cent of its population is below 15 years of age, with the result that the existing working population has to support a large percentage of dependents.

In short the area may be summarised as one of the backward region of Uttar Pradesh. It is densely populated, the birth rate is very high, the level of literacy is low, a very low percentage of population is engaged in secondary or tertiary activities, the yield of principal crops are low, and the farming practices are mostly traditional and primitive. Per capita land available is small and the loss to the standing crops due to natural clairities like flood, drought, is very high.

1. The population of the region has been computed by the author with the help of the District Census Handbooks of Bahraich, Gonda, Basti, and Gorakhpur for the Census years of 1951 and 1961.
Thus it is seen that Ghaghara-Rapti Doab is an undeveloped region and the necessity of a planned development can hardly be over emphasised. The planning for an adequate food supply based on the maximum utilization of the existing cultivated land and the maintenance of an agronomic balance between agriculture, forestry, and grazing ground, human habitation and means of communication emphasize the need of careful land use study of the area. The present work is an attempt in this direction.

In the present work an attempt has, therefore, been made to study and interpret the use of agricultural land as it exists today in the 15 selected villages of Ghaghara-Rapti Doab. It is admitted that it would have certainly been more useful if the total survey of all the agricultural land were carried out, but keeping into consideration the time and cost, such a survey would have needed, there was no other alternative but to adopt sampling technique. However, it should be pointed out at the very outset that utmost care has been taken in selection of these villages. These villages are representative of a large class of villages found in similar geographical and socio-economic conditions.

The impact of geographical conditions of relief, drainage, climate, and soil on the present utilization of land in these villages has been studied in detail and is supplemented by a number of land utilization maps and diagrams.
With the help of per hectare yield of various crops grown in the villages under study, the total production of the village is ascertained. For an assessment of the nutritional standard of the area in terms of calories, Food Balance Sheet has been prepared for each village. Per head per day supply of various edibles have further been converted into different elements of diet and the nutritional status of the people has been assessed with the standard requirements of these elements. Finally attempt has been made to correlate the deficiency or surplus of any particular element of diet and the prevailing nutritional deficiency diseases in the selected villages.