INTRODUCTION

In an agricultural country the measurement of agricultural productivity serves a good indicator for planning the allocation of resources so that production efficiency is improved and output is increased in a substantial manner. Often an under-developed economy of a certain region is characterized by a low level of productivity in agriculture. The measurement of agricultural productivity add our knowledge by (i) serving as barometers of agricultural progress, (ii) serving a guide to adjust resources within the regional frame, (iii) providing a framework for formulating and evaluating agricultural policy, and (iv) indicating problem areas that need further research. But the final objective behind the assessment of agricultural productivity is to find ways of increasing output per unit of input and of attaining desirable interfarm transfers of production resources, thereby providing the means for raising our standard of living. Considering the rate of agricultural growth we must be able to measure it, and for formulating effective policies, it would be necessary to assess existing levels, their past trends (growth patterns) and future prospects. It is worthwhile that agricultural productivity should be examined on a regional and intra-regional basis in order to assess variations in time and space, and to
suggest imperative measures to formulate plans for different macro as well as micro regions on the basis of past and prevailing realistic conditions. In the absence of such assessments, planning would be haphazard and possibly more developed regions might receive a greater share in the resource allocations whereas, the less developed regions which in fact should receive much greater attention, may lag behind.

Recently the importance of such task was emphasised by the International Geographical Union by establishing the Commission on World Food Problems and Agricultural Productivity at the International Geographical Congress in Moscow in August, 1976. The proposals before commission cover five broad topics:

1. "Assessment of the natural conditions of agricultural development, treated either as resource complexes to be used for food production—leading to conclusions as to their better use, conservation and improvement, or as obstacles hampering agricultural development—leading to conclusions as to the elimination of these

obstacles, including assessment of the transformation of the agricultural potential of various environments.

2. Assessment of the management of natural conditions and resources by different agricultural systems, using various inputs of labour and capital technology and equipment—leading to conclusions as to the rationalisation and improvement of such management by overcoming various natural, technical, economic, social and cultural obstacles.

3. Assessment of the actual agricultural productivity of various types of agriculture in relation to their production potentialities and food demand—leading to conclusions as to the ways of raising productivity of land or labour and commercial output of the existing types by making use of unused resources or, it is impossible, by the transformation of the present types of agriculture into, more productive ones.

4. Assessment of the present output and potentialities of non-agricultural food products—leading to conclusions about the possible extension of their use.

5. Assessment of the present storage, transport and marketing of food products and their impact on food production—leading to conclusions as to their rearrangement or improvement to meet the demands of world population".
These were the considerations which led the writer to determine food crop productivity in each of the forty-eight administrative districts of Uttar Pradesh (Plain portion), considering all the food crops which covered an area of about 20.50 million hectares (92.46 per cent) of the total cropped area of the State (1970-71). The district has been taken into account as the unit of study.

Uttar Pradesh is one of the largest and most compact States of the Republic of India. It has a length of about 650 km. from east to west and 240 km. from north to south, and covers an area of 2,94,463 sq. km. of which 48,034 sq. km. (16.30 per cent) is under hilly tract in the north, and the remaining 2,46,429 sq. km. is a plain portion and accounts for 83.70 per cent. The proportion of it to the total area of country as a whole accounts for nearly 9 per cent.

It has rather well-marked natural frontiers on the north and northeast, where it is joined by Tibet and Nepal respectively. On the northwest, west, southwest and east it is separated from the States of Himachal Pradesh, Haryana, Delhi, Rajasthan, Madhya Pradesh and Bihar. On the northeast however, the boundaries with Nepal are partly natural and partly artificial. On the
south, boundaries with Madhya Pradesh are not only artificial but also irregular on account of the intrusion of the Vindhyan hills on to the plains of the River Yamuna.

The State lies between north latitudes 23°52' and 31°18', and east 77°3' and 84°39'. It is bounded on the north by the Himalaya mountains and by the southern watersheds of the River Sutlaj and its tributaries, and of Tibet. On the northeast the boundary is formed by the River Kali, which separates its from western Nepal. Further northeastwards, the district of Pilibhit, Kheri, Bahraich, Gonda, Basti and Gorakhpur form a common boundary with Nepal. On the east and southeast the State borders on the districts of Bihar, viz., Champaran, Saran, Shahbad and Palamau, while on the south it adjoins the districts of Madhya Pradesh, viz., Surguja, Sidhi, Rewa, Satna, Panna, Chhatarpur, Tikamgarh and Saugor. On the southwest the State is bordered by the districts of Guna, Shivpuri, Datia, Bhind and Morena (all in Madhya Pradesh) and the Bharatpur district of Rajasthan. On the west the boundary is formed by River Yamuna and the Delhi State, the adjoining districts being Gurgaon, Rohtak, Karnal and Ambala (all in Haryana). On the northwest the State shares a common boundary with
Himachal Pradesh and its districts of Sirmur, Mahasu and Kinnaur.

In terms of natural features the River Kali and Mohan partly form the northeastern boundary; the Gandak, Ghaghara, Ganga and Karumasa form part of the eastern and southeastern boundaries; the Dhasan forms part of the southwestern boundary; the Yamuna forms part of the western boundary and the Tons forms part of the northwestern boundary. Similarly, the Himalayas form the northern, and the Dundwa range forms for a few distance the boundary with Nepal. The rest of the southern and northeastern boundaries are mostly artificial and irregular.

For the administrative purposes the State has been divided into fifty-four districts (Fig. 1) and they are grouped into eleven commissioneries namely, Meerut, Agra, Rohilkhand, Allahabad, Jhansi, Varanasi, Gorakhpur, Lucknow, Faizabad, Garhwal and Kumaon. (Appendix I). Each commissionery comprises at the most five to seven districts to administer. Excluding the commissioneries of Garhwal and Kumaon (comprising the districts of Chamoli, Garhwal, Tehri-Garhwal and Uttar Kashi under

Garhwal), and Almora, Pithoragarh and Naini Tal under Kumaon) which cover an area of about 27,000 (9.16 per cent) and 21,000 sq. km (7.14 per cent) respectively of the State, the other commissioneries of the plain portion accounts their aggregate share as 83.70 per cent.

The total population during 1971 census was estimated 88.75 million persons with a density 300 persons per sq. km.

The general slope of the plain is from northwest to northeast with the result the all the rivers rising in the Himalayan mountains, except the right-bank tributaries of River Yamuna flow from west to east. The River Ganga divides the plain into two parts by traversing from one end to another.