The assessment of agricultural productivity has recently attracted the attention of a large number of agricultural scientists, geographers, economists etc. Therefore, the concept and methodological procedure has been quantified for its measurement and viewed from different angles i.e., in 'time' and in 'space'. Conceptually, productivity is the ratio between output and input. In other words, it is the arithmetical ratio between the amount produced and the amount of any resource used in the course of production. Quantitatively, if the productivity of a crop in a particular area is increased from 2 qnt. to 3 qnt. by using better seed, better methods of cultivation and more fertilizer etc., the productivity of that land, in the agricultural sense, has been increased by 50 per cent.

The present work is an attempt to analyse the regional variations in food crops productivity of a selected Indian territory. For this purpose the State of Uttar Pradesh has been selected for the reason that the area is intimately known to the writer, and that it is well defined geographical region.

Uttar Pradesh lies between the latitudes of 23°52' and 31°18'N and the longitudes of 77°03' and 84°39'E, comprising fifty-four administrative districts (1971 census)
with a geographical area of 2,944,463 sq. km. of which 48,034 sq. km. (16.30 per cent) in the north is under hilly tract. For the present purpose out of fifty-four, six hilly districts namely, Uttar Kashi, Chamoli, Pithoragarh, Garhwal, Tehri-Garhwal and Almora of the State have been excluded from the study due to non-availability of required information and partly it supports a very scanty population.

It was proposed to examine crop productivity in each of the forty-eight districts of the State from three broad angles: (i) to measure inter-district variations in crop productivity at a given point of time, (ii) to ascertain changes in productivity between three points of time, and (iii) to assess the growth of productivity during the study periods. For the computation of productivity indices the crops considered are namely, rice, jowar, bajra, maize, wheat, barley, gram, arhar, pulses (including urd, moong, moth and masur), oilseeds (including groundnut, mustard, linseed, castor and rapeseed), sugarcane and potato.

The principal objectives of the study are to make a regional comparisons of productivity spatially and to assess crop productivity variations during three different points of time e.g., 1950-51, 1960-61 and 1970-71. The productivity indices (considering the above mentioned food
crops) have been computed with the help of following four productivity evaluating methods:

1. Food crop productivity, based on Yang's Crop Yield Index;

2. Food crop productivity, based on Standard Nutrition Unit output per hectare;

3. Food crop productivity, based on output per-hectare (Rs.), and

4. Food crop productivity, based on output per agricultural worker (Rs.).

Among the four methods considered above, the first method signifies the two aspects of productivity assessment. Firstly, it measures the productivity considering the yield of a crop in a certain unit area with the entire region selected for study. Secondly, it is 'weight sensitive', i.e., the productivity index of a certain unit of study is influenced by the magnitude of area under the specific crop concerned when it is compared with the entire region.

The second method, Standard Nutrition Unit considers calories as the multiplying factor with the yields of respective crops when viewed from nutritional point, thereby, persons supporting capacity per hectare of cropped land.
The third and fourth methods measure productivity by incorporating prices of the crops as weights considered to get the value of output per hectare/per agricultural worker. The productivity per hectare (method third) of the selected food crops has been assessed by considering the wholesale prices of individual crop as the multiplying factor and each product of crops concerned was added up and the final product thus obtained was divided by the total area of the crops considered relating the district concerned. The productivity of agricultural worker (method fourth), too, has been worked out by incorporating wholesale prices of the crops as the multiplying factor to get the value of output (Rs.) per agricultural worker engaged for the production of crops since sowing to harvest times.

Besides these, a detailed account has been produced on the perspectives of agriculture in different parts of the State e.g., the problem of wastelands, ground water resources, size and number of holdings, initiation of intensive cultivation programmes, land use profile, and cropping pattern and crop production levels. In addition to these, role of some important variables like, water and irrigation facilities, area planted under high-yielding varieties of seed, consumption levels of fertilizers (NPK), use of modern farm implements and machinery and the levels
of agricultural finance to enable the farmer to adopt modern agricultural strategies are discussed rather in detail.

It was further hypothesized to establish an input-output relationship by selecting a set of twelve independent input variables and a dependent variable i.e., the productivity index relating to the value of Standard Nutrition Unit per hectare (Chapter X). For the statistical formulations, two important techniques of 'factor analysis' and of 'multiple linear regression analysis' leading to the development of Cobb-Douglas production function were performed on Scientific Sub-routine Programme, IMB 1130 Computer. The input and output variables were analysed while considering Uttar Pradesh (forty-eight districts) as a single unit, as well as into different productivity regions for the year 1970-71. At the first instance, among the four productivity evaluating methods, the significant productivity index was tested through factor analysis which yielded SNU output measure as the most significant method of productivity assessment (see Table XLIV). Therefore, the values of selected input variables were incorporated for the identification of significant input variables through factor analysis for U.P. as a whole and also for the productivity regions. After doing factor analysis for determining the significance of variables, linear multiple
regression analysis was done while incorporating the logarithmic values of the variables identified. It is also tried to formulate the elasticities of inputs which can bring the change in productivity while other factors remain the same.

In the last Chapter XI some of the measures that can bring the change in productivity spatially are suggested providing them on a scientific basis and in a suitable manner.