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Title: Water Availability and Agricultural Productivity in Upper Ganga – Yamuna Doab

Abstract

Indian agriculture has made impressive strides in enhancing productivity. The present study is an analysis of changes in productivity in relation to water availability. The role of water as a major limiting factor in agriculture is increasing due to the unpredictable nature of rainfall and increasing demand in domestic and industrial sectors. There is an urgent need to increase crop water productivity (CWP) at the farm level through water resource management.

In this study, the first part of the first chapter deals with the physiography, drainage pattern, climatic conditions of the study area.

The second part of the first chapter deals with the distribution and density of population, its district wise total, the share of rural and urban population, occupational structure, concentration of working population.

The second chapter deals with the land use pattern of the study area. Crop combination region have been worked out. The Upper Ganga-Yamuna Doab is dominated by wheat, sugarcane and rice combination. Levels of crop diversification have been calculated by using Gibb's Index.

Agricultural crop productivity of various crops falls under cereals, pulses, fodder, cash crops of 82 blocks have been discussed from 1960-61 to 2005-06 with an interval of 5 years. The study reveals that the productivity in the blocks of Upper Ganga- Yamuna Doab did not increase substantially during last 45 years. Only in high productivity category, number of blocks has

increased from 17 to 31 over a period of 45 years. Agricultural crop productivity from 1960-61 to 2005-06 has also been shown on 10 maps. Production and yield of all the major crops grown in the region have been worked out from 1960-61 to 2005-06.

Third chapter deals with the water resource availability in the study area. Availability and distribution of rainfall from 1960-61 to 2005-06 has been calculated in all the districts of the study area. The level of ground water and drainage pattern of the study area has also been discussed in short. Different sources of irrigation like canal, tube well, well and ponds and other sources have also been identified.

In chapter four, block level agricultural productivity in 82 blocks has been calculated. During 1960-61 almost 71% of the total blocks fell under medium and low productivity regions. This percentage decreased to 62% during 2005-06. The percentage of blocks under very high productivity region has decreased considerably during 1960-61 and 2005-06. There were 15 blocks which fell under high productivity region in 1960-61. The number of blocks under this category increase to 29 in 2005-06.

Regression analysis between water availability and crop groups has also been worked out. Water availability has been worked out by dividing total production of a crop by the total water available to that crop in the region.

The present study is an analysis of changes in productivity in relation to water availability.

A category wise detailed assessment of the working and non working population has been made. The highest proportion of manpower is engaged in agriculture in those blocks where land is fertile, irrigation facilities are adequate.

In the initial period, trends in water productivity of the crops/crop groups exhibit a slow pace of growth. Decline has been observed from 1990-91 onward. Somewhat stagnation is more the

trend in the case of rice and barely, while decline is more pronounced in the case of bajra. The second from of trend in water productivity is shown by the crops of wheat, jawar, maize, rabi pulses and sugarcane. Decline is more pronounced in the case of jawar, rabi pulses and maize, the wheat and sugarcane show somewhat a stagnant water productivity level since 1990-91 onward.