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COTTON CULTIVATION IN HARYANA: A SPATIO-TEMPORAL EXPLORATION

Doctoral Dissertation Abstract (2019)

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The cotton cultivation in India is currently in the domain of public discussion due to increasing cost of production, falling level of yield and various economic and ecological problems faced by the farmers. With the increase in the cost of inputs viz., fertilizers, pesticides and labour etc. during post liberalization period, the cost of cotton cultivation has gone up. Moreover, un-seasonal rainfall, incidence of pests and diseases cause heavy losses to the cultivation of cotton. Haryana holds an important position in cotton cultivation in India. With 1.44 per cent of the total geographical area of the country, it accounts for about 5 per cent of the country's total area under cotton. The importance of cotton in the economy of the state can be gauged by the fact that it is mainstay of over 21.50 per cent working population and accounts for about 26.28 per cent of state's agricultural income during the kharif season. The growth of cotton cultivation in Haryana is very closely associated with the expansion of irrigation and introduction of modern agricultural technology which led to Green Revolution in late 1960s. Introduction of Bt cotton seeds in India in 2002 provided impetus to its significance in agriculture. It remains an important commercial crop in north-western and western Haryana despite fast expansion of paddy cultivation, during last two decades, in the region.

Objectives of the Study

Major objectives of the study are:

- to study the trends in acreage and spatial pattern of cotton cultivation in Haryana;
- to evaluate the trends in production and yield of cotton and to highlight spatial pattern of yield level;
- to examine the extent of use of modern agricultural technology in cotton cultivation and
- to assess various environmental and socio-economic problems associated with cotton cultivation in the state.

Database and Methodology

The present study has utilized both primary and secondary data, collected from different sources. The primary data have been generated through a field survey conducted during the period 2012-2013. The relevant data have been collected through a household schedule and a village schedule. Secondary data per-taining to three trienniums i.e. 1966-69 (mid-sixties), 1982-85 (early eighties) and 2012-15 (early 21st century) have been collected from Statistical Abstract of

Haryana. The district level data on acreage, production and yield of cotton for various years have been collected from Economic and Statistical Organization, Panchkula. The data on cotton marketing and related industries have been taken from offices of the market committees. Some information on cotton marketing has also been obtained from the office of the Administrator of Haryana State Agricultural Marketing Board, Panchkula, and the Director, Industries Department, Haryana. The Districts Gazetteers, District Census Handbooks, and some other historical reports have also been consulted for the study.

The cotton growing area of Haryana has been divided into core cotton growing area (Hisar, Sirsa and Fatehabad districts) and periphery cotton growing area (Jind, Bhiwani and Rohtak districts) for sampling. Nine villages have been selected for household survey. Six villages have been selected from core cotton area and three villages have been randomly selected from peripheral cotton growing area. About 45-50 farmers have been randomly selected for collection of data from each district.

Trend graphs have been prepared to depict the trends in the acreage, production and yield of cotton cultivation over the study period. Choropleth technique has been used to depict spatial distribution and concentration of cotton acreage and production. Multiple correlation and regression statistical technique has been used to compute the degree of association between acreage, yield and determining factors. The analysis of various problems faced by cotton cultivators has been done on the basis of qualitative information obtained from farmers through group discussion during the course of field work.

Major Findings

The area under cotton in the state increased, to the maximum from 1.83 lakh ha in 1966-67 to 6.53 lakh ha in 1995-96. Thereafter, area under this crop has been fluctuating between 5 and 6 lakh ha. Overall, there has been an increasing trend in area under cotton in both core and peripheral cotton growing areas. Haryana has recorded many folds increase in cotton production from 1966-67 to 2014-15. Both core and peripheral areas have maintained an increasing trend in production, though its growth rate has been lesser in the later. Two periods of growth in cotton yield have been noticed. Firstly, cotton yield increased following initiation of Green Revolution in 1960s, but it became stagnant by late 1980s. Secondly, the production and yield of cotton increased significantly after 2002-03 with the introduction of Bt cotton seeds. But both the production and the yield, have stagnated during recent period.

The study reveals that biological inputs are mainly responsible for gaps in cotton yield at farm level. However, there are various socio-economic constraints which has influenced cotton production. Farm size, seeds, chemical fertilizers and pesticides, irrigation, and labour have been the main factors in the process of cotton production. Gross inequality in land distribution among different categories of farmers has been found both in core and peripheral areas. The unequal distribution of land also has adverse impact on the cotton production. Cotton is the dominant crop in core area. Rice and guar are two main competing crops of cotton in core area but in two different edaphic conditions. Rice is competing with cotton in the areas endowed with adequate surface water and groundwater resources. On the other hand, guar competes with this crop in the soil moisture deficit areas with limited irrigation facilities. Cotton yield level has been found to be higher in core area

as compared to peripheral area. The large farmers are in advantageous position on a number of counts. It has been found that application of chemical fertilizers in cotton cultivation declines with the size of land holding. The access of water for irrigating cotton is higher among the large farmers, while it declines with the decrease in size of land holding. Overall, there is less accessibility of irrigation water for cotton cultivation in peripheral area. The large farmers of core area who have the capacity to invest more on the irrigation assets incur higher expenditure on irrigation. A similar pattern has also been observed in peripheral areas as well.

There are many factors such as environmental, institutional, social and economic that determine cotton acreage and yield. Correlation and regression analysis decipher the factors influencing cotton acreage and production. It has been observed that the farm size is not a significant factor in explaining inter-farm variations in yield of the cotton crop but it significantly influences the acreage of cotton. Similarly, the expenditure incurred on the cotton seed also significantly influences the inter-farm variations in its yield. But it has no effect on variations in crop acreage. The fertilizers' consumption, in cotton cultivation, contributes towards higher yield level but it does not influence the acreage under cotton. The incidences of pests and diseases have been the big issues in cotton cultivation. It has been found that use of pesticides influences the yield of cotton to some extent but it has no impact on the acreage of cotton. Although cotton is a gently irrigated crop, yet the number of waterings has a significant impact on its yield. But it has moderate influence for the area under cotton. Expenditure incurred on irrigation is an important variable in explaining variations in cotton acreage. Labour absorption is most significant variable in explaining the area under cotton both in core and peripheral cotton growing areas. But its explanatory power is low in case of the yield of cotton.

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