

**A NOTE ON THE TRENDS IN THE YIELD RATES OF
MAIZE IN INDIA DURING THE FIRST THREE
FIVE-YEAR PLANS**

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Panse (1959) had examined the trends in the yield rates of rice and wheat during 1946-47 to 1955-56. He further extended the study to cover the second plan period 1956-57 to 1960-61. Saxena and Sardana (1973) had attempted this study with a view to finding out whether and to what extent the first three five-year plans have made their impact on the yield rates of rice and wheat in different States and in the country as a whole.

Apart from rice and wheat, maize is considered as an important cereal crop in India. It occupies about 5.8 million hectares of land and gives an annual output of 7.4 million tonnes. It contributes about 7% to the total annual production of foodgrains in the country. In view of its sizeable contribution to the total foodgrains production and also from the point of view that it is consumed as a staple food in quite a few pockets of the country, the plan efforts were directed towards increasing the production of this crop. In the present study an attempt is made to study the trends in the yield rates of maize during the period 1950-51 to 1965-66 with a view to finding out the impact of first three five-year plans on the average yield of this crop in different States of the country.

Comparable and reliable series of data on the yield and area of maize crop were obtained, over a period of 16 years, from the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India. The data cover about 77% of the area under maize in the country. The States of Bihar, Madhya Pradesh, Punjab, Rajasthan and Uttar Pradesh were covered in the study.

The study is confined to identical coverage of districts, divisions and States for the period of 16 years during 1950-51 to 1965-66. The results are presented according to the political boundaries after the

States Reorganisation had taken place in 1956 except for Kangra district which has been included in the State of Punjab. The divisional yield is obtained as a weighted average of district yields, the weight being the area under the maize crop in the district during the year. The method of analysis as developed by Panse (1959 and 1964) has been used in the present study.

The different components of analysis of variance as suggested by Panse (1964) were worked out and the proper comparisons were made. The yield data regarding pre-plan, first, second and third plan periods when tested against uncontrolled variation (error) gave highly significant results in all the States except Uttar Pradesh.

The comparison in yields between first and pre-plan, between second and first plans and between third and second plans gave significant results for all the three components only in the State of Madhya Pradesh. In case of Rajasthan, the comparisons between first and pre-plan and third and second plans gave significant results, while in case of Bihar, the comparison between second and first plan and third and second plan gave significant results. For Punjab, the comparison between first and pre-plan gave significant results. In Uttar Pradesh none of these components gave significant results.

The variation between the yield rates of pre-plan, first, second and third plan periods was tested against the variation between years within plan period and it gave significant results in case of Bihar and Madhya Pradesh.

However, when the yields between first and pre-plan, between second and first plans, and between third and second plans were tested, the third component viz. comparisons in yield between third and second plans were significant in case of Bihar and Madhya Pradesh. None of these components gave significant results in the States of U.P., Rajasthan and Punjab. This indicates that impact of efforts in any plan period was not adequate enough to raise the yield level of maize in the above three States. However the results of statistical analysis showed that the yield levels in third plan period were higher than those of second plan period in the States of Bihar and Madhya Pradesh. The variation representing the inter-actions between plan and division was observed to be significant in Madhya Pradesh indicating thereby differential response of individual divisions in the States to plan efforts.

The quinquennial average yields for different States and for the country as a whole for the pre-plan, first plan, second plan and third plan alongwith the corresponding differences between them and appropriate standard errors are presented in Table I. It may be seen that at all India level the increase in the yield rate in first plan over pre-plan, second plan over first plan and third plan over second plan were respectively 179, 122 and 131 kg./ha. When expressed as percentages, these increases worked out to be 3.1, 16.3 and 15.1. Further, when the increases were expressed on per year basis, the figures for the three comparisons are 0.6, 3.2, 3.0 percent respectively.

The States of Madhya Pradesh, Rajasthan and Punjab contributed significantly to the increased yield in first plan compared to pre-plan. The States of Bihar, Madhya Pradesh and Punjab showed increasing trend during the second plan as compared to first plan. During third plan, the increase over the second plan was observed in the States of Bihar, Madhya Pradesh and Rajasthan.

SUMMARY

In the present paper, the trends in yield rates of maize crop have been studied over a period of 16 years from 1950-51 to 1965-66 with the objective of finding out the impact of the first three Five-Year Plans on the yield rates of this crop in important States growing this crop and in the country as a whole. The results obtained in the study lead to the conclusions that at the All-India level the increase in yield rates in the plan period over the corresponding control period was highest during the first plan being 179 kg./ha. followed by increases of 131 and 122 kg./ha. during the third and second plan periods. Madhya Pradesh showed a steady increase during all the three plans. Bihar recorded significant increases in yield rates during second and third plan periods, while Rajasthan showed significant increases during first and third plan periods. Uttar Pradesh recorded depressions in yield rates during first and second plan periods.

REFERENCES

- Panse, V.G. (1959) : Recent trends in yields in rice and wheat in India. *Ind. Jour. Agri. Econ.* 14,
- Panse, V.G. (1964) : Yield trends of rice and wheat in first two five-year plans in India. *Jour. Ind. Soc. Agri. Stat.* 16.
- Saxena, R. and Sardana, M.G. (1973) : Study on the trends, in yield of rice and wheat in India during the first three five-year plans, *Jour. Ind. Soc. Agri. Stat.* 25,

TABLE I
 Quinquennial average yields (in quintals) per hectare of Maize in different States for Ist, 2nd, 3rd Five-Year Plans

<i>State</i>	<i>Pre-Plan 1950-51</i>	<i>Ist Plan 1951-52 to 1955-56</i>	<i>2nd Plan 1956-57 to 1960-61</i>	<i>3rd Plan 1961-62 to 1964-65</i>	<i>Difference Ist Plan & Pre-Plan</i>	<i>S.E. of Difference</i>	<i>Difference 2nd Plan and Ist Plan</i>	<i>3rd Plan and 2nd Plan</i>	<i>S.E. of difference</i>
Bihar	5.4604	5.4083	8.0912	10.0163	(-) 0.0521	0.8026	2.6829	1.9251	.4634
Madhya Pradesh	3.2707	4.7075	7.4699	10.3358	1.4368	0.5642	2.7624	2.8659	.3258
Uttar Pradesh	7.8494	7.7028	7.6824	8.0859	(-) 0.1466	0.7368	(-) 0.0204	0.4035	.4254
Rajasthan	2.9604	8.8741	8.9021	10.2118	5.9137	0.8539	0.0280	1.3097	.4930
Punjab	5.7616	11.7479	12.7489	13.0634	5.9863	0.8390	1.0010	0.3145	.4844
Combined (All India)	5.7012	7.4942	8.7161	10.0280	1.7930	0.3571	1.2219	1.3119	.2062