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Vol XLI
No. 2

ISSN 0019-5014

APRIL-
JUNE
1986

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

OFFICIAL DOCUMENT: SUMMARY OF FINDINGS*
**REPORT OF STUDY GROUP ON AGRICULTURAL
STRATEGIES FOR EASTERN REGION OF INDIA**

(Planning Commission, Government of India, New Delhi, July 1985, Pp. 45.)

The Planning Commission appointed a study group in 1984 under the Chairmanship of Dr. S. P. Gupta to review the performance of major food crops in the Eastern Region comprising Bihar, East Uttar Pradesh, Orissa and West Bengal, identify the constraints and possibilities for agricultural growth and suggest an outline of strategy for achieving rapid growth. This report embodies the findings of the study group. The introductory chapter provides background information about the States in the Eastern Region, such as the distribution of gross cropped area and cropping pattern in 1980-81, the share of the States in the total production of cereals, share of gross irrigated area in the cropped area, consumption of fertilisers, pattern of distribution of land, land-man ratio, extent of tenancy, etc. The second chapter examines the changes in agricultural productivity in the 60 districts of the Eastern Region between 1970-73 and 1980-82, analyses the disparity in the levels of productivity among the districts and identifies the factors influencing the changes in agricultural productivity in the region. The next two chapters present a districtwise and Statewise analysis of yields of rice and wheat in the region respectively and some of their major determinants. The last chapter examines the potential for enhancing rice and wheat yields in the Eastern Region of India.

The eastern region accounts for 15 per cent of the geographical area and one-fifth of the gross cropped area of the country. The main crop of the eastern region is rice which accounts for about 50 per cent of the gross cropped area of the country and the region's share of wheat in the gross cropped area is 12.8 per cent. Though the share of cultivated area in the region increased marginally from 19.6 per cent in 1970-73 to 20.6 per cent in 1980-82, the share of agricultural production declined from 25 per cent to 23 per cent during the same period. The growth rates of yield of rice and wheat were lower (0.8 and 0.9 per cent) in the eastern region as compared to the average for the country (1.8 and 2.2 per cent per annum respectively) during 1970-80. During the same period, the growth rates in total fertiliser consumption and gross irrigated area in the region were higher at 9.98 per cent and 3.42 per cent per annum respectively as compared to those for the country (8.41 per cent and 2.68 per cent per annum).

The report presents the change between 1970s and 1980s in the ranks of the 60 districts of the eastern region on the basis of changes in aggregate agricultural productivity defined as value of output per hectare of net sown area. The districts are classified into very low productivity (less than Rs. 950), low productivity (Rs. 950-1,150), medium (Rs. 1,150-1,650), high (Rs. 1,650-2,000) and very high (more than Rs. 2,000) productivity categories. It is revealed that 26 out of 60 dis-

*This feature seeks to disseminate information on official publications and other studies, which are not easily available, by publishing the main findings of such studies. (*Chairman—Editorial Board.*)

districts were in the low productivity range in the seventies—nine each in Bihar and Orissa, seven in East Uttar Pradesh and one in West Bengal. In the eighties, 15 out of these low productivity districts had moved into medium productivity range. Of the remaining 11 laggard districts, seven belonged to Bihar, three to Orissa, and one to East Uttar Pradesh. Of the 25 districts in the medium productivity category, 14 moved into the high productivity range but 11 did not record any upward mobility. The eastern region had only 9 districts in the high productivity category in 1970 while eight remained in the same category and one slid into medium productivity category, their total number by 1980 stood at 22.

Most of the identified low and negative growth districts of the eastern region happen to be in upland or hill districts where the level of irrigation is very low. What is baffling is the poor growth performance of the districts of Bihar, particularly of the Ganga plains including Gaya, Patna, Monghyr, Shahabad, Bhagalpur, Saran and coastal districts of Puri and Ganjam in Orissa where not only the level of irrigation is high but has increased substantially during the past decade. As opposed to this, some less endowed districts like Palamau, Muzaffarpur and Purnea of Bihar and the upland districts of Orissa have performed well.

The report points out that notwithstanding the change in productivity levels, the disparity among districts in the eastern region almost remained the same over time as measured by the coefficient of variation of productivity which marginally increased from 32.56 in the seventies to 32.77 in the eighties. This is explained by an increase in the district level disparity in Orissa, East Uttar Pradesh and West Bengal and a decline in inter-district disparities in Bihar over time. It is noted that inter-district disparities have increased only in the high productivity region, while no change is observed in the medium productivity region. On the whole, more than 90 per cent of the cultivated area in East Uttar Pradesh and about three-fourths in Orissa operated under medium and high growth rates, while nearly three-fourths of the cultivated area in Bihar, two-thirds in Orissa and 40 per cent of the cultivated area in the eastern region operated under negative or very low growth rates. A large part of the eastern region thus continues to be characterised by agricultural stagnation.

The inter-district variation in productivity within each category is explained by fertiliser consumption per hectare, which in turn is determined by the extent and quality of irrigation, access to inputs and the availability of infrastructure.

Classifying the districts in the eastern region into three categories according to levels of yield per hectare, the report showed that all but one district in Bihar are in the low (4 to 8 quintals) and medium (8 to 12 quintals) yield ranges. In Orissa and East Uttar Pradesh, most of the districts are in the medium range while in West Bengal, the districts are distributed in the medium and high (more than 12 quintals per hectare) yield ranges. The growth rate in rice yields has also not been satisfactory in the region except in East Uttar Pradesh which recorded a growth rate of 2.9 per cent per annum, higher than the all-India average of 1.8 per cent per annum during 1970-80. One major reason for the low levels of yield in the eastern region is the much lower level of irrigation. About three-fourths of the rice area in the region is still cultivated under uncertain monsoon conditions. Apart from the creation of irrigation potential, irrigation management is identified as

an important factor influencing the inter-State differences in yields within the eastern region. Flooding and drainage problems are quite serious in the region which block the optimal utilisation of the created irrigation potential, besides other problems like saline and alkaline soils found over large areas.

Lack of suitable varieties of rice for the flood-prone low lands has been a major constraint in increasing productivity. Use of fertiliser under flood-prone or drought-prone conditions is also found to be unprofitable. The report notes that deficiency in infrastructural facilities like roads, availability of power, credit, sales outlets for seeds and fertilisers, etc., has hampered the spread of even available technology. Lack of procurement agencies and absence of regulated markets are the other major disincentives for the farmers to adopt the costly inputs.

The productivity of wheat has been in general higher than that of rice in the four eastern States due to better coverage under irrigation and HYV.

The study group has highlighted the scope for increasing production of rice and wheat in the region. For estimating the potential in rice and wheat yields, two alternative approaches are used. In the first approach, based on the results of experiments conducted on cultivators' fields by the Indian Agricultural Statistics Research Institute, the additional production has been estimated by taking the differences in the economically optimum yields under experimental conditions on cultivators' fields and average yields as actually observed. In the second approach, the States of the region have been divided according to agro-climatic zones, and in each zone, the average yield is then compared with the highest yield obtained in a district falling in that zone. The first approach seeks to realise the expected additional production by proper extension effort taking the technology to the farms while the second approach aims at achieving the potential by providing infrastructure and inputs at par with the best district in each agro-climatic zone. On the basis of the first approach, the potential of rice and wheat yields in the eastern region is estimated respectively at 400 per cent and 220 per cent higher than the actual yields as compared to the corresponding figures of 244 per cent and 167 per cent for the country as a whole. In terms of optimum potential yield as also gap between optimum and actual rice yield, Orissa ranked first followed by Bihar and the potential of wheat yield is highest in Bihar not only in the region but also as compared to the country as a whole.

Using the second approach, it is estimated that the eastern region has a potential to increase rice yields by about 24 per cent and wheat yields by 12 per cent. The additional potential of rice and wheat yields is estimated to be highest in East Uttar Pradesh (26.8 and 15.39 per cent respectively), followed by West Bengal (20.67 and 19.94 per cent), Orissa (8.45 and 8.90 per cent) and Bihar (7.5 per cent and 4.97 per cent).

The study group has outlined the strategies for raising productivity under three major heads: (a) Land and Water Management, (b) Technology and (c) Infrastructure and Institutions. The strategies recommended for adoption under land and water management include (1) States' help in expediting the process of consolidation of holdings, (2) regulation of share cropping where it is prevalent for promoting input use, (3) introduction of soil amelioration programmes in areas with soil problems, (4) control of erosion in the plateau regions of Bihar, Orissa

and West Bengal through soil conservation programmes, (5) speedy construction of field and drainage channels in the canal command areas of the region, regulated water supply and introduction of Warabandi system to promote efficiency and equity in water distribution system, (6) groundwater development programmes, financing and subsidising the construction of private tubewells, dugwells, etc., particularly for small farmers, (7) tapping and/or fully utilising other sources of minor irrigation and (8) introduction of more effective flood control measures in the region.

The strategies under technology lay emphasis on intensification of research for developing drought- and pest-resistant high-yielding varieties of wheat and new paddy varieties more resistant to flood/droughts and suited to low land and upland situations and promotion of inter-cropping of cereals and pulses/oilseeds, especially on uplands. Finally, the study group recommends the development of infrastructural facilities like roads, sales outlets for fertilisers, seed multiplication farms and strengthening of regulated markets, extension system and co-operative societies and supply and distribution of modern inputs among different sections of the farming community.

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