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Vol XXXVIII
No. 4

ISSN 0019-5014

OCTOBER-
DECEMBER
1983

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

PROCEEDINGS

REPORT OF THE SYMPOSIUM ON CONSTRAINTS TO AGRICULTURAL PRODUCTION IN THE NORTHERN REGION OF INDIA*

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The Symposium was presided over by Professor A. M. Khusro, Member, Planning Commission, and inaugurated by Professor S. S. Johl, Vice-Chancellor, Punjabi University, Patiala. Johl in his inaugural address pointed out that growth could take place as a result of enhanced use of factors of production and/or improvement in production technology. During the decade 1970-71 to 1980-81 foodgrain production increased at the rate of 2.28 per cent, more due to the growth of productivity than due to the area expansion but it is only five States, viz., Maharashtra (9.79 per cent), Punjab (5.68 per cent), Haryana (3.93 per cent), Andhra Pradesh (3.56 per cent) and Jammu & Kashmir (2.87 per cent) which contributed most to it. Of these five States, production in Maharashtra increased mainly through increase in productivity (7.78 per cent) and in Punjab, through a combination of increased productivity (3.10 per cent) and cropped area expansion (2.44 per cent). In Haryana, Andhra Pradesh, Karnataka and Gujarat, the production increased mainly due to increased productivity. In the latter three States, the cropped area showed a negative growth rate. Surveying the growth pattern of two major crops, wheat and rice, Johl concluded: "Thus, to sum up, of the 2.28 per cent growth rate in foodgrains production, 75.6 per cent has come through productivity improvement and only 5.03 per cent through expansion of area under the foodgrain crops. The rest could be attributed to various other factors like change in cropping pattern and other interactions. The pattern of growth has not shown the same trend throughout the country. It is only 25.8 per cent of the crop area which has shown good growth (above average growth), 55 per cent of the area poor growth and 19 per cent negative growth." After carrying the study further to analyse the growth pattern of coarse grains, he generalised that:

1. Agricultural production did not grow at a desired rate and that there was enough scope for its growth.
2. Negative or below one per cent growth in production and productivity in vast areas is an intolerable situation and should not be acceptable in any crop except where it is due to displacement by more productive/remunerative crop(s).
3. Attention of government and concerned agencies has been focussed on remunerative high productivity crops. Others have suffered comparatively in respect of technology development as well as marketing and price policy leading to poor response on the part of the farmers.

* Organized at Punjabi University, Patiala on 25th and 26th July, 1983.

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According to Johl, the task before the Symposium was two-fold. First to bring out the factual situation about production and productivity of foodgrains and second, if there was stagnation or slowing down of growth, to analyse the reasons for it.

In his presidential address, Khusro stressed the point that acceleration and deceleration of growth was a normal historical sequence. No sector of the economy can grow indefinitely and that the momentum of growth passes on from one sector to another with the passage of time which brings about changes in the economic base, technology, inter-sector relations and relative opportunity cost of investments. Thus, he emphasized that the slowing down of the rate of growth of agricultural output should be viewed in the wider economic context. Indeed, referring to the uncertainties of agricultural production and seasonal variations in output, he was even doubtful of the validity of the stagnation hypothesis in the wider Indian context. He emphasized that the States of the region should diversify their agricultural economies and also try to develop agro-based industries as a step towards industrialisation and urbanisation.

The Symposium was divided into three sections: (a) Economic and Policy Constraints to Production; (b) Administrative Constraints to Production; and (c) Scientific and Technological Constraints to Production. Thirteen papers were received for discussion at the Symposium (see the Appendix).

The first main issue was the stagnation hypothesis which emanates from the fact that foodgrains production has not been going beyond 123 million tonnes on the basis of three-year moving trend point values around the mid-years 1977-78 through 1980-81. It was noted that foodgrains production had experienced seven three-year cycles from 1949-50 through 1981-82 and that in the Northern States the per hectare productivity had almost levelled off. Value productivity per hectare also remained more or less constant. However, this was not regarded as conclusive and a more rigorous analysis was suggested, in particular the use of sigma bands above and below the trend line to account for year to year fluctuations. If agricultural production falls below the lower band over a number of years that would be a decisive evidence of stagnation.

While economic and statistical analysis was not conclusive, the scientific and technological analysis seemed to support the stagnation hypothesis. An analysis of the contribution of fertilizers to foodgrains production showed a strong quadratic relationship with fertilizer consumption at the all-India level and for the States of Haryana and Punjab which confirmed the existence of diminishing returns to fertilizer use, on the implied assumption that the increase in the production of foodgrains was the result of greater use of fertilizers whereas irrigation and high-yielding varieties act only as facilitating agents. Another notable point was that the increase in the fertilizer consumption was strongly influenced by the quality of irrigation in terms of supply and timeliness of its availability. It was for this reason that fertilizer use did not keep pace with

the increase in irrigated area in States such as Bihar, Madhya Pradesh and Rajasthan where irrigation provided was of uncertain nature. Another important limiting factor that emerged during the discussion was the greater incidence of weeds in crops like wheat and paddy, which robbed the soil of costly nutrients. Attention in this regard was urgently needed. It was accepted that there was great need to promote the use of fertilizers in the case of areas/farmers having low level of fertilizer use and to extend its use to new areas both irrigated and under dry farming conditions.

Some further suggestions for improving per hectare productivity in the Northern States were: (i) to diversify the cropping pattern as it was feared that uninterrupted wheat-paddy crop rotation affected soil fertility adversely; (ii) to evolve a suitable land use policy to prevent the process of urbanisation from encroaching upon high productivity vegetable growing areas; and (iii) construction of storage and cold storages to remove marketing constraints.

In the area of energy constraints to agricultural production, a distinction was drawn between direct and indirect energy use and also between commercial and non-commercial energy use in the field of agriculture. It was agreed that there was a positive correlation between energy input and agricultural production. Under conditions of limited cultivated area, energy inputs to field operations increased production only if the soil-crop production environment was properly modified through the use of additional energy inputs. It was noted that technological advances forced a shift from non-commercial to commercial energy input and led to increased consumption of commercial energy. The analysis for the State of Punjab showed that over a period of 14 years, *i.e.*, 1965-66 to 1979-80, the use of commercial energy in agriculture increased by about 13 times while the use of non-commercial energy input was at the same level and its relative importance had declined. It was highlighted that the commercial energy needs would continue to increase for another two decades in the Punjab which was nowhere near the saturation point from energy consumption point of view.

An exercise to work out the energy demand in the three States of Punjab, Haryana and Uttar Pradesh for three important crops of this region, *viz.*, wheat, paddy and maize and two selected operations, namely, land levelling and threshing, which were most energy intensive, was discussed. Two indirect inputs, *i.e.*, irrigation and fertilizer required to raise the yield level of these crops to a level of 4 tonnes per hectare were also estimated.

After aggregating additional consumption of each type of energy input, it was estimated that additional requirements of diesel oil will be one million tonnes which is about 70 per cent of the present consumption of diesel in the agricultural sector in these three States, and about 33 per cent of the consumption in the country as a whole. The additional requirement of electricity was ascertained as 15,000 million kWh which represents an increase of three and a half times over the present consumption of electricity in the agricultural sector of these States and exceeds the total consumption of electricity for the country by a substantial amount. In the case of nitrogen, the additional requirement was worked out at 1.5 million tonnes which represents an increase

of 150 per cent over the nitrogen consumption level in 1980-81. Based on this analysis, a wide gap was noted between the requirements and present available quantities of different types of energy inputs for these States. The Symposium agreed that of all these inputs, electricity was likely to emerge as a major constraint to agricultural production followed by fertilizers and diesel oil.

Two related aspects discussed in two separate papers were: (i) impact of migration on rural and urban development and (ii) financial constraints particularly in the context of the weaker sections. As regards the first aspect, it was generally agreed that out-migration of the more dynamic members of farming households had not adversely affected the adoption of new technology, rather the inflow of remittances and the new awareness brought in by the return-migrants have helped the process of technological change.

As regards the second aspect, the working of the SFDA programme revealed the following difficulties: (i) the limitation of resources, (ii) the vested political interest, (iii) the absence of reliable land distribution records, (iv) the economic viability of projects initiated for the benefit of weaker sections and (v) the mini-max risk aversion behaviour.

Administrative constraints were necessarily specific to each State for which papers were presented for three States, *viz*, Himachal Pradesh, Uttar Pradesh and Punjab.

Himachal Pradesh: The State was divisible into four zones on the basis of agro-climatic conditions. The nature and extent of constraints to growth differed from zone to zone. Due to these agro-climatic differences, inter-zone or inter-State transfers of technology could not be visualised.

Only 20 percent of the total area was endowed with irrigational facilities. General resource base of the region was extremely low. Low income prevented the farmers from investing in soil and plant protection measures. Due to over-grazing of cattle and reckless deforestation, soil erosion had emerged as a very serious problem. Lack of cheap and adequate means of transportation and the extremely low size of holdings which did not allow the use to full capacity of even a pair of bullocks on a single holding, were the two other problems affecting the agricultural growth of the State.

Uttar Pradesh: On the basis of cropwise analysis stagnation was evident. The main constraints were:

1. Dominance of wheat and paddy rotation and its adverse effects on soil fertility.
2. Increased power requirements faced with power shortage and breakdowns.
3. High prices of diesel and fertilizers.
4. Late sowing of high-yielding varieties which reduced per hectare yield considerably.

5. Storage and marketing facilities were grossly inadequate.
6. Absentee owners, whose number was quite large, did not invest in output-augmenting inputs while tenant farmers were not in a position to do so.

Punjab: There was a chronic deficiency of resources for agricultural development. Power was the greatest source of drainage of resources of the State. As regards irrigation, the cost of collecting irrigation charges was greater than the receipts. The State lost approximately Rs. 400 crores during a single Plan period through its contribution to the central pool of foodgrains. The major proportion of this loss was accounted for by paddy.

A major issue that emerged from the presentation of these papers was the pricing of agricultural output and inputs. Pricing of output affected three parties: farmer, State Government and the Union Government. The cost of inputs was incurred by the first two parties whereas benefits percolated to the consumers outside the State to the extent grain surpluses were moved outside of the State. The Union Government subsidised the farmer to an extent which kept him afloat. As for pricing of inputs like power, the farmers were charged at a flat rate per unit of horse power of the engine. While calculating the cost of cultivation for pricing purpose, the opportunity costs of these inputs should be taken into account. The opportunity cost of the users, the State and the consumers was tremendous. If paddy was grown because cheap supply of power made it economically viable, farmers had given up the possible income that they could have earned by raising other crops such as fodders, sugarcane, cotton, maize, etc. The State diverts power from industries, services sector and the domestic consumers, which involved sacrifice of potential output of the industrial and tertiary sectors. If all these opportunity costs were taken into account, the input prices might be quite different from the currently prevailing ones. Therefore, the price of both inputs and outputs need to be fixed in such a way that it ensures proper balancing of the costs and benefits among the parties involved.

APPENDIX

List of Papers Submitted to the Regional Symposium on Constraints to Agricultural Production

1. "An Analytical Study of Growth of Punjab Agriculture" by S. S. Grewal and P. S. Rangi.
2. "Investigation of the Hypothesis of Deceleration in Indian Agriculture" by S. D. Sawant.
3. "Stagnation in Indian Agriculture—A Myth or Reality" by Prakash and Veena Goel.
4. "Capital Constraint in Agricultural Production on Tribal Farms of Himachal Pradesh" by R. K. Sharma and T. V. Moorti.
5. "Small Farmers Development Agency Model: Constraints and Implications" by Baldev Singh.
6. "Production Constraints in Agriculture—The Financial Factor" by Ajmer Singh Sidhu and Partap Singh.
7. "Rural Outmigration as a Constraint to Agricultural Production" by H. K. Manmohan Singh.
8. "Growth Rates and Factors Affecting Agricultural Production in Haryana" by A. C. Gangwar and K. N. Rai.
9. "Problems of Hill Farming" by I. S. Kingra.
10. "Constraints to Agricultural Production in U. P." by Ram Iqbal Singh.
11. "Some Constraints on Growth of Agricultural Output in Punjab" by P. H. Vaishnav.
12. "Contributions of Fertilizers to Foodgrain Production" by S. S. Prihar and N. T. Singh.
13. "Energy Constraints to Agricultural Production" by B. S. Pathak.