RAPPORTEUR'S REPORT

ON

LABOUR ABSORPTION IN AGRICULTURAL AND RURAL DEVELOPMENT

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Thirty-four papers have been accepted for discussion in the Conference under this subject. To facilitate a systematic presentation, the papers are classified into seven groups. Accordingly, the first seven sections of the report are devoted to a review of the papers and the final section lists the important issues emerging from the review that might be taken up for discussion in the Conference.

I

LABOUR ABSORPTION IN CROPS, LIVESTOCK, POULTRY, FISHERY, ETC.

Nineteen of the 34 papers accepted for discussion in the Conference belong to this category. In spite of a clear indication in the synopsis on the subject that the contributors should accord a high priority to writing papers in such non-conventional areas as poultry, sericulture, bee-keeping, fishery, forestry, agro-based processing enterprises, etc., an unexpectedly large number (15) chose to write about labour use in crop and livestock enterprises. Most of the papers in this group are descriptive and deal with the farm level data on labour use only ignoring labour availability. The authors do not discuss how their findings could be used in helping to resolve the unemployment problem in the rural areas.

V. P. S. Arora and J. S. Sharma have used an interregional linear programming model to evaluate the impact of alternative fertilizer allocation strategies on regional absorption of labour in Uttar Pradesh. They found that the allocation of fertilizers based on the productivity criterion had the highest employment potential and that based on the regional cropped area criterion the least. The authors do not, however, discuss how the desired allocation could be achieved. B. N. Asthana and P. C. Shukla present estimates of the level of on-farm and off-farm employment and the extent of unemployment by size-groups of land holdings including the landless labourers in the Saidpur block of the Ghazipur district in Uttar Pradesh. They also suggest a few measures including setting up of labour bureaus for tackling the problems of unemployment in the block. The suggestions do not, however, flow from their work reported in the paper.

A. K. Bansal and S. P. Sarswat have studied the level and pattern of labour use in crop production, animal

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husbandry, off-farm jobs and social functions by sex and by size-groups of land holdings in the low and high hills of Himachal Pradesh separately as well as jointly. They find that the females worked for more hours (10-11) per day as compared to the males and that the people in the low hills worked more than their counterparts in the high hills. They suggest that the work load of the females should not be increased further under any new programmes.

B. Beharrell has analysed the data of 87 farms in Punjab for the year 1968-70. He has used a regression model and finds that soil fertility and labour input per acre are important factors affecting output per acre and that the proportion of family labour used is significantly and negatively related to output per acre. T. S. Chahal and J. S. Chawla examine the present and potential levels of labour absorption on a sample of tractor and bullock operated farms at the land ceiling limit in the Gurdaspur district in Punjab. They conclude that tractorisation does not adversely affect the level of labour use and that there exists substantial potential for increasing labour use on the farms if the optimum crop mix is adopted. They have used the budgeting technique to determine the optimum crop mix. One could question the optimality of the crop mix so determined.

R. D. Ghodake and J. G. Ryan have studied the various facets of human labour availability and use under the existing crop production systems in the semi-arid areas of Andhra Pradesh and Maharashtra. They find that females are the major contributors in the supply of labour and that both males and females supplied less than 50 per cent of their available total time for crop activities. The farm size and the proportionate male labour availability moved together while there is an inverse relationship between farm size and the proportionate availability of female labour. The small and medium farms have sufficient labour to meet their demand but the large farms faced labour deficits. K. Kalirajan and R. T. Shand have estimated the extent to which the present modern technology of rice production in Tamil Nadu absorbs hired labour. They find that a modernized rice crop enterprise has the capacity to absorb a considerable amount of hired labour and that the demand for hired labour is highly elastic to wage changes. They suggest that the pricing policy can be used as an instrument for increasing labour absorption in agriculture with favourable socio-economic consequences in the short run.

R. N. Pandey et al. have attempted to estimate the level of annual employment of human labour in raising crops and livestock in Haryana agriculture with two different sources of power—bullocks and tractors. They conclude that tractorisation has led to considerable reduction in labour use in crop production. They have suggested the need for promoting the use of high-yielding seeds-fertilizers-water technology as an instrument for increasing labour employment in agriculture. Their results contradict those obtained by Chahal and Chawla in their study conducted in Punjab and reviewed in this report. It would be interesting to discuss why the results of the two studies are different.
V. Prasad et al. have evaluated the employment effects of the SFDA and MFAL programmes in the Fatehpur district in Uttar Pradesh on the basis of a sample of 65 participant and 35 non-participant households. They conclude that although the agricultural development programmes have substantially increased the level of on-farm employment, there is lack of regular employment throughout the year.

B. S. Rathore et al. have studied the labour use pattern in agriculture in the semi-arid and arid tracts in Rajasthan during a normal year and a drought year. By using the technique of multiple regression analysis, they have measured the impact of selected causal variables on the level of employment. Besides, they have also estimated the income elasticity of demand for hired labour, labour efficiency, and labour requirement per farm and per hectare for various size-groups of farms. Like many other contributors, they do not, however, compare the actual labour use with the labour available.

C. B. Singh et al. attempt to study the level and determinants of labour employment in crop, dairy, and poultry enterprises in the Karnal district in Haryana. Using the linear and Cobb-Douglas forms of regression equation, they find that the gross cropped area and expenditure on new technology are the important factors influencing labour use per farm in crop production, number of milch animals, gross income from milk, and dairy assets in milk production, and annual wage earnings in the poultry enterprise. They conclude that high-yielding breeds of milch animals for small farms and poultry for landless households provide good opportunity for enhancing labour employment.

Using a linear programming model, Nirmal Singh et al. project the employment potential on the small, medium and large farms in Punjab at the feasible levels of improved technology with the existing and enhanced irrigation facilities incorporated in the model. Their results indicate substantial potential for increasing employment in the State. But they do not discuss how the untapped potential could be realised. Similarly, Shiv Karan Singh and R. Ramanna, using the linear programming technique, estimate the employment potential on the small and large farms in the Eastern Region of the Hyderabad district in Andhra Pradesh. It is found that both the types of farms have substantial scope for increasing employment if improved technology is adopted. They suggest that the unemployment problem on the farms can be eased by providing irrigation facilities in summer.

Anant Ram Verma attempts to study the pattern and extent of labour use and availability by size-groups of farms in the Unnao district in Uttar Pradesh. He finds that the utilization of available family labour on the farms varied from 28 per cent on the smallest farm to 55 per cent on the largest farm. He does not discuss the implications of his results.

Dilip Kumar Bagchi has studied the extent of labour utilization in crop production and sericulture on small farms in the Maldah district in West Bengal. It is revealed that sericulture provided, on the average, 97 days of employment per annum to the family labour and 29 days to the hired labour
for the agricultural labour-cum-cultivator household and 300 days to the family labour and 391 days to the hired labour for the teacher-cum-cultivator household.

Anjana Gupta evaluates the employment effect of new technology (poultry manure-lime-drag netting) on the basis of data obtained from one experimental pond and one control pond in a rural area in West Bengal. She finds that the new technology can generate about 1,600 hours of employment per hectare of water area per annum as compared to only 80 hours under the traditional method. T. B. Jain and D. K. Bhatia have estimated the extent of labour use in poultry keeping on the basis of the data collected from a sample of 103 commercial poultry farms in the Hoshiarpur district in Punjab. They find that 60 layers can generate one hour of employment for one adult person per day. Gurdev Singh and Amar S. Gulria examine the prospects of labour absorption in agriculture and forestry in India. They first evaluate the estimates of current and potential employment in the forestry sector prepared by the National Commission on Agriculture and a few individual researchers and then present their own estimates. They have estimated the current and potential employment from minor forest products alone at 1.6 and 4 million man-years respectively and that the collection of minor forest products can absorb about 16 per cent of the 15 million unemployed labour force estimated for the year 1983 by the Planning Commission. The authors do not, however, suggest any strategy for harnessing the untapped potential.

II

LABOUR ABSORPTION IN AGRO-BASED PROCESSING ENTERPRISES

There are only two contributions on this topic. A. K. Bora traces the history of growth of the Assam tea industry, estimates the extent of present and potential employment in it and evaluates its contribution to rural development. He concludes that the industry can generate job opportunities for about 4 lakh persons in the State.

C. S. Raghubanshi et al. estimate the extent of present and potential employment in the sugarcane processing industry in the Muzaffarnagar district in Uttar Pradesh. It is noted that the labour employment in the sugar factories has increased by about 167 per cent, in the mini-sugar units by 129 per cent, in the khandaari units by 135 per cent, and in the power kohlus by 241 per cent over the decade 1970-1980. They conclude that there is a tremendous potential for increasing employment in the mini-sugar plants, khandaari units and power kohlus. They have also estimated a labour demand function and find that the wage rate has a positive and statistically significant impact on the demand for labour. They do not, however, provide any explanation for the positive relationship between labour demand and wage rate which is inconsistent with what one would expect normally.
III
EFFECT OF NEW TECHNOLOGY ON LABOUR USE

Four papers belong to this category. Balishter and R. K. Singh assess the employment effects of three different levels of mechanization in the Agra district of Uttar Pradesh. It is reported that the labour use per hectare of cropped area has decreased but in terms of per hectare of cultivated area it has increased with an increase in the level of mechanization. The latter phenomenon is attributed to the increase in the cropping intensity and the shift from less labour intensive to more labour intensive crops with mechanization. This is not wholly correct. A number of other factors, besides mechanization, may also have contributed to the increase in the cropping intensity and the shift in the cropping pattern. B. K. Gupta examines the changes in labour utilization in crop production in the Kanpur district in Uttar Pradesh over the period 1966-67 to 1978-79 and attributes the increase in labour use per hectare over the period to the use of high-yielding varieties of crops only. This is not wholly correct. Given such a valuable time-series data, the author could have used a decomposition model to isolate and measure the contributions of various other causal factors to the observed change in employment. Y. S. Chaughan et al. evaluate the impact of mechanization on labour use in the Kalyanpur block of the Kanpur district in Uttar Pradesh on the basis of data collected from a sample of 30 mechanized and 30 non-mechanized farms. They find that the labour use per hectare on the mechanized farms is, on the average, about 17 per cent higher than that on the non-mechanized farms and they attribute this to the higher cropping intensity and use of more new farm inputs on the mechanized farms.

P. K. Joshi et al. decompose the total change in labour employment in wheat and rice crops in the western and eastern regions of Uttar Pradesh over the period 1966-67 to 1977-78 into components like irrigation, high-yielding varieties, tractorisation, etc., and assess the future prospects of increasing employment under alternative assumptions regarding the status of these components. The authors have used an extension of Raj Krishna’s decomposition model. It is found that the overall direct effect of the technological changes in rice-wheat production over the study period has been negative and that irrigation, variety, and irrigation × variety interaction have positive effects and tractor ploughing, threshing, chemical weed control and irrigation technology have negative effects on the level of employment. They conclude that the growth in agricultural production per se would not be labour absorbing. They point out the need for according a high priority to agricultural research focused on increasing productivity and cropping intensity.

IV
EFFECT OF IRRIGATION, RURAL ELECTRIFICATION, ETC., ON LABOUR USE

There are four papers on this topic. Arun S. Patel evaluates the impact of irrigation on employment at the farm level in the proposed command areas
of 24 different medium irrigation projects, 12 each in the erstwhile Saurashtra State and Gujarat on the basis of data collected from a random sample of 2,400 farm households. Using the technique of multiple regression analysis, he finds that the differences in (1) per hectare total expenditure, (2) relative area under non-foodgrain crops, (3) relative area under superior cereals, (4) fertilizer use per hectare, and (5) manure use per hectare between the irrigated and rainfed areas explained about 68 per cent of the additional employment in the irrigated areas. The author also presents the estimates of the additional employment that could be generated as a consequence of irrigation in the Saurashtra and Gujarat regions. He also discusses how this additional employment potential could be realised. The study provides a good example of how the results of the farm level studies could be used at the macro level.

P. M. Sharma examines the employment effect of ceilings on land holdings and the consequent redistribution of land in the Bhilwara district in Rajasthan. His findings reveal that about 28 per cent of the allottees of land have benefited from the ceilings in terms of increased employment and, on the average, the level of employment increased by about 24 per cent. It would have been useful if the author had also presented some information about the changes in farming that resulted from the ceilings and which increased the level of employment.

D. K. Singh evaluates the employment effects of rural electrification in the Ballia district in Uttar Pradesh on the basis of data collected from a sample of 30 farmers using electrically operated machines and 30 farmers not using such machines. He finds that the total on-farm and off-farm employment on the farms is about 94 per cent higher than that on the non-user farms. The author argues that the labour displacement effect of electrification of such operations as threshing, pumping water, etc., is more than offset by the additional employment generated from increased cropping intensity on the user-farms and from off-farm uses of electricity in agro-based industries such as flour mills, rice hullers, oil expellers, etc. Besides, the user-farms have more uniform utilization of labour over the months than the non-user ones.

Rajendra Singh examines the employment effect of consolidation of land holdings in the Allahabad district in Uttar Pradesh on the basis of data collected from a sample of 50 farmers having consolidated farms and 50 farmers having non-consolidated farms. It is found that the per hectare use of labour on farms of 2.50 acres and less has gone down by about 30 per cent, that on farms between 2.50-7.50 acres by about 3 per cent but that on farms of 7.50 acres and more have gone up by about 26 per cent due to consolidation. On the whole, the employment has declined by about 26 per cent. The decline in employment is attributed to saving in time spent on moving from one land parcel to another on the non-consolidated farms and the increase in employment is due to the higher intensity of cropping on the consolidated farms.
TEMPORAL CHANGES IN LABOUR USE AND WAGE RATES

Only two papers deal with this topic. Daulat Singh et al. have studied the changes in labour use pattern on a sample of 100 farms in the Kanpur district in Uttar Pradesh over the period 1967-68 to 1979-80. Their study has revealed that labour use per hectare has increased over the period 1967-68 to 1972-73 but declined thereafter probably due to substitution of labour saving inputs for labour. The use of male labour has been going up steadily over the entire period but that of female labour increased up to 1972-73 and thereafter came down in 1979-80. The daily money wage rate increased from Rs. 1.60 in 1967-68 to Rs. 6.50 in 1979-80 but the net returns per labour day declined from Rs. 7.27 in 1967-68 to Rs. 6.08 in 1979-80. A more thorough analysis of the factors that have led to the changes in the labour use pattern would have enhanced the value of the study further. Besides, the authors could also have examined the changes in the real wage rate over the study period.

Joyotee Smith et al. examine the trends in labour absorption and earnings at the farm level in rice production in two areas of the Philippines over the period 1966 to 1979. They find that the use of hired labour per hectare has substantially increased over the study period in both the areas. Family labour use has decreased by 50 per cent in one area and has remained unchanged in the other. The real wage rate for transplanting operation has declined in both the areas after registering an increase in the initial 5-10 years but those for harvesting and threshing operations have increased over the study period in both the areas. Labour’s share in output increased by 75 per cent in one area but declined by 9 per cent in the other over the study period.

VI

LABOUR DEMAND FUNCTIONS

Only one paper contributed by P. Kumar et al., is concerned with this topic. The authors employ the profit function approach for estimating the labour demand and wheat production equations for a sample of tractor and bullock operated farms in the Union Territory of Delhi. They also decompose the difference in the level of employment between the two types of farms into mechanization, wage rate and compensatory inputs. Wages, wheat price and irrigation are identified to be the major determinants of employment. The tractor operated farms are found to be less sensitive to the changes in wages, wheat price and irrigated area than the bullock operated farms. The negative employment effect of tractorisation, wages, and fertilizer prices is not off-set by the positive employment effect of wheat prices and complementary inputs. The present structure of input-output price is found to be labour displacing. The authors suggest enhanced technological change and
expansion of irrigation facilities as measures to absorb the labour rendered surplus by factor price inflation. The paper is a good example of how the results of the farm level studies could be used to formulate and evaluate policy alternatives at the macro level.

VII

PLANNING FOR LABOUR EMPLOYMENT

There are only two papers on this topic. G. D. Kumar and V. K. Sharma, using the linear programming technique, have formulated two alternative plans for the Rudrapur block of the Nainital district in Uttar Pradesh. In one of the plans the value of agricultural output is maximized and in the other the level of on-farm employment in the block. The crop mix in the two optimal plans differed markedly. There is a trade-off between output and employment; generation of one day of additional employment necessitated the sacrifice of 90 paise in output. The authors also estimate the secondary employment effect of the two plans in the agro-based processing industries. The study reveals that the total employment effect of the plan aimed at maximizing on-farm employment is higher. The authors suggest that to increase labour utilization in agriculture block level plans should be formulated and implemented, providing for optimal horizontal and vertical integration of various rural enterprises.

Using a multi-period linear programming model, D. Ramakrishnaiah has formulated a five-year agricultural development plan for a small watershed in the Uttar Pradesh hills. The objective of the model is to maximize the returns over variable costs. The optimal plan showed substantial potential for increasing employment year after year over the plan period. The author emphasizes the need for creating appropriate institutions for implementing the optimal plan. The author could also have developed an alternative plan aimed at maximizing the total on-farm and off-farm employment in the watershed, and could have compared the total employment generated from the plan with the total labour force available. The paper is a good example of how a multi-period linear programming model could be used for formulating plans at the macro level.

VIII

ISSUES FOR DISCUSSION

The following important issues emerge from the preceding review of the papers which might be taken up for discussion in the Conference:

1. How to generate and maintain reliable data on labour input coefficients of various rural enterprises particularly those in the secondary and tertiary sectors of the economy?
2. How to use the findings of the farm level studies on labour use for formulating and implementing employment oriented policies and programmes at macro levels?

3. How to direct the generation and diffusion of new technologies so as to strike a socially acceptable compromise between the goals of economic efficiency and employment?

4. What policy instruments to use for realising the untapped employment potential in the agricultural sector. In particular, how to price labour substitutes like tractors, weedicides, electricity, etc., so as to promote the use of socially desirable mix of labour and capital in agriculture?

5. Problems and prospects of developing and using multi-period-cum-multiple goal planning models for block level planning with maximization of employment as one of the goals.