

## PROCEEDINGS OF THE SYMPOSIUM ON "PLANNING FOR EMPLOYMENT IN AGRICULTURE"

*Chairman :* SHRI TARLOK SINGH  
*Former Member, Planning Commission*

*Convenor :* DR. PADAM SINGH  
*Joint Adviser, Planning Commission*

Prof. P. V. Sukhatme welcomed the Chairman and explained the objectives of the Symposium. He said that Shri Tarlok Singh had specially come to attend the Symposium because of his keen interest on the subject. Prof. Sukhatme mentioned that Society could not have thought of a better person for chairing this Symposium than Shri Tarlok Singh who had devoted his life to this very subject.

Chairman, while introducing the topic of the Symposium suggested that rather than discussing the employment potential in Agriculture, more appropriate thing would have been taking rural areas as a whole covering not only agriculture but also other activities in rural areas. He was happy to see that there is a theme paper by the Planning Commission on the subject. He also mentioned that statisticians have a very crucial role in providing the data base for estimation of employment and other relevant things for planning purposes.

In all, seven papers were received and of which three were presented by the respective speakers and rest were summarised by the Convenor.

Dr. K. C. Seal, Prof. P. K. Bose, Prof. P. V. Sukhatme, Prof. Prem Narain, Dr. Daroga Singh, Shri T. R. Puri and many others participated in the discussion. As a result of presentation of the papers and discussions, following are the salient recommendations of the Symposium.

1. The employment norms used by the Planning Commission appear to be out-dated. Instead of up-dating these norms for future years, attempts should be made to re-estimate these norms utilising the latest available data.

2. In estimating the addition to labour force, Planning Commission utilizes the concept of population in age group 5 plus. With the objective of universalisation of primary education, children in the age group 5 to 15 years should be in schools. As such, Planning Commission should calculate the labour force only with respect to 15 plus population.
3. It would be worthwhile presenting an analysis for the 38th Round which is the latest year for which employment data have been collected by NSSO. The analysis of 38th Round together with that for the 32nd Round would provide intertemporal profile of employment/unemployment position in the country. It was recommended, therefore, that NSSO while analysing the data for 38th Round should present a comparable analysis on the basis of two years information.
4. The employment norms for the direct anti-poverty programmes viz. IRDP, NREP and RLEGP used by Planning Commission are based on the evaluation study of PEO (Planning Commission). It is suggested that the findings of other similar studies should also be utilized in improving the estimates of employment norms for these programmes.
5. The Indian Society of Agricultural Statistics might take up a project on 'Concepts, Methodology and data on rural employment in Agriculture' in view of the importance of the subject for National Planning and that no relevant literature is available at one place of the subject.

Prof. Prem Narain thanked the Chairman for conducting the Symposium and the Convenor for the help extended in getting the speakers and the meeting for the Symposium.

The detailed summary of various papers presented is given in what follows.

## 1. EMPLOYMENT IN AGRICULTURE

DR. PADAM SINGH

*Joint Adviser, Planning Commission, New Delhi*

Removal of poverty and unemployment have remained basic objectives in Indian Plans. The rate of growth of national income has been around 3.5% p.a. during 1950-51 to 1984-85. But, since 1974-75 Indian Economy has moved on to a higher growth path registering a growth in GDP of about 4.2% p.a. The last two plans i.e. Fifth (1974-79) and Sixth (1980-85) have performed better by achieving growth rate of over

5 per cent in each. In fact, the Sixth Plan achieved growth of 5.3% p.a. as against the target of 5.2%. A growth rate of 5% during Seventh Plan and thereafter can be sustained.

Presently agriculture account for about 40% of National income. Over 80% of workers in rural areas are engaged in Agriculture of which 51% are cultivators and 30% Agricultural labourers. The share of Agriculture in national income has declined from around 60% in the First Plan to around 40% in the Sixth Plan but the proportion of dependents on Agriculture has remained around the same level.

### **Employment Target in Seventh Plan**

One of the objectives outlined in the Seventh Five Year Plan is providing fuller employment by the end of the Century. Presently, of the total employment generation of 187 million standard person years agriculture accounts for little more than half (96 million standard person years). Further, of the 96 million standard person years of employment in agriculture, crops account for 58.75 million SPY (about 60%) and non-crops 37 million SPY (about 40%). Seventh Five Year Plan aims at increasing employment by 40 million standard person years which is more than the expected addition to labour force of 39 million during the same period. Of the targetted increase of 40 million standard person years during the Seventh Plan 18 million (45%) is expected from agriculture and the rest from other sectors. The annual growth rate of employment generation in agriculture sector during Seventh Five Year Plan is 3.5% per annum which is significantly higher than the growth rate of the rural labour force which is expected to be around 2%. Thus the Seventh Plan would provide fuller employment in rural areas. In the non-agriculture sector employment during the Seventh Plan is expected to increase at nearly 4.5% per annum which should lead to some shift in labour force out of agriculture into non-agricultural activities. The strategy of the Seventh Plan is based on the promise that with a high rate of industrial growth the excess rural population cannot be fully absorbed in organised industrial sector and additional employment has to be generated in rural areas through intensification of agriculture and village and rural industries, diversification of rural economy and a large programme of construction and capital formation. The employment projections of the Seventh Plan reflect this orientation of development strategy.

The Seventh Plan also envisages the continuance and expansion of the National rural employment programme (NREP) and Rural Landless Employment Gaurantee Programme (RLEGP) which started in the Sixth Plan. These programmes are expected to generate about 2460 million man days of additional employment (over 9 million standard person

years) in rural areas. They are particularly important in providing additional incomes to landless labour households who lack a resource base in the form of land. Depending on the food situation in the country and the position of food stocks with the public sector agencies, the employment promotion programmes could be expanded at a faster rate.

### Employment Norms

The employment estimates in different sectors in the Seventh Plan are based on sector-specific employment norms the details of which are given in the Technical Notes on the Sixth Plan (1980-85) and the Seventh Plan (1985-90). These employment norms have been worked out by making the use of both time series and cross-sectional data. For agriculture, the employment norms for crops relate to area separately for irrigated and non-irrigated ones whereas for non-crops including forestry and fishery, it is related to value added. For mining and quarrying and electricity the employment norms relate to the physical level of production. For construction, manufacturing, transport and services the employment norm relate to value added.

The employment under NREP and RLEGP have been estimated by making use of outlays under the programme, wage rate of Rs. 8.60 (on the basis of 1984-85 information) and wages to material ratio of 50 : 50. Employment generation in the Seventh Plan under NREP and RLEGP works out around 2460 million mandays. One fourth of this additional employment is expected in the terminal year of the plan which when converted to standard persons years works out around 2.2 million standard person years.

The employment under IRDP has been estimated by making use of the outlay under the programmes, credit subsidy ratio of 2 : 1 and investment to incremental income ratio of 2.7, together with the employment norms of activities covered under these programmes. With these, the employment under IRDP is estimated around 3 million standard person years.

It is important to mention that the employment under NREP, RLEGP and IRDP is included in the employment generated in different sectors by suitably making use of the activities covered under these programmes.

On comparing the elasticities of employment for VI and VII Plan it is observed that the employment elasticity is higher in the Seventh Plan as compared to Sixth Plan for sectors like agriculture, construction and other services. One of the reasons for this is that the employment generation due to IRDP and NREP mainly for animal husbandry, construction and services were not incorporated in estimating the elasticity of Sixth Five Year Plan. Furthermore, increased emphasis in the Seventh Plan in the agricultural production from irrigated land, from small and marginal

farmers in the eastern region has also resulted in a higher elasticity of employment in agriculture in the Seventh Plan as compared to the corresponding elasticity in the Sixth Plan. Besides, the Sixth Plan employment elasticity in agriculture is largely reflecting the low base of 1979-80 from the point of view of output generation.

### Employment Norms in Agriculture

The Table presents the employment norms cropwise as used in the Seventh Five Year Plan. It would be seen that for rice the employment norm per unit of irrigated area is 0.48 SPY/hect. and for unirrigated as 0.35 SPY/hect. The norms of employment per irrigated and unirrigated hect. for wheat are 0.42 and 0.27 SPY/hect. respectively. For other cereals the employment norm per irrigated/hect, and unirrigated/hect. is 0.26 and 0.12 SPY/hect. respectively. For pulses the norms are 0.18 and 0.14 SPY per irrigated and unirrigated hect. respectively. For sugarcane the employment norms are 1.20 and 0.76 per irrigated and unirrigated hect. respectively. For jute and mesta the norm is 0.69 SPY/hect. and for cotton as 0.31 per irrigated hect. and 0.21 per unirrigated hect. For rest of the crops the employment norm is taken as 0.50 per irrigated hect. and 0.43 per unirrigated hect. Making use of the crop-specific employment norms and the cropped area (irrigated and unirrigated in different crops) the employment estimates have been worked out for the base and the terminal years of the Plan. With this, the estimate in the base year of the Seventh Plan works out as 58.75 million SPY and that in the terminal year as 65.72 million SPY indicating thereby that about 7 million SPYs of employment would be generated in the crop sector of Agriculture during Seventh Plan.

For taking a decision on investment and output profit for a Plan linked with employment generation both direct and direct plus indirect co-efficients are considered. Employment norms measured in standard person years per million rupee of income for different sectors, direct as well as direct plus indirect as implicit in the Seventh Plan are worked out. The comparison of the direct co-efficients reveals that the employment per unit value of income is highest (94) in agriculture. The direct plus indirect co-efficient is also seen to be highest (82.1) in agriculture as compared to other sectors.

TABLE—EMPLOYMENT ESTIMATES, 1984-85 AND 1989-90

CROP	Labour Coeffi- cient (SPY/Hec.)	1984-85		1989-90	
		Area (Million Hect.)	Employ- ment (MSPY)	Area (Million Hect.)	Employ- ment (MSPY)
1	2	3	4	5	6
<i>Rice</i>					
Irrigated	0.4804	20.0	9.61	23.6	11.34
Unirrigated	0.3464	21.2	7.34	24.8	8.59
Total		41.2	16.95	48.4	19.93
<i>Wheat</i>					
Irrigated	0.4187	22.1	9.25	29.7	12.44
Unirrigated	0.2736	2.5	0.68	1.6	0.44
Total		24.6	9.93	31.3	12.88
<i>Other cereals</i>					
Irrigated	0.2610	3.7	0.97	3.5	0.91
Unirrigated	0.1200	37.3	4.48	31.6	3.79
Total		41.0	5.45	35.1	4.70
<i>Pulses</i>					
Irrigated	0.1845	1.9	0.36	1.9	0.35
Unirrigated	0.1386	21.6	2.99	23.8	3.30
Total		23.5	3.34	25.7	3.65
<i>Foodgrain</i>					
Irrigated		47.7	20.18	58.7	25.04
Unirrigated		82.6	15.49	81.8	16.12
Total		130.3	35.67	140.5	41.16
<i>Sugarcane</i>					
Irrigated	1.2055	3.2	3.86	3.6	4.34
Unirrigated	0.7560	—	—	—	—
Total		3.2	3.86	3.6	4.34
<i>Jute &amp; Mesta</i>					
Irrigated		—	—	—	—
Unirrigated	0.6891	1.1	0.76	1.7	1.17
Total		1.1	0.76	1.7	1.17
<i>Cotton</i>					
Irrigated	0.3080	3.0	0.92	3.2	0.99
Unirrigated	0.2581	5.0	1.29	5.5	1.42
Total		8.0	2.21	8.7	2.41
<i>Other Crops</i>					
Irrigated	0.5042	8.9	4.49	11.8	5.9
Unirrigated	0.4275	27.5	1.76	25.0	10.69
Total		36.4 <sup>1</sup>	16.25	36.8 <sup>1</sup>	16.64
<i>All Crops</i>					
Irrigated		62.8 <sup>1</sup>	29.45	77.3	36.32
Unirrigated		11.62 <sup>1</sup>	29.30	114.0 <sup>1</sup>	29.40
Total		179.0 <sup>1</sup>	58.75	191.3 <sup>1</sup>	65.72

<sup>1</sup>Excludes Tea, coffee and Rubber — 1 m.h. in 1984-85, 1.2 m.h. in 1989-90.

## 2. AGRICULTURAL WORK-FORCE OF INDIA : A STATISTICAL PROFILE

NATIONAL SAMPLE SURVEY ORGANISATION, DEPARTMENT  
OF STATISTICS, MINISTRY OF PLANNING, NEW DELHI

A proper planning of employment in agriculture and a complete picture of the employment situation with its various facets obtaining for the agricultural sector, is very much essential. This paper attempts to give the necessary statistical background on the nature and quantum of employment in the agricultural sector presenting also some analyses of certain aspects of our agricultural work-force based on NSS data.

### Dimension of Rural Work-Force

One of the procedures adopted by NSSO in its quinquennial surveys on employment and unemployment for quantification of 'employment' is classification of the population by their usual status, that is, the activity pursued during a reference period of one year adopting a major time criterion. Accordingly, a person is considered to be employed (or working) in the principal status (or say, main worker) if during the 365 days preceding the date of survey he/she pursues any gainful activity for a relatively longer period compared to the period during which the person is unemployed or the period during which he or she is not in the labour force. A person so classified as not a 'main worker' if he or she pursues any gainful activity in the subsidiary capacity more or less regularly (even if intermittently regular), such a person is considered to be employed in the subsidiary capacity (or say, marginal worker). This classification has helped in obtaining the proportion of population usually employed (or say more or less with stable employment) in the principal capacity (main workers) as well as in the subsidiary capacity (marginal workers).

The work-force participation rates obtaining for rural India separately for males and females for the year 1977-78 based on the NSS 32nd round data, are presented in the Table.

The proportion of 'main workers' amongst rural males is more than double (62 per cent) of the proportion of female main workers (29 per cent). On the other hand, the proportion of female marginal workers is almost five times that of the male marginal workers which is of the order of 2 percent only. The pattern is clear while the working rural men have work (or work) almost throughout the year, many of the working women do not have work throughout the year or they participate in work only in a marginal capacity, probably due to other commitments. Of the 38 per cent of women categorised as employed, only about 28 per cent work in the

TABLE—PERCENTAGE OF PERSONS OF AGE 5 YEARS AND ABOVE  
'EMPLOYED' TO TOTAL PERSONS (5 + ) IN RURAL  
INDIA BY SEX

Sex	Sector of Employment	Percentage of Persons (5 + ) Employed to Total Persons (5 + ) as		
		Main Workers	Marginal Workers	Total
(1)	(2)	(3)	(4)	(5)
Male	Agriculture	50.06 (80.42)	1.55 (85.64)	51.61 (80.57)
	Non-agriculture	12.19	0.26	12.45
	Total	62.25	1.82	64.06
Female	Agriculture	25.00 (86.75)	8.90 (92.13)	33.90 (88.10)
	Non-agriculture	3.82	0.76	4.58
	Total	28.82	9.66	38.48
Person	Agriculture	37.80 (82.35)	5.14 (90.97)	42.94 (83.30)
	Non-agriculture	8.10	0.51	8.61
	Total	45.90	5.65	51.55

Figures in brackets give the percentage of persons employed in the agricultural sector to total employed.

main capacity and the remaining 10 per cent work only in a marginal capacity either due to lack of work or by preference.

### Agricultural Employment

In general, the 'employment' can be categorised into three broad types, namely, (i) self-employment, (ii) regular wage/salaried employment and (iii) casual wage labour.

Of the main workers in the agricultural sector, 65 per cent of the men and 56 per cent of the women work in their own farm enterprises in self-employed capacity. While only 30 per cent of the men workers are casual wage labour, over 42 per cent of the women workers work as casual labourers for wages. Among marginal workers—majority (85.6% male and 79.7% female) work only in self-employed capacity. Relatively smaller proportion has opted for wage labour.



It is important to know the principal status of marginal workers. The distribution of marginal workers employed in the agricultural sector by their principal status, showed that of the men workers about 51 per cent are basically students, 30 per cent unemployed, 5 per cent engaged in house chores and remaining 14 per cent other principal status. Among females about 88 per cent are engaged in house chores, and 9 per cent unemployed.

Only about 42 per cent of the unemployed males and 53 per cent of the unemployed females find some marginal work and that too mainly in the agricultural sector. Obviously the rest do not find opportunities even for marginal work.

### **Sector of Agricultural Activities**

Utilising first two sub-round data of NSS 38th round (1983), the distribution of rural agricultural work force by sector of employment was obtained. Agricultural production and livestock production account for most of the employment in the agricultural sector. While the former absorbs almost 90 per cent of both male and female main workers, livestock production gives only relatively less opportunities for full employment. Only 5 per cent of the male main workers and 7 per cent of the female main workers have employment in that sector. Next in importance is the plantation sector. On the other hand, for marginal workers, though agricultural production commands 72 per cent of the male employment and 59 per cent of the female employment, livestock production also plays an important role. In fact as high as 40 per cent of the female and 23 per cent of male marginal workers find marginal employment in that sector.

### **Unemployed—the Potential Additional Work-Force**

'Employed' and 'Unemployed' together constitute the man-power available for employment. A picture of the extent and nature of the employed in the agricultural sector has been presented. The picture will be complete only if the magnitude and nature of the 'unemployed' who are available for work in the agricultural sector is also known. The NSS 32nd round survey, through a set of probing questions to the persons categorised as unemployed, has attempted to obtain data on the nature and type of employment, the 'unemployed' would prefer to have.

Only about 42 per cent of the male 'unemployed' are found to be available for agricultural activities. On the other hand, about 71 per cent of the females reported as unemployed are available for work in the

agricultural sector. For an objective planning to provide employment to this additional man-power available for work in the agricultural sector, it is necessary to know the types of employment for which the 'unemployed' who opted for work in the agricultural sector are available for, with their magnitudes. The distribution of unemployed available for work in the agricultural sector by type of employment (wage/salaried employment, contract/piece rate work, self employment) was also worked out.

Most of the unemployed (about 92 per cent) willing to work in the agricultural sector appear to be preferring wage/salaried employment. Only about 6 per cent are willing to undertake self-employment.

#### Availability for Additional Work

Information was collected from those categorised as usually employed, on their availability for additional work, nature of the additional work etc.

About one-fifth of employed males and one quarter of the employed females are found to be available for additional work in the agricultural sector. Of course, some of them are available only for part-time work.

The proportion of 'employed' and 'unemployed' person-days on an average in a day compared against the corresponding proportions based on classification of population according to usual status for rural India has also been worked out.

There is almost a 6 percentage level drop in the proportion of employment obtained through classification of population by current day status approach in the case both the males and females compared to the employment level obtained through usual status approach. Obviously, many of the persons who work for the major part of the year do not find employment atleast on some days of the year.

Results show that rural under-employment is a big problem to be dealt with. Any plan to strengthen the agricultural employment, certainly will have to keep this in view.

#### Availability for Work in the Household

Women are normally engaged in the execution of house chores. It is natural that some of them though not available for employment outside the sphere of their household activities, may be willing to work if suitable work is provided at their residences. The NSS 32nd round survey has obtained some interesting results on this issue for rural India as below :

- Percentage of women (5 + ) engaged in household duties : 40.23
- Percentage of women among them available for work if suitable work is provided at the household : 23.11

- Percentage of women among those available for work in the household willing to undertake :
- |                |         |
|----------------|---------|
| full time work | : 24.96 |
| part time work | : 75.04 |
- Among those women available for work in the household, percentage of women available for work relating to :
- |                                    |         |
|------------------------------------|---------|
| —dairy activities                  | : 36.23 |
| —poultry activities                | : 14.75 |
| —other animal husbandry activities | : 8.65  |
| —non-agricultural activities       | : 40.37 |

Thus about 14 per cent of women usually engaged in household duties are available for work in the agricultural sector, if such work can be provided as a part of their household activity sphere.

### Conclusion

The paper has revealed interesting features of the rural agricultural workforce with its almost built-in underemployment problems which on the face of it appears to be enormous compared even with the rural unemployment. It is observed that the worst sufferers are the casual wage labourers in the agricultural sector who do not find employment throughout the year and as a result remain unemployed on some days of the year. Some of the women who under the Indian tradition, though not available for work outside their residences are found to be willing to undertake work relating to various animal husbandry activities as well as some non-agricultural activities if such 'work' can be provided at their households. Any planning for the employment in the agricultural sector has to keep in view all these features in the frame for obtaining fruitful results. Obviously, the features of the employment pattern are to be studied in depth at disaggregated geographical levels for homogeneous micro-groups of the populations.

### 3. PLANNING FOR EMPLOYMENT GENERATION IN AGRICULTURE

PROF. P. RANGASWAMY

*Agro Economic Centre, University of Delhi*

Massive generation of productive employment in all the sectors of the economy for absorbing the existing unemployed as well as the new entrants to the labour force is crucial for achieving the Plan objective of growth with equity. In fact, this is the central element in the development strategy of the Seventh Five Year Plan. 'With this emphasis on the generation of productive employment, the Seventh Plan aims at a significant reduction in the incidence of poverty and an improvement in the quality of life for the poor in the villages and towns'.

#### **Trends in Employment**

The Problem of unemployment and poverty has been one of the chronic and intractable problems facing India for long. The number of unemployed and underemployed people has been increasing over time. The Rural Labour Enquiry has shown that between 1964-65 and 1974-75, the number of days for which employment was available for rural labourers declined by 10% for men, 7.5% for women and 5% for children. Again the 27th and 32nd Rounds of National Sample Survey shows that unemployment rate of the rural male based on daily status has gone up from 6.84% to 7.12% and the rate based on weekly status, from 3.03% to 3.57% between 1972-73 and 1977-78.

The 32nd Round of NSS indicates that the rate of unemployment was highest (15.82%) for agricultural labour households in rural areas during 1977-78. These households constituted 21.2% of total population but accounted for as much as 46.7% of total unemployment. Unemployment rates were lowest for self-employed households in agricultural as well as non-agricultural occupations (2.7 and 6% respectively). An unfortunate trend is that the percentage of self-employed in agriculture to total workers has gone down from 45.4 to 43.2 and the percent of regular wage-employees in agriculture has also declined from 4.2 to 3.0, while the percent of casual labour has gone up from 16.6 to 20.1 between 1972-73 and 1977-78. The reason for this trend is the growing landlessness and assetlessness. The All India Debt and Investment Survey reveals that the share of the bottom 30% of rural households in total assets which was as low as 2.5% in 1961, further deteriorated to 2% in 1971, while the share of top 30% of households has increased from 79% to 81.9% during the same period.<sup>5</sup>

### Factors Associated with Labour Use Pattern

Vaidyanathan (1978), for instance, analyses Farm Management Survey data for three districts to show that the proportion of hired labour to total labour use in crop production has increased sharply between mid-fifties and late sixties or early seventies (to 40 and 50% in Muzaffarnagar and Ferozepur and to 85% in Coimbatore). This was associated with a general increase in the size of operational holdings indicating that small farmers and tenants have been increasingly dispossessed of their holdings and have swelled the ranks of agricultural labourers. The above study indicates that the total human labour input per hectare for crop production has increased in Coimbatore but fallen in Ferozepur and Muzaffarnagar during this period. The increase in labour use in Coimbatore can be attributed to the sharp increase in percent of area irrigated from 20 to 50% and the resultant increase in cropping intensity from 90 to 143% as well as rise in the share of labour intensive crops like paddy in gross cropped area. Comparatively, the increases in percentage of area irrigated and cropping intensity have been much less in the other two districts, though the initial levels were higher. The fall in labour input per ha. in these two districts could be also partly due to greater mechanization of threshing, interculture etc.

Farm Management data for Hooghly district in West Bengal analysed by Bardhan (1978) show that labour intensity per acre doubled in that district between 1956-57 and 1970-71 as a result of rise in irrigation ratio from 15% to 55%, and increase in multiple cropping index from 1.23 to 1.53. The proportion of hired labour to total labour use also went up from 41 to 48%. Regression analysis of farm level cross-section data for West Godavari (1958-59), Tanjore (1967-68) and Hooghly (1956-57 and 1970-71) indicates that total man days as well as hired labour days applied per acre of cultivated area are positively associated with land quality or improvement factors like irrigation, multiple cropping Index, manures and fertilisers and negatively associated with the village wage rate. The hired man-days and hired proportion of total farm labour days generally increase with farm size indicating their greater use by big farmers. The hired man-days decrease with the number of adult members in the family because of larger use of family labour.

Vaidyanathan's analysis of inter-district variations in human labour use per ha shows their positive association with output per ha which in turn depends upon percentage of area irrigated, proportion of irrigated area under wells and tubewells and proportion of cropped area under labour intensive crops like paddy and sugarcane. Labour use is negatively associated with the degree of mechanisation.

The estimated regressions are the following :

$$Y = 116.26^{**} + 0.031x_1^{**} - 1.94x_2 - 10.57x_3 - 267.46x_4^{**} \quad (1)$$

(2.985)      (2.104)      (1.441)      (0.467)      (-2.258)

$R^2 = 0.398$

where  $Y$  = human labour days per ha.

$x_1$  = output per ha.

$x_2$  = bullock labour days per ha.

$x_3$  = cost of human relative to animal labour

$x_4$  = horsepower per ha.

$$Y = 203.2 + 11.2x_1^{**} + 0.18x_2 = 4.39x_3 + 1026.2x_5^* + 6.03x_6$$

(0.421)   (3.14)      (0.81)   (-1.27)   (1.92)      (1.42)

$R^2 = 0.574$       (2)

Where  $Y$  = output per ha.

$x_1$  = percentage of area irrigated

$x_2$  = total rainfall

$x_3$  = % of rainfall occurring in June-September

$x_5$  = proportion of irrigated area under wells and tubewells

$x_6$  = proportion of cropped area under paddy and sugarcane

The study by Alagh *et al.* makes an analysis of the growth rates of agricultural output and labour absorption rates in 281 districts. It shows that the main source of agricultural growth in India between 1962-65 and 1970-73 has been increased in land yield which in turn was associated with higher ratio of labour to land implying a more in tensified pattern of land use. Districts which have experienced high rates of growth of agricultural output and land yield have not only absorbed more labour per ha. but also maintained higher labour productivity.

High growth rates were achieved in agriculture mainly in areas where rapid extension of irrigation has made possible higher cropping intensity and significant expansion of HYV area.

Regarding the impact of mechanisation on employment in agriculture, available evidence suggests that harvest combines have a large labour displacement effect without any contribution to output (Laxminarayan *et al.*, 1981, Bartsch 1977, Rao 1975). Tractors seem to displace animal labour more than human labour and their impact on output, if netted out of other associated inputs, is not significant (Binswanger 1978). Mechan-

\*\*Significant at 10% level, \*significant at 5% level.  $t$  values are given in brackets.

isation of irrigation through tubewells and pumpsets is observed to have a positive impact on employment through increase in cropping intensity (Bartsch 1977, Rao 1975, NCAER 1973).

### Impact of Sixth Plan on Employment

The Sixth Five Year Plan appears to have made a significant impact on growth, employment and poverty alleviation, all of which are inter-related. The Plan could achieve the aggregate growth target of 5.2 per cent mainly because of good agricultural performance and a rapid growth in the services sector. The rate of growth in mining and manufacturing was, however, well below the target. The percentage of people below the poverty line has come down from 48.3 in 1977-78 to 37.4 in 1983-84 (provisional). Overall employment is estimated to have increased from 151.11 million standard person years (SPY) in 1979-80 to 186.71 million SPY in 1984-85 i.e. an increase of 35.60 million SPY as against the target of 34.28 million SPY. 44 per cent of this increase in employment has been generated in agriculture as compared to 13 per cent in manufacturing and 30 per cent from 'other services'. The growth rate of employment generation during the Sixth Plan works out to 4.32 per cent. This achievement was possible mainly because of the good performance of agriculture and services sector (in which the actual growth rates exceeded the targets) and also the visible impact of the poverty alleviation programmes like, IRDP, NREP and RLEGP.

Some of the key factors which would have contributed to agricultural growth and employment generation in it during Sixth Plan are :

- (i) Creation of additional irrigation potential of 11.3 million ha, of which the major share was contributed by minor irrigation sources (7.4 million ha).
- (ii) Better utilization of the irrigation potential created through Command Area Development Programme. In this regard construction of field channels has been completed over an area of 5.24 million ha. exceeding the Sixth Plan target of 4 million ha. Land levelling has been done on 0.49 m. ha. and warabandi has been introduced in 1.81 million ha.
- (iii) Installation of 1.77 million electrical pump-sets.
- (iv) Increase in gross cropped area from 171 to 180 million hectares.
- (v) Area under HYVs of foodgrains went up from 35.2 million ha in 1979-80 to 56.0 million ha in 1984-85 which was the Sixth Plan target.
- (vi) Consumption of chemical fertilizer went up from 5.3 million tonnes to 8.4 million tonnes, though below the target.

The Seventh Plan aims at intensification of the above and other related programmes (including antipoverty programmes) which have effectively contributed to the achievement of the Sixth Plan targets on growth and amelioration of poverty and unemployment. Higher targets have been set up for each as shown in the Table.

TABLE—PLAN ACHIEVEMENTS AND TARGETS FOR KEY INPUTS IN AGRICULTURE

<i>Key Inputs</i>	<i>1979-80 Position</i>	<i>Sixth Plan Achievement (additional)</i>	<i>Seventh Plan Target (additional)</i>
1. (a) Major and medium irrigation : potential (m. ha)	26.60	3.90	4.30
(b) Utilization (m. ha)	22.60	2.70	3.90
2. (a) Minor irrigation : Potential (m. ha)	30.00	7.40	8.60
Utilisation (m. ha)	30.00	5.10	7.00
3. Electrical pumpsets (million)		1.77	2.40
4. Construction of field channels (m. ha)		5.24	6.81
5. Land Levelling (m. ha)		0.49	1.82
6. Warabandi (m. ha)		1.81	8.03
7. Gross cropped area (m. ha)	171.00	9.00	10.00
8. Area under HYV (m. ha)	35.20	20.80	14.00
9. Consumption of fertilizer (Million tonnes)	5.30	8.40	13.5-14.00

The Seventh Plan has also introduced some special programmes which will help to redress regional, class and crop imbalances and will also generate sizeable additional employment. The programmes are: (a) Special Rice Production Programme in the Eastern Region, (b) National Oilseeds Development Project, (c) National Watershed Development Programme for Rainfed Agriculture, (d) Development of Small and Marginal Farmers, and (e) Social Forestry.

In view of the above it appears that it would not be difficult to achieve the Seventh Plan Target of generating additional employment in agriculture to the tune of 18 million standard person years out of a total of 40 million SPY (Table III). But even this will not be sufficient to absorb the



backlog of unemployment estimated at around 9.2 million for the age group 5 plus, plus the net addition of about 39.38 million to the above force. So, around 9 million will still be left as backlog of unemployment at the end of the Seventh Plan.

#### 4. EMPLOYMENT OF HUMAN LABOUR IN AGRICULTURE

S. N. DARAK AND B. D. BHOLE  
*Punjabrao Krishi Vidyapeeth, Akola*

High growth rate in population during past 4 decades has resulted in significant increase in the labour force in rural area seeking employment in agriculture sector of the country. Rural employment in India is more in the nature of underemployment rather than of complete unemployment. This is mainly on account of the seasonal variations in demand for labour due to the immobility in labour. In the present paper the efforts have been made to study the cropwise, monthwise and farm sizewise requirement of human labour in agriculture. More specifically the objectives of the study were (i) to study the employment human (male and female) labour on different size of farms, (ii) to study the crop-wise labour utilisation, and (iii) to study the monthwise human labour requirement in agriculture.

In a view to get realistic data Shirala village of Amravati district was selected purposively for the present study. By adopting the method of two stage stratified random sampling, 75 farmers were selected randomly from 3 different size groups. Sample size from each group was decided by the proportion of farmers falling in that group in total population. Thus the sample consisted of 47, 18 and 10 farmers from small, medium and large size groups respectively. Average size of holding in small, medium and large size groups worked out to 2.69 hectares, 8.10 hectares and 16.94 hectares respectively. Data were collected by survey method in the questionnaire specially developed for the purpose keeping in view the objectives of the study. The data pertained to the year 1982-83 crop seasons. One day of work was considered to be of 8 hours.

The utilization of male labour days for different crops was about 43 days per hectare and that for female labour it was worked out to be 85 days, the highest utilization being in small holdings.

The study leads to the following conclusions :

(i) Groundnut, hybrid cotton and Bhendi crops require high levels of male as well as female labour. (ii) As regards male labour employment July, August and September are observed as peak period while a period

consisting of November to March was noted as lean period. (iii) Demand for female labour is concentrated in July and August while February to June can be considered as lean period of employment. (iv) Hybrid cotton provides much high employment to male as well as female labour than local cotton. Taking into consideration the peaks and slumps in demand for human labour in agriculture, it can be suggested that there is a necessity of providing employment for 5 months each to male as well as female workers during the lean periods of employment.

## 5. PLANNING FOR EMPLOYMENT IN AGRICULTURE

S. W. GOVITRIKAR

*Department of Agriculture, Maharashtra—Nashik*

Unlike cyclical unemployment or frictional unemployment, we in India have the problem of chronic unemployment, under-employment, or disguised unemployment in the rural Sector and the existence of urban unemployment among the educated classes. Bulk of unemployment in India is observed in rural areas. Rural unemployment has two aspects, seasonal and perennial. Agriculture, which is the main occupation in the country, is by its nature of seasonal character. It is observed that a sizable portion of the rural population engaged in agriculture, remains idle for at least 5 to 7 months in the year. The second aspect is the perennial under-employment or chronic disguised unemployment. About 72% of the working population is engaged in the primary sector i.e. agriculture and allied activities. There has been a sharp increase in the working population engaged in agriculture. This fast increase in working population in agriculture has resulted in what is called a disguised unemployment. The main problem of this type of unemployment is that apparently every one seems to be employed though enough work is not available for all. That means even if we remove surplus population from agriculture, the agriculture production will not be affected. This problem of disguised unemployment is very serious as it is of a perennial nature.

### **Causes of Unemployment in Agriculture**

(1) The main reason of rural unemployment is a decline of native, cottage industries, handicrafts. Before independence, there was no growth of modern industry in the country. People working in the rural cottage industry were compelled to become labourer in agriculture. As more and more traditional industries were destroyed large number of people found themselves pushed into the rank of landless agriculture labourers,

(2) Many small farmers are heavily indebted not being able to pay interest and repay the principal. Many of them have lost their lands and these people become landless labourers. Because of sub-division and fragmentation there has been emergence of uneconomic holdings. This also has contributed to the increase in the number of landless labourers.

Although these are the important reasons of rural unemployment, the most important reason is that there has been a tremendous rise in the population of the country. Since more than 3/4 of the population is rural, most population growth has taken place in rural areas only. In the rural sector agriculture has been the main occupation. There has been virtually no expansion in non-farm occupations. As a result of all this, there is a considerable increase in agriculture unemployment.

### **Occupational Structure of Developed and Under-Developed Countries**

All occupations are broadly divided into three groups:

- (i) Primary or Agriculture sector.
- (ii) Secondary or Industrial Sector.
- (iii) Tertiary or services sector.

It is always observed that in all the under-developed countries a large proportion of labour is engaged in agriculture. Simon Kuznet has observed that in those countries 56% of labour force depends upon agriculture, 26% on services and 15% on industries. As against this in developed countries the services sector occupies the first place, followed closely by the Industrial Sector and the agriculture takes the last place. It is, therefore, desirable to adopt strategy to increase employment opportunities, not in agriculture sector but in other two sectors. The problem of rural unemployment or under-employment in agriculture is serious, so also equally serious is the problem of unemployment in other sectors especially among educated people. Among many remedies of the problem of unemployment, an important one is the creation of the facilities for self-employment. This is mainly for two reasons. In the first place it is recognised that the expansion of wage-employment in the public and private organised sectors is not expected to absorb any significant portion of the labour force. Secondly even at present this majority of the labour force is self-employed. Therefore the policy should aim at imparting the skills, supply of inputs, facilities of marketing of product, extension of credit facilities etc. so as to equip people for self-employment. Areas in which self-employment can be increased have also to be indentified. These are agriculture and allied activities, village and small-scale industries and in

un-organised sector of non-farm occupations. There should be special measures to help people in the rural areas where unemployment is concentrated. Examples of such programmes are as integrated Rural Development Programme (2) The Small Farmers Development Agency. (3) The Draught Prone Area Programme. The National Rural Employment Programme (N.R.E.P.) provides work for people who depend upon their labour for earnings. For the landless labourers there is also the rural landless employment guarantee programme which guarantees minimum employment in the lean season.

## 6. PLANNING FOR EMPLOYMENT IN AGRICULTURE

V. P. TYAGI, BRAHM PRAKASH, L. K. GANGAL AND  
(MRS.) S. SRIVASTAVA

*Directorate of Pulses Research (I.C.A.R.), Kanpur-208024*

Unemployment has always its roots much deeper in the economic system than is commonly supposed. There is no problem so fundamental to economic development as the problem of unemployment. So long as the satisfaction of human needs is the prime objective of all economic activity, the prevalence of unemployment and underemployment will stand as an index to economic distress and primary poverty. The larger the opportunities of employment, the greater the scope for the people to increase their prosperity and augment production of goods and services and thereby national welfare. Industrialization was the answer to problems of economic backwardness, unemployment and poverty in the developed countries. However, since the less developed countries depend much more heavily on agriculture and are faced with much faster growth of populations and labour force than the industrialised countries faced in their pre-industrial phase, it is widely maintained that high priority must be given to agriculture in order to provide not only adequate food and fibre but also sufficient employment and income to the poor.

There are two options before us for reducing the unemployment rate. Either we should reduce the supply of labour or should increase the labour demand.

In India, population is increasing very rapidly. High rate of population growth puts great pressure on land and natural resources, particularly of the non renewable category. The extent of land that could be brought under cultivation is limited but the effort continues at increasing rate. More and more forest and pasture lands are brought under cultivation giving rise to grave environmental problems.

Demand for labour is determined by capital and labour capital ratio. We have to derive measures for augmenting the capital supply and also

the number of labourer used per unit of capital. The policy instruments can influence the availability of capital and the labour capital ratio.

The rate of accumulation of capital and the sectoral allocation of investment would determine the supply of capital in different sectors. Product mix, mainly determined by demand pattern and influenced by price policy can significantly influence the use of labour as different products have different labour components. The same products can however be produced by different techniques which use different input combinations. A particular technique may be capital intensive while another may be labour intensive. For providing employment to most of the people, we have to choose labour intensive technique (although selection of the techniques is principally determined by factor prices).

More employment opportunities can be generated in agricultural sector by increasing the cropping intensity, increasing irrigated acreage, appropriate technology, land reforms, rural works programme, choice of project, choice of time, development of cottage industries and other activities.

Govt. of India has launched several programme like Integrated Rural Development Programme, Special Livestock Production Programme, National Rural Employment Programme, Rural Landless Employment Guarantee Programme. The Industries, services and Business, Training of Rural youth for self employment, small farmers and Marginal Farmers Development Agencies, The Draught Prone Areas Programme, Command Area Development Authority and Food for work etc., from time to time which also shows importance of agricultural sector in generating employment opportunities, in India.

Still now, there is a large scope for generating employment in the agricultural sector. But we have to explore the opportunities to generate employment in the agriculture.

## 7. PLANNING FOR EMPLOYMENT IN LIVESTOCK SECTOR

K. C. RAUT AND P. NARAIN

*Indian Society of Agricultural Statistics, New Delhi*

While planning for livestock Improvement Programmes, there is need to assess and evaluate the existing utilization of labour so that steps can be taken to fruitfully utilise surplus labour. A quantitative assessment of labour input at State and national level is handicaped due to non-availability of adequate and relevant data. While carrying out methodological investigations, the Indian Agricultural Statistics Research Institute collected some data which would throw light on the extent of labour utilised in livestock keeping. In the areas where surveys were carried out by IASRI, the time utilised by the householders is estimated following a procedure

in which all the categories of bovines are brought to standard animals (cow-in-milk) and categories of labour to standard man-hours. The estimates were worked out for the areas : Hissar (Haryana), Ludhiana (Punjab), Bikaner (Rajasthan), Bhopal (Madhya Pradesh), Jabalpur (Madhya Pradesh), Dhulia (Maharashtra), Krishna Delta area (Andhra Pradesh), Nadia and 24-Parganas (West Bengal).

In these areas, a cow in milk needs about 1 to 1.6 man-hours (2.2 for a crossbred cow in milk) of labour per day (excluding grazing time) depending on the level of production, quantum of feed fed, type of milch stock and particularly the efficiency of the householders.

MAN-HOURS UTILISED PER DAY PER COW-IN-MILK  
(EXCLUDING GRAZING TIME)

<i>Area</i>	<i>Man-hours/day</i>	<i>Area</i>	<i>Man-hours/day</i>
Hissar (Haryana)	1.35	Dhulia (Maharashtra)	1.15
Ludhiana (Punjab)	1.25	Krishna-Delta Area (Andhra Pradesh)	0.95
Bikaner (Rajasthan)	1.60		
Bhopal (M.P.)	0.85	Nadia and 24-Parganas (West Bengal)	1.60
Jabalpur (M.P.)	0.95		

Based on data collected during a survey in Aligarh district of Uttar Pradesh, it was worked out that 3.9 man-hours were utilised in piggery work in a household maintaining 3 to 30 pigs.

In a survey carried out in Mahasu and Mandi districts of Himachal Pradesh, it was estimated that about 12 man-hours per day in Mandi and 10 hours in Mahasu district were utilised in looking after a migratory flock having 50 to 150 sheep; whereas in the case of a stationary flock having 3 to 7 sheep, about 4.5 man-hours were utilised per day.

Based on the data collected in a survey in Hoshiarpur district (Punjab) and Delhi area, it was estimated that about 5.5 man-hours were spent per day per farm maintaining 50 to 1000 birds.

It is desirable to have regular village-agency for recording basic data similar to the agency existing at village level for crops. In all the States and Union Territories, there are about 596,000 inhabited villages in 358 districts. Although village records are maintained regarding details of crops grown in each plot, no such records are maintained by any agency in respect of animals and poultry birds. Keeping in view the number of households in a village, distance between villages and communication facilities etc, it is worked out that about 66,000 persons may be required

for recording basic livestock data. Each livestock recording agent will be in charge of 5 to 10 villages. The information to be recorded includes number of animals of each species in a household, breed and age, birth and death, cause of death, production characteristics like age at calvings, lactation length, calving interval etc, extent of fodder cultivation, prices of animals in local markets and condition of grazing areas. In order to ensure that village records are maintained properly, supervisory staff at different levels need to be appointed. The primary as well as supervisory staff should be under the administrative control of the Animal Husbandry Department in the States. For proper coordination, guidance and to ensure uniformity, there should be proper set up at the Centre in the Animal Husbandry Division of the Department of Agriculture, in the Ministry. These new set up would provide employment to a large section of educated persons both in the States and Centre. Each State can have a phased programme for appointment of such primary recording agency giving priority to those areas/blocks where livestock development programmes are in operation or likely to be implemented soon.