A SURVEY OF RESEARCH ON RURAL EMPLOYMENT, WAGES AND LABOR MARKETS IN INDIA

by

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Series : Studies in Employment and Rural Development No. 39
Division : Employment and Rural Development
Department: Development Economics
Development Policy Staff
International Bank for Reconstruction and Development

This paper provides a selective survey of empirical work on rural labor markets in India. Section I surveys the literature on size, characteristics and composition of the rural working force and rural employment, particularly with a view to changes which have occurred through the decade of the sixties and early seventies. The focus of Section II is on the employment effects of the seed-water-fertiliser innovation and those of the application of tractor technology to different farm operations. Section III covers the empirical work connected with some of the major hypotheses of wage determination in agriculture: the dual labor market hypothesis; the hypotheses of institutionally-determined and nutritionally-determined wage rates; the seasonality factors in the wage determination process; and the role of supply and demand in determining wages. Finally, Section IV surveys the available data, and the work done so far with these, on labor time disposition in different categories of households on one hand, and the farm-level determination of demand for labor and its composition of family and hired labor on the other.

The author prepared this research paper in her capacity as consultant to the Bank. This paper forms part of a research study on Structure of Rural Employment, Income and Labor Markets (RPO 671-30) undertaken in this Division. The views expressed represent those of the author and not necessarily those of the Bank. This report may not be published nor may it be quoted as representing the views of the Bank and its affiliated organizations.

Washington, D.C., June 1977
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RURAL EMPLOYMENT, WAGES AND LABOUR MARKETS IN INDIA

Introductory Summary 1/

1. To understand the operation of the rural labour market in India, the question of how the employment and wages of the landless or near landless are determined must be seen in the overall context of modes of production, types of employment and employer-labour relations. Even if the subject of investigation is a rather narrow one, such as the determination of wages, it is necessary to look at the entire structure of rural employment.

2. For most parts of the country, it would be a gross over-simplification to see the agricultural economy in terms of separate categories of capitalist farmers, self contained peasants, and landless labourers. The majority of rural households combine self employment and wage employment. In different areas there exist various combinations of (1) capitalist farmers producing almost exclusively with hired labour; (2) feudal landowners with sharecropping tenants; (3) peasant households almost exclusively engaged in subsistence production; (4) farm households employing both family and hired labour, and whose members may at times work for wages elsewhere; and (5) households who, not having enough productive assets for self-employment, are almost fully dependent on wage employment. Households of the fourth group, who both seek and offer wage employment—either simultaneously or in different seasons of the year—play a very significant role.

3. The non-agricultural sector of the rural economy, traditionally small and dependent on the agrarian activities of the village, now provides more wage employment in public works, private construction, marketing and transport, and more self-employment in trading and repair services, replacing some of the self-employment in declining traditional vocations. These changing patterns of production and income-earning opportunities make a broad approach to analysis of the rural labour market even more necessary.

1/ This is a self-contained introduction giving a broad outline of the findings of the review.
4. The characteristics of rural employment and modes of production are still the subject of much controversy. There is a virtually endless series of village surveys and small scale empirical studies, describing in minute detail the fabric of a rural economy which varies a great deal from one region to another. There are also systematically collected large scale data sets. The present survey of empirical research is selective in coverage and concentrates largely on the period since 1960, which has been marked by significant change in agriculture and in the rural economy in general in many parts of India.

Changing Structure of the Rural Labour Force
(See Section I, pp. 1-23)

5. The past fifteen years have seen an increase in the rural proletariat. The proportion of wage labourers in the total rural labour force, stable during the 1950s, has grown rapidly since the early 1960s and there has been a corresponding decline in the proportion of cultivators and other largely self-employed workers. The spread of new agricultural technology has accentuated this trend, but the data suggest that the rural poor were already relying increasingly on the market for employment before the Green Revolution took hold.

6. The tenurial reform legislation adopted in the late 1950s and early 1960s was intended to abolish intermediary tenure, giving tenants security and eventual right to the land they farmed. The results belied the intentions in many areas, particularly in the north, where the new laws led to the outright eviction of many tenants. Large landowners whose property had traditionally been farmed by tenants now began managing their own land with the help of wage labour. Former tenant cultivators swelled the ranks of the agricultural proletariat.

7. This process was reinforced by the dramatic increases in the profitability of farming being made possible with the new technology, subsidies for agricultural inputs and a tax system that was lenient towards agricultural profits. Public investment in irrigation, fertilizer indus-
tries and in the supply of credit and other vital infra-
structural services was considerably increased in the 1960s.
At the same time, with the availability of high yielding
seed varieties and fertilizers, private investment in
irrigation and other elements of technological change
was rising rapidly. Fiscal policies--price support, input
subsidies, liberalisation of tractor imports, continued
under-taxation of agricultural profit--favoured the growth
of agricultural output. These policies influenced farmers' investment choices between alternative technologies, some-
times with labour-displacing effects. In most areas, the
progressive farms were generally large: small farmers and
tenant cultivators did not have such easy access to credit,
new seeds or other modern production inputs, quite apart
from their lesser ability to bear risk, and this ensured
that relatively little innovation took place among them.
Biases against small farmers in general, and tenants in
particular, in the distribution of credit and other infra-
structural facilities have directly constrained the growth
of employment.

8. In areas (Maharashtra and Gujarat) where land
reform was better implemented, the results were inadequate.
Without supportive measures, yields on the ex-tenants' tiny
new holdings remained stagnant, while the size of the families
dependent on them went on rising, and by then it was virtually
impossible to lease in additional land. More and more members
of small cultivating households became labourers. In some of
the agriculturally progressive areas, observers have noted
that leasing by large to small farmers has not only declined
or ceased, but has even been reversed, with small farmers
pushed by their lack of working capital or pulled by rising
wage rates to cease operating their own land. In the prime
"green revolution" area of Punjab, the distribution of opera-
tional holdings has become more concentrated than the dis-
tribution of ownership holdings.

9. Outside the farm sector, with the decline in tra-
ditional means of self employment, many traditional artisans
have either migrated to cities or have become agricultural
labourers. Though rural-urban population ratios have been
declining, the absolute size of the rural population and
rural labour force have continued to increase.
10. Rural policies and programs need to be evaluated in the context of these changes in the structure of the labour force. Growth in the demand for labour, stimulated by agricultural growth or technological changes, must not only be large enough to absorb the growing rural labour force, but also directed sufficiently towards wage labourers. The accepted objectives of economic growth with dispersed benefits, and employment of the growing rural labour force, must be pursued within an integrated policy framework, coordinating land reform measures, progressive taxation of agricultural incomes and holdings, price policies for inputs and outputs, infrastructural investment and rural works schemes so that the results reinforce each other.

**Employment Effects of Technological Change**
(See Section II, pp. 24-33)

11. In evaluating the employment effects of recent agricultural growth with technological change, or projecting the employment effects of innovation on the basis of alternative policy environments, it is rightly considered important to distinguish between the elements of the technological change "basket" that are not necessarily bound up with each other. The three main elements from this point of view are: adoption of the water-seed-fertilizer innovation, tractorisation, and use of purely labour-saving devices like harvesters. The last of these obviously has a negative effect on employment. All available studies indicate that the seed-water-fertilizer innovation has a clearly positive effect on employment, being land-augmenting and capable of generating large increases in labour demand. The more intensive cropping patterns mean that demand for labour is less drastically reduced in slack seasons, and can thus reduce the seasonal under-employment and poverty of the landless and the land-poor.

12. The effect of tractorisation is composite and variable. There remains a discrepancy in the existing literature between the macro-level direct effect of tractors on employment, which is strongly negative--
estimated or projected on the assumption that tractors will be used for the multiplicity of operations of which they are technically capable—and the micro-level effect, which is more or less neutral, observed from the use of tractors during the 1960s. However, during the 1960s tractor use was much more limited (being mainly concentrated on seedbed preparation), and hiring out was more common, than is likely to be the case now or in future, given the continued policy of encouraging tractorisation. As the number of tractors rises rapidly, hiring out declines and their owners begin to use them for other more labour-intensive tasks, their labour-displacing effect increases.

13. The new agricultural technology has affected both the amount and the type of labour required. Though the seed-water-fertilizer innovation can be equally successful on large or small farms, most innovative farms are large, and the employment effects of the new technology have been greatest for the hired labour on which these farms depend. Tractorisation is apt to raise the demand for attached labourers or permanent farm servants, rather than casual labour; tractor farms need to be able to rely on a core of workers familiar with the schedule of operations and with the machines. In many of the "green revolution" areas of northwest India, farmers are making increasing use of permanent labour contracts (often with new tying instruments replacing the traditional ones). We return to this subject below.

14. So far, during the initial phase of diffusion of technological change in agriculture, the combined effects of controlled irrigation, high yielding seed varieties and fertilizers in augmenting farm employment have outweighed the negative effect of mechanisation. The employment effects of technological change can obviously be influenced by policy intervention. Considerable research has been done on the issues of corrective policy concerning credit, agricultural taxation, land consolidation with a view to groundwater utilisation, and so forth, which influence the mode of organisation of production and the farmers' choice of technology.
Levels of Employment
(See Section II, pp. 34-41)

15. Conclusions about the actual levels of employment of the growing agricultural population are difficult to draw for India as a whole, since agricultural growth has varied so much between regions. Moreover, comparisons of rates of employment and unemployment over time are difficult with the available data, and are at best rough approximations. Some of the findings may be summarized as follows:

- the rate of open unemployment (the ratio of days without work to days available for work) among both rural labour households (the fifth group in para 2 above) and poor small cultivator households 1/ is low in absolute terms, but this is partly because at any given time the desperately poor may not have a reservation wage below which they choose to remain unemployed. Better indicators of welfare in their case would be their willingness to take up alternative part time or full time employment, and their level of income.

- the rate of open unemployment is relatively lower among poor small cultivator households than among rural labour households. However, there may be more disguised unemployment among the former.

- for rural households in general, taking into account all the economic activities they are currently engaged in, underemployment per person per week (defined as less than 28 hours of work during the reference week and availability for more work) appears to have slightly declined over the past fifteen years, but not enough to raise the employment of the average wage labourer significantly.

1/ Here defined as the poorest ten percent of households mainly dependent on self-employment, whether tenants or smallholders.
16. A survey of rural households mainly dependent on wage employment in the West Godavari district of Andhra Pradesh showed that their availability for extra wage employment increased as their present incomes rose. There was also an inverse relationship between landholding (which indicated self employment) and availability for extra wage employment. At the time of the survey, members of the better-off labour households were spending less time on wage employment, but had a higher average wage rate, than members of poorer households. This suggests either that the labour market is stratified, perhaps on the basis of skills, specialisation or labour tying arrangements, or that these workers’ reservation wage rises as their incomes increase beyond the level of acute poverty.

17. Data collected in the 27th round (1972-73) of the National Sample Survey will provide a broader basis for judging whether willingness for alternative employment is due to too little employment, or insufficient wages for current employment, or both, and thus for designing remedial schemes and specifying the amount, duration, location and timing of the additional employment needed.

18. Summarising available information on levels of employment, it can be said that during the initial phase of agricultural growth with technological change:

- employment per acre has risen, though not enough to raise the level of employment per agricultural labourer significantly even though increases in employment per acre have mainly affected hired labourers;

- with high yielding varieties there are less dramatic seasonal fluctuations in the demand for labour than with traditional varieties.
19. As was noted above, technological change, along with changes in land tenure, has been accompanied by an increase in the use of long-term labour contracts (2 years, and sometimes up to 5 years). In areas where the traditional and still dominant category of permanent labourers are paid in crop-shares, payments have changed. While they used to receive a fixed fraction of gross output, they now receive a fixed share of farm income, from which other production costs have been deducted. The payment has thus become a variable share of gross output; since the more sophisticated the production technology is, the larger is the share in total production costs of elements other than labour, and hence the smaller the share of labour. Other new features of permanent labour contracts, observed in Haryana where permanent labourers often come from households with small farms, incorporate carefully timed advance payments and managed indebtedness, whereby the employer "relends" part of the institutional credit he receives, or "resells" some of the modern inputs to which as a large farmer he has easier access. In an area such as Haryana where the labour supply is tight, the employment of attached workers selected from small cultivating households, on a variable share basis with managed indebtedness built into the contract, assures large farmers of a supply of labour on favourable terms.

20. Labour relations appear to be very different in Tamil Nadu, where there have been violent confrontations between organised labour and commercial paddy farmers over wages, followed by government arbitration, and in Kerala. In the latter state, agriculture has grown only slowly but collective bargaining between agricultural unions—organized with support of major political parties—and organized farmer-employers, is now a regular way of determining wages, working hours, employment procedures, and regulation of tractor use, and of preventing employment of migrant labour.
21. As levels of productivity have diverged between states, so have money wage rates. Since the mid 1960s real agricultural wage rates have fallen in a few regions, though they have increased in the fast growing highly productive areas of north and north-west India, and in Kerala (Table 5, page 46).

22. Changes in agricultural labourers' wage rates are poorly adjusted to and lag behind rises in their cost of living. Without the organised bargaining power of the industrial worker or the protection of a minimum food ration, their real wages decline when there is a sharp rise in foodgrain prices. (Except in Kerala, there has been virtually no subsidised public distribution of foodgrains in rural areas.) Payments to workers in kind do not offer adequate protection when the harvest is poor, or when farmers have a strong incentive to stock up, for selling later in the year.

23. The extent of change in agricultural labourers' living standards since the mid-1960s has not yet been adequately measured. Even in the high growth regions it appears unlikely that increases in agricultural employment and wages were enough to raise the per capita income or level of living of the increasing numbers of agricultural labourers, or to distribute a fair share of production growth in their favour. Several studies have attempted to measure the share accruing to labour of the value of incremental crop output (net of material costs) resulting from the change to high yielding varieties. From scattered estimates it appears that, in a switch from traditional to high yielding varieties of wheat, kharif and rabi paddy, wage labourers usually received only 10%, or slightly less, of the value of incremental output, net of material costs. Considering that from 50 to 90 percent of the work on medium and large farms is done by wage labour, and that wage labourers account for over a third of the agricultural workforce, this is not an impressive figure.
Labour Market Imperfections
(See Section III, PP.52-63)

24. The fact that money wage rates have risen or remained stable while most of the wage labour force is underemployed suggests that there are imperfections in the labour market. A number of possible explanations for this have been advanced.

25. According to Arthur Lewis's hypothesis, in a labour-surplus rural economy the real wage level is fixed institutionally, and has no impact on the amount of labour offered. However, it is very difficult to visualise the exact institutional mechanism which could maintain a constant real wage rate except in a closed system of feudal patron-client relationships or in a totally opposite situation where commercial producers face unionised labour.

26. The second explanation, related to the first, is that wages are based on nutritional needs. Through labor-tying arrangements and time-wage adjustments, the few employers who control the market set an equilibrium wage rate that at least maintains the required number of work units at the subsistence level. Assuming that better nutrition does increase efficiency, Lewis's constant real wage is thus explained in terms of employers' economic rationality, which may have become formalised over time in institutions of labour tying and payments in kind.

27. However, the subsistence hypothesis is not an adequate basis for a general theory of wage determination. For example, the wages of attached labourers are those most likely to be determined on the basis of nutritional requirements. The employer's "investment" in their nutrition clearly pays him back. But the decision to engage them as tied labour may rest on the cropping pattern, and on the need to rely on a core of non-seasonal workers, as much as on minimising the cost of work units. Most of the farmers in the highly developed high wage regions of Punjab now use more attached labourers than ever before, while in many areas with low calorie income levels and a less intensive cropping pattern there are very few attached labourers. The subsistence hypothesis is even less applicable
as a basis for wage determination in the case of casual agricultural labourers, who still constitute the majority of the wage labour force in many regions.

28. The third hypothesis is that the labour market has a dual structure, with the supply price of family labour on small or peasant farms being lower than the market price of wage labour employed on large or capitalist farms. This difference in labour costs between small and large farms may account for the greater use of labour and higher production levels per acre observed on smaller farms. For various possible reasons, peasant households do not compete directly with landless labour for wage employment on other farms. They may prefer working on their own farm--particularly the women members of the household. Another reason may be that if the peak season absorbs almost all the family's labour supply, they are only available for work elsewhere in the lean season when wages are usually lower. Third, even if members of peasant households were available for part-time wage employment during the peak season, large farmers may prefer the full commitment offered by pure labour households for such activities as harvesting or transplanting whose timely completion is very important. Some peasant households may be able to release one of their members to work full time as a wage labourer, by hiring in some part-time workers in the peak season.

29. The empirical work done so far in India has neither conclusively proved nor disproved that labour is cheaper for small farms than large, but if the apparently greater use of labour, and greater output, per acre on small farms has been due to a labour cost advantage (rather than to differences in land quality or irrigation), the question arises as to why larger farmers do not lease out land in small parcels so that the difference in labour use and productivity per acre disappears, rather than leasing out less land now than they did twenty years ago. Two reasons for this trend are imperfections in the land market and counteracting cost differentials for factors other than labour. As was noted above, existing imperfections in the land market were accentuated when the new tenancy legislation was pre-empted by evictions.
Moreover, large farms can more easily bear the costs of new inputs. Though traditionally smaller holdings were more intensively irrigated than large, the rapid increase in tubewell irrigation, mainly on larger farms, has been reducing this gap. Large farms' advantage in capital and access to institutional credit, coupled with the availability of machinery, has far outweighed the possible labour cost differential of the earlier period.

30. Dualism as it has usually been hypothesised may also be declining because many erstwhile small cultivators have become labourers primarily dependent on the market for employment. However, other imperfections in the labour market may be on the increase. Understanding those arising from new labour tying arrangements may be vital for understanding not only the response of wages and employment to technological changes but also the changing relationships between labour and employers in rural areas. More information on the types and provisions of labour contracts in various agrarian regions would obviously be very useful.

31. So far not much empirical work has been done in the important area of seasonal fluctuations in employment. How labourers use their peak season bargaining strength, how they migrate into and out of a rural area seasonally, and how employers react to labourers' peak season bargaining strength under different circumstances are basic to understanding rural labour market behaviour. More disaggregative data are required for the analysis of patterns of seasonality in employment and agricultural wages, seasonal shifts in the composition of various types of employment for rural households, and seasonal migration patterns.

32. The ideal data base for analysing labour demand and supply behavior in rural areas would be an integrated household schedule that gave both the labour time disposition of its members and the use of family and hired labour in all household enterprises. This is because most rural households act as both employers and employees. How far their members are involved in the labour market, to hire out and/or hire in labour, depends on labour allocation
decisions taken at the household level. Data from the 27th round of the National Sample Survey, giving both farm management details and labour time disposition, should begin to make such analyses possible.

33. The present survey has identified two main priorities for further study, both with existing data and with newly collected more detailed data: 1) types of labour contract, and the ways in which contracts are influenced by conditions prevailing in the land, labour and credit markets; 2) the labour supply behavior of rural labour households and the labour demand-supply interactions in small cultivator households under different institutional and technological conditions.
Section I. Size and Composition of Rural Working Force

The enormous body of Census data on working force—by rural and urban areas, by age and sex, by primary and secondary occupations, by level of education, and by regions (down to the district level)—has provided the chief material for intertemporal as well as cross-sectional comparisons. The National Sample Survey data, for rural households in general and for rural labour households in particular, are used for answering more detailed questions regarding economic activity rates per person, particularly the flow rates of unemployment, and the level and the composition of gainful employment (on own account and on wage, on farm work and on non-farm work). Visaria (1975) has done a general survey of the concepts and definitions used in these two data sources, problems of comparison and of projection of the demographic and the economic characteristics of the population. The object here is to focus more on the conceptual issues and specific pieces of research that have direct bearing on questions regarding changes in size and structure of the economically active in rural areas, the market allocation of employment under sets of conditions varying regionally and over time, and how this is reflected in certain simple indicators. The Census-based indicators that are relevant here are: changes in rural working force participation rates, occupational distribution of rural workers, the modes of combination of different categories of economic activities in their cases, and the nature and degree of mobility or migration of labour to and from rural areas.

I.a Recent Trends from the Census

The main difficulties encountered in comparisons over time, covering the three post-Independence Censuses, arise from (a) the basic problem of defining a worker in the rural context of predominantly household-based economic activity, with use of family labour as the chief mode of employment, and of seasonal variations in work participation; and (b) related to the consequent search for a suitable criterion, the changes made from time to time in the definition used for describing the worker status of a person and the occupational category of a worker. The definitional changes affect comparability and, unless properly adjusted, might indicate unreal shifts in economic characteristics of the population.

The 1951 and the 1961 Census used the "usual status" definition of a worker. It gives an inventory of persons engaged in any economic activity on a more or less regular basis, irrespective of the time intensity of such work participation. The reference period for agricultural and allied rural occupations was broadly defined as "the greater part of the working season" during which anyone gainfully employed for at least one hour a day was considered to be a worker. The relative importance of different kinds of employment for a worker was enumerated in terms of primary and secondary work. The 1951 Census also made a distinction between "earners" or self-supporting workers and "earning dependents," enumerating primary occupation of the latter and both primary and secondary work of the former.
The 1971 Census made a major departure by using a labour time disposition criterion over the reference period of one year (for those engaged in cultivation/livestock raising/household industries and plantations). It defined as workers only those who spent the major part of the reference year in economic activities. Thus, all irregular/marginal/part-time workers according to the time disposition criterion came to be enumerated as non-workers in their main activity, and whatever economic activity these "non-workers" might be doing was enumerated under their secondary activity. Thus, a measure of total rural working force in 1971 comparable with the preceding Census would have to include the workers according to the main activity criterion and most of the non-workers with secondary work participation. Subsequently, the Census Commissioner's Office, in a report (1974) based on a sample resurvey designed for the purpose, gave estimates of two sets of adjustment factors for deriving comparable worker participation rates. The sets of adjustment factors—one for adjusting 1961 figures in terms of the 1971 concept and the other for 1971 figures in terms of the 1961 concept—were derived from surveying the sample twice, using the respective definition of a worker, length of reference period and the order of canvassing the economic questions. It has been argued that in the rural context of self-employment and use of family labour in seasonal type of productive activities, use of the more liberal concept of a worker like that used in the 1962 Census might be more appropriate and capture the reality better. The argument is justifiable particularly in the case of women and children who, except during the peak agricultural seasons when they are heavily and overtly drawn into the working force, very often dovetail their participation in household-based economic activities with domestic work. The borderline separating these is not always very clear either to the respondent or to the enumerator—simply because they are not compartmentalised as in the case of wholetime workers employed on wages and salaries. At the same time, for many purposes it might be useful to separate the hard core of regular, "full time" (relatively speaking, though not necessarily by an absolute time norm) workers from the rest even in an "informal" sector of household-based productive activities.

Whichever concept and set of adjustment factors is used, a comparison between 1961 and 1971 indicates that there was a genuine decline in worker participation rates—a decline that has been more drastic in the rural than in the urban area, and among rural women in particular. The composition of this decline, the underlying reasons and the implications are of obvious interest in understanding the dynamics of rural work force structure in the technological and the institutional contexts of development.

Between 1961 and 1971 population had grown at a compound annual rate of 2.23%, as against 1.98% between 1951 and 1961. In 1971, 80% of the population was rural and 51% of the rural population belonged to the prime working age groups. The proportions were not very different in
1961: 82% of the people were rural, of which about 47% were in these age groups. But the worker participation rate after adjusting for definitional changes was much lower in 1971 than in 1961. For rural India as a whole, comparable estimates of worker participation rates after adjustment on each of the alternative bases are shown in Table 1.

Table 1: RURAL WORKER PARTICIPATION RATES (%), 1961-1971

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<tr>
<td>Male</td>
<td>57.0</td>
<td>53.5</td>
<td>58.2</td>
<td>54.7</td>
</tr>
<tr>
<td>Female</td>
<td>25.7</td>
<td>13.1</td>
<td>31.4</td>
<td>18.9</td>
</tr>
<tr>
<td>All Persons</td>
<td>41.6</td>
<td>33.8</td>
<td>45.1</td>
<td>37.3</td>
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With the stricter as well as with the broader definition of a rural person's "usual" work status, the worker ratio seems to have declined considerably over the decade, and the decline seems to be much sharper for women than for men.

The distribution of this large decline in rural worker ratio was rather uneven—regionally and occupationally. The decline was relatively less in Kerala, West Bengal, Punjab and U.P.; and it was relatively large in the more arid western states, the north-central Madhya Pradesh and Haryana, and the eastern states of Bihar, Orissa and Assam. It is quite significant that the first group of states even initially (in 1961) had a much smaller proportion of their rural women as workers. Because of the smaller weight of women in the rural work force, the further decline over time in female worker ratio in their case had less effect on the overall ratio. In the second group of states, particularly those (Orissa, Assam, Madhya Pradesh, Rajasthan and Maharashtra) which continued to remain agriculturally backward during the decade, the decline even in male worker ratio has been somewhat more than in the agriculturally developed and growing states (Punjab, Tamil Nadu, U.P. and Haryana). The state of Kerala, despite very little agricultural growth over the period and a lot of urban unemployment, managed to retain a stable male rural worker ratio (though at a lower absolute level than in other southern states) — a phenomenon largely attributable partly to the relative success of family planning in rural Kerala and partly to migration from its rural areas.

The change in occupational distribution of rural workers (on either definition) appears to be very interesting in the context of the decline in overall worker ratio. While there was a large decline in the proportion of self-employed and unpaid family workers (both male and female, but particularly female) engaged in cultivation and other household enterprises, the proportion of those who worked primarily as hired
agricultural labourers went up quite considerably at the same time (Table 2). The Census Resurvey Report does not separate out the case of non-agricultural rural labourers; they are combined with artisans and household industry workers. But in all probability, their proportion went up too, while that of the self-employed non-agricultural workers declined more than shows up in the combined figures. Thus, the proportion of hired (wage-employed) workers among all rural workers went up from around one-fifth to around one-third. The decline in worker participation rate was concentrated among various categories of the rural self-employed, those taking part in household-based economic activities.

Table 2: PERCENTAGE DISTRIBUTION OF RURAL WORKERS BY CATEGORIES OF PRINCIPAL OCCUPATION, 1962 and 1971

<table>
<thead>
<tr>
<th>Sex/Main Work</th>
<th>Adjusted 1961</th>
<th>Census 1971</th>
<th>Census 1961</th>
<th>Adjusted 1971</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Cultivators</td>
<td>62</td>
<td>56</td>
<td>61</td>
<td>56</td>
</tr>
<tr>
<td>Male Agricultural Labourers</td>
<td>15</td>
<td>25</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>Male Other Workers</td>
<td>23</td>
<td>19</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>Female Cultivators</td>
<td>60</td>
<td>33</td>
<td>59</td>
<td>39</td>
</tr>
<tr>
<td>Female Agricultural Labourers</td>
<td>23</td>
<td>54</td>
<td>25</td>
<td>48</td>
</tr>
<tr>
<td>Female Other Workers</td>
<td>17</td>
<td>13</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>All Rural Workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male Cultivators</td>
<td>61</td>
<td>51</td>
<td>60</td>
<td>52</td>
</tr>
<tr>
<td>Male Agricultural Labourers</td>
<td>18</td>
<td>31</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>Male Other Workers</td>
<td>21</td>
<td>18</td>
<td>21</td>
<td>17</td>
</tr>
</tbody>
</table>

A lot of attention has been attracted by these rather striking changes in the participation rates and in the occupational structure of rural workers over a decade that experienced faster agricultural growth with technological changes as well as higher rate of population growth compared to the earlier ones.

A demographic explanation for the decline in the overall participation rate derives from an increase in the proportion of children over the decade. Visaria's (1973) tabulation of age-specific worker rates for five states on the basis of the 1962 Census indicates an inverted U-shape for rural areas with a flat plateau for ages from 20 to 55 years. Though children and teenagers in rural areas are drawn into productive employment to a much greater extent than in urban areas, and possibly even more so in poor than in better-off households, the worker rate in
their case still lies below that for adults. A rise in the proportion of children, together with some rise in incomes and in school enrolment that took place even in the rural areas over the decade, might constitute one of the reasons behind the decline in the worker rate for all ages combined. But this can hardly be a major reason.

An important explanation may also arise from linkages between changes in occupational distribution of rural workers and those in the overall rural working force participation rates. The cross-tabulations necessary for quantifying these linkages and to identify the correlates of rural occupational structure are not available. However, the question has cropped up in several studies in various contexts, and certain aspects of changing agrarian structure that have been observed in other connections are relevant to understanding the shifts in the proportion of rural wage labourers relative to the self-employed or own-account workers.

I.b. Correlates of Changes in the Proportion of Agricultural Laborers.

One plausible explanation for the sharp rise in the proportion of agricultural laborers along with the decline in overall work participation during the sixties, which followed their relative stability over the fifties, could arise from a change in the distribution of cultivated area. It has been argued that, as a consequence partly of the tenurial legislations and partly of the technological changes taking place in agriculture, small peasants have been increasingly pushed out of cultivation or self-employment into wage labor. The introduction of irrigation-seed-fertilizer innovation, though theoretically scale-neutral, has been very unevenly distributed on account of the prevailing imperfections in credit (capital) markets. The official policies of low taxation of agricultural incomes and assets and subsidisation of modernising inputs, combined with the large farmer’s advantage in self-financing investment and in getting credit, have encouraged big landowners to take a more direct interest in farm management. At the same time, the tenurial legislation discouraged their leasing out. From all accounts, there took place considerable eviction of small tenants, and more large holdings were now operated with hired labor. In some parts of the country, rising land prices might also have led some small owners to sell out. But, on the whole there is some indication of a decline in the proportion of the non-landowning rural households, and little indication of net sale of land by small owners. But nationwide aggregative data in this respect average out so many cross-currents that not much can be said on its basis. In some parts of the country, there has been a significant decline in the proportion of rural households not owning any land. This has been so at least in the western region (Dantwala and Shah, 1971) and in Punjab (Bardhan, 1976). Irrespective of whether the proportion of rural households owning little or no land is growing or declining or remaining unchanged, a more significant fact is that they are now finding it harder than ever before to lease in land for cultivation.
Available data on tenancy do not give a clear-cut average picture because of considerable regional variations in the nature of tenancy, because registration and reporting of tenancy has been affected by the land reform laws, and above all because of very significant recent changes in the composition of tenants. Joshi and Dharm Narain (1969), on the basis of NSS data relating to 1953-56 and 1960-61 and a few village surveys, argued that the incidence of agricultural tenancy declined over the fifties and that the decline was more for the larger tenants with long-term contracts than for smaller ones. Though the two rounds of NSS data, on which this argument is based, are not comparable on account of a definitional change (in 1960-61, land leased in on long-term contract was classified as owned) and though several other village surveys indicate an opposite tendency (Bardhan, 1970), it is more or less agreed that there had been some amount of genuine decline in the proportion of area under tenancy over the fifties. But subsequently, during the sixties and thereafter, there seems to have been taking place along with "green revolution" a very significant change in the pattern of leasing in and out. Comparing between 1953-54 and 1970-71 (8th and 26th rounds of NSS), Bardhan (1976) observes that while the leased in proportion of land declined in some states, it increased in others. However, in the two major "green revolution" states of Punjab and Haryana, while the proportion of rural households not owning any land went down from 40% to 9%, the proportion not operating any land went up from 30% to 54% over the period. In contrast with the usual situation in other parts of the country and in the earlier year in this part, the Lorenz curve for distribution of operated area in 1970-1971 was found lying below that for owned area. In other words, the direction of leasing in and out seems to have been reversed, at least in some of the growing areas. The small landowners are leasing out (obviously to larger ones)—either because of their disadvantage in terms of resources for investing in irrigation and purchasing the fertilisers and the new seeds (the push factor) or because of the rising wage rates (the pull factor) or both. Bandyopadhyayaya (1975) reported a similar phenomenon from recent village-level data for parts of West Bengal, where large farmers with tubewells lease in land from neighboring small owners for the early summer season in order to raise a high-yielding variety of paddy. In the relatively better-irrigated Birbhum district of West Bengal, Rudra and Newaj (1975) observed sharecropping tenancy declining with agricultural development and owner-cultivation with hired labor rising. Thus, it seems that technological change with use of controlled irrigation (involving investment in tubewells which, like tractors, offer a scale advantage) and cash purchased inputs, because of its bias in favor of large farmers and against small tenant operators in particular, has led to a major decline in the proportion of the self-employed and rise in that of the wage-employed in the rural working force. The change thus indicates a polarisation within the agricultural sector, with a faster-growing subsector of medium and large farms generating much of the increasing supply of wage employment that the previously self-employed land-poor households are now taking up along with landless labour households.
The second explanation for the rising proportion of agricultural labourers is that even if in some or most areas landowning peasants still manage to cultivate the owned bit of land, their incomes from such self-employment are getting increasingly inadequate for supporting their families, as a result of which more of their workers are now taking up wage employment. Collating from various small-scale studies relating to Gujarat, Vyas (1976) partially substantiates this hypothesis. Most of the entrants in the smallest size-group of farms in this area came from below—as a result of relatively more effective implementation of tenancy legislation here—rather than from above through sale or loss of mortgage. The number of small farms (absolutely and as a proportion of all farms) had increased in Gujarat over the last few decades and their average farm area remained stable. But, as the size of these farm households grew over time, the unchanged productivity of their small holdings (because of a lack of public investment in irrigation in the area and the low and uncertain groundwater level that makes any private investment harder even for large farms) led to increasing resort to hiring out and outmigration of workers. Even for this case, one might argue that if these households could lease in more easily, they could have more self-employment.

In the case of some other states like Punjab, Haryana and West U.P., which in contrast with western India have experienced much faster agricultural growth centered around controlled irrigation, and also a more prominent emergence of "capitalist" farmers (however defined in terms of farm size, hired proportion of labour, investment in modern inputs and technology, use of farm machinery, or the rate and mode of reinvestment of farm income), one might reasonably argue that a sharp rise in the proportion of agricultural labourers was partly the result of an increased growth in demand for hired farm labour. Any prosperity-induced leisure preference in their case could further reinforce the direct effect of production growth with technological changes on demand for hired labour.

The hypothesis of leisure preference among better-off farm households in the context of production growth as an explanation for structural shifts in the composition of rural workers has not been tested adequately yet. From the 9th round (1955) of NSS data for rural households, Visaria (1970) noted an inverse relationship between the rate of female labour force participation and the level of per capita consumption expenditure level (as a proxy for income) of the household. In the case of rural males, however, the relationship was a clearly positive one. However, the 9th round data are not nearly as good as those of recent rounds, and, besides, the stock of gainfully employed people such as from this source is much less suitable for testing the leisure preference hypothesis than the flow of employment per person per unit of time from the more recent rounds. From a recent tabulation of grouped data from two subrounds of the 27th round (1972-73) issued by the NSS Organization, Raj Krishna (1976) observes a positive relation between employment and the per capita monthly expenditure group to which a household belongs. If, instead of covering the entire range of per capita expenditure
from the poorest to the richest households, one separates out those below "a poverty line," then perhaps the income elasticity of leisure preference would come out to be more clearly positive for the rest. Bardhan (1975), after separating out from the 25th round a subset of labour and peasant households—in Punjab, Haryana and U.P.—with their consumption level below minimum subsistence norm, correlated per capita expenditure of a household with the flow rate of adult employment. He found that there was no significant correlation between the two, because in the case of the very poor, the income elasticity of demand for leisure is counteracted by the need for better nutrition to enhance capacity for work.

It seems that separate cross-tabulation for the male and the female members of a household, and for the poor and the better-off sets of households is likely to yield a more definitive result by separating the nutrition/work-capacity effect of increases in level of living at the lowest end from its leisure preference effect at the middle and upper end on the degree of work participation in rural areas.

The fourth hypothesis, connected with the first one concerning changes in tenancy, for explaining the recent shift in distribution of rural workers from cultivators to labourers is that it could be partly a lack of identification. Apart from small tenants being pressurised by their landlords into reporting themselves as hired hands, the borderline between a sharecropper and an attached labourer is being rendered thinner as a result of higher turnover of tenants on oral contract along with the landlord taking over more and more farm management decisions.

Another plausible hypothesis to explain the shift is linked with the changing age-structure of a growing population. Visaria noted from the 1961 Census that while the proportion of cultivators among male rural workers went up with age, the corresponding proportion of agricultural labourers went down. The proportion of such labourers got steadily higher among young workers down to the age-group 10-14 years. If this pattern has any general validity arising from any stable socio-economic reasons,* then any shift in age-distribution over time in favor of the very young workers would have a corresponding effect on the distribution of workers between these two categories. In the case of rural female workers, however, Visaria did not

* Younger male members of rural households with small farms are more often found seeking outside employment on wages while the older men concentrate on the family farm or craft. The strain of wage employment (which may involve daily commuting on foot across villages and is often more muscle power intensive), the lower prestige that goes with it which is less acceptable to the patriarch than to his nephew, the land received as or bought out of dowry that enables the older man to move from wage-labourer to self-cultivation—all of these can be more or less important factors in various cases.
find much of a systematic relation between the age and the proportions engaged primarily in cultivation and agricultural labour respectively, which he attributes more to misreporting of age in the case of rural women than rural men. And yet in their case there has been a considerable rise (even larger than for male workers) over the decade in the proportion of agricultural labourers and a decline in that of cultivators.

While some of these explanatory hypotheses may hold better than the others in different parts of the country, it would be quite difficult, and perhaps meaningless too in view of the tremendous heterogeneity, to try to assess their relative importance or contribution to the overall shift in the occupational structure of rural workers. Even the initial situation differed from one region to another. The proportion of wage labourers among male agricultural workers was much higher in most of the South Indian states than in the northern states of Punjab, Haryana, U.P. and Rajasthan. These regional differences arise not only from purely economic factors but also from institutional/historical differences (like, landownership pattern or mode of labour contract) as well as from interaction between these two kinds of factors over time. The dynamics of changing rural labor force structure and their socio-economic correlates are understood better within relatively homogeneous agro-institutional regions.

Within a more or less homogeneous region, it would be interesting—even for understanding the macro-level changes—to identify at the household level the allocation of labour supply across kinds of employment, and at the farm level the allocation of labor demand as between family labor and attached and casual hired labour. If this analysis is done for a series of situations over time or across regions characterized by different institutional setups, then one might see better the distinct effects of the economic and the institutional factors as also the effects of institutional changes in the context of shifts in agricultural technology. This type of studies is discussed in Section IV.

I.c. Female Work Participation in Rural Areas

Although work participation rate among rural women is much lower than among rural men, a larger proportion of female workers is engaged in agriculture and within this group agricultural labourers constitute a larger proportion as compared with the case of male workers. Over the sixties, this pattern has been accentuated. Female work participation has fallen further, the proportion of them working as agricultural labourers has increased and the proportion of cultivators declined more than in the case of the male workers in rural areas. This could possibly be interpreted in at least two ways, of which the strength of one relative to the other cannot be established adequately from the available macro-level information. Both are valid in varying degrees.

One is that this shift in distribution of rural female workers as indicated by the Census is a correct description of reality, and is
consistent with the available evidence indicating a rise in rural income disparity during the sixties. The argument usually runs in the following manner. Assuming that on an average the poorest rural households without land have more of their women working as wage labourers, that at the next level of small cultivators female labor more or less withdraws from the market and shifts to own-account work on the farm even as some of the male members might still keep on working as wage labourers, and finally at the level of prosperous farmers employment of female members of the family even on their own farm declines whether due to leisure preference or status considerations.

The other plausible interpretation is that self-employment in household enterprise tends to be under-reported in the case of women workers in general and more so among those of cultivating households. Their employment reporting is more subject to recall lapse, oversight and under-recognition than wage employment is. Some of the productive work that the women of farm families do (like winnowing, handpounding or parboiling of paddy, preparation of dairy products, storage of seeds and produce, and marketing of some of the produce) is sometimes not clearly differentiated from purely domestic work. This sort of under-reporting of female self-employment in rural areas would affect not only the size and distribution of workers in the Census and the NSS, but also the NSS-based estimates of the flow rate of their employment and its distribution as between own-account and wage-employment. Some of the findings of Bardhan's (1975) study of adult female labour time disposition in small cultivating households from the 25th round point in this direction.

The elusive nature of female work participation (from both Census and NSS data) brings to us with special force the enormous complexities that are involved in collecting the kind of data and doing the kind of analysis that can capture the reality of work and employment in the "informal" sector, which is characterized by household-level decisions about combining and arranging various economic activities including production for own consumption.

I.d. Principal and Subsidiary Work Combination

The Census data on principal and subsidiary work, and the NSS labour time disposition data, indicate that for any rural worker there is some mixture of the formal categories of work: agricultural/non-agricultural, wage-employment/own-account employment. Understanding the operation of rural labour market essentially involves identifying the correlates of the variations in the pattern or composition of this mixture.

The Census categorizes the primary occupation of a rural worker in terms of what accounts for the major part of this working time.* Then it

* There is no basic difference in this procedure between the 1961 and the 1971 Census. In the 1971 Census, a person not working over the major part of his total time (not the working time) is effectively defined as a "non-worker" by primary occupation. What he does for the major part of his work time is then regarded as his "secondary" occupation. For the "worker," the procedure is the same as in 1961.
also enumerates his secondary occupational category in terms of what takes the next largest share of working time. Someone working on his farm during days and taking up wage-employment in others' farms or a public works site is categorized as primarily cultivator or agricultural labourer, depending on their relative shares in his total employment. By this criterion, in 1961, 11% of the 100 million rural workers with own-account cultivation as main occupation had agricultural labour as a secondary occupation; and 13% of the 32 million rural workers with agricultural labour as main occupation had cultivation as secondary work. About a third of those who were (rural) non-agricultural workers by primary occupation had secondary employment as cultivators or as agricultural labourers. And undoubtedly a good many of those who were enumerated as non-workers even by the liberal definition of a worker used in the 1961 Census had some amount of "secondary" own-account employment in agriculture or other household-based productive enterprise. Coming to variations across regions, in 1961, secondary agricultural labourers amounted to more than half as many as the primary agricultural labourers in Orissa, Bihar, Tamilnadu and M.P., while in Punjab, Gujarat and Kerala they were of marginal importance.

For the 1971 Census, tabulations on secondary work participation are not yet available. However, one can reasonably expect that its more restricted definition of a worker and the long reference period would result in showing not only a very large proportion of rural non-workers as having some secondary employment in agriculture, but probably also a larger proportion of the agricultural workers as having secondary employment outside of agriculture on account of the seasonal shifts of rural labour from non-agricultural work to agricultural operations during the peak growing seasons and back again during the lean months.

The enmeshed character of primary and secondary participation of different groups of rural workers in various sectoral or occupational categories of work raises certain important questions regarding the operation of the rural labour market and the dynamics of the rural working force. How does the composition of employment of a rural worker change seasonally under different conditions and how are these related to changes in the structure of rural wage rates? How does the combination of types of work vary across regions for a comparable set of rural households, and how is it related to other regional differences? What determines the extent of secondary involvement of self-employed rural workers in wage-employment? The available Census tabulations do not permit adequate handling of these issues, and these are not coordinated with data from other sources relating to the other socio-economic factors, for many of which the unit is the household and not the individual as in Census. Besides, while the "usual status" definition used in the Census captures reasonably well the reality of seasonal work participation in rural areas, it does not tell us anything about the quantum of employment and its distribution among different types of work. For these two
reasons, one has to turn to the intensive household-level (NSS) and farm level (FMS) surveys, if one wants to find out about the economic characteristics of any particular group of rural households in relation to the intensity and pattern of employment for their members.

I.e. Changes in Rural Working Force from National Sample Survey

NSS conducted labour force surveys with reference to individuals from the 9th round (1955) up to the 17th round (1961-62). In the subsequent rounds up to the 21st (1966-67), labour force data were based on the integrated household schedule canvassed intensively among a relatively small sample of households. For the earlier series of rounds, a person was considered to be a worker if he was gainfully employed, for however nominal a time, on at least one day during the reference week preceding the date of enumeration. If he was not gainfully employed even on a single day but was seeking and/or available for work then he was considered unemployed. The workers and the unemployed thus defined constituted the labour force. In the subsequent rounds up to the 21st, though the weekly "usual status" definition of a worker was continued, the time intensity of his/her gainful employment ring the week was the criterion for determining the usual status. Following the recommendation of the Committee of Experts on Unemployment Estimates (1970), the practice of collecting data regarding the numbers of "usual status" workers and unemployed was abandoned. And from the 25th round onwards data were collected regarding labour time disposition during each day of the reference week for each member of the household, which yield the flow rate of employment (and unemployment, etc.) for each individual and not just for the "usual status" gainfully employed as in the 21st and earlier rounds. In the 27th round (1972-73) along with these, the annual "usual status" of each person was also recorded to give an annual stock rate of worker participation similar but not entirely comparable to that from the Census.

Visaria's (1970) comparison of rural labour force participation rates from the 1961 Census and from the 16th round of the NSS indicates a reasonably close correspondence in the male case; but the female participation rates from the NSS are considerably lower than from the Census, particularly among younger women below 24 years. This is due to the difference in reference period to which enumeration of women's work (or labor) force participation is particularly sensitive. The NSS uses a shorter reference period of a week, which is intended to minimize recall lapse in enumeration of time disposition. The prevalence of seasonally unstable participation being more among rural women, the shorter reference period would result in some of them not being classified as workers with the definition of weekly "usual" status. But many of them might still be classified as workers by the Census definition of "usual status" over a longer period of reference.

The 27th round (1972-73) worker participation rates based on "usual" status during the year might be definitionally more comparable with the 1971 Census figures. From available tabulations (1975) for two subrounds of the 27th round, the usual status rural worker participation rates appear to be
much higher than those from the 1971 Census. These are 64% for male, 37% for female and 51% for all persons, as against 64%, 13% and 34% respectively from 1971 Census (unadjusted). It would be very useful if the exact reasons behind this difference, which is quite large even for male participation, were investigated. As for the proportion of agricultural labourers among all rural workers (an indicator that is more relevant in the present context than the overall worker participation), the differences between the two sub-rounds of 27th round and 1971 Census are considerable. In 1972-73 from NSS the percentage of agricultural labourers was 34, 31, and 33 for male, female and all rural workers. From 1971 Census, these percentages were 25, 54 and 31 respectively.

In a situation where much of productive employment is organized within the household as a unit and takes the form of self-employment and use of family labour and of permanent or semi-permanent farm servants, and where all such employment is organized according to a seasonally changing basket of various kinds of economic activities, simply categorizing persons into workers and non-workers or the workers into cultivators and labourers on the basis of the share of work time or on the basis of an absolute cut-off point is not enough. The broad orders of magnitudes of changes can be meaningful and useful only when we know enough about the whole basket of time disposition—and the nature of its distribution in terms of seasons and in terms of the economic and demographic characteristics of the household. Many household workers in rural areas (women, children and the aged in particular and sometimes adult males as well) usually participate in gainful employment to extents varying greatly from one part of the year to another, one type of household to another, and one region to another. Categorizing them in terms of any cut-off point (whether it is the 1961 Census one "at least one hour of work a day during the greater part of working season," the earlier NSS one of work—irrespective of hours—on at least one day of the reference week, or the 1971 Census one of work taking up the major part of one's time during the year) results in leaving out a part of work participation and clubbing together all diversities in what is included. There is obviously a great deal of heterogeneity in terms of the time intensity and composition of employment among those above the cut-off point, which have to be analyzed with reference to other variables. Besides, instead of categorizing persons in a shifting and mixed situation it would be more correct to consider the flow rate and time structure of work or employment for everybody in the household. From this point of view, NSS data from 25th round onwards which record the time disposition for each member of the household might prove to be more useful.

I.f. Migration Pattern of Rural Labour

How far is the supply of rural labour responsive to spatial or regional differences in work opportunities? This covers a large number of more specific questions. To what extent does labour migrate from one rural area to other rural and urban areas? How much of it is long-term or semi-permanent and how much short-term or seasonal? What are the occupational directions of movement of the out-migrants: i.e., what is the occupational distribution of the migrants before migration from rural areas, and what is it afterwards at the
place of enumeration? Are the rural-rural or the rural-urban migrants mainly from agricultural labourers, from cultivators, or from the non-agricultural rural households? And, in relation to the pre-migration situation, what is their employment status after migration? What is the net inflow or outflow of workers for different rural regions? How have the regional disparities in recent development affected the pattern and directions of migration? These are some of the most elementary questions of migration characteristics that researchers concerned with the elasticity of rural labour supply have to contend with.

The sources of data at the macro-level are mainly the 1961 Census migration tables and the 13th round of National Sample Survey. Much of the careful analyses of these large-scale data sets have been more useful indirectly by revealing their inadequacy for answering most of these questions. The 1961 Census considers a person enumerated in a place different from their place of birth (or origin) to be a migrant. When he migrated, how many times he did so and for what durations are not recorded. Apart from the spatial directions of such "life-time" migration, the Census also gives the distribution of migrants by their present worker status and the (primary) occupational category. The Census was not concerned with the reasons of migration or the socio-economic characteristics of the migrants before migration, nor with the duration or the frequency of one's migration for work as distinct from other reasons. However, some of the findings are still of some interest in the present context. These are reviewed below.

Internal migration of women, which constitutes the bigger component of intrastate migration in particular, is largely accounted for by marriages across villages and districts, and though many of them are workers at the place of enumeration their migration reveals nothing about the pulls and pushes of work availability. Of the rural male population in 1961, about 14% were migrants, mostly (13%) from other rural areas and a small fraction from urban areas. Of the male rural-rural migrants, 71% originated from other rural areas within the district, 20% from other districts within the state and 9% from other states. Of the urban male population, 40% were migrants: 26.5% from rural areas and 13.5% from other urban areas. Of the male rural-urban migrants, 35% came from rural areas within the district, 34% from rural areas of other districts within the state and 31% from other states. As the urban areas accounted for about a fifth of total male population, it is easy to see that the bulk of their migration was from rural to rural (nearly twice as much as that from rural to urban). Secondly, the bulk of rural-rural migration was intra-district, and at nearly 8% of total male population in the country this constituted the single largest component of migration. The Census data also indicate certain other demographic features of the migrants. One is that the male-female sex ratio for migrants of rural origin is much higher (nearly double) for movements across states than across districts within a state, and the interdistrict one was similarly higher than that for intradistrict migration. In other words, migration over longer distances and from villages to cities features more of male individuals and less of entire families.

The importance of internal migration and an adjustment factor for labour supply in the rural economy are indicated, among other things, by its quantitative importance, by its directions of movement and by its occupational
structure before and after migration. Considering the two available sources of macro-level data on migration, the formats of their tabulations, and the major findings of the research done so far on this basis, the questions may be posed and answered in the following manner.

First, about the worker participation rates among those who migrated into rural areas, and about the proportionate importance of the outmigrant and the immigrant workers in the composition of rural workers. According to the 1961 Census, the worker participation rate is much higher for the migrants from rural areas into other rural areas or into urban areas compared with what it is for the non-migrant residents of the respective area—in the case of men as well as women, though obviously more so in the case of men. There could be a variety of reasons for this: the migrant from rural areas to urban or to other rural areas might be poorer than the non-migrants residents in the place of enumeration; they might contain more adults of working age; or they might simply be on an average tougher or more enterprising. The NSS 18th round data do show that the share of young adults was higher among the immigrants in rural areas (who are almost entirely from other rural areas) and still more so among the immigrants in urban areas (more than half from rural areas) than among the non-migrants in either. About their being also generally poorer, there are no data at the macro level.

From the rural sample of the 18th round of NSS conducted in 1963–64, the overall immigration rate in rural areas was 92 per 10,000 of rural population. From the urban sample, the immigration rate was 2400 per 10,000 of urban population out of which about 60% came from rural areas. Using the Census rural-urban population ratio, the outmigrants from rural areas moving to urban areas thus works out for that year to not much more than 3.3% of the remaining rural population including the immigrants. There is a very important reason why the NSS figures indicate so much smaller incidence (proportionately speaking) of both immigration and outmigration for the rural population compared with what the Census indicates. The NSS used a specific, shorter reference period. A member of a sample household was considered to be an immigrant if the usual place of residence one year before the date of enumeration had been different from the village/town of residence at the time of enumeration. In contrast, the Census regarded the immigrant as one whose place of birth (or origin) is different from the place of enumeration. The NSS data thus gives an idea of recent migration (within one year preceding enumeration), which is naturally much less than a "lifetime migration." But even if as a proportion of rural population, the extent of recent migration from rural to rural and urban areas is rather small, their quantitative importance is larger among the working population, more so among workers belonging to poorer sections or particular occupational groups like the agricultural labourers.

The Census tabulations analyzed so far indicate the following pattern according to whether the rural migrant workers came from within the district, from rural areas of other districts within the state or from other states. The proportion of agricultural labourers among immigrant workers of the first two categories was substantially larger (21%) than what it was among the non-migrant rural workers (15%), though in the case of immigrant workers from other states it was slightly smaller. The proportionate importance of cultivators, on the other hand, was smaller among immigrant workers than what it was among non-migrant workers (Table 3 upper half). It is worth noting
that the proportion of migrants who seem to have succeeded in acquiring or leasing in land for cultivation is considerable, even though it is still smaller than in the non-migrant case.

Tabulations from NSS "recent migration" data also indicate that the composition of the working rural immigrants was more heavily weighted for agricultural labourers, as in the Census data, and for craftsmen and production process workers, than was the composition of the total working rural population. Correspondingly, the share of cultivators (including farm managers) was much smaller among working migrants in rural areas than among the rest of rural workers (Table 3 lower half). Yet, as in the Census data, even this smaller proportion of cultivators was large enough to match in importance the agricultural labourers among the rural migrant workers. It seems reasonable to say that the immigrant workers in rural areas, though consisting more (i.e., more than "local" workers) of floating proletarian elements like agricultural labourers, construction workers, also contain a good many relatively affluent landowners, cultivators and artisans apart from servicemen.

Table 3: PERCENTAGE DISTRIBUTION OF IMMIGRANT AND NON-MIGRANT RESIDENT WORKERS IN RURAL AREAS BY MAIN OCCUPATION

<table>
<thead>
<tr>
<th></th>
<th>Cultivator/ Household</th>
<th>Agric. Labourer</th>
<th>Agric. Rentier/farm managers</th>
<th>Industry Worker</th>
<th>Construction Worker</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961 Census, Male workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-migrant</td>
<td>15</td>
<td>66</td>
<td>6</td>
<td>1</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Migrant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i) Intradistrict</td>
<td>21</td>
<td>45</td>
<td>7</td>
<td>1.5</td>
<td>25.5</td>
<td></td>
</tr>
<tr>
<td>(ii) Interdistrict</td>
<td>19</td>
<td>36</td>
<td>7</td>
<td>4</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>(iii) Interstate</td>
<td>12</td>
<td>24</td>
<td>5</td>
<td>7</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>NSS (18th Round) 1963-64, All Workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All workers</td>
<td>22.5</td>
<td>62</td>
<td>7</td>
<td>8.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(incl. migrants)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immigrant Workers</td>
<td>25</td>
<td>29</td>
<td>15</td>
<td>31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is worth noting that among the "recent" female migrant workers in rural areas, the proportion of agricultural labourers was even larger than the corresponding proportion in the case of male migrant workers. On a closer look, it appears that the proportion of agricultural labourers was particularly high among the women migrating from other rural areas within the same district. Much of the "short-distance" rural-to-rural migration
of women workers thus consists of those in search of agricultural wage employment. The phenomenon of tribal and scheduled caste women in paddy areas migrating in the busy season to take up agricultural work like transplantation in prosperous villages seems to be not an isolated one, but rather of some general validity.

NSS provides some cross-tabulations of the previous with the present activities of the immigrants in rural areas, and their distributions by present activity and by previous activity for each of the various "reasons for migration." From these, several interesting conclusions emerge.

First, of all (male and female) the working migrants employed as agricultural labourers at the time of survey, 50% had it as their main occupation even prior to migration, 9% were cultivators/farm managers, etc., and 14% craftsmen or production process workers. As much as half of all the migrant agricultural labourers were thus previously engaged in economic activities other than agricultural labour, or were unemployed or out of the labour force.

Another interesting finding is that among the working migrants in rural areas most were workers even prior to migration: 85% in the case of such men and 76% in the case of women. Taking all the migrants in rural areas including those working and those not working at the time of enumeration, 48% were working previously in the male case and 25% in the female case.

Thirdly, of those who had immigrated explicitly in search of employment for the first time, the percentage that had found work by the time of enumeration was 62 in the male case and 86 in the female case. Of those who came in search of employment not for the first time, more than 80% in both cases were known to have had prior employment and were also found to be employed at the time of enumeration. Of those who came in order to start their own enterprise, the proportion that was employed prior to migration was nearly of the same order as that employed at the time of enumeration. Thus, the conclusion is that the major reason for migration in rural areas has not so much been overt unemployment as the search for better employment. And, among the recent rural immigrants, those who had already found work included not only those who were working earlier but a substantial proportion of those not working earlier and/or looking for work for the first time.

All this about rural-to-rural migration, which is by far the largest component. What about rural-to-urban migration? Comparison between the distributions of these two types of migrants in terms of their previous activity reveals an interesting feature. The proportion of migrants, both male and female who were employed or working even prior to migration was much larger for rural-to-rural migration than for rural-to-urban migration. This could be interpreted as an indirect evidence in favor of the hypothesis that the second type of migration compared with the first is undertaken more by young adults seeking work for the first time or by better-off households in which the economic pressure for women and children to work is somewhat less. But as the available census and NSS data do not indicate the socio-economic characteristics of households that the migrants belong to prior to migration, we do not have any definitive general conclusions about the "class" character of rural-to-rural and rural-to-urban migration.
I. Background of Rural Migrants

On the socio-economic characteristics of rural households that send out migrants, the nature of the "push" factors, and the process of selection of regional or job destinations, which combine at the individual or at the group level to determine the composition of outmigrants and the directions of their movement, there are a few micro studies which partially reveal some aspects of outmigration pattern.

A carefully intensive, small-scale survey focused on the household characteristics of rural outmigrants was conducted by the Demographic Section of Bombay University's Economics Department in 1966 for 9 villages of Ratnagiri district in Maharashtra and 14 villages of Kutch district in Gujarat. These two agriculturally backward districts had been characterized by heavy outmigration, slowing down their population growth. The landless had been migrating as entire families and the cultivating households had been sending out selected male workers. Savla (1973) and Visaria (1970) analyzed this set of data and some of their findings are interesting in the present context. About a third of the reported male outmigration was accounted for by non-cultivating households. As the landless families tend to migrate as a whole while the cultivating families retain some to look after and derive income from the farm, the former group probably gets under-represented in a survey conducted at the place of origin. Their actual share in total or even in male outmigration may be even more than what was reported. In Ratnagiri, another 40% of male outmigration was from tiny peasant households cultivating less than an acre of land. For the rest (about a quarter of the total), in both districts the incidence* of male outmigration was inversely related to farm size.

Savla’s analysis of the Kutch villages points out an interesting difference, namely that while the incidence of male outmigration was generally higher among the households not cultivating any land, in the case of households belonging to the top castes (Brahmins and Garashiyas) it was a reverse situation: the incidence was smaller for the non-cultivating than for the cultivating households. In the case of these two castes and also the trading/business castes (Vaniyas and Luhanas), the incidence of male outmigration is higher among the landowning that among the landless households—a very plausible situation that possibly has some general validity. The upper castes in the area have a tradition of male members migrating and sending back their savings for buying land as an investment. Even in their case the migration might have originally been prompted by poverty or lack of acceptable employment, though subsequently it resulted in the remaining members getting richer. A one-point study cannot be expected to capture the entire sequence of events.

Savla’s study also shows that the outmigration and the subsequent remittance resulted in varying degrees of increase in per capita income for the resident members of different castes. There is a close positive association between the upper caste and per capita household income and the increase in income resulting from remittance. The remittance depends on the

* Incidence defined as outmigrants as a proportion of all residents (including non-migrants, return migrants and immigrants) plus outmigrants.
kind of work which the migrant takes up at the destination, which—as any casual observer knows—is far from a random process and depends very much on the caste- or community-transmitted information and contacts guiding the migrants to specific types of work. Not only will the migrating Vaniya enter trade and business guided and aided by those who had already migrated from his kinship group, and the Muslim or the Harijan migrant become a factory worker possibly helped similarly by his kin in the city, but the process will also determine for him the exact type and location of his new work. It seems quite plausible that even with a strong push factor (unless it is extreme as in an epidemic or an acute drought), outmigration from rural areas is selectively determined in terms of persons, timing and destination on the basis of the main available system of information and contact cumulated through past migration from kinship groups.

This hypothesis is also corroborated by the studies relating to unskilled factory workers in urban areas, their composition and background [Norris (1965), Papola and Subrahmaniyan (1973), Bhattacharya and Chatterjee (1973)]. Most of these studies indicate that the process of migration from rural to urban areas is structured, connecting specific groups of rural migrants (from specific regions and/or specific groups or communities) to particular types of urban work. The mechanism of such structuring is a combination of factors: specific needs (like the need for seasonal jobs) and skills of the migrants, personalized or community-based system of contacts and information, and the use of gang-leaders and other intermediaries for labour recruitment in industry and in civil construction works.

Workers employed in public sector construction like canals and dams have usually consisted predominantly of landless agricultural labourers (Raj, 1960; Dandekar, 1956). Even there, mobilization through established links with contractors and labour intermediaries is one of the factors that produce concentration of particular groups of landless labourers from particular localities not necessarily in the neighborhood of the project site. The famine relief projects are exceptions to this. Though we do not have enough data regarding the operation of all the factors normally involved, the available evidence indicates that the shape-ups of migrant labour tend to be group-or-community-specific, that the markets for different types of even unskilled manual labour are not integrated and that the patterns of rural migration to other rural and urban areas are determined not just by differential wages and employment opportunities.

Willingness to Migrate for Regular Work

NSS in the 25th and the 27th rounds canvassed some probing questions about whether the rural household had any member willing to take up regular full-time employment on wages, and about their preference for the location or the type of such employment and the expected wage. Some researchers (Raj Krishna, 1976) have interpreted the answers to indicate readiness to migrate. The 25th round gathered the response of non-cultivating labor households and from small* cultivating households. The 27th round posed the questions to all

* The lowest decile of rural households according to the size of cultivated area.
rural households, and grouped the answers by whether those willing to migrate were regular farm workers, non-farm workers, irregular workers.

Observations based on this type of data corroborates that the proportion of persons willing to leave the village for full-time employment is generally higher in the case of landless households than in cultivating households with small farms. Secondly, among both types of households readiness to leave village for full-time work is much more widespread than actual unemployment during the reference week. In the case of male workers in particular, the proportion willing to leave village for work is several times those reporting some unemployment during reference week. This observation is consistent with the earlier one based on NSS cross-tabulation of present and previous activity status of the actual immigrants in rural areas. And both are consistent with the fact that the poor cannot afford to remain without work, that in order to survive they would take up in the short run any work however little it might offer. Eventually, some of them manage to migrate in order to improve their earnings.

The overwhelming majority of those willing to migrate in this sense are in the prime working age group and most of them are illiterate. From the answers (25th round) regarding the expected income at which they are willing to take up alternative full-time work outside the village, Raj Krishna points out that on an average it is about 60% higher than the wage rate they reported having earned during reference week—a margin that he interprets as the premium for migration. Considering the percentage distribution of those willing to migrate according to the ranges of income expected, he suggests that at the all-India level there are three backward-bending migrant labour supply curves in three broad income ranges, possibly relating to three distinct classes with very little different skill/endowment levels and also present income levels. The hypothesis though plausible needs more detailed testing. Lal (1974), using the same data set at the state level and a similar interpretation of response to the rather vague question about expected annual income, reaches the somewhat different conclusion that the supply curve is upward sloping in a normal fashion—particularly for the non-cultivating wage-earning households. The main reasons for the difference is that Lal considers cumulative percentages of those willing to migrate at different wage ranges while Raj Krishna takes the absolute percent implicitly assuming that those available at a certain wage range are not available for a higher wage range. However, in view of the highly approximate nature of the income expectation figures from the 25th round, it would be better not to read too much in them. In this connection, we may refer to an intensive micro study of agricultural labour households in West Godavari district by Parthasarathy and G. D. Rama Rao (1973), which indicates that, for the male as well as the female labourers prepared to work outside the village, the expected wage rate was 20-30% higher than their actual wage rate, and for those who wanted to go for non-agricultural work the wage expectation was somewhat higher. The supply curve for work outside the village was found mostly rising forward, with a backward turn at the end.

Bardhan's (1976) analysis of the poor (households below a bare minimum of per capita consumption) subsets of small cultivating and non-cultivating labour households shows that in 1970-71 even in the agriculturally growing areas of Punjab, Haryana and Western U.P. as many as 40-50 percent
of these households reported having at least one person willing to take up regular full-time employment outside the village. Bardhan does not, however, interpret this entirely as readiness to outmigrate semi-permanently.

For an employed and yet very poor household, the willingness to spare any member to take up regular full-time work outside the village can definitely be interpreted as a very meaningful indicator of disguised unemployment (if it is a cultivating household) or low productivity/exploitative employment (if it is a labour household). But how far it can be interpreted as an indicator of willingness to migrate is not so clear always. One can commute from the village or one may be thinking of short-term stays away from it.

In 1970-71, at the all-India level, 7% of all men belonging to small cultivator households and 10% of those belonging to non-cultivating rural labour households reported as willing to take up full-time employment outside the village, particularly in public works at suitable locations. There was considerable regional variation. As a proportion of the adult male population of the two sets of households, they were more than 20% in West Bengal for both sets and in Punjab and Haryana for the non-cultivating households. It is doubtful whether such high proportions of the rural poor are entirely to be regarded as ready to migrate. In the absence of more specific information in the 25th round regarding the distance they are prepared to move away from their village and whether they are thinking in terms of a brief period or a long period, it would not be right to regard all of them as prepared to migrate.

For one district (West Godavari), Parthasarathy and Rao (1973) based on an independent intensive survey provide the needed breakdown, in the specific context, in terms of the durations for which the labourer is willing to take up the full-time or the supplementary employment, in terms of his locational preference, and the kind of work he is prepared or able to do. One of the findings is that of all the labourers with or without land who are willing to take extra or alternative employment 47% preferred it inside the village, 52% outside the village but within the district and only 1% outside the district. As this is the case of one district and as the willingness question in this study relates to supplementary as well as full-time employment, one cannot quite generalize on its basis or compare with NSS. However, the example indicates the importance of the need for detailed characterization of the willingness to take more employment.

The 27th round of NSS was intended to fill up at the nationwide level an important gap on these issues. It canvassed fairly detailed questions about preferences for farm or non-farm work, inside or outside the village, in rural or in urban areas. And these questions were asked not only from small cultivator and labour households but all other rural households as well. When the tabulations from these become available at the state level, it would be possible to separate out the cases of those willing to migrate for long periods, those willing to migrate seasonally, and those wanting supplementary or alternative full-time employment within the village. Together with their stated work preferences, wage expectations and household economic characteristics, this set of data would constitute excellent material for studying (a) the connected phenomena of low-income employment (or unemployment) and willingness to migrate for different durations or stay on for suitably located alternative (or extra) employment,
(b) the centers of "pull" for the different rural groups in different areas, and (c) the policy issues concerning how to structure rural works and other programs in terms of the location, the timing and the kind of employment to be generated so as to match the specific needs and preferences of the poorer sections of rural population.

I.i. Seasonal Migration of Rural Labour

In sections I.f and I.g, we have discussed long-term, more or less permanent migration of rural labourers on the basis of Census, NSS, and other survey data. It is possible that the 18th round NSS migration data contain an element of seasonal migration, but there it is not separated out.

Seasonal migration of labour into and out of the village economy, from all observers' accounts, an important mechanism of adjustment of labour supply to seasonal changes in labour demand for agricultural operations. Seasonal immigration of labour to rural areas is of two types: inflow of pure wage labour from outside, from relatively depressed areas with a single cropping season and without much animal husbandry; and the seasonal return of members of cultivating households to help out at harvesting time on the family farm. How far the latter constitutes a necessary contribution to the required labour input during the peak season is not entirely clear. It may be partly a necessary one, though as Sen (1975) pointed out, "working is not merely a method of producing output, it is also a way of establishing one's right to a share of the family income from a joint farm." But the immigration of outside wage labourers in the peak season and the corresponding outmigration from their own villages certainly constitute more genuine changes in labour supply in response to seasonal changes in demand or employment opportunities in one area relative to another.

During the recent period of rapid agricultural growth in certain regions and consequent sharpening of regional disparity, the importance of rural-to-rural seasonal flows as a mechanism of labour supply adjustment is likely to have increased. The data necessary for intertemporal comparison to check this are not available.

The manner in which the seasonal inflow of farm labour is organized and offered in the local market matters very much in wage determination. Observers report different modes and degrees of organization of the immigrant casual labourers in different areas. A prevalent mode seems to be through an intermediary or a labour gang-leader who negotiates the wage rate and assesses the amount of labour supply required. The seasonally migrating labourers usually move in groups. It would thus be reasonable to think that often the inflow, and by implication, also the outflow of rural labour for seasonal agricultural operations is more or less prestructured rather than a completely unorganized convergence of independently moving labourers.
Apart from moving seasonally to other rural areas for farm work and to the urban areas for temporary employment in the informal industrial or services sector, seasonally underemployed rural labour is also absorbed in rural construction works. Since the Third Plan initiated a Rural Works Programme, there has been some increase in organized public sector efforts to generate rural employment through labour intensive construction in order to absorb seasonal underemployment. The Crash Scheme of Rural Employment, started in 1971, was designed to generate 10,000 man-months of employment in each district at specified minimum wage rates. Following a series of field evaluation of performance, these programs have been subsequently modified. There is now more emphasis on locating the pockets of underemployment, on adjusting the timings, and on providing more continuous employment and creating assets to sustain a core of extra employment. Without going into the many details of policy issues of organizing seasonally complementary employment generation, we may note certain interesting aspects of the needs and preferences of seasonally underemployed labourers, as revealed by some of the field studies undertaken for evaluating performance of the programs.

It has often been noted (Rodgers, 1973; Dantwala, 1975) that in spite of apparently considerable underemployment and/or reported availability for alternative employment, the rural poor do not seem to utilize fully the employment offered through public construction works. Some of the studies used questionnaires to probe into the reasons behind this apparent inconsistency. The 25th round of NSS indicated that a very high proportion of persons from small cultivator and labor households willing to leave village for work were quite keen about employment in public works provided it was suitably located and timed. The qualifying clause is important. Later on Dantwala pointed out, on the basis of field studies in two areas of Gujarat and one of U.P., that the major reasons why many of the low-income workers considered employment in public works unsuitable for them were: (1) being undernourished and used to agricultural operations or traditional vocations, they considered heavy earthwork and stonebreaking as too strenuous or requiring a skill they did not have, (b) the timing clashed with their seasonal employment in agriculture, (c) the usually ad hoc nature and short duration of employment in public works. Rodgers too found these to be important reasons for rural labourers not participating in the local public works. Other reasons included the wages offered being considered as too low. Though on par with or slightly higher than the local off-season wage rates, these can still be too low for those who are prepared to migrate to other areas for harvesting and other peak operations. Another factor is the use of outside contractors and intermediaries rather than local institutions for mobilizing labour groups for the public works. Formal or informal tie or contract of a rural labour household to the farmer-employer is sometimes quoted as another reason, tending to depress labour mobility in general in the non-cultivating rural households normally considered to be a floating population.
Section II. Agricultural Growth and Technological Change: Impact on Wages and Employment

During the sixties, particularly since the mix-sixties when massive public investment took place in the New Agricultural Strategy to create the infrastructure for a seed-fertilizer centered breakthrough, in many parts of the country an unprecedented pace and kind of agricultural change was experienced. The irrigation-seed-fertilizer innovation is normally considered to be land-augmenting and labour-using, capable of generating large increases in employment and also distributing these more evenly over the year, thus reducing the seasonal under-employment and poverty of the landless and the landpoor. With the use of perennial groundwater irrigation and shorter duration seed varieties, the usually lean seasons (from November to April in the single-monsoon kharif belt of east and central India and from May to October in the rabi areas in the north and the north-west) have become more active over the decade. Along with the shifting production possibilities with adoption of the biological-chemical innovation, related technical changes have also been taking place, some of them labour-saving and thus modifying its effect on employment.

Barring a Lewisian theoretical extreme of the supply curve of labour being perfectly elastic over a wide range, the large increases in demand for labour would normally be expected to have significant positive impact on both employment and wage rates for labour. What have the actual changes been like? What has been the impact of agricultural growth with the technical changes on employment? How has the structure of wage rates and the composition of labour employment changed in response to the shifts in supply and demand? Considerable amounts of data collection and empirical analysis relating to these issues have taken place meanwhile. Though there still are major gaps in both, these enable us to understand some of the employment and distributive implications of recent agricultural growth.

This section surveys the macro-level studies concerning the labour demand aspects of recent agricultural growth with technical changes, the actual changes in employment, for hired agricultural labourers in particular, and their wages. Section III concentrates on the studies relating to the questions of market determination of wages. Section IV surveys the work concerning micro-level issues of allocation of labour supply at the household level, and those of composition of labour demand at the farm level.

II.a. Nature of Technological Change and Implications for Labour Demand

Perennial, controllable irrigation is growth-inducing and labour-using in two ways: it extends the effective cropping period thus increasing the productive absorption of labour on an acre of land; and it works as a vehicle for introducing innovations embodied in the new fertilizer-responsive
seed varieties which raises productivity of labour use on each cropped acre. While most of the major public sector projects for irrigation, flood control and drainage have made indispensable infrastructural contributions in this direction, the immediate impetus came, in much of north and north-west India, from private tubewells that gave farmers the kind of irrigation that encouraged them to invest in a fertiliser-intensive crop rotation with the high-yielding seed varieties. Incidentally, a similar thing took place also in West Pakistan (Nulty, 1972).

Although the water-seed-fertiliser innovation is normally considered to be scale-neutral, its adoption rate in India so far has effectively been rather unequal across size-groups. This has been due partly to the prevailing imperfections in credit (capital) markets. Though the initial installation cost of tubewells as well as the working capital for investment in improved practices came in quite large measure from institutional sources of credit and not just from private capital, the actual distribution of even such credit in most cases strongly favoured the larger farms. Some small cultivators eventually managed to use some of this type of irrigation—through buying from tubewell owners or managing to stay on as cropsharing tenants paying higher rental shares in exchange of the landowner getting the tubewell installed. But this has been very limited. Buying tubewell irrigation from large farmers requires locational proximity and having to pay exorbitant monopoly price. By and large, "green revolution" has been predominantly a medium and large farmer phenomenon.

The second feature of this phase of agricultural growth has been its concentration in certain regions—regions that were even initially better endowed in terms of rainfall and canal irrigation. The regional disparities in agricultural productivity are sharper today than they were in the late fifties and the early sixties. The regional and the size-group disparities in the growth of the leading inputs have been rightly emphasized in most of the evaluation of the impact of recent production growth on employment and levels of living of the rural poor.

In most studies of the farm employment implications of technological changes, a distinction is made between the effects of the water-seed-fertiliser innovation, of tractor ploughing, and of mechanical harvesting/threshing/reaping. This is obviously important not only for understanding what has been happening but also for future policy purposes. For, use of the growth-promoting innovations, even though accompanied by some of the labour-saving technical changes, may still be a basically distinct and independently viable process. Their concurrence, it has been argued, is largely a product of concentrated distribution of cultivated area, the fiscal policies, and the biases in the credit market favouring large farms' investment in machines. Analytically and estimationally the employment effect of the seed-water-fertiliser innovation must be separated at the macro-level from those of the mechanical innovations.
When these two effects are not separated from each other, then the seed-fertiliser technology might seem to be labour-saving (Hayami and Ruttan, 1970, in the Japanese and the American context). Hanumantha Rao (1975), using aggregative data for 265 districts in 1964-65, points out a lack of positive association between fertiliser use and number of agricultural workers per net sown acre, which he interprets as an indication that use of fertilisers and irrigation might have on balance been labour-saving. But this is not a conclusive indicator. An overall inverse association at the macro-level between per acre intensity of irrigation and fertiliser use on one hand and of labour input on the other could be the result of labour-saving mechanization that in some areas has accompanied the use of the new seed and fertiliser. Secondly, other important interdistrict variations (like those in cropping pattern, rainfall, tenurial and size distributions of land) have not been controlled in this comparison. One has to compare either intertemporally for the same region or cross-sectionally within a relatively homogeneous region in order to abstract from these basic variations. Thirdly, even with an unchanged or declining number of agricultural workers per acre, labour input per acre could have gone up a lot if earlier the workers were only partly engaged in agriculture, if more of their labour time were now shifted from other kinds of employment or idleness to agricultural work, or if there were an increased seasonal inflow of labour from other areas or decreased seasonal outflow. Most of the farm-level data (FMS) indicate a consistently positive correlation between use of labour input and use of other material inputs per acre.

Some estimates have been attempted in the Indian context regarding the effect of different types of mechanization on farm employment of labour. They are not very conclusive, the reason being partly the non-uniform procedures of the estimation and partly the inadequate data base and the approximation used.

The major micro-level studies, using farm level data, are by Hanumantha Rao (1975), Lockwood (1972), Rudra (1971), Sharma (1972), Sapre (1969), Acharya (1973), Singh and Singh (1972) and Vashishtha (1975). The major macro-level studies on the direct employment effects of technical change in Indian agriculture are by Billings and Singh (1970, 1971), Sethuraman (1971) and Raj Krishna (1974). On the indirect (or non-farm) employment effects, estimates have been attempted by Sethuraman (1971) and Raj Krishna (1974).

The micro estimates--from farm-level data--of the coefficients of labour input per hectare (for a given crop pattern and for a given category of farms, and for an improved crop pattern--with and without the specific technical changes) constitute the building blocks. With these, and taking account of the relative importance of different crop patterns, different categories of farms and the specified elements of a technological change "basket," one proceeds towards estimating the macro level coefficients. The element of the "basket" that has received the most attention is the tractor.
Most of the studies (both micro and macro level) on the direct employment effect of tractorization end up, as Raj Krishna points out, by attributing to tractors some of the effects that are really due to other innovations and farm practices. Most of the differences in their findings, and the conflicting claims made on their basis, stem partly from differences in estimation procedure, how well they control for other concurrent--related but independent--changes in farm technology from which the effect of tractor use is sought to be separated out. Part of the differences are also due to regional or sequential differences in the phase of tractor use. Given other things, the direct employment effect of tractors would differ depending on how far they are used--seedbed preparation apart--for the more labour-intensive operations like harvesting, drilling seeds, irrigating, and transporting crops.

Hanumantha Rao (1975), using farm-level data for a progressive district (Ferozepur) of Punjab during 1954/55-1956/57 when use of tractor power was negligible, and during 1968/69-1969/70 when it was quite considerable, attempts an estimate of the employment effect of tractor use. First, he compares between tractor farms and bullock farms of similar size and irrigation levels, and finds that the tractor farms have higher cropping intensity and employment per hectare. This being a combined effect of tube-well irrigation, high-yielding seeds, fertilizer and tractors, he tries to separate out the effect of tractor use. He uses a multiple regression analysis in which labour employment is a function of farm size, irrigated proportion, proportion under HYV seeds, fertilizer input, investment in tubewell, and two sets of dummy variables--one for tractor ownership and the other for thresher ownership. As the coefficients of the tractor dummy turn out as insignificant for both output and employment, he concludes that "the technological displacement of labour consequent on the use of tractors is roughly compensated" by the positive employment effects of the change in cropping pattern and intensity associated with tractor use. But, unless the increase in cropping intensity and in use of HYV seeds is essentially dependent on the tractor use, this conclusion though plausible is not quite established.

Vashishtha (1975), using the same (Ferozepur 1968-69) data set, estimates the effect of tractorization on the intensity of cropping, on output per acre as well as on employment per acre. His method consists of working out from a variance-covariance model the adjusted mean levels of each of these 3 variables for farms with tractors and farms without tractors, after standardizing for the effects of farm size, irrigation intensity, inputs of seed-fertilizer-manure-pesticide, tubewell/pumpset, and thresher. Comparing the adjusted mean levels with each other and with actual ones, he finds that tractorization had no significant effect on either cropping intensity or output per acre. The observable differences between tractor farms and non-tractor farms in these two respects were mainly the results of differences in irrigation and seed-fertilizer input rate. As for farm labour employment per acre, while the standardized effect of tubewell/pumpset was positive and that of threshers negative, the effect of tractorization turned out to be neutral. The adjusted mean levels of employment per acre on farms with tractor and those without it when compared with each other and with their observed mean levels showed that very little of the overall difference was attributable to the tractor.
Both the studies, being based on farm management data, are admittedly limited by having to analyse in terms of tractor ownership rather than tractor use. Besides, unless the breakdown of total use of tractor in terms of various operations (particularly its distribution between seedbed preparation, irrigation and threshing) is known, one cannot be sure about the stability of the employment coefficient of tractorization. For, the employment effect would change with a different (operationwise) composition of tractor use. The third limitation of tractor studies based on FMS data is that the estimated effects on cropping intensity, output and employment per acre are worked out not for a specific crop, but for all crops put together, many of which may not be using the tractor at all.

Sharma (1972), with cross-sectional data from a pilot study of HYV Programme in the Karnal district of Haryana, and using the method of comparing between tractor and non-tractor farms similar in terms of size and irrigation, concludes that the labour used per acre is about 7% higher for bullock-farms, which is not a very large difference considering that it might include the effect of the difference in fertilizer use. The studies by Singh and Singh (1972), Crewal and Kahlon are more or less similar, relating to western U. P. and parts of Punjab respectively. Sapat's study, relating to a relatively backward region (viz., Dhulia district of Maharashtra), takes output per acre as an indicator of employment per acre. It is perfectly possible that to the extent tractor use contributes to cropping intensity it also increases employment, with the labour saved on ploughing outweighed by the labour needed for more weeding, harvesting, threshing, etc., unless any of these are also mechanized with the help of a tractor. But even then the main problem is to separate out the effect of tractor use on cropping intensity from the effects of other related but independent factors like irrigation. Acharya (1973), with farm-level data from two districts of Rajasthan, compared labour use per cropped acre between a tractor-operated HYV user and a non-mechanized HYV user, and found that it was higher for the first one. This, of course, assumes cropping intensity to be entirely independent of tractor use, which may be so for a particular crop rotation and not so for another.

Lockwood's study, though it does not measure the effect of tractor use, is interesting for at least two reasons. One is that he manages to study the features of all tractor using farms—those owning it and those hiring it. Secondly, he considers separately the employment effects of different operational uses of tractors. He uses the farm survey data collected by the Programme Evaluation Organization, during 1967-68 to 1969-70, for samples of farms using HYV seeds and those not using them in 8 districts from Punjab, Haryana and western U.P. In the sample of HYV using farmers, while 9% owned tractors, 40% hired or contracted its service, although they used it for smaller proportions of area. The farm size-distribution of tractor users (which included some non-HYV farms too) was much more broad-based than that of owners. In most of the projection exercises (as in Billings and Singh), it is assumed that the tractors would be used in the multiplicity of farm tasks for which they are designed and hence that there would be no time for hiring out, "unless the farmer wants to use his tractor beyond break-even point." But in the samples studied by Lockwood, mostly representing an initial phase
of tractorization, the tractors were actually being used "mainly for land preparation, including a good amount of contract work, and were not used for many additional operations" except for carting during harvest season and as "automobiles" during off season. As the number of tractors increases and their owners apply them more and more to additional operations like weeding and harvesting with the use of various attachments, the demand for labour is likely to be affected much more seriously. Large farms' investment in these attachments is more common now than it was five years back.

Since there is a definite large farm bias in the use of tractor (though less than the bias in its ownership), partly because of his greater access to working capital and partly because of some economy of scale involved in tractor use, it is of some interest to break down the employment effect in terms of family labour, hired casual labour and permanent farm servants. Rudra's study (1971), based on a sample survey of large farms (above 20 acres) from 11 districts of Punjab in 1968-69, makes some interesting comparisons regarding the composition of labour use. Considering the relative frequency distributions of these large farms by the number of farm servants and the number of mandays of casual labour used for 3 mechanization categories—(a) farms having tubewells, pumps and tractors, (b) those having tubewells and pumps but no tractors, and (c) those having none, he observes that the mechanized farms (particularly group a) save some casual labour in per acre terms compared to the non-mechanized farms but the intensity of use of permanent farm servants is more or less the same (about 26-29 acres per servant) across these categories.* Given a certain number of male family workers on a large farm, the addition of tubewells and pumps reduces (at the cross-sectional level) the demand for permanent farm servants somewhat but increases that for casual labour. The further addition of tractors then increases the demand for farm servants and leaves that for casual labour unchanged. Pumps and tube-wells seem to displace permanent farm servants, who presumably were used earlier for lifting water and maintaining the bullocks, and create demand for casual labour. Tractors seem to raise demand for permanent farm servants and reduce demand for casual labour. The net effect on total use of hired labour in farm category (a) is, however, not clear from Rudra's study.

Considering all sources of farm labour, he finds that as the number of male family workers on a large farm increases, the demand for permanent farm servants declines within all the three categories, while that for casual labour declines in (a) and (c) but not in (b). Vashishta's analysis of Ferozepur farms (mostly large) also indicates a slightly lower proportion of casual to all hired labour on tractor farms than on non-tractor farms, which is consistent with Rudra's point.

* Rudra's mechanization effect on labour use per acre is admittedly mixed up with the farm size effect, if there is any even within the large size-group.
The available micro-level studies in the context of north-west India tend towards the conclusion that tractorization at least in its initial phase did not have any independent effect on cropping intensity. * Nor did the use of tractor significantly affect the use of hired labour per acre, as its use was confined mostly to seedbed preparation. It seems to have some effect on the casual-attached composition of hired labour, raising the attached component. However, this could be partly an effect of the larger cropping intensity itself. Lastly, in this region at least, tractor use reduced the use of family labour at the tillage/sowing stage.

Bell (1972) studied farms in a somewhat different region—the Kosi canal area in Bihar. His conclusion is that although tractors used for land preparation alone could be called land-augmenting, their overall net effect on labour use would be negative or positive depending on the adoption of labour-intensive intercultural practices. Comparing between a traditional paddy-jute rotation with a 3-crop (wheat and two crops of paddy) rotation with high-yielding seeds, he observes that the constraint for the switch is not labour shortage but shortage of draught power which is required for two more or less simultaneous and critically time-bound operations (threshing the harvested crop and preparing land for the next one). Besides, he argues, the bullock power needed for the switch would be much more expensive for the farmer than tractor power—not only in terms of relative costs of comparable efficiency units but also the land area that would have to go in raising the requisite fodder. Given the particular time schedule of the improved rotation, and given the supply and the efficiency of local bullocks, use of tractor for land preparation is thus regarded as a concomitant of the labour-using seed-fertiliser innovation. For ploughing and threshing, human labour complementary with bullock labour is displaced by tractor. To get the net effect on employment, the labour displacement on account of these two operations is to be offset against the increased frequency of major operations and the larger-sized crop of each for the harvesting operation. The question of trade-off between a somewhat smaller total employment and its greater seasonal stability (and shortening of total slack period), Bell points out, is also to be taken account of in considering the effect of tractor use for land preparation alone.

When it comes to projection of the employment effect of tractorization, one must take account of the likely or the planned composition—operationwise—of tractor use. The employment effect experienced in the initial phase, and analysed by the micro-studies discussed earlier, is specific to the particular operational composition observed at that time. Given the official encouragement of tractorization (liberal import, subsequent delicensing of its domestic production, subsidised credit for buying it), its continued rapid expansion is likely to make the labour-displacing effect get stronger as it is increasingly used for more labour-intensive operations. Adjusting the

* However, together with tubewells and pumps, the use of tractors affects the cropping pattern to the extent it does away with the need to grow fodder for bullocks for lifting water and ploughing.
growth in tractor stock to what would be needed for just seedbed preparation, coupled with institutional arrangement for handling its dispersed use, can be a policy issue of considerable importance.

For macro-level projection of the direct employment effect of technological change, Raj Krishna (1974) carries out an algebraic decomposition in terms of the effects attributable to its different elements. In the same paper he surveys the other macro-level estimates of direct and indirect employment effects of mechanization. The basic procedure used in macro-level projection of the direct employment effect is to apply the coefficients of labour input for each crop, with the old and the new techniques of raising it, to the projected areas under each crop grown with the traditional technique and with the new technique, respectively.

A major study of this type is by Billings and Singh (1971), who conclude that over the period from 1968-69 to 1983-84, farm labour demand in Punjab would decline by 17%, assuming that in the terminal year 20% of all cropped acreage will be tractor ploughed, the entire wheat crop mechanically threshed, all corn mechanically shelled, 50% of wheat crop mechanically harvested, and tubewells and pumpsets will cover 60% of irrigated area. They assume a 14% increase in cropped area and a cropping pattern determined by past trends and optimality conditions. Of the total direct labour displacement in the model of Billings and Singh about half would occur in the peak harvesting months on account of mechanised harvesting and threshing, affecting the casual labourers most. The remaining, on account of pump irrigation and tractor ploughing, would be spread over the year.

In Raj Krishna’s model, which clears up some of the common algebraic mixup in decomposition of incremental effects, the direct employment effects in the Punjab context are worked out separately (for wheat alone and then for all crop production) in terms of the effects of cropping pattern, cropping intensity, specified items of mechanization, and the interaction element. Assuming a terminal year pattern of technology similar to that assumed by Billings and Singh, his model indicates for Punjab over 1968-69 to 1973-74 a sizeable negative direct employment effect for wheat and rice combined, which is composed of a large negative one on account of the assumed rates of mechanization, partially compensated by the positive effects on account of rise in cropping intensity and on account of change in rice-wheat mix. He then separates out the direct employment effect of tractors with their multiple uses. For wheat, assuming that ploughing and threshing are entirely tractorized and half of the pumping is done with tractor, the total direct employment effect of tractor is indicated as -90 manhours per hectare, composed largely of the effect of mechanical threshing. For rice, assuming only the ploughing

* Raj Krishna’s (1974) model indicates effects of technology, crop-mix and intensity on labour use (manhours) per net hectare for wheat and rice combined (Punjab, 1968-69 to 1973-74) as -74.51, +17.04, +27.67 respectively. After allowing for a small interaction effect, the total direct employment effect of the entire "basket" of innovations would be -30.14 manhours per net hectare.
and half of the pumping are done by tractor, the corresponding employment effect would be less adverse (-27 manhours per hectare). For wheat and rice combined, the employment effect of tractor technology (comprising mechanized ploughing, threshing and irrigation) works out as -95 manhours per hectare which, set against the +64 manhours/hec tare arising from the other elements of change (including those in pattern and intensity of cropping arising from reasons other than the use of tractors), is the only reason in this model for the negative direct employment effect of technological change. The negative "substitution" effect of the technological change; Raj Krishna concludes, though outweighed by the positive "scale" effect of growth, would thus mean slower farm employment growth rate corresponding to a given agricultural production growth.

It has been argued that the manufacture, servicing and operating of agricultural machinery increase non-agricultural employment which must be taken account of in evaluating the overall employment effect of tractor technology. Raj Krishna's illustrative calculations indicate that the growth in non-agricultural employment induced by something like a 5% rate of growth in agricultural production with labour-displacing technological change will not fully compensate for the slower growth in agricultural employment. To avoid rural unemployment, he argues, the policy maker would have to adjust the "growth-innovation-demand mix."

In the existing literature on the employment effect of tractor, there remains a discrepancy between the macro-level direct effect (negative) estimated or projected on the assumption that tractor is used for the multiplicity of operations for which it is designed and the micro-level effect (more or less neutral) derived from its earlier actual use which, from available accounts, consisted during the sixties mostly of ploughing and very little of threshing. Mechanical harvesting, reaping, shelling, threshing are more strongly labour-displacing than mechanical ploughing. How far, from a policy point of view, tractor use has necessarily to be an all-or-none choice is not altogether clear.

So far, during what has been an initial phase of diffusion of technological change in agriculture, the combined effect of controlled irrigation, high-yielding seed varieties and fertilizers on farm employment has dominated over that of mechanization. When it comes to macro-level estimation of likely employment growth, from the planning point of view of what is required for utilizing rural labour supply, it would be interesting to explore the role of institutional and policy alternatives in achieving a normative combination of the two elements of technological change: the water-seed-fertilizer innovation and the mechanization of labour-using operations. The explicit bias of the New Agricultural Strategy towards regions with developed irrigation potential, and the institutional biases against small farmers in general and tenants in particular in the distribution of credit and other infrastructural facilities have been noted in many studies not only for their direct dampening effect on employment but also for the
indirect one through affecting the very choice of the technological alternative for investment by large farmers. The issues of corrective policy concerning credit, agricultural taxation, land consolidation with a view to groundwater utilisation, etc., which have been engaging considerable research interest in the Indian context, are important from the point of view of influencing the mode of organization of agricultural production and the farmers' choice of technology.

II.b. Changes Over Time in Employment of Rural Labourers

How has the labour demand effect of the given pattern of agricultural growth shown up in the levels of employment/underemployment for the major groups of suppliers of rural labour and in their wage rates? What has been the share of labour in the benefits of increasing production? How has the composition of farm labour input (in terms of unpaid family labour, wage labour, and, within the latter, casual and attached labour) been changing and what are its correlates? Besides, how does the non-agricultural component of the rural labourers' total employment relate to their farm employment, in a static and then in a changing setup?

Understanding the operation of rural labour market, the shapes of the macro-level supply and demand curves and the mechanism of allocation, in a situation where decisions regarding supply of labour as between market and own-account work and demand as between family labour and hired labour are taken by a large number of households operating simultaneously on both sides of the market, is obviously far more difficult than in a hypothetical situation with capitalist farmers purely hiring in, non-cultivating labour households purely hiring out, and peasants completely outside the labour market. The mixed category of rural households, with own productive enterprise and entering the market to demand as well as to supply labour in various combinations, which by all empirical account is very sizeable in any region of the country, seriously limits the use of any pure-category analysis of rural labour market.

Since a lot of small cultivators hire out some of their family labour and hire in some, since a part of the labour hired by large farmers is in the form of attached labour, since both small cultivators and landless households derive part of their wage employment from outside agriculture within the rural area, and since the rural labour market interacts with the urban labour market, it becomes difficult to generalise in terms of the available theoretical formulations. Fragmentation and imperfections in the rural labour market might result in rising wage rates for some suppliers of labour and low-productivity employment or unemployment among others even within a region. Similarly, there may be a lack of adjustment across seasons. Across regions, of course, institutional differences add an important dimension to the question of the impact of agricultural growth on employment and wage rates for rural labour.
The rest of this section surveys the major findings of existing empirical studies on the structure and the changes over time in rural employment/unemployment/underemployment and on the correlates of differences in employment/underemployment. Following that we move on to the studies on changes in wage rates for agricultural labour, labour’s share, and on correlates of cross-sectional wage variations.

II.b. (i). Employment and Underemployment in Rural Areas: Changes over Time

The Report of the Committee of Experts on Unemployment was followed by a chain of intensive discussion on the conceptual and the empirical problems of measuring rural employment and unemployment, on interpretation of available estimates, and identification of qualitative characteristics of unemployment. Raj Krishna’s survey (1976) of this discussion is an adequate reference for the conceptual issues and methods of measurement.

Recent rounds (25th and 27th) of NSS collected the time disposition data for each member of a household that are necessary for measuring flow rates of employment or unemployment for the household or some part of it (like, the working age men). The earlier rounds give the flow rates for only those members of a household whose employment during the reference week exceeds a specified minimum. Rounds of NSS up to the 21st, and then the 27th provide data for measuring weekly stock rates of employment and unemployment. 1971 Census and the 27th round of NSS yield the annual stock rates. Raj Krishna’s survey conveniently puts together these measures in a comparable form.

The annual stock rate of "usual status" or chronic unemployment increased over the sixties from 0.35% in 1961 to 1.07% in 1971 (adjusted with 1961 Census definition) and 1.01% in 1972-73 (from 27th round of NSS). However, this is not a meaningful indicator of employment/unemployment for the major suppliers of rural labour, because the poor cannot afford to remain chronically unemployed at a reservation price.

Stock rate of "current" unemployment is somewhat more relevant. It shows a declining trend over the decade (Raj Krishna, 1976). Defining unemployment for a person as less than one hour of work during the reference week and availability for work, the rate was 5.6% in 1958-59, 3.8% in 1964-65, and 3.4% in 1972-73. Defining severe underemployment as less than 28 hours of work in the reference week and availability for more work, the current or weekly stock rate of the unemployed and the severely underemployed in rural areas seems to have declined from 11.7% in 1958-59 to 6.5% in 1964-65. The corresponding rate for moderate underemployment (working 28-42 hours in the week and available for more) dropped from 16.1% to 9.2%. A rise in the stock rate of "chronic" unemployment along with a decline in the stock rate of "current" weekly unemployment is not difficult to explain. It is because the former relates more exclusively to the rural rich. Educational levels
of the chronically unemployed are higher than those of the rest of rural people, particularly in the case of women (Raj Krishna, 1976). The educated being usually better off can afford to be voluntarily unemployed while looking for a suitable job.

Ahuja (1975) pointed out that if the composition of persons working below a specified cut-off level kept changing from week to week, then an average estimate based on weekly stock rates might be misleading. But if one considers separately the subrounds that comprise any rounds of NSS, then the seasonal fluctuation which causes this problem will be minimised. Besides, even in more aggregative estimates of weekly employment/unemployment rates, this problem will not arise if one uses flow rates (mandays or hours per person per unit of time). These are not only less ambiguous but also more meaningful for the purpose of comparison across regions with heterogenous production and seasonality conditions.

In the rural context where almost every member of a household (except perhaps the pure labour households) does some economic activity at some time or other in a year, for measuring the flow rates of employment/unemployment of an entire household or any group of households or a state one must consider the time disposition data for all household members. This is what the 25th and the 27th rounds collected, but not the earlier rounds. Thus, comparisons over the sixties are difficult—particularly for aggregative rural situations comprising various categories of households.

However, as the prevalence of part-time, seasonally varying, work participation is likely to be somewhat less among the labour households than among cultivating households, a comparison over time for the "working" members of these households might make more sense. NSS collected such data regarding not only employment but also wages/income/consumption for agricultural labour households in 1950-51 and 1956-57 and for rural labour households (including those engaged primarily in non-agricultural labour) in 1963-65. There is a definitional non-comparability problem between 1950-51 and the later ones: an agricultural labour household was defined in 1950-51 as one with the major part of its members' working time taken up in agricultural wage employment; later it was according to whether the major part of household income came from wage employment (in agriculture for 1956-57 and all kinds for 1963-65). For 1970-71, 25th round collected data for the "weaker sections of rural households," comprising two groups: non-cultivating wage-earnings households and the lowest decile of cultivating households. These two groups, though not always precisely representative of the population of agricultural labour households, do consist predominantly of this category (about 60-80% of their employed weekly mandays on an average were in agricultural wage-employment, and the proportion is even more if one considers non-farm wage employment). There are a few other differences too which affect comparisons over time; for example, the first two labour enquiries (1950-51 and 1956-57) made a distinction between casual and attached laborers which was not made in the later ones. However, broad comparisons over time are still possible on some common basis for just those household members who are mainly working as
agricultural labourers in 1950-51, 1956-57, 1963-65 and 1970-71. As the available tabulations are at the state level (except the earliest labour enquiry which gave the data for regions within a state), it is not possible to use them for more detailed micro-level analysis. Not much use has been made of these labour enquiry data sources except to find out whether their earnings and level of living had risen or declined. The data can be used also for analysing the pattern of cross-sectional variation in their employment derived from various sources, wages, modes of wage payment, nature of labour contract, etc.

Comparing the case of the relatively full-time agricultural labourer between 1950-51, 1956-57 and 1964-65, picked out from the somewhat divergent sets of labour households covered in the three years, it seems that his total employment (on wage and on own account) in a year had on an average declined a bit from 267 8-hour days to 255 and then risen back to 267: a remarkable stability over a 14-year period, a slight improvement if one takes the more comparable years. The 12-day increase in per workers total employment from 1956-57 to 1964-65 was composed of a 20-day increase in wage employment and an 8-day decrease in self-employment, indicating that the trend towards increased market dependence of the rural poor for work started even before the new technology that accentuated it.

Unemployment comparison between the two earlier years and the later one is difficult because the distinction between casual and attached labourers was given up. The unemployment question is obviously relevant more to casual labourers. In 1950-51, a casual agricultural labourer was unemployed due to want of work for 67 8-hour days in a year (i.e., for 20% of his days of labour supply). In 1964-65, unemployment was 48 days (i.e., 15% of labour supply) per worker for casual and attached agricultural labourers combined.

In 1970-71, from the 25th round, unemployment during the reference week was 7.18% of labour supply of working age men (15-44 years) of non-cultivating wage-earning households and 11.75% for working age women. It was 5.54% and 9.79% of labour supply of working age men and women respectively of small cultivator households. How far the difference between 1964-65 and 1970-71 is a genuine decline in unemployment, and how far it is on account of differences in reference period, sampling design and sample coverage, have not been researched yet.

Thus exact numerical comparisons of rates of employment and unemployment over time are rather difficult with available data and are at best rough approximations. Cross-sectional comparisons are likely to be more accurate. It is also possible to compare ranks (across states) over time in respect of employment, unemployment and wage rates for agricultural labour.

An interesting difference, from 25th round, is that the flow rate of unemployment is significantly higher among the landless labour households than among the small cultivator households. Across regions too there are significant differences in the unemployment rate among the non-cultivating
labour households, which was considerably higher than the all-India average in Tamil Nadu, Kerala, Orissa and Rajasthan, and was considerably lower than average in Maharashtra, Haryana and Assam. Most of these differences can be better understood after one has considered them in relation to certain other characteristics of the rural households or the persons concerned. NSS 25th and 27th rounds collected data regarding some of the micro-level correlates of employment/under-employment, like farm size, consumption level of the household, the age-sex distribution and educational levels of its members, the availability for full-time work, etc. Some household-level cross-tabulation has been done with 25th round for a few states by Bardhan (1975), in connection with identifying economic/demographic characteristics of the "poor" households. Parthasarathy and his co-workers (1973) have done interesting cross-tabulations for a sample of rural labour households in West Godavari district.

The labour household survey gives an idea of that part of total rural labour supply which comes from households with too little means of self-employment. The market supply of, and the market demand for, labour in most rural areas of the country is still not the major part of total labour demand or supply. The 27th round fills up an important data gap in this respect by collecting labour time disposition data for the primarily cultivating households as well as for the primarily non-cultivating wage-earning households. However, the relevant tabulations are not yet available for analysis.

To summarise some of the research findings discussed so far concerning employment/unemployment of rural labour, particularly changes over time, at the macro level:

The proportion of rural workers primarily employed as wage labourers has been going up in the recent period in contrast with its stability over the fifties; and the importance of all self-employment in their total employment has been going down.

The incidence of open unemployment (in terms of days without work but available for work) per person is more among the rural labour households than among other rural households. Correspondingly, disguised unemployment must be less in their case than in the case of the self-employed cultivating households.

Even in the case of labour households, the flow rate of open unemployment is quite small, and from available evidence, is going down on an average over time. But this is partly because at any point of time the desperately poor may not have a reservation price at which he chooses to remain unemployed. Better indicators of unemployment in their case would be their willingness to take up alternative part-time or full-time employment, and their level of income. Their answers to probing questions regarding willingness to take up alternative full-time employment have to be cross-tabulated with other characteristics to identify whether the reason is too little employment or too low wage rates or both.
To get a complete idea of actual employment effect of the recent agricultural changes, labour time disposition data for non-cultivating labour households have to be studied along with those for self-employed cultivating households. Available NSS data do not permit this type of study over time. But the 27th round would permit a more integrated one-point study of the labour supply and demand situation covering all major groups that generate them in rural areas.

II.b (ii). The Surplus Labour Question

It has often been pointed out that, except for the landless labourers, much of rural unemployment may be disguised rather than open. It may be disguised as employment: a given amount of work in the household enterprise may be spread or stretched over longer hours or shared among a large number of family members, with consequent over-reporting of self-employment (in time units or in person units). Unemployment may also go unrecognized and get reported as outside the labour force altogether (Sen, 1975; Bardhan, 1975). When unemployment is defined as the time for which one is available for more work, the respondent may interpret the question as one relating to availability for insecure or otherwise unsuitable work. Or, if he regards the prospect bleak anyway, he may simply not care to talk about it or too resigned to it to recognize that he is unemployed.

Empirical studies on the surplus labour question in Indian agriculture have mainly been of two types. One involves direct estimation of the stock of labour time (with reference to a specified norm of working time per adult worker engaged in cultivation) and the required labour time for maintaining existing production level with existing technology, the difference between the two being a stock estimate of surplus labour. The second approach is through estimation of marginal productivity of labour in agriculture in order to find out if it is zero, and if positive whether it is significantly different from the prevailing market wage rate for hired agricultural labour.

The major attempts at direct estimation are by Mehra (1966), Ahuja (1973) and Rudra (1973). Using FMS data, Mehra calculates the required number of workers per acre for each size-group of farms by assuming that it equals the actual number of workers per acre in the highest size-group (where the proportion of hired labour is the largest) multiplied by the mandays of labour input per acre in a size-group as proportion of mandays of labour input per acre in the highest one. The sum of differences between the actual number of workers and the required number obtained in this way for the different size-groups is the surplus. This assumes that the mandays of labour put in by a worker in the highest size group can be regarded as the norm for calculating the required number of whole-time workers in the remaining size-groups. If there are major differences in cropping pattern among the various size-groups, and in the extent of employment outside crop production or farming, then this assumption may not hold.

Ahuja uses coefficients of labour requirement per acre for each of the major crops calculated as averages on the basis of farm management data relating to a number of states, and also a standard labour coefficient for
maintenance of animals. Applying these to the actual cropping pattern in Rajasthan, she works out for each of the two major crop seasons, the labour requirement. The difference between the actual total number of workers engaged in farm production multiplied by a 2400 hours a year work norm and the requirement is the stock of surplus labour days which is taken as the combination of disguised and open underemployment in this exercise. The use of standardised labour coefficient for a crop—in the form of an average of actual labour coefficients over a number of varied regions—implies that more labour is used for raising wheat (i.e., employment productivity slower) in a Rajasthan district than on an average in a number of other major wheat-growing states.

Rudra’s estimate for a district in West Bengal, on the other hand, is simply that of open underemployment in farm households. He takes the actual amount of labour used in cultivation as equal to the required amount. Then he deflates the hours worked on the farm by family workers of farm households by a 2400 hours annual work norm to derive the required number of whole-time family workers. The rest of actual family workers is taken to constitute the surplus. As the peak season work load is much higher than the average, Rudra calculates in the same way the surplus manhours for the peak season, and also for different size-groups of farms separately. The smaller peak season surplus still works out to a significant proportion of male family workers actually engaged in farming. This is simply a measure of the difference of agricultural work from the specified norm of 300 days in a year, which tells us nothing about how much of it is unemployment and how much is leisure preference or outside the labour force or spent in essential non-economic activities. It is not surprising that Rudra’s estimate shows up more surplus labour defined in this way among the larger farms where it may be largely voluntary. Among the smaller farms, the measure reflects work sharing among household members, as a concomitant of income sharing, which is an important but not the sole indicator of their underemployment.

Ahuja’s and Mehra’s estimates are intended to indicate low-productivity employment along with open underemployment of the work-sharing type. But the criterion for determining efficient employment that they use—per worker employment in large farms or an average of regional labour inputs per acre for each crop—can give misleading results for a number of reasons. Production functions even for the same crop can differ across regions and farm size-groups, depending on soil, water and other conditions. The crop-mix can differ very much even within a region, among size-groups.

Another major limitation of all of these estimates lies in the artificial separation of agricultural work from an essentially integrated totality of rural employment. Ahuja takes account of labour input for animal husbandry which is important in Rajasthan. There are various other kinds of work as well—farm, non-farm, on own account, as an employee, inside the village, outside the village—that the family workers of a farm household combine in seasonally varying proportions depending on the environment and their ingenuity in utilising it. Calculating underemployment or labour surplus based on farm requirements alone is likely to give a gross overestimate in most cases. For planning the volume, the timing and the location
of additional employment streams to be generated through rural public works, it would be more useful to have an estimate of the surplus mandays left over after taking account of all the different types of economic activities that the members of the household engage in and the labour that is required to maintain all the ongoing work. And when it comes to estimating the requirement of labour, it might be safer after all to consider the actual uses of labour input in the various activities than to apply any standardized norm of average labour productivity taken from other regions or from a particular farm type. But then it will not tell us about disguised unemployment for the rural self-employed.

The marginal productivity approach to measuring disguised employment has led to quite a few estimates with Indian data, the usual purpose being to prove or disprove the Nurksian hypothesis that the marginal productivity of labour in an overpopulated, traditional agriculture is not significantly different from zero, or to find out if in the case of family labour-based small farms it is significantly different from the prevailing market wage rate. For this, the problems and the limitations of the marginal productivity estimation approach are well known, most of them pointed out by the authors themselves. These are discussed in details in Section III. c. Here we shall briefly mention the major ones. First, the estimated marginal productivity of labour includes the marginal productivities of all those inputs (like equipments, bullock labour) that are complementary to labour in production, but are left out of the production function estimate as they have to be in order to avoid the problem of multicollinearity. Secondly, family labour and hired labour may be different from each other in terms of efficiency per unit of time. Hence, an estimate based on some "efficiency" units of labour input might give a somewhat higher marginal productivity than what would seem to be the case with all labour regarded as homogeneous. The question of possible heterogeneity of labour used for different farm operations is also relevant in a related way. Thirdly, the complementarity between farm labour used in different seasons for different time-bound operations with inflexible sequence makes it unrealistic to think in terms of marginal inputs of time-units of labour, as is assumed in the usual non-seasonal interpretation of production functions. Unless the marginal unit of labour is so defined as to incorporate the entire chain sequence of operational inputs of labour, the seasonal complementarity aspects may not be taken care of. This would be hardly possible with available data,* in view of the seasonal complementarity of labour used in agriculture being less than perfect and regionally varying.

* The FNS data are not readily available for each farm in the form of labour inputs for the different crop-operations and/or for the different operation-periods, even though the data were often collected from the field in that form. S.K. Nath (see Oxford Economic Papers, Nov 1974) estimated, for Ferozepur district 1967-68, the marginal productivity of labour during slack and busy season separately. He found it to be zero for the slack season and positive for the busy one, indicating seasonal underemployment. He took casual labor input as an approximation for the busy season and labour days of permanent workers as an approximation for the slack season. The validity of this procedure is limited by the fact that the permanent workers intensify the share of their work time on the farm during the busy season.
The operational significance of indicating the presence or absence of surplus labour in agriculture by measuring its marginal productivity is less than the attention it has received. More relevant questions are about its extent in different regions and for different sections of rural people. The issue of physical transferability of surplus rural labourers without affecting production is irrelevant from the policy point of view in a context where unskilled labour supply is not generally a bottleneck for industry growth, where there already are substantial migration flows from rural to urban and other rural areas and where urban unemployment is fast becoming a major social problem. An immediately relevant objective in this context would be to correct rural underemployment—open as well as disguised or low productivity—within the rural area itself through suitably designed public investment. For that purpose it would be useful to quantify underutilized labour regionally, seasonally and household-group-wise, after taking account of all the economic activities they are normally engaged in and not just their farm work. The NSS time-disposition data give some idea of the open underemployment. In view of the limitations of available estimates of disguised unemployment noted earlier, it might be better to consider the rural wage rates (their levels at a point of time and changes over time) as an additional indicator.

II.c. (i). Changes in Wage Rates Over Time.

To recollect some of the general observations that can be made from our present empirical understanding of the macro-level situation: (a) employment of labour per hectare has been going up with agricultural growth, at least during what has been the initial phase, with the labour-using irrigation-seed-fertilizer package of innovation taking the lead and dominating over the effect of labour-saving mechanization, although the generation of employment is probably less than what could be achieved if adoption of the innovation were more broadbased with correction of the impediments to the small farmers' adoption; (b) the increases in employment have consisted mostly of hired labour; (c) adoption of the land-augmenting innovations has not only shifted upward the seasonal distribution of farm employment, but also reduced the extent of the dips and the total duration of slack periods apart from raising the peak levels.

How did the wage rates for agricultural labour behave over this period?

The source of wage data used by Jose and Krishnaji is a Ministry of Food and Agriculture publication called Agricultural Wages in India (AWI). Apart from these two major sources, wage data are available from Farm Management Surveys (FMS) relating to a number of selected districts for a few years. Quite a few scattered sources of small-scale data on agricultural labourers and their wage incomes are also available, * though their utilisability is somewhat more limited by differences in sampling procedure concepts used for identifying labour households, and data processing methods.

Data: There are important differences between agricultural wage data from the three major sources, viz, NSS, AWI, and FMS, from the point of view of intertemporal and cross-sectional comparisons. NSS--in the three rural labour enquiries (1950-51, 1956-57, and 1963-65)--collected data regarding wages, employment, levels of living for the gainfully employed members of rural households primarily dependent on agricultural wage employment (all wage employment in 1963-65). In its 25th and 27th rounds (1970-71 and 1972-73), NSS collected data on employment and wages for members of non-cultivating wage-earning rural households, along with similar data for other household categories. There are certain conceptual and procedural differences as between these different rounds of NSS data, like scrapping of the distinction between casual and attached labourers which was used for the earlier years. However, after careful processing intertemporal comparisons with these data are possible.

Unlike the NSS data, in which the respondents belong to rural labour households, FMS data are collected from sample farm households as part of the cost accounting survey. The farm-level data on employment of hired labour and wages paid give the average wage rate paid by a farmer for the labour he actually hired. In other words, while the NSS wage data are those received by labourers, the FMS wage data are those paid by the farmers. Unfortunately, they cannot be matched because of differences in coverage and sampling design. In connection with FMS, some data were also collected regarding monthly and/or operationwise wage rates prevailing in the sample villages. These were collected, as part of general background information, from village functionaries and village records.

* A number of complete-enumeration general village surveys were conducted from time to time by the Agro-economic Research Centres for purposively selected villages. Wage data were collected in these as part of production cost payment data from farm households and as part of income receipt information from labour households. Wage data are available from a series of HYVP evaluation studies conducted for sample farms (HYV users and non-users) by the Programme Evaluation Organization. Then there are surveys by individual or teams of researchers. To mention some of the major recent ones in this category, Brahme (1975) for Dhulia district (Maharashtra), Chandra (1975) for Burdwan district (West Bengal), Bhalla (1976) for Haryana State. These, however, are one-point studies and cannot be used for comparisons over time. Studies on historical trends over the decades preceding the mid-fifties are by Rath and Joshi (1966), Mavin Kurve (1948) and Chaturvedi (1947).
As for the third major source (published as AWI), which is the only continuous source of agricultural wage data (month by month, year by year, for a number of districts from almost every state), there is considerable doubt about its reliability for intertemporal and cross-sectional comparisons. Rao (1971) has gone into the question of reliability of this data source, by examining the procedure of their collection and also by using systematic tests for plausibility when compared with wage data from the more reliable sources, like NSS and FNS. AWI wage data are recorded for the Ministry by various village-level functionaries not trained on the matter (like revenue officials, school teachers or presidents of local boards). No standard procedure is used for selection of villages in a district, and nothing is specified about who the respondent should be. The data are thus subject to all kinds of investigator bias, locational bias and respondent bias. Rao (1971) and Krishnaji (1971), who did another reliability study of this data set, came to the conclusion that it was thoroughly useless for studying seasonal variation. The investigator, giving mostly his casual impression of what he considers to be the prevailing wage, might be repeating the same figure month after month. Both Rao and Krishnaji found this source less unreliable for indicating changes in peak season wage rates from year to year. Unlike some of the unwary earlier researchers, Jose and Krishnaji sifted and scrutinised the data very carefully and used them only for this purpose.

Findings: Using NSS data on agricultural wages and Labour Bureau's Consumer Price Index for Agricultural Labourers, Bardhan (1970) compares Punjab (including Haryana and Himachal Pradesh) with Kerala in terms of the change in money and real wage rates from 1956-57 to 1964-65. The average money wage rate for male agricultural labour rose in both the cases, but much more in Kerala than in Punjab, while the rise in cost of living was of a similar order. There was thus a considerable rise in the real wage rate in Kerala over the period and a decline in Punjab, in spite of its production growth being higher even at that time. In a subsequent study, Bardhan (1973a) extended our comparison over a longer period between 1956-57 and 1970-71.* The initial decline in real wage rates in Punjab and Haryana was temporary.

* Table 4: CHANGE IN AGRICULTURAL LABOURERS' WAGES AND COST OF LIVING IN PUNJAB AND KERALA, 1956-57 TO 1970-71 (1971-72)

<table>
<thead>
<tr>
<th></th>
<th>Index of av. money wage rate for male ag. lab. (1956-57 = 100)</th>
<th>Index of Ag. lab. Consumer Price Index (1956-57 = 100)</th>
<th>P.C. Change in real wage rate for male ag. lab. From NSS From AWI</th>
</tr>
</thead>
<tbody>
<tr>
<td>From NSS</td>
<td>From AWI</td>
<td>1970-71</td>
<td>1971-72</td>
</tr>
<tr>
<td>Punjab</td>
<td>273</td>
<td>204</td>
<td>+34</td>
</tr>
<tr>
<td>Haryana</td>
<td>245</td>
<td>204</td>
<td>+20</td>
</tr>
<tr>
<td>Kerala</td>
<td>386</td>
<td>224</td>
<td>+72</td>
</tr>
</tbody>
</table>

Source: Bardhan (1973 a)
and there was a rise after the mid-sixties. But still the rise was not more than in Kerala. And over the entire 14-year period the rise was less. The phenomenon of a larger rise in real agricultural wage rates in Kerala is remarkable in the context of its higher proportion of landless rural labour households, higher incidence of unemployment among these labourers, and smaller rate of growth in agricultural production and in labour employment per hectare—things which usually would tend to depress their wage rates. Bardhan attributes much of the credit for sustaining the rise in farm wages in Kerala to the organized bargaining power of agrarian trade unions. A detailed study of the Kerala situation by Trivandrum Centre for Development Studies (1975) points out that agrarian trade unions have become really widespread in Kerala only since 1970. All through the sixties, trade unions have been very powerful in the Kuttanad region of Kerala. It would seem reasonable to think that a significant spread effect of that was at work in other neighbouring regions as well even before their formal unionization. It is quite significant that the two districts which, from the districtwise wage comparisons done in this study for Kerala, experienced the largest increase in real wage rate for agricultural labour over the sixties belonged to the Kuttanad region.

For selected years preceding the "green revolution" and during its early phase, Bardhan, Krishnaji and Jose have computed changes in real wage rates for other areas as well—on the basis of FMS, NSS, PEO (HYVP Evaluation Studies) and AWI, as used selectively by Krishnaji. Some of their findings indicate a regionally varying picture.

In Ferozepur district of Punjab and Muzaffarnagar district of Western U.P. -- regions that were agriculturally advanced even before the "green revolution" -- real wage rate calculated from village-level farm wage and wheat price data from FMS was found to have declined from mid-fifties to end-sixties in the former and remained unchanged in the latter, despite considerable growth experienced over the period. Among 13 TARP districts from all over the country, 7 experienced a decline in real agricultural wage rate between 1962-63 and 1967-68 and the largest rise was again in the two from Kerala. Between 1956-57 and 1964-65, the index number of real wages for agricultural labourers from NSS declined appreciably in 6 out of the 14 states, remained more or less unchanged in 4, and rose appreciably in the rest. In the last group, all except Kerala had a relatively depressed base-year wage level (both money and real). In the first group, which covered Punjab (including Haryana and Himachal Pradesh), U.P., Assam, West Bengal, and Maharashtra, all except U.P. had relatively high initial wage rates. If there is some element of truth in the institutional explanation of labour’s bargaining power, then it must be particularly low in U.P. and particularly high in Kerala. For the remaining areas, some degree of convergence took place over this period, during which remarkably enough the production growth in agriculture—arising largely from protective irrigation, land consolidation and stabilisation of agricultural prices—was much more evenly distributed regionally than what it became after the mid-sixties.
Using AWI data (with Krishnaji's screening method, using peak season wage), Jose compares at the state level trends in real and money wage rate for male field labourers* over a longer period from 1956-57 to 1971-72** covering the "green revolution" period. The disparity between Punjab/Haryana and Kerala in the trend in real wage rate was much less during the five years following 1966-67 than during the preceding five years. This is consistent with Bardhan's comparison based on NSS data. Over the initial 5 years of the fifteen year period, real wages were rising more or less. Then there was a decline of varying degrees between 1961-62 and 1967-68 in most of the states, except Kerala, with rising food prices culminating in the two drought years of 1965-67. Since then the trend has been upward, except in a few agriculturally stagnant states like Orissa (Table 5).

From the available studies, it appears that agricultural labourers' wages are poorly adjusted to and lag behind rises in their cost of living. Without the organized bargaining power of the industrial worker and the protection of a minimum food ration, they are hit harder by a sharp rise in foodgrain prices as during the mid-sixties. Subsidised public distribution of foodgrains has been (except for Kerala) practically non-existent in rural areas. The usual justification is on the ground that their receipt of harvest wages partly in kind would offer some protection. But when there is even a partial harvest failure, the kind component of their wage is also drastically reduced, exposing them more to the market price rise. When foodgrain prices are stabilised, as they were by 1970-71, then the effect of differences in growth of agricultural productivity becomes more significant for changes in real wage.***

An interesting observation (Jose, Krishnaji) is that, in contrast with a convergent tendency in interstate variations in the money wage rates over the earlier pre-"green revolution" period, there was a significant divergent tendency in the later period, when the already better developed and high-wage states experienced faster growth while the agriculturally backward low-wage states lagged further behind. The coefficient of interstate variation on the basis of AWI agricultural wage (money) data was 25.5% in 1956-57, 18.5% in 1964-65 and 31.1% in 1970-71. The accentuation of regional disparity in yield per acre with the "green revolution" was accompanied by widened regional disparity in rural labourers' level of living. In other words, the bigger demand for labour generated by more intensive agricultural investment and productivity increase in certain regions did have a positive impact on the wage rates.

* These are labourers usually engaged in non-specialised operations in agriculture.

** Herdt and Baker (1972) also used AWI data to compare changes in real wages over time in different states, but their results are difficult to accept in view of their unqualified use of AWI data with apparent unawareness of its limitations.

Table 5  CHANGE IN AVERAGE MONEY AND REAL WAGE RATE FOR MALE AGRICULTURAL LABOURERS

<table>
<thead>
<tr>
<th>State</th>
<th>1964-65</th>
<th>1970-71</th>
<th>1970-71*</th>
<th>From NSS, rupees per 8-hour day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MW</td>
<td>RW</td>
<td>MW</td>
<td>RW</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>159</td>
<td>116</td>
<td>260</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>139</td>
<td>134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assam</td>
<td>105</td>
<td>74</td>
<td>178</td>
<td>171</td>
</tr>
<tr>
<td></td>
<td>116</td>
<td>81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bihar</td>
<td>135</td>
<td>89</td>
<td>196 a/</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>140</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gujarat</td>
<td>139</td>
<td>102</td>
<td>212</td>
<td>167</td>
</tr>
<tr>
<td></td>
<td>116</td>
<td>104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Karnataka</td>
<td>160</td>
<td>102</td>
<td>188</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>121</td>
<td>120</td>
<td></td>
<td>128</td>
</tr>
<tr>
<td>Kerala</td>
<td>170</td>
<td>121</td>
<td>337</td>
<td>201</td>
</tr>
<tr>
<td></td>
<td>122</td>
<td>124</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>129</td>
<td>93</td>
<td>195</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>96</td>
<td>106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maharashtra</td>
<td>144</td>
<td>93</td>
<td>212</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>108</td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orissa</td>
<td>192</td>
<td>128</td>
<td>212</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>95</td>
<td>97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punjab &amp; Haryana</td>
<td>144</td>
<td>103</td>
<td>304</td>
<td>216</td>
</tr>
<tr>
<td></td>
<td>155</td>
<td>154</td>
<td></td>
<td></td>
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<tr>
<td>Tamil Nadu</td>
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<td>174</td>
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<tr>
<td></td>
<td>109</td>
<td>138</td>
<td></td>
<td></td>
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<tr>
<td>Uttar Pradesh</td>
<td>178</td>
<td>110</td>
<td>315</td>
<td>225</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Bengal</td>
<td>129</td>
<td>95</td>
<td>183</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td>96</td>
<td>96</td>
<td></td>
<td>n.a.</td>
</tr>
</tbody>
</table>

MW: Money wage rate, index numbers in cols. 1-3, absolute in cols. 4-5
RW: MW deflated by Agricultural Labourers' Consumer Price Index.

Notes. a/ Relates to 1968-69, data for 1970-71 being unavailable for Bihar from AWI. Wage rates for farm operations relate, in 1964-65, to those received by working-age men of agricultural labour households and, in 1970-71, to those of non-cultivating wage-earning rural households.

Whether the increases in agricultural employment and wage rates even in these regions were enough to distribute a fair share of the production growth in favour of the agricultural labourers, and to raise per capita income or level of living for their increasing numbers, is another question.

II.c. (ii). Labour's Share in Production Growth.

The basic difficulty in measuring labour's share lies in how to evaluate the family labour input. Most of the studies evaluate it at market wages. But if the hired component of total farm labour use rises with intensive cropping and production growth, and if the implicit supply price of family labour is lower than that of hired labour, then this procedure when used for overtime comparisons would tend to overestimate labour's share in the earlier period.

Hanumantha Rao (1975) compared labour's share in gross and net farm output for a random sample of farms in Ferozepur district of Punjab as between 1954-57 and 1968-70, and found the share to have declined. Comparing labour's share as between the local variety and the high-yielding variety (Mexican/IR-8) of wheat and rice separately during the later period, he observes its tendency to get smaller with the HYV, which is consistent with the change over time for crop production as a whole. The absolute labour cost (including family labour evaluated at market rates) per acre is considerably higher for HYV paddy or wheat than for the local variety, and is higher in the end period than in the earlier period. But in each case—considering the individual crops that underwent change as well as the entire cropping mix—the rise in both gross and net output was much larger, making labour's relative share go down. For the large farms (above 50 acres) in Ferozepur, there was some rise in the absolute value of labour used per acre over the period, but the decline in labour's relative share was much sharper than for all farms taken together. Labour's incremental share in production (gross) growth over the period in the district works out to 24% for all farms and 13% for the very large farms. Correspondingly, the incremental share as between local and Mexican wheat was 16% and between local and IR-8 paddy 11% for all farms.

Considering wage bill for hired labour alone, Parthasarathy and Prasad (1971) earlier came up with a similar result for East and West Godavari districts, showing the wage bill per acre going up from local to IR-8 paddy, but its relative share in net or gross value of output getting smaller—particularly for rabi IR-8 on which farmers in the area use more fertilizers than on Kharif IR-8 paddy. The incremental share of hired labour for a switch from local to IR-8 paddy works out to about 10% on an average for these two Andhra districts.

Mellor and Lele (1973) gathered together a large number of small-scale surveys conducted by Agro-economic Research Centres, PEO, and individual researchers in different parts of the country. From these they found that the incremental share for hired labour in an increased production with switch to HYV was usually about 10% for wheat and for
Kharif paddy and somewhat less than that for rabi paddy. This is very much less than what has been observed in Bangladesh, for example.

Bell's (1972) computation of labour's share in value added is based not on the average situation for a sample of farms, as in the studies discussed above, but on construction of the typical or the most common cost structures for local wheat, HYV wheat and jute in the Kosi canal area of Bihar. Like Hanumantha Rao and unlike the rest of the studies noted above, he considers the share of all labour (not just hired), evaluating family labour as well as other non-purchased inputs at the market rates. Unlike in Ferozepur, the share of labour in this case shows a small increase with change from local to high-yielding variety of wheat, assuming other crops unchanged. But as the switch does involve in that area replacement of a wheat-jute rotation with a HYV paddy-wheat-paddy rotation, and as labour's share in value added is larger for jute than for either variety of wheat, the net impact of the changed rotation might be a slight decline. This is considering the growth arising simply from change in seed variety and rotation. Mechanisation, particularly of the labour-intensive operations of harvesting and threshing, would bring down the share drastically, particularly for hired labour.


The few studies that try to explain inter-regional variations in agricultural wage rates are by Sinha (1968), Misra (1970), Vaidyanathan (1971), myself (1973), Lal (1974a) and Pandey (1975). The basic method used proceeds by selecting--on a priori grounds and considering availability of data--certain indicators of supply and demand parameters that are likely to affect agricultural wage rates, and then doing a multiple regression analysis. The object is not so much to use the coefficients for any projection or estimational purposes (which, in any case, may not be based on inter-regional coefficients) as to find out the significant determinants of regional variations in agricultural wage rates.

Sinha relates interstate wage variations in 1950-51 with variations in value of agricultural production per farm as indicating demand and in the ratio of agricultural labourers to the number of farms as indicating supply. He finds a positive significant association with the first, none with the second. Misra relates interdistrict (in Gujarat) variations in agricultural wage rate in 1960-61 with three demand factors (per capita rural income indicating agriculture's "paying capacity," proportion of area under crops requiring more than 100 mandays per hectare, irrigated proportion of net sown area) and with one supply factor (the proportion of agricultural labourers in rural working force). His two equation model indicates the wage rate as negatively related with the demand factors but unrelated with the supply factor. Misra's wage data are taken from AWI which is a less reliable source. So are Pandey's.
Vaidyanathan relates the ratio (from NSS) between the agricultural labourers’ consumption level (as proxy for income level) and the cultivators’ consumption level with the proportion of the agricultural labour households among all rural households (from Census) and with the average income level of cultivating households. The last two are taken as indicating supply and demand differences for labour across regions. He finds a negative correlation of labour’s relative level of living with the first and a positive one with the second.

My study (1973) uses state-level wage data from NSS (11th-12th rounds for 1956-57 and 25th round for 1970-71), and some village-level data from village surveys conducted by AERC in Punjab, Haryana and Western U.P. For indicating regional differences in the labour demand parameter, I used alternatively the intensity of irrigation, the intensity of cropping (which depends largely on irrigation and rainfall) and the variance of agricultural production around the trend (indicating the degree of uncertainty and weather dependence of production or, inversely, the extent of assured irrigation and/or rainfall). Regional differences in the supply parameter are indicated by (a) the non-agricultural wage rates (reflecting alternative employment opportunities available to the landless and the landpoor within the rural sector itself or in the urban areas); and (b) the proportion of rural population or workers who were primarily dependent on agricultural wage employment or the coefficient of concentration of cultivated area among the landless and size-groups of farm households or the degree of indebtedness of agricultural labour households (usually to farmer-moneylenders), which might be expected to influence labour’s bargaining strength in the wage determination process. The underlying argument is that the more the labour market is flooded by those with very little or no land, and the smaller the group of large farmer-employers, the weaker is likely to be the bargaining position of labourers. Indebtedness to farmer-moneylenders for consumption loans quite often leads to adverse employment contract or labour tying arrangements, and its high incidence in a region may indicate labour’s bargaining weakness.

With wage rates relating to casual labour * in 1956-57 and to casual and attached labour in 1970-71, * which were both agriculturally normal years, and using a single-equation regression model, wage variations across states are explained reasonably well by the selected factors. Average wage rate for agricultural labour appears as positively responsive to irrigated proportion of sown area (or cropping intensity) or negatively to the production variability index. It is negatively responsive to the relative size of agricultural labourers in rural work force, and positively to interstate variations in non-agricultural wages (either referring to casual non-farm labour or to the lowest paid industrial workers). Given other things as

* Casual labour is likely to be more comparable between states, because of substantial heterogeneity in the nature of a permanent labourer’s wage contract, which ranges from semi-feudal serfdom to more or less voluntary contracts. Unfortunately, the distinction between casual and attached farm labour was removed in subsequent rounds of NSS.
equal, an area with better irrigation or more intensive cropping seems likely to have higher agricultural wages. Any given increase in irrigation is likely to raise the wages more in an area with a smaller proportion of the rural labour force dependent on farm employment and/or with more non-farm employment opportunities than in an area having masses of landless and semi-landless and a relatively meagre non-farm sector. One of the worst possible combinations might be seen in areas where the labour market is flooded by the virtually landless, the level of agricultural productivity stagnant on account of poor irrigation and feudal landlords, and the non-farm sector undeveloped. Madhya Pradesh, eastern U.P., Orissa and parts of Bihar fit into this description. Migration—seasonal and permanent—is high from the rural areas of these states, but apparently not high enough to compensate for the wage-depressing effect of low productivity and skewed distribution of land. It is these areas that call for lots of public works employment as well as public investment in irrigation development. The two can be combined in one framework.

It may be noted that when cross-sectional differences in the money wage rate deflated by agricultural labourers' cost of living are sought to be explained in similar supply and demand terms, the fit is relatively less significant. Lal (1974a) tried to relate interstate variations in change over time in the index of real wage rate thus defined to changes in a demand variable indicated by cereal output and a supply variable indicated by the size of agricultural labour force. Though the coefficients were of the expected sign, the proportion of variations in real wage change explained by them was rather small. Most of the available studies * show sluggish and weak response of agricultural wage rates to price changes, over time or across regions. The labour supply and demand factors get reflected better in the money wage variations. Given these factors, differences in food price or cost of living for rural labour do not seem to generate an immediate adjustment in their money wage rates.

A single-equation regression analysis of wage variations with supply and demand factors is more of a crude approximation than a simultaneous equation model. However, the purpose of Bardhan's exercise was not to estimate the coefficients of cross-sectional wage determination but rather to see if a few selected demand and supply factors could explain any significant part of the observed wage variations. The method used was not too inadequate for that limited purpose. But, a more serious approximation involved in this type of exercise, irrespective of whether one uses a single-equation or a simultaneous-equation regression, is the very effort to explain wage variations

* Rath and Joshi (1966) studied agricultural wage and price changes in Bombay Presidency over 1924-1940 and in several states during 1954-57. Krishnaji studied (1971) state-level changes in agricultural labourers' wage rates and cost of living index over a more recent period. I tried, in connection with the 1973 study, to relate cross-sectionally the wage rate for casual agricultural labour to current crop price index—with village-level and state-level data. None of these studies indicate any significant relationship.
in supply-demand terms across areas that are vastly heterogeneous institutionally and agronomically. * Analysis of wage variation, for estimating response coefficients, should preferably use time-series data or, since comparable basis reliable time series on wages are hard to come by from available data, cross-sectional data relating to areas within an agro-institutionally homogeneous region. With the right kind of cross section or time series, a simultaneous equation model will give better estimates. Whichever model is used, the basic hypothesis in this kind of exercise is that the agricultural labourers' wage rates, despite market imperfections, are responsive to shifts in demand and supply.

* For a set of 39 villages from a relatively homogeneous region (Punjab/ Haryana and western U.P.), my 1973 paper did attempt a similar analysis of intervillage wage variations in terms of supply and demand factors, including alternative indicators like concentration of operated area and a "location/communication" ranking of the villages. The results were quite consistent with those of the interstate case.
Section III. Labour Market Imperfections and Wage Determination

Labour time disposition data for adult members of farm households as well as non-cultivating labour households indicate the presence, in the informal rural sector, of considerable open underemployment (with reference to any usually accepted full-time work norm, like 300 days in a year). In the case of the landless or the near-landless farm labourers, low-productivity agriculture means less-than-full-time employment or low wage rates or both. And in the case of own-account workers in cultivating households, disguised unemployment is possibly quite important even apart from the open one. A productivity-raising factor, like an expansion in irrigation, tends to reduce underemployment level and also to raise wage rates in varying degrees. The coexistence of underemployment with stable or rising market wage rates for agricultural labour has led to some theoretical hypothesization about the nature of labour market imperfections in rural areas that would explain the phenomenon.

III.a. Hypotheses

Some of these hypotheses have inspired or provoked varying amounts of empirical research with Indian data aimed at supporting or demolishing them. One of these is the Lewisian hypothesis of an institutionally determined fixed constant real wage level in a labour surplus rural economy, with a perfectly elastic labour supply at that wage. Except in a closed feudal setup of patron-client relationship based on serfs, or in a totally opposite situation of commercialized agriculture facing labour union for collective bargaining, it is very difficult to visualise the exact institutional mechanism whereby a constant real wage is maintained with less than full employment in equilibrium in an average Indian village. There might, however, be a locational mechanism: nearness to an urban area or a large source of employment for unskilled labour, facilitating seasonal movement of labourers in and out of a rural area.

The second hypothesis, related to that of institutionally fixed real wage, is in terms of nutritionally-based wage determination. It assumes that rural labour market takes account of the nutrition-efficiency relationship. In Leibenstein's (1958) and Mazumdar's (1959) formulation, as there is a positive association between wages and the efficiency of labour, it would be profitable for the employers to pay the workers a higher than subsistence wage rate. Rodgers' (1975) generalised model is in terms of the demand for and the supply of work units rather than of labour time. These determine, through oligopsonistic decisions of labour tying and time wage adjustments, a "minimum cost of work units" equilibrium wage rate that would at least maintain the required number of work units at the subsistence level. Marginal productivity of work units, which below this level diverges from marginal productivity of labour time and merges together above it, determines the "optimum" level of employers' equilibrium wage with a given demand curve. With demand shifts beyond this level, the usual theory in terms of labour time becomes relevant again. In this model, the seasonal variations in labour requirement can be visualised as shifts in demand. Then, if almost the entire labour force has
to be kept fit for the peak season, there would have to be in the remaining seasons part-time employment of the whole labour force according to a closed model. Lewis' constant real wage is thus explained in this model in terms of the oligopsonistic employers' economic rationality, which may be institutionally formalised over time.

The third hypothesis is in terms of labour market imperfection of a dual agrarian economy with peasants using mostly family labour and capitalist farmers using mostly hired labour. In Sen's (1962) formulation, the imputed price of labour to the small peasant farm is lower than the actual price of labour to the larger farms.

The fourth hypothesis is in terms of the seasonality of labour requirements in agriculture, and the effect of seasonal peaks in maintaining a minimum number of workers in agriculture even if they are not fully utilised throughout the year, and in determining wage rates at levels that would not impede the required availability of labour in the busy seasons. This has several implications. One can argue (Bardhan, 1973) that where in the peak season many agricultural operations have to be performed within a short period, the worker with a small farm may be reluctant to offer himself fully in the labour market for that time. For the same reason, he is also at a disadvantage against the competition from landless workers. The employer is interested, even at the expense of higher wages, in some commitment on the part of labourers regarding the timing and speed at which a time-bound operation like harvesting will be performed. In a situation with a sharp peak of labour demand, even if there is underemployment during the lean season (with labour mobility less than perfect), the wage rate offered in the lean season in a formal contract with an "attached" labourer or an informal one with a casual labourer would be more favourable to him than if the peaks were either moderate or taken care of with machines. This situation might prevail irrespective of whether labour's calorie income is high or low. And then the explanation has to be in terms of employer's rational decision under uncertainty (about labour supply in peak season) rather than his nutritionally determined decision to minimise cost of required work units.

Seasonality may have other implications besides this. Terms and conditions of labour hiring are often quite different in the peak season from the rest of the year. Payment of a fixed harvest share has been prevalent traditionally in many parts of the country. In some they now are being adopted with modification. Piece rates are used for other peak operations too. These are negotiated with a labour family or with an intermediary for a whole group of them. And group bargaining, wherever there is any, is more common for the peak operations both from employers' side and from labourers' side. The small cultivator seeking supplementary wage employment may usually be left out of such group bargaining. The small cultivator who has to hire in some supplementary labour during the peak season is also understandably the one worst affected by supply uncertainty and the associated contracts and group bargaining. He might in that case tailor down his crop pattern to his family labour availability or lease out and become a full-time labourer himself.
III.b. Empirical Basis: Nutritionally Determined Wages

Rodgers made an attempt to corroborate this hypothesis by using it to explain certain prevalent patterns of wage variation and stability, labouring arrangements and interrelationships between wages and the dependency ratio in a labour family and employment. He used the data that he collected from selected agricultural labourers in 7 villages in the Kosi area of Bihar.

His approach consists of deducing from the theoretical model certain observable features of wage payment practices which can then be checked with an actual situation. The major deductions are: seasonal stability of wage, variation of average time wage among labourers inversely with the earner-dependent ratio in their families, tying of labourers to particular employers, the sharing out of lean season work among the labourers on a part-time (regular half-day or rotating full-day) basis, and the importance of perquisite (meals) content in the daily wage which according to Rodgers is designed to weigh the labourer's intra-family distribution of food consumption in his favour.

Rodgers then looks at his small-scale surveys data from an area which, according to his evaluation of the labourer's wage incomes, seems to be poor enough in terms of calorie income to qualify for the testing of nutritionally-based wage determination. He finds that many of his observable deductions are borne out. In 5 out of the 7 villages, the daily paid wage was stable through a large part of the year, rising moderately and briefly during the peak season. The wage variation was much less than employment variation across seasons. A major part of the daily wage was supplied in the form of meals to be consumed by the labourer at work. In 4 out of the 5 villages, a proportion of labourers ranging up to nearly a half, were "tied" to their employers with a longer-term contract. The "tied" labourers thus had more employment over the year and though their total earning from farm employment was higher, it worked out to a lower daily level compared with the casual labourers. A considerable part of the labourers' lean season employment was in the form of half-day work, the wage for half day being slightly more than that for full day. In one village, he found that the Muslim labourers with a higher dependency ratio (because of the customary non-participation of their womenfolk in labour force) were getting a higher total wage compared with the tribal and the lower caste labourers with lower dependency ratios. Across the 5 villages, he found average wage and employment to be inversely related which he interprets in terms of one of his deductions; viz., that the higher the overall level of employment over the year, the lower the employers' "optimum" wage.

Partly in view of the admittedly narrow empirical base of the study and partly because of the method of hypothesis testing, which does mention but does not adequately explain the counterexamples within the sample or the presence of similar institutions and practices in dissimilar situations, it is essential that we discuss carefully the interpretation of the findings, particularly from the point of view of its generalisability even for a very low "calorie income" situation. Let us start by mentioning the counterexamples that Rodgers himself points out from his sample of villages, for which he offers some explanation.
First, the two villages which had considerable seasonal variation in wage rates, in spite of as low an average calorie income per consumption unit as in the 5 other villages, were found having a different cropping pattern from the rest. In the two villages it consisted of the traditional 3-crop rotation with autumn and winter paddy and jute, resulting in sharper peaks in demand for labour, particularly in the monsoon period when various operations for all the crops must be done at the same time. In other words, the seasonal stability of wages as well as the greater prevalence of tied labour was partly due to the more varied crop rotation that possibly generated a more steady stream of labour demand compared with the two exceptional villages. The seasonal fluctuation in employment may be higher than that in wages, but still it may be less than in the other two. Though Rodgers does not explicitly compare the differences in seasonal distribution of employment, this is what appears to be the case from his description of cropping pattern differences.

Where there is a steady flow of labour requirement over the greater part of working season, one can think of a number of reasons for labour tying arrangements—which are apart from, if not conflicting with, the employers' rational concern for the continued maintenance of the number of work units required at peak season. Which one of these becomes a decisive reason depends on the particular situation. An old hand saves the "training" cost in time. And as it often works out to a lower daily wage rate, it is cheaper in conventional terms too and not just in terms of the cost of a requisite number of work units. In the highly developed capitalist farming set up in Punjab, Rudra (1971) observed a significantly larger degree of hiring "attached" labourers or permanent farm servants on (a) the farms with non-mechanised lift irrigation and (b) on the tubewell farms with tractor and a very intensive cropping pattern. In the case of Ferozepur district with a high intensity of tubewell irrigation and improved crop rotation, I found that most of the large farms were employing permanent farm servants even though their per day wage worked out at about the same level as that for casual labour which they hired mostly in peak seasons. Thus, it seems that continuity and the core volume of the stream of farm employment generated by a particular cropping pattern is very likely to be an important consideration in a farmer's decision in the first place to enter into a long-term contract with a labourer. Having done so, ensuring the subsistence for work efficiency is certainly important to him. But how far that is the primary consideration even in a moderately commercialized agrarian setup is rather doubtful.

In connection with feudal patron-client relationship between oligopsonistic employers and their employees with little alternative form of employment—a situation where one may observe a pure form of nutritionally based wage determination, it would be interesting to see the manner of change. Notable work has been done by Srinivas (1955, 1965) and Beidelman (1960) on the *jajmani* system, and on the *hali* system in southern Gujarat by Breman (1974). From field work in two villages in the area, Breman describes the recent changes in agrarian relations between the landowners, almost all of them still belonging to a single top caste, and the local tribal caste of landless labourers. They were traditionally employed as bonded labourers.
Over the last few decades, the feudal patron-client relationship has been changing. The landless Dublas are still employed by the farmers to do their agricultural work—but now as casual labourers and permanent farm servants in a much more commercialized relationship. Disintegration of the hali system and its replacement by the commercialised employer-labour relationship was facilitated partly by changes in the crop pattern (a partial shift from sugarcane to mango) and, what is equally important, by the rise of a tradition of migration to cities by the labourers through their own mediators rather than through their landlord-patron as it used to be earlier. At the same time, though the proportion of farm servants has declined drastically in the area, the landowners still prefer to have a small fixed core of labourers who can do most of the year-round farm work and who have skills and knack for handling tools which are now increasingly used in the area. For harvesting and other peak season operations, they now employ casual labourers on a daily basis or on piece rate contract. The particular form of contract labour—with gangs of migrant or local labour undertaking to carry out a specific amount of work at a prearranged price and within a specified period—has gained a lot of ground in recent years here as in many other parts of the country. In their relations with labourers, Breman notes, the landlords are now completely averse to being reminded of their former obligations. Commercial bargaining has taken the place of patron-client relationship. It is possible that the labour gangs manage to bargain for a contract calculated to give at least a minimum subsistence. But that is quite a different thing from employers’ unilateral rational decision based on consideration of a food-efficiency nexus, as Rodgers hypothesizes. As a matter of fact, use of contract labour of the type mentioned above and also piece rate systems like payment for harvest in kind are now being increasingly favoured by commercialized farmers as the alternative mechanism for ensuring efficiency and minimizing supervision costs.

The major assumptions in Leibenstein’s and also in Rodger’s model is that of oligopsony and absence of nonagricultural employment opportunities for labour. Rodgers extends this assumption to explain wage determination in the case of the casual labourers as well (more than half, nearly three-fourths, of the labourers he interviewed were not formally tied). His argument is that even for these labourers agricultural employment was either the only or the principal source of income. In another paper (1973) on employment in public works in the same area around the same time he observed very few of the local agricultural labourers working at the construction site. For this, he lists several reasons. The heavy earthwork in the summer months was not favoured by the local labourers, the contractors who were used as convenient intermediaries by the works authorities were bringing in groups of sturdy workers from other parts of Bihar, the socio-culturally determined low female work participation among many of the labour households in the locality prevented them from utilising this employment opportunity, and because the labourers were afraid of bringing down their individual wage income from agriculture by going to the construction site and not being readily available to the landlords, which they did not consider worth doing in view of the temporary or short-term nature of the work available at the public works site.
In a situation where there is a prolonged lean period and the system is not closed in the sense that there is scope for out-migration of local labour during the lean months and/or in-migration of outside labour during the peak season, it is difficult to visualise the operation of the type of wage determination that Rodgers describes. But in a situation where the cropping pattern requires a steady stream of work almost throughout the year, with not much of a slack season involving large and prolonged lull in farm work, and where the excess heads of labourers tend to migrate to the city leaving the size of the labour force within the limits of requirement of local agriculture, the employers would be more interested in maintaining the labour force at a subsistence level. The labourers would also have the bargaining strength to ensure it for themselves. As for formal labour tying arrangements, it has been observed in very high income situations as well, and the primary determinant seems to be volume and distribution of the core work, which is determined by the pattern and the intensity of cropping. In either case, there are variations in the degree and the form of labour tying arrangements. Rodgers reports some amount of informal labour tying in the sense that a casual labourer keeps on going to the same farmer. Not enough work has been done on the manner in which casual labourers choose or are picked up by their employers and about their turnover rate in different parts of the country. There does not seem to be any uniform pattern or mode. Chandra's (1975) study of Burdwan district gives an account of the simultaneous existence of a wide variety of labour contracts as between neighbouring villages or even in the same village. Apart from the annual farm servant and the informally tied casual labourer who goes every morning to a particular employer but is free to take up other employment in case he is not required there, there are ordinary casual labourers employed on a full-day or half-day basis; there are also specialised groups of casual labourers, like the ploughman who brings his bullocks and during the ploughing season gets at least twice the wage rate of others. However, Chandra does not go into the production conditions in the villages, and whether and how the crop cycle and the labour supply situation might have something to do with the institutional arrangements for various types of labour contracts and modes of payment.

The custom of paying part of the wage in the form of meals at work is probably the clearest indicator, apart from labour tying, of the employer's deliberate effort to use wage for minimising cost of a work unit by tilting the distribution of consumption out of a given wage in favour of the labourer vis-a-vis his dependents. This is a fairly common practice, and there are many other reasons for it. Bringing lunch from home is hard when one is starting work before dawn; letting the worker go home for lunch is wasteful for the employer. Short-term migrant labourers are also given meals at work, to save time rather than out of the employer's concern for their nutrition.

Rodger's observation of an inverse relation between average wage for a labourer and the earner-dependency ratio in the labour household, though quite plausible, requires more empirical corroboration, particularly with reference to those cases where there is no cultural taboo on female participation so that the dependency ratio is a variable. Besides, his explanation
of the phenomenon in terms of a unilateral decision on the part of employers may not be established until one shows that the composition of operations performed by the workers with different dependency ratios is the same or at least randomly distributed. It is well known that daily wage rates for different operations vary even in the same period, partly due to differences in skill or strain involved. It could very well be that the workers with a given high dependency ratio manage to specialise in operations like ploughing which is more paying, and for which they happen to have an advantage over other labourers by way of physical strength and/or ownership of bullock and plough. In other words, if his higher wage is partly a result of the worker's own decision, capacity or asset (like bullock ownership), then it does not substantiate a theory of nutritional determination of wages by employers.

It is quite possible that minimum nutritional requirement tends to influence the wage "floor"—although the landless labourer is not necessarily a passive recipient of employers' decision on this matter, because beyond a point even individually (i.e., apart from collective wage bargaining) he can and does migrate in search of better income. However, as a general theory of agrarian wage determination, the minimum nutrition or subsistence argument is far from corroborated by available empirical evidence. Even in the case of farm servants or "tied" labourers, while their wages are more likely to be stabilised at or above minimum subsistence requirement and though the employer's investment in their nutrition clearly pays him back in efficiency units, it would be very difficult to claim this consideration to be the primary determinant or decisive factor rather than the requirement of the cropping pattern. Farmers in different parts of the country have been found using various means of tying labour, through supply of consumption loans or through tie-in allotments of land for cultivation or residence, which are not necessarily designed to take care of even the attached labourer's subsistence needs.

The theory of nutritionally based wage is even less applicable in the case of the very substantial body of casual agricultural labourers. First, the theory is apparently not consistent with the available evidence (discussed in Section II.c.) indicating wide interregional variations in the average wage rate (both money and real) of casual agricultural labourers. It is unlikely that the minimum nutritional requirement of a farm labourer in different parts of the country varies that much with climatic differences. Secondly, agricultural wages have been found to be very sluggishly responsive to increases in foodgrain prices. Studies on trends of agricultural wages and food prices (Rath and Joshi, 1966; Misra, 1948; Mavin Kurve, 1948; Krishnaji, 1971; Bardhan, 1970; the Agricultural and Rural Labour Enquiries) all tend to indicate that the real wage rate in agriculture declines with rising foodgrain prices. During the mid-sixties, it dropped in almost all states. Studies on differential price increases also show that the average price of cereals has gone up at a higher rate for the poorest deciles in rural areas than for the higher ones.* Without group bargaining, protective food distribution by the government or a

policy of minimum employment guarantee, rural labourers obviously do not manage to hold their real wage at or above any nutritional level. Thirdly, as we shall discuss in Section III.e., available evidence shows different degrees of seasonal variation in agricultural wage rates. In the cases where the degree of seasonal wage variation is less than employment variation, the explanation must take account of a combination of factors including the crop pattern, labour mobility and alternative employment opportunities, how far the labourers are purely landless, and perhaps also subsistence maintenance of "attached" labourers as a deliberate decision on the part of employers. But the latter can hardly be described even as the main determining factor in most of the rural labour market situations in India today.

III.c. Labour Market Dualism

The dominant mode of employment in a traditional rural economy is self-employment and use of family labour in economic enterprises organized at the household level. Wage-employment, though rising fast, is still a small part of the totality.* But the proportion of hired workers is very much higher than the average in larger sized farms, and much lower for the small-sized farms. Across regions, in 1961 for example, the proportion of hired agricultural labourers ranged from less than 12% in Assam and Punjab to more than 40% in Kerala and Andhra Pradesh. Besides, some of the hired labourers are "attached" to particular employers, which can often be regarded as introducing an element of imperfection in the market. In 1956-57, the "attached" proportion of all agricultural labour households ranged from 15% or less in the south Indian states to 40% or more in Punjab, Bihar, Uttar Pradesh and Madhya Pradesh. As the case-attached distinction has now been dropped from National Sample Surveys, we cannot give a comparable recent figure. But small-scale surveys and micro-studies indicate a rising proportion of permanent labourers, particularly in fast-growing north-west India.

Corresponding to these three distinct modes of labour employment (family workers, casual and attached labourers) in an agrarian economy, there might be distinct (market or imputed) wage rates at any point of time and

*From 17th round (1961-62) of NSS, the following figures clearly illustrate this point. Of all the rural workers in India in that year, 44% were owner-operators and their working partners, 25% were dependent members of household working as unpaid workers, and 31% were working for salaries or wages. If we consider only the more fully employed rural workers (say, those working for 43 to 70 hours during the reference week), even then the proportion of the wage-employed works out to about 33% as against 35% own-account workers and 22% unpaid family workers. If we want to look at the farm sector alone, then, from 1961 Census, 15% of all agricultural workers were hired for all size-groups of farms taken together. In 1971 this proportion was 37% (by 1961 definition).
distinct processes of wage determination with distinct sets of supply and demand curves. What empirical evidence do we have in this respect?

In the late fifties, after the first batch of FMS reports came out with figures of inputs and outputs by size-groups of farms, using a common set of prices and market wages for their evaluation, and thus showing big deficits against the small sized-farms, there followed a lot of concern and controversy. Sen (1962) argued that the imputed cost of family labour to the small family farm might not be the ruling market wage but somewhat less than that. In that case, this would also constitute one important explanation for another farm management finding: that both labour input per acre and output per acre were higher on the smaller-sized farms. Subsequently, Sen formalized this as the dual labour market hypothesis, with capitalist farms using hired labour facing higher wages than the peasant farms using lower valued family labour.

Some attempts have been made to test the hypothesis that the small farms might be using family labour to the point where its marginal productivity was less than the ruling wage rate, to find out whether it would be a reasonable approximation of rural labour market to regard the supply curve of family labour for use on own farm as lying below that of wage labour. Estimates of labour's marginal productivity with Indian data were attempted by Desai and Mazumdar (1970), Saini (1971) and Bardhan (1973). Some of these have already been discussed in Section II.b.(ii) in connection with the disguised unemployment question. If the labour market consisted of two imperfectly competing groups of suppliers, then apart from the differential use of labour in the two categories of farms, this might have some implications for wages.

The estimates are based on fitting a production function (usually of the Cobb-Douglas type) with actual input and output data at the farm level. Saini took the marginal product of labour at the geometric mean level to compare with average market wage rates. The geometric mean marginal product is irrelevant for the hypothesis which relates to small farms. Desai and Mazumdar, in the case of a West Bengal district in the mid-fifties, took out separate estimates of marginal product of labour for large and for small farms, and found that for the small ones it was not significantly different from zero and hence presumably smaller than the ruling wage rate. For 4 districts during the fifties and 4 districts during the sixties, Bardhan compared the average daily wage actually paid by each farm with the value of marginal product of labour for each of them (average product on a farm multiplied by the labour coefficient from the production function fitted to all farms). The value of marginal product at the farm level appeared to have statistically significant higher value than the actually paid wage rate for 7 of the 8 districts, while the difference was insignificant in one (Ferozepur, 1967-68). There was no uniformity in the case of the individual small farm, the value of marginal product being smaller in some cases and equal to or larger in others than the wage rate paid for whatever amount of labour was actually hired.
One plausible explanation, Bardhan points out, for the high estimates of marginal productivity of labour may be that it includes the marginal productivity of some other factors (like bullock labour and implements) that are complementary with labour, and which are left out of the production function in order to avoid multicollinearity in estimation. Another plausible reason could be qualitative difference in efficiency or in other respect between hired and family labour, as the estimated marginal product is an average for hired and family labour while market wage relates to hired labour alone. He tries to test this possibility by fitting a modified form of production function, including hired proportion of labour used as a separate variable. In two of the eight districts (West Godavari and Thanjavur, both in irrigated, intensively cultivated paddy zone and heavily dependent on hired labour) he does get an indication that hired labour is more "efficient." To the extent time inputs of hired and family labour are not homogeneous, measurement of farm labour inputs in "efficiency" units would partly smoothe out differences in its marginal productivity across family and wage-based farms.

Thus, the marginal productivity estimates that are available for selected areas are not very conclusive. Besides, there are genuine criticisms of the approach. First, varying degrees of seasonal complementarity of farm labour inputs (and non-substitututability even between family and hired labour where both are used) make it very difficult to define the composite unit of operational labour use (Sen, 1975) for the purpose of empirical estimation of its marginal productivity. Secondly, the constant response coefficients which assume similar efficiency in input use for all farms may be unrealistic.* It might be better to group farms according to more or less homogeneous technologies. Thirdly, permanent farm servants or tied labourers—the nature and extent of their use on big farms varying regionally—introduces an element of heterogeneity even within the category of hired labour. The imperfections introduced into the labour market through the big farmers lending money or allotting land for tying labour and/or getting it cheap (interlocking of land, labour and credit markets) can be more important than the hypothesized difference between full-time wage-labourers and members of cultivating households with secondary market involvement. Fourthly, in most parts of the country there is a very substantial mixed category of cultivating wage-earning households, hiring in as well as hiring out labour. Rudra's (1976) study of hiring in and hiring out behaviour of small farms in Hooghly district indicates the inadequacy of the dualism hypothesis in explaining labour supply and labour demand behaviour in their case. However, if the hiring in and hiring out are for different operations at different times of the year—i.e., if they take place in virtually different labour markets—then the phenomenon may not interfere with the duality hypothesis.

*Incidentally, Singh and Vashishtha (1975) fitted the C-D function with variable response coefficients to Ferozepur data. But there is practically no pattern in the farm-level labour coefficients, except that they are lower for mechanized than for non-mechanized farms. Among the non-mechanized farms, their method shows no clear tendencies.
In view of these limitations of the indirect production function approach, it is worthwhile to look for direct indications of differences in labour market behaviour of different groups generating demand or supply or both at the same time, and the possible causes behind these differences. One such direct indicator is whether per acre use of labour is larger on family farms than on hired labour based capitalist or commercial farms. Considering farm size as a proxy for difference in mode of employment, the question has two aspects: whether total labour use per acre varies inversely with farm size and thus, in the absence of technological differentiation, whether output per acre also varies inversely with farm size.

The observation of inverse relationships was based initially on data grouped by size of farms, and it was soon pointed out that this might involve an averaging bias. If, instead, one looked at farm-level data as such, separating out the "within village" variations from the "between village" variations, then the picture might be different. When this was done, it was found that the inverse relation between output per acre and size of farm still stood in some cases, but did not in some others, possibly because of the prevalence of other counteracting differences between farms of different size. Even under labour market dualism, there is a considerable "asymmetry between... non-labour cost differentials, which favour the large farmer, and the labour cost advantages, which go in the opposite direction." (Sen, 1975).

How far is the hypothesized labour cost advantage of small or family based farms and consequently their greater intensity of labour use an observed phenomenon? Since many small farms may be run by very small families (or by families with many of their workers engaged in other occupations including wage labour), and since many larger farms may be run by large joint families, the size of farm may not be a perfect proxy for the proportion of hired to total labour. With farm-level data for Hooghly district, Rudra (1973) noticed that while there was a significant negative correlation between labour use per acre and size of farm, there was none between labour use per acre and its hired-family composition. For the same sample, use of material input per acre and intensity of irrigation were also inversely correlated with farm size. Farm management data, particularly for the earlier period in the fifties, indicate that the larger input of labour on the smaller farms is associated with greater intensity of cropping and more irrigation per acre (FMS Reports: Bharadwaj, 1974; Bardhan, 1973). When one adjusts for the differences in irrigation (or cropping intensity), then the inverse relationship between farm size and labour use per acre is much weaker (Bardhan, 1973). The larger input of labour in smaller farms is thus partly due to their traditionally having greater intensity of irrigation,* to which labour and other current inputs are highly complementary, apart from the reason of a possible labour-cost differential.

*Why, historically, have the smaller farms become better irrigated? The Malthusian explanation in terms of population density being larger on better lands does not quite hold for farm-level differences within a district. Bhagwati and Chakravarty gave an explanation in terms of the poorer quality of land that passes hands in distress sales by poorer farmers. This, Bardhan points out, implicitly assumes that the land market is imperfect, that "land prices do not fully reflect the risks in parting with land as evaluated by the farmer on the margin of subsistence" (1973).
Thus, from the empirical work done so far using Indian data in connection with the labour market dualism question—indirectly, through estimating marginal productivities of labour, and directly, through identifying the correlates of an apparently greater intensity of labour use on smaller farms—the answer is not very clear. The hypothesis of a labour-cost advantage for "family-based farms" as compared with "wage-based farms" is neither conclusively proved as a general theory nor disproved as a qualified, conditional one.

What could be the concrete institutional reasons behind such a labour cost differential? Bardhan (1973a) using 25th round NSS data for different states, observed that the average rate of earnings for the actually hired out adult mandays was higher with the pure wage-earning households than with the small cultivator households. The basic question then is why and when is it that the workers from small cultivator households do not or cannot compete with landless labourers to bid down the market wage. What exactly are the institutional, cultural, or other impediments that preserve this labour market division? Answers to this are relevant for understanding when and where or with what kinds of change this demarcation or non-competition might weaken or shift.

One such factor may be the small cultivators' preference for working on their own farm, particularly in the case of the female workers in these households (Visaria on Kutch and Ratnagiri and NSS data showing open underemployment coupled with their unavailability for outside work). This was discussed in Section I.c. Another factor may be that where the small cultivator needs almost all of his labour on own farm in peak season, he cannot offer himself fully in the market except during the lean season, when market wages are lower than the annual average anyway. In other words, if there is any significant seasonal fluctuation in daily wage rates, then any difference in the seasonal composition of availability for market employment between the landless or near-landless labourer and the small cultivator will make the relevant market wage rates different for them. Even if the small cultivator were available for hiring out part of his labour time during the period of peak operations, the large farmers may still prefer the whole-time commitment for the crucial time-bound operations that is offered by the pure labourers. Some of the small cultivator households may be in a position to respond to this by hiring in part-time labour during the peak season and releasing one of the members (usually the young unmarried man) to take up whole-time employment as an agricultural labourer.

To the extent the larger use of labour per acre on small farms, and a larger output per acre, is due to a differential labour-cost advantage, and not due to difference in irrigation or quality of land, the question arises as to why the large farmers do not lease out enough until the differential disappears. The hypothesis of imputed cost of family labour being lower than market wage thus boils down either to imperfection in the land market (Sen, 1966; Bardhan, 1973), or to the prevalence of counteracting non-labour-cost differential in favour of the larger farms.

It is at this point that we must go back to the implications of the two sets of major changes that we have gone over in Sections I and II. One is the nature of agricultural growth with technological changes, and the other, related to this, is the changing structure of rural labour force.
The rapid increase in private investment in tube well irrigation as a vehicle of growth promoting innovations, largely concentrated on large farms, has been reducing the traditional irrigation gap. Coupled with the institutional advantage of the larger farms in credit (capital) market even for meeting the working capital needs of the innovation, this has loaded the differential in material input cost to the advantage of the larger farmers. What about returns to scale? For the progressive wheat growing areas, the available evidence is indicative of constant returns to scale (Bardhan, 1973; Hanumantha Rao, 1975). Bardhan’s comparison over time (1955-56 and 1967-68) of the estimated C-D production function for farms in Ferozepur district of Punjab indicates a sharp rise in the irrigation parameter, emergence of the fertilizer coefficient as a significant one, and constant returns to scale in both the years. For the paddy growing districts, however, the evidence is in favour of decreasing returns to scale. But even in paddy areas the institutional biases of the capital market lead to larger farms getting ahead in terms of investment in the growth-promoting innovations. The large farmers now even lease in land from smaller ones in certain areas and farm with hired labour, instead of leasing out to them to be cultivated with family labour.

Alongside this, the rising proportion of wage labourers among all agricultural workers, resulting from transformation of primarily peasant families into primarily labour families, would imply a growing normalisation—more so in certain areas than in others—of the overall labour supply curve. However, while the usually discussed market dualism in terms of labour supply from the landless and from the small cultivators might be on the decline in some of the rapidly growing areas, other kinds of market imperfection might be getting stronger at the same time. The requirements of the new technology with its time-bound operations and tighter crop rotation are already visibly affecting the nature of employer-labour relations in rural areas.

**III.d. Some Emerging Employer-Labour Relations**

From whatever little information has been collected regarding recent changes in the nature of labour contracts and agrarian relations, one can hardly generalise about the country or even about the pockets that have experienced agricultural transformation. However, they give some qualitatively significant insights into the interactions between forces of production and relations of production, or between these and the local socio-political power structure.

Bhalla’s study (1976) concerning the "prime Green Revolution area" of Haryana (covering Karnal district and adjacent highly irrigated areas) indicates certain changes in labour contracts accompanying shifts in demand for labour and changes in composition of labour supply. Traditionally, it was an area with a low proportion of hired agricultural labourers. Over the last 10 years their absolute number as well as proportion has more than doubled. The increase came partly from evicted tenants, partly from households with cultivation as main source of income and partly from shift of landless households from other occupations to agricultural labour, apart from natural increase in
the traditionally labour households. Compared with other less developed regions of the state or with the same region earlier, a much larger proportion of agricultural labourers are employed as permanent farm servants on rather long-term contracts (for two years, and in some cases even three-four- and five years). For the traditional and still dominant category of permanent labourers who are paid in crop share, the determination of the share has changed. Earlier, it used to be a standard fraction of gross output. Now it is a share of net farm business income estimated by the employer after deduction of a diverse set of production costs. The payment has thus become a variable share of gross output, inversely related with the technological level of production on a farm.

In West Bengal, Rudra (1975) and Beteille (1974) have independently observed intricate variations from the traditional 50:50 ratio of cropsharing arrangements with tenants, depending on crops and the landlord’s fixed investment in land and cost sharing arrangements. Some of the annual cropsharing tenancy contracts now look almost indistinguishable from that of a share-paid permanent farm hand. In both cases, a traditional mode of payment with an essentially labour-efficiency-ensuring function has been adapted by employers to changes in the technological aspects of agriculture.

In the developed region of Haryana, Bhalla observed several new features of the permanent labourer’s contract. It is elaborately formal, with the details of farm cost accounting and the amount of share payable and each periodic payment recorded, which is an apparent modernisation compared with oral contracts. But in this formal contract are built carefully timed advance payment and managed indebtedness that lead to continuation of original contract over longer periods, thus containing the worker’s emerging bargaining strength. Some of these permanent labourers, Bhalla noted, are from households with small farms. And their indebtedness often takes the form of the employer "relending" part of the institutional credit or "reselling" part of the modern inputs to which as a big farmer he has easier access. These labourers thus become the ones that are least interested in any form of collective bargaining. In the context of a tight labour situation as in this area, the use of attached labourers selected from small cultivating households on a variable share contract, with managed indebtedness built into it, seems to work as the farmer’s insurance for assured labour supply on favourable terms, and also against the labourers’ emerging bargaining power in the new situation. There is no collective bargaining yet in this area. Though casual labourers in a village sometimes get together and agree upon the wage to be demanded at the next harvest, there is still no organization for its implementation, and the labour groups for harvest are selected by the employer or by a contractor rather than collectively formed by the labourers themselves.

A strikingly different picture of organised polarisation of farmer-labour relations has been observed in Thanjavur district (Tamil Nadu) with its commercialised paddy cultivation based on intensive use of irrigation, fertilizers and improved seeds. Muthiah (1970), Beteille (1974) and Alexander (1975)
have studied different aspects of the increasing militancy of organizations of the landless and those of the big farmers, which in recent years broke out in violent confrontations followed by government arbitration in wage fixing.

In Kerala, agrarian trade unions have been established and functioning in a stable manner over a longer period, particularly in Kuttanad region. And now almost all over the state, collective bargaining between agricultural labourers' unions, organised with support of the leftist political parties, and farmers have become a regularised way of determination of wages, working hours, employment procedures, regulating the use of tractors and preventing the use of migrant labour, etc. (Alexander, 1973; Oomen, 1971; Center for Development Studies, 1975). Collective bargaining by agrarian unions organised with political support of a major party and thus facing monopsonistically organized farmer-employers, although still a highly localised phenomenon in India, presents a form of polarised agrarian relations that can possibly emerge as more important over time even in the general context.

III.e. Seasonality in Agriculture and Wage Determination

Many of the labour market imperfections—whether between labour supplied from small cultivating households and full-time wage labour, or between tied and casual labour—can be interpreted at least partly as an institutional response to the presence of seasonal peaks of labour requirements. As the production of a crop depends indivisibly on the timely carrying out of a chain of time-bound operations, peak labour requirements together with availability determine the mode of employment as well as the degree of seasonal wage fluctuation in a related manner. The seasonal peak gives labourers a brief bargaining power that they lose during the lean season. How they use this bargaining power under different circumstances, and how the employers react to their potential use of it through a variety of means for pre-emption, neutralisation or confrontation, is in a sense the crux of rural labour market behaviour, particularly when production conditions are changing.

The empirical questions that arise in the seasonality context are about the patterns of seasonal wage variation in India, and how they have changed with irrigation, multiple cropping, use of new seeds. Is the seasonal wage pattern systematically related with the extent of unemployment or underemployment in a region? How are the wage contracts affected by seasonal shortage or otherwise of labour? How extensive is the use of migrant labour groups? How does the use of machines affect seasonal pattern of employment and wages?

Two major sources of available data for seasonality analysis are the FMS and the NSS (including the so-called Labour Enquiries). For most of the FMS districts, monthly average and/or operationwise daily wage rates were collected as part of background information for the villages covered. Besides this, if one has access to the original farm-wise field returns, then one can use the periodic labour employment and wage payment figures to arrive at
seasonal variations in the wage rates actually paid by the farmers. The NSS supplies for 1950–51, 1956–57, 1963–64 and 1964–65, in the published reports, monthly and/or operationwise wage data collected from the agricultural labourers (in the last two years, for all other rural labourers). In the 25th round and the 27th round, no operationwise distinction is available, but one can look at the four quarterly subrounds as broadly representing some of the seasonal variations. The third source of large-scale wage data on a continuous monthly basis, which is the AWI data issued by the Ministry of Food and Agriculture, is the least reliable one for the purpose of a seasonality analysis, although it is usable with some modifications for trend analysis.

There are not many empirical studies on the patterns of seasonality in employment and agricultural wages in India and on their determinants. Identifying and interpreting the seasonal pattern in wage rate is much more complex than identifying the seasonal pattern of employment from the available data. This is because to identify wage variation, one has to separate the case of casual labourers. There is obviously little seasonal variation in the case of permanent labourers, and some of the data sources combining payments to or receipts for both types of labour give an average picture with very little variation. Secondly, there may be mutual interactions between labour tying and seasonal variations in wages, an issue to which attention has been drawn (Raj, 1959) but which has not yet been researched in the Indian context. The third problem of identifying seasonal wage variation arises from the diverse practices of piece rate and time rate employment of even casual labour for different operations, periods, and parts of the country.

Raj (1959) advanced a hypothesis that the amplitude of seasonal variation in agricultural wage might be regarded as an ordinal index of the extent of underemployment of the labour force in a region. The argument is that in regions where there is considerable underemployment at the seasonal low wage level (which he regards as something like a "subsistence wage"), the rise in wage rate in the busy season may be expected to be more moderate than in regions where the excess supply of labour in the lean period is less. For this, he considered the amplitude of seasonal variations in daily wage rates as a proportion of the minimum reached. The data used were monthly average of daily wage rates for FMS villages for one West Bengal district, two relatively backward districts of Madras and two Punjab districts—all of them during the mid-fifties. He found the proportional amplitude for male labour to be the smallest in the two Madras districts and highest in the two Punjab districts, which he interpreted as consistent with the relatively low-keyed cropping pattern and large labour supply in the former, and with the shortage in peak season in the latter. Labour supply is taken to be reflected by the proportionate importance of agricultural labourers and their dependents in the village population. However, as Raj himself points out, comparisons of seasonal wage variation across such varied regions may not be very meaningful, unless one takes account of differences in the extent of use of attached labour, in agro-climatic and technological conditions of production, and in mobility of labour in and out of the rural area.
Sethuraman (1972) argues that the degree of seasonal wage variation directly reflects the extent of underemployment, assuming given elasticity coefficients of labour demand and supply. The peak season wage is regarded as full employment wage and the extent of decline from it as reflecting underemployment. This is the reverse of the earlier interpretation of seasonal wage variation. He looks at operationwise variations in daily wage rates from the three NSS labour enquiries over three years: 1950-51, 1956-57, and 1964-65, for each of the major states. His approach basically ends up comparing between just the major operations—harvesting, ploughing, transplanting and weeding. The lean season is underrepresented, because even weeding is a peak operation for certain crops and regions and for female labour in general.

Even so, in the less heterogeneous case of male labour, the amplitude ranges between 25 to 50%. Over the period he observed a widening of the seasonal gap measured in this way. Sethuraman interprets this as a rise in seasonal underemployment. It could as well reflect an accentuation of demand during the peak season and/or institutional rise in labour's bargaining power. Without considering other related aspects of the situation, particularly the farm employment pattern, very little can be made out of this information.

Rath and Joshi (1966), in an interesting study using FMS data for a few districts in the mid-fifties, considered the pattern of seasonal wage variation in relation to the cropping pattern. The seasonal variation was understandably less in the districts with a more intensive cropping pattern spread out over the kharif and the rabi seasons.

When considered together with the seasonal pattern of employment, the seasonal wage variation might be a somewhat more meaningful indicator of demand and supply elasticities. Even there, the presence of "attached" labour on one hand and seasonal migration of casual labour on the other complicate the analysis enormously. All the necessary data are hardly available in a coordinated form.

Rudra (1973a), using periodwise data for a sample of farms in Hooghly district, studied the seasonal pattern of employment. Although he did not consider this in relation to the seasonal pattern of wages, some of the findings are interesting in this context. First, he finds that while for the smaller farm size-groups the seasonal peaks of farm labour use are moderate, they go up sharply for the larger sized farms—indicating presumably the scale effect for the most part.* Secondly, in the smaller size-group with traditional crop rotation, the seasonal pattern of farm employment has four clear humps in the year corresponding to the sowing and the harvesting of two crops of paddy. In the larger size-groups the peaks are much less regular, Rudra points out, because of their cropping pattern being more varied with overlapping sowing and harvesting periods for different crops. The dips

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*Rudra does not show whether on a per acre basis too the peaks are sharper on larger farms. His graphs with per farm employment figures give the impression that they are not.
in employment are briefer too on the larger farms. Thirdly, while the smaller farms hire in some casual labour during the peak seasons, their family members also do more work at those times on their own farm (apart from hiring themselves out partly). In the small and medium size-groups there is a positive association across seasons between use of family labour and use of hired labour on own farm. In the larger farms (particularly those above 10 acres which is a very large size for that region), the use of family labour on own farm though not negligible remains unchanged at a low level throughout the year. They might be doing more supervisory work during the peak season. Rudra does not include supervisory work. Members of rich farm families in this region obviously do not put in more manual work during the busy season. They have their permanent farm servants who work more during the peak periods like the family members of small farms. Fourthly, even for the largest size-group in this region the bulk of peak season labour requirements are met through the use of casual labour. Casual labour employment keeps on shooting up and down on the very large farms. On the medium-sized farms, it remains quite high throughout the year (because they use very little of attached labour) and has moderate peaks. What could be the reason for the fact that the use of attached labour in the area (though it is quite developed in terms of irrigation and use of improved seeds) is much less than in, say, some of the south Indian paddy districts? Small farm size could be one reason. Besides, the nearness of the city with its alternative employment possibilities might have encouraged the landless to move back and forth between peak and lean seasons instead of seeking to be permanent farm hands.

Rudra does not go into the relationship between seasonal wage variation and seasonal variations of employment at the farm level (both total and hired casual), and the links between the seasonality aspects of labour demand with the crop pattern and conditions of production. By grouping farms according to size, his analysis indicates the scale effect on overall and seasonal composition of farm labour use. But in this treatment the scale effect is not isolated; it is combined with effects of other differences (across sizes and even within a given size-group) that are not entirely dependent on size. Proportion of area irrigated and availability of family labour are two of the many things that are not uniformly related to size when one looks at the household-level data—in Hooghly as well as in other cases. A multivariate analysis might separate some of these effects.
Section IV. Micro-Level Correlates of Labour Demand and Labour Supply

In rural areas of India, by and large, labour supply and demand are both generated and their allocation decided at the household level. Ranging from the tiny cultivator to the big farmer, the household-level coordination and allocation of labour supply and labour demand for production determine the extent of their market involvement for hiring in or hiring out on wage. Beyond this wide range there are the pure employees on one side and the pure employers on the other. Here the complicated coordination of allocative decisions on both demand and supply does not arise. Still, the supply of labour from the landless is generated and allocated at the household level in relation to its composition, income level and alternative opportunities relevant for the different members. For the vast intermediate range, the ideal data base would be an integrated household schedule that gives both the time distribution of household members and the use of family and hired labour on farm and other household enterprises. This is something that the available data sources do not offer.

IV.a. Data

With a few exceptions, most of the large data sets relate either to farm-level employment and production characteristics or to labour households' working time disposition, not both. There are a few exceptions. One is FMS data for a few of the districts (like Hooghly), which give for a farm household the labour time disposition of family members including hiring out, the pattern of hiring in labour, wages paid for labour hired in and received for labour hired out, and farm management details. The other is NSS data from 27th round which gives the allocation of family labour as well as of labour hired in by a household. These still do not give the complete picture, the first one leaving out the pure labour households in the area, the second one leaving out most of the farm management information.

Apart from these large bodies of data, some small-scale surveys by individual or teams of researchers have also been used in this context. Of these, Ahuja's (1974) labour time disposition survey for households in six villages of Rajasthan and Parthasarathy's (1973) survey in West Godavari district are of special interest. Some of their findings have already been discussed at several points of this review. Both the surveys are basically similar to 25th or 27th rounds of NSS. Ahuja covers all types of households, as in 27th round, and Parthasarathy covers the labour and small cultivator households, as in 25th round. Unlike NSS, Ahuja's data for each household refer to the entire year, not just one reference week, and thus her total estimates of employment are more free of seasonal factors.

With most of the available data, one thus has little choice but be confined to analysing either the labour supply allocation across types of work or the farm labour demand composition in terms of family and hired
sources, but not both in one integrated framework. Even for such partial analyses, the published tabulations for grouped data are often inadequate. FMS reports give data averaged for size-groups of farms. The NSS regularly releases estimates of employment, unemployment and availability for more work at the state level. Recent tabulations of 25th and 27th rounds are quite illuminating in these respects. Still, for most of the cross-tabulations essential for analysing the factors determining farm labour demand and those determining labour supply, one has to use the household-level data.

IV.b. Studies on Labour Demand and Supply

Apart from production function estimates and analysis of input use in relation to farm size, technological and tenurial conditions, which we discussed earlier, it is possible to use disaggregative farm management data for analysing labour demand behaviour and the determinants of its family-hired composition. Existing studies in this area are of two kinds. One on inter-farm variations in employment of labour per acre. These include single-factor studies like those relating labour per acre with just the size of farms, and multivariate analysis including wage, irrigation or crop pattern, use of technological innovations, as well as farm size. Examples are: Rudra (1973), Hanumantha Rao (1975), and K. Bardhan (1975). The second kind is concerning the composition in terms of family labour and hired labour, and its determinants. Rudra (1973, 1973a, 1975) has described the composition of farm and its variation across farms in Hooghly district. He did not, however, attempt to explain those variations in terms of differences in crop pattern and technology.

For analysing the supply behaviour, within rural labour market, of landless and landpoor labour households, the disaggregated data on labour time disposition of the workers can be useful. Supply of labour in the theoretical (ex ante) sense is not directly measured by actual employment for the labourers, as demand is not by what farmers actually employ. Still, by relating variations across households in the level and also the pattern of employment with those in certain other aspects—like the demographic characteristics of the household, productive assets held, and the availability of any of its members for more or alternative work at specified wages—it is possible to get some idea of their supply behaviour.

We discussed earlier (Sec. I.h.) Lal’s (1974) observation (based on 25th round data from probing questions about alternative employment) that the supply curve of labourers for full-time work outside the village is upward sloping in the case of both landless and small cultivator rural households. Lal looked at the data for each of the states separately. Raj Krishna (1976), looking at the even more aggregative all-India situation, observes supply curves for alternative outside work to be upward sloping up to a point and then backward bending. Disaggregation is important on this issue. And it would be worthwhile to estimate the supply curve using household-wise data
within a state. Besides, the estimate should take account of, apart from the "supply price" in the form of expected wage or income for alternative full-time employment outside the village, the effect of the household's age-sex composition and its present income level.

Parthasarathy and Rama Rao (1973) did—using data from a small-scale intensive survey of rural labour households in West Godavari district of Andhra Pradesh—interesting cross-tabulations of intensity of current employment, current income and land held with availability for extra wage-employment. The distribution of workers opting for extra wage employment by the wage rate desired or expected shows the curve as rising forward normally and then bending backward in the case of men, and indeterminate in the case of women labourers. Their cross-tabulation of availability for extra employment with present income is contraindicative of the hypothesis of withdrawal of labour supply with rise in income—at least in the case of labour households. The proportion of workers opting for extra wage employment is found to be somewhat higher in the group of households above poverty line than in the group below it. There is, however, an inverse relation between landholding (indicating self-employment) and willingness for extra wage employment—which, incidentally, implies a lack of relation between landholding and income in the case of the labour households).

When they cross-tabulate current employment level per worker with household income, they find an inverse correlation. The better-off labour households (above poverty line) seem to be having a slightly lower current level of employment per worker, but a larger proportion of workers opting for extra wage employment. The discrepancy would seem to indicate either a stratified condition of labour market,* or an increase in the level of reservation price with rise in the labourer’s income beyond acute poverty, or both.

In identifying supply behaviour of rural labour—whether as actual employment in relation to wage rate received, or as willingness to take up extra or alternative employment at the expected wage—it is clearly important to take account of the differences in household income level. From all available evidence, rural labourers in India do not seem to constitute a homogenous, perfectly competitive mass. And we can get a clearer and more useful idea of supply behaviour in the rural labour market by disaggregating and re-grouping so as to control for the effects of other characteristics, of which some of the more important ones are income (or expenditure) level, land held (or other indicator of self-employment), household size and age-sex composition.

* The better-off labour households in this sample have a lower level of current wage employment per worker at a higher average wage rate. The poorer ones owe their condition to the lower wage rate at which they have to work. Bardhan’s (1975) study of rural labour households below poverty line in Punjab, Haryana and U.P. also reveals wide differences in the extent of employment/underemployment even among the poor. This apparent stratification among rural labourers could arise from a number of factors including specialisation, skills or other advantage of particular labourers for the high-wage operations, labour tying arrangements, differences in age-sex composition of workers among labour households.
IV.c. A Study of Correlates of Labour Demand and Supply in Rural Areas

In a separate study, I have attempted--using household level farm management data on one hand and labour time disposition data on the other--two sets of cross-sectional analysis with the object of identifying the major correlates of farm labour demand and of rural labourer's supply behaviour as indicated by his actual employment pattern.

For four districts representing technologically and institutionally different agricultural situations, the demand exercise will try to explain variations across farms in the per acre intensity of total labour use and its composition (hired and family labour) in terms of variations in

(a) farm size (net planted area),
(b) the irrigated proportion, or the intensity of cropping which is largely determined by rainfall and irrigation,
(c) the crop-mix, particularly the share of labour-intensive crops (like jute in a paddy area, paddy or cotton in a millet area, and, of course, the high-yielding varieties of most of the crops),
(d) new inputs like chemical fertilizers and technological changes embodied in tubewells and tractors,
(e) the wage rates for hiring labour,
(f) availability of family labour for work on the farm, which depends on alternative employment opportunities, household income level, cost of hiring labour, socio-cultural factors influencing work participation of women and children and leisure preference, if any,
(g) institutional factors like whether cultivator owns the land or is a tenant.

For these four distinct farm management regions, it presents also an intertemporal analysis comparing between a normal year in the mid-fifties and one in the end-sixties, a period covering major agricultural changes. It is an analysis of changes in farm employment pattern and changes in real wage rates (and hired labour's share of value added) in relation to each of the specific technological and institutional contexts.

Farm management data give a partial view of the rural labour market, concentrating on the demand side. To the extent part of the demand is met by the farm family, we get an idea of the supply behaviour of family labour for use on farm, how it responds to changes in total labour demand or requirement and also to changes in household income level (or changes in farm size as a close proxy). But it hardly tells us anything about the supply behaviour of the landless and the near-landless who supply the wage labour in agriculture. Hence, using the 25th round NSS data for rural labour households having little
or no cultivated area, an attempt is made in that paper to indicate the household characteristics (economic and demographic) that are correlated with differences in intensity, composition and seasonal pattern of variation of employment for its workers. The relation between actual wages received and employment, and also between the potential volume of labour supply for alternative or for extra employment and the wage rates or incomes at which they are willing to make this supply available, are explored in this context.

Since the demand and the supply analyses, with the available data sources, had to be based on entirely different samples with uncoordinated coverages, these cannot be meaningfully combined in order to derive an integrated econometric model of wage determination in rural labour market. The data required for this purpose must contain within a single integrated framework, covering all categories of rural households, information about both labour use pattern in household productive enterprise (farm or non-farm) and time disposition. However, until this ideal kind of data becomes available, the results of the separate exercises can be interpreted in relation to each other in order to derive some useful, if qualitative, insights into the operation of rural labour market within a broadly specified environment.


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