

Land, Labour and the Level of Living in Rural Bihar

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1. Introduction

The phenomenal volume of research which has been conducted over the past decade on problems of poverty in India, following the seminal contribution of Dandekar and Rath¹, falls broadly into two groups:² Those which are primarily concerned with measuring the incidence of poverty and those which are concerned not only with the measurement of poverty but also with an *explanation* of the level of poverty and its changes over time. Of the latter perhaps the most recent is an impressive exercise by Ahluwalia where he has analysed time series data from the annual NSS consumer expenditure surveys covering the period 1956-57 to 1973-74, for individual states as well as the country as a whole, in order to determine the impact of agricultural performance on rural poverty.³ The Ahluwalia study is not free from problems of measurement or interpretation.⁴ It is nevertheless necessary to take note here

1 V.M. Dandekar and N. Rath "Poverty in India" *Economic and Political Weekly* 2 and 9 January 1971.

2 The literature has been surveyed in D. Kumar "Change in Income Distribution and Poverty in India: A Review of the literature" *World Development* January 1974 and the most important among the early papers have been collected in P. Bardhan and T.N. Srinivasan (Eds) *Poverty and Income Distribution in India* (Statistical Publishing Society, Calcutta, 1974.) For a brief but recent review see I. Ali et. al. "Indian Society at 2000: Strategies for Equity" *Economic and Political Weekly*. Annual Number, March 1981.

3 M.S. Ahluwalia "Rural Poverty and Agricultural Growth in India" *Journal of Development Studies* April 1978.

4 For a critique of the methods of measurement employed by Ahluwalia, see M.H. Suryanarayana *Growth and Income Distribution in India: A study of the trends in Intersectoral Disparities and Intrasectoral Distributions based on NSS data* (M. Phil Dissertation, submitted to Jawaharlal Nehru University, Centre for Development Studies, Trivandrum, 1980). For a substantial reinterpretation of the same data, see A. Saith "Production, Prices and Poverty in Rural India, *Journal of Development Studies* January 1981.

of some of its more important implications, for, in a sense, they set the point of departure for our present chapter.

Ahluwalia's exercise shows some conflicting patterns between the analysis of data at the level of individual states and that at the level of the country as a whole. This is not really surprising in view of the known sharp variations across states in the conditions and relations of agricultural production which obviously influence the incidence of poverty in different regions. In view of such variations between regions in the level of poverty, or its changes over time, it is not easy to judge what analytical inferences can be reasonably drawn from the aggregated data regarding factors governing the incidence of rural poverty in an economy of subcontinental dimensions like India.

Studies undertaken at the level of individual states or at an even lower level of aggregation would seem to be more appropriate for this purpose. Unfortunately such detailed studies of trends in the incidence of poverty and factors underlying these trends in individual states are relatively scarce. Of these the most important is perhaps the United Nations study on Kerala⁵ incorporating some of Panikar's earlier work on the same state⁶ and the series of studies sponsored by the ILO on Tamil Nadu, Punjab and Bihar.⁷ In this chapter an attempt is made to extend Nayyar's earlier work to the state of Bihar.⁸

Another feature revealed by the Ahluwalia study is that there have been sharp fluctuations in the incidence of poverty over time, rather than a monotonic or near monotonic trend, both at the aggregate level as well as in the case of most of the individual states. Almost all the earlier studies, including those of individual states, were confined to one point of time or a few points of time and most of these studies showed an increase in the incidence of poverty over time. Ahluwalia argues that this picture appeared because the terminal observations of these studies fell in the late sixties when the incidence of poverty was exceptionally high. His own time series, which comes up to 1973-74, shows that after reaching a peak in the late sixties the incidence of poverty declined during the early seventies. He finds no discernable trend increase or decrease in the level of poverty for the period as a whole except in the case of a few states.

In the presence of such fluctuations it is easy to see why continuous time series are essential for drawing any firm inferences regarding *trends* in the level of poverty and the factors underlying the trends. In this chapter, changes in the incidence of poverty have been analysed on the basis of such time series data, though the latter has been supplemented with point to point comparisons in the case of those variables for which the necessary time series data are not available.

A third feature of the Ahluwalia exercise, and for our purposes perhaps the most important, is its somewhat ambiguous conclusion regarding the

5 Centre for Development Studies *Poverty, Unemployment and Development Policy: A case study of selected issues with reference to Kerala* (United Nations, New York 1975).

6 P.G.K. Panikar "Economics of Nutrition" *Economic and Political Weekly* Annual Number, February 1972.

7 ILO *Poverty and Landlessness in Rural Asia* (Geneva 1977).

8 R. Nayyar "Poverty and Inequality in Rural Bihar" in ILO op. cit.

factors underlying changes in the level of poverty. While the incidence of poverty was significantly and inversely related to agricultural performance (defined as per capita production) at the national level, Ahluwalia found in the disaggregated analysis that this relationship did not hold in the case of more than half the states, including even states like Punjab and Haryana where the dramatically successful performance of agriculture does not appear to have reduced the incidence of poverty. Also, unidentified secular tendencies, which did not show up at the national level, appeared as significant effects towards increasing the level of poverty in individual state.

These puzzling features are not unexpected in an analysis which attempts to examine the effect of one factor, namely agricultural performance, on the level of poverty without identifying and isolating the other important effects which are also reflected in the observed incidence of poverty. In this chapter, we start by constructing, however crudely, an inventory of the principal factors underlying the level of rural poverty. An attempt is then made to explore the movement over time of some of these factors along with trends in the level of poverty itself.

The rural poor are not a homogeneous category of households. They are differentiated not only in terms of the level of poverty but also functionally in terms of the roles which they play and the positions they occupy in the structure of agrarian relations. Accordingly, the sets of factors which affect the well-being of different segments of the rural poor also vary. For the purpose of identifying these factors it is therefore useful to separate, from the outset, at least two broad strata of rural households who make up the large bulk of poor households in rural areas — the term poor being used somewhat loosely here pending a more rigorous definition further on. The first is the strata of peasant households who make their living primarily by operating small plots of land, either owned or leased in, mainly on the basis of family labour. The second is the strata of agricultural labourers who earn their living mainly by hiring themselves out as wage labourers.

In the case of the self-cultivating peasant households we may say that the real "income" per head (y_1) is the net output per family farm (q) divided by the average family size of peasant households (n_1), defined in standard consumer units:

$$y_1 = \frac{q}{n_1} \quad (1.1)$$

Here q can be expressed as a share (k) of total production (Q) such that we have

$$y_1 = \frac{k \cdot Q}{n_1} \quad (1.2)$$

The rate of change of peasant incomes per capita is thus given by

$$\frac{\dot{y}_1}{y_1} = \frac{\dot{k}}{k} + \frac{\dot{Q}}{Q} - \frac{\dot{n}_1}{n_1} \quad (1.3)$$

The term k in (1.2) may be roughly interpreted as the ratio of land operated per individual peasant household to total area operated (land being defined in standard hectares to abstract from variations in land quality). The implied suggestion is that the share claimed by a peasant household out of the total net output is proportional to its share of land in the total area operated. It may be argued here that the share of output acquired by a peasant household would also be affected by the intensity of application of labour and other inputs apart from holding size. However, it is well known that most of these factors are in fact closely related to the size of holding which is also a good proxy for the credit worthiness of a peasant household. The share of land operated, k , is thus not a bad index of the share of net output going to a peasant family.

We have seen that the income per capita of self-cultivating peasant households depends on three variables: Q , the level of net output, k the average holding size and n , the average family size of this strata. However, the incidence of poverty, i.e. the percentage of peasants with incomes below a given poverty line, depends not only on the mean level of income but also on the distribution of income about the mean. While moving from the level of per capita peasant income to the incidence of poverty in this strata, therefore, the determinants k and n , must now be appropriately reinterpreted to represent not just the mean values but the full distribution of the relevant variables. The same reinterpretation would obviously apply also to the changes experienced over time such that the incidence of poverty among the peasant population and changes in this incidence are seen, finally, to depend on three factors: the level of agricultural output, the distribution of land and the family size distribution of peasant households.

Three qualifying remarks are necessary here before passing on to the case of agricultural labour households. First, the demographic factor has not been directly introduced here except in the change of family size. However, it is easy to see that the pressure of population on land is very much represented here in the distribution of land through changes in which it would reflect itself. Second, the level of agricultural production is itself obviously dependent on a number of factors like the state of technology, land quality, weather and the application of labour and other inputs. However, for our present purposes it is enough to take all these factors as reflected in the level of production which is itself treated as an exogenous variable.

Finally, we have not brought in prices. To the extent the peasants buy or sell in commodity markets their real income will be affected by a change in the level of prices. However, the direction of this price effect on peasant poverty cannot be judged *a priori* since it would depend on the purchase and sale ratios of peasant households as also the pattern of change in relative prices of commodities bought and sold by them. The price effect on peasant poverty is therefore something which might vary from case to case and needs to be verified empirically.

Turning now to agricultural labour households we say that the real

income per head, (y_2) is here given by the ratio of average family income (y) to average family size of agriculture labour households (n_2):

$$y_2 = \frac{y}{n_2} \quad (1.5)$$

Here y is equal to the product of average number of earners per family (e), the average number of days of employment per year (m) and the daily wage rate (w) divided by the consumer price index of agricultural labourers (p):

$$y = \frac{e.m.w.}{p} \quad (1.6)$$

The average number of days of employment per agricultural labourer (m) is in turn given by the total demand for man-days of agricultural labour divided by the number of labourers (N). Where (P) is the productivity of agricultural labour and x the proportion of total production based on hired labour, this can be written as:

$$m = \frac{x.Q}{PN} \quad (1.7)$$

such that the complete term for income per head of agricultural labourers can be written as:

$$y_2 = \frac{x.Q.e.w}{n_2.P.N.P} \quad (1.8)$$

The rate of change of per capita income is then given by:

$$\frac{\dot{y}_2}{y_2} = \frac{\dot{x}}{x} + \frac{\dot{Q}}{Q} + \frac{\dot{e}}{e} + \frac{\dot{w}}{w} - \frac{\dot{n}_2}{n_2} - \frac{\dot{P}}{P} - \frac{\dot{N}}{N} - \frac{\dot{p}}{p} \quad (1.9)$$

As with equations (1.2) and (1.3) in the case of self-cultivating peasants, so also here, equations (1.8) and (1.9) are really no more than simple identities. However, they serve the useful purpose of enabling us to identify the two sets of variables with, respectively, positive and negative effects which determine the level of per capita incomes of agricultural labourers.

However, as it was pointed out in the earlier case, the incidence of poverty in a strata depends not only on the mean income of the strata but also on the distribution of the relevant population about this mean. As such, while moving from the mean income to the level of poverty, it is important to remember that what we have identified here are only the arguments of the function which determines the level of poverty and not the function itself. Indeed, some of these arguments must now be reinterpreted as full distributions rather than average values of the relevant variables as explained in the earlier case.

The factors governing the incidence of poverty, through their impact on either peasant household income or income of agricultural labourers, can be seen therefore as falling into three main groups. First, we have factors like the

level of agricultural production and prices which affect both peasant households as well as agricultural labour households. An increase in agricultural production has a positive effect on incomes of both categories, and is therefore expected to have a strong inverse relationship with the incidence of poverty. The effect of price movements is less clear. While a rise in prices adversely affects the income of agricultural labourers, its impact on peasant incomes may tend to reinforce or offset this effect depending on the sale and purchase ratios and also the movement of relative prices of commodities bought and sold.

The net effect of prices would also depend on the relative size of agricultural labourers and the lower strata of peasants. The effect of production and price movement on poverty in Bihar is analysed along with trends in the incidence of poverty itself in Section 2.

Second, we have factors like the size of peasant households and distribution of land which directly affect the per capita income levels of peasants. These factors are examined in Section 3. Of course while changes in land distribution affect most directly the incomes of peasants it is easy to see that the share of total production based on wage labour (x) is basically determined by the size distribution of operational holdings. An increase in landlessness would also have far-reaching effects on the average employment, and possibly wages of agricultural labourers. These and other factors which primarily affect the incomes of agricultural labourers are taken up for discussion in Section 4. The main conclusions are finally summarised in Section 5.

2. Poverty, Production and Prices

The problems of defining an appropriate measure of the incidence of poverty are by now well known. The method most widely used in India is to specify some minimum consumption expenditure level and estimate the percentage of population below this level.⁹ The first problem that arises with this head-count method is that the measured incidence of poverty is highly sensitive to the choice of a particular poverty line and attaches no weight whatsoever to the distribution of the population below the line. The index defined by Sen¹⁰ does take account of this problem and it has been employed among others by Bhatta and Ahluwalia in India.¹¹ However, the Sen index, while analytically efficient, is an extremely complex index especially when adapted to grouped data.

An alternative way around this problem, less elegant but perhaps intuitively more appealing, is to adopt the conventional head-count method but

⁹ See, for example, the studies in Bardhan and Srinivasan op. cit.

¹⁰ A.K. Sen "Poverty, Inequality and Unemployment" *Economic and Political Weekly*. Special Number, August 1973.

¹¹ See I.Z. Bhatta *Inequality and Poverty in Rural India* in P. Bardhan and T.N. Srinivasan op. cit. and M. Ahluwalia op. cit.

employ several poverty lines simultaneously. This serves the same purpose of capturing the spread of the population below a specified level of consumption. This procedure has been employed by Bhatta for India,¹² Kurien for Tamil Nadu¹³ and by Khan for Bangladesh.¹⁴ We shall also follow this procedure. It is noted here that so far as the pattern of change in the incidence of poverty over time is concerned, the use of both indices yield similar patterns in the Indian case as has been shown in Ahluwalia's recent exercise.

The use of multiple poverty lines has the added advantage of getting around the extremely difficult problem of finding any single consumption level which is the most appropriate as a minimum norm. The procedure usually followed is to specify a minimum nutritional requirement, such as daily per capita calorie intake, and work out the corresponding expenditure level. One way of transforming the nutritional norm to an expenditure level is to solve the standard linear programming problem of finding a least cost diet subject to a set of nutritional constraints and this method has been employed in some of the state specific studies cited earlier.

The difficulty with this approach is that the nutritionally adequate least cost diet may not be accepted as palatable by actual consumers such that additional taste preference constraints have to be built into the model to make the solution realistic. In doing so of course a great deal of arbitrariness and personal judgement gets built into the model at the same time. The procedure more widely accepted, therefore, is to find the lowest actual consumer expenditure level in the observed NSS data at which the quantum of food intake meets the nutritional requirement and adopt that as the minimum consumption norm.

Bardhan adopted the All India rural norm of Rs.15 per head per month at 1960-61 prices¹⁵ which corresponded to the All India (rural plus urban) monthly per capita expenditure of Rs.20 originally specified as the poverty line by the Planning Commission in its own exercises.¹⁶ Dandekar and Rath also adopted this line of Rs.15 at 1960-61 prices as meeting the minimum calorie norm of 2,250 calories per day and it has been employed most recently by Ahluwalia. The same line was applied, with appropriate adjustment for inter-state price variation, by Nayyar in her earlier cited estimate of rural poverty in Bihar. However, as Rajaraman¹⁷ and others have pointed out, the state specific poverty line must take into account not only inter-state variations in prices but also that in food habits and consumption preferences in general. As such, the appropriate procedure would be to transform nutritional (calorie) requirements directly into state specific minimum consumption expenditure norms

12 I.Z. Bhatta op. cit.

13 C.T. Kurien "Rural Poverty in Tamil Nadu" in ILO (1977) op. cit.

14 A.R. Khan "Poverty and Inequality in Rural Bangladesh" in ILO (1977) op. cit.

15 P.K. Bardhan "On the Incidence of Poverty in Rural India in the Sixties" in P. Bardhan and T.N. Srinivasan op. cit.

16 Planning Commission *Perspective of Development 1961-76, Implications of Planning for a Minimum Level of Living* reprinted in P. Bardhan and T.N. Srinivasan op. cit.

17 I. Rajaraman "Growth and Poverty in the Rural Areas of the Indian State of Punjab" in ILO (1977) op. cit.

using the observed correspondences between calorie intake and consumption expenditure in the data of individual states.

Apart from the procedure of converting nutritional requirements into consumption norms, an even more serious problem with defining a poverty line is that of specifying the minimum calorie requirement itself. Recently, the Planning Commission's Perspective Planning Division, after considering the recommendations of the Nutrition Experts Group, adopted the norm of 2,435 calories per head per day in rural areas.¹⁸ Subsequently, Sukhatme recommended that the appropriate norm should be much lower than this figure. However, most participants in the current debate in India seem to agree that Sukhatme's recommendations are too low.¹⁹ The problem appears to be almost intractable since the evidence suggests that there are variations in calorie requirements not only between persons but also for the same person on different days and this is quite apart from the effects of variation in the nature of work or the environment.

To get around these problems, in the present exercise we have adopted a range of three different poverty lines. One corresponds to the recent Planning Commission figure of 2,435 calories per head per day. This was transformed to a monthly per capita consumption expenditure of Rs.35 per day at 1971-72 prices in Bihar. The calorie norm was converted to monthly per capita expenditure using the Bihar tabulations of the NSS 26th round data which give calorie and protein intake per day per consumer unit by expenditure classes for all states.

The intake per expenditure unit is easily converted to per capita intake since the number of consumer units and persons per household is also given by expenditure classes. The second line was marked at 10 per cent below the top line and the third at 25 per cent below the top line. This, incidentally, was the proportion of downward revision recommended by Sukhatme to the poverty line first adopted by the Perspective Planning Division in its recent exercise.

The percentage of population below these three lines may be described, for reference purposes, as those *below* the poverty line (P_1), *well below* the poverty line (P_2) and *far below* the poverty line (P_3). The three lines, which incidentally work out to approximately Rs.17, Rs.15 and Rs.13 at 1960-61 prices, were extrapolated to other years using the official Agricultural Labourers Consumer Price Index (ACPI)²⁰ and the proportion below each line

18 Planning Commission *Report of the Task Force on Projection of Minimum Needs and Effective Consumption Demand* (New Delhi, 1979).

19 For the current discussion in India, see S.K. Chakrabarti and M.K. Panda "Measurement of Incidence of Undernutrition" *Economic and Political Weekly* August 1, 1981; N. Krishnaji "On Measuring the incidence of undernutrition: a note on Sukhatme's procedure" *Economic and Political Weekly* May 30, 1981; P.U. Sukhatme "Assessment of Adequacy of Diets at Different Income Levels" *Economic and Political Weekly* Special Number August 1978 and P.U. Sukhatme "On Measurement of Poverty" *Economic and Political Weekly* August 8, 1981.

20 There is another problem here relating to the deflator. Since prices of different commodities change at different rates and the composition of the consumption basket varies from class to class, using the same deflator for all classes will bias the results. There are several exercises which attempt to tackle this problem by constructing different deflators for different fractile groups (I. Rajaraman op. cit, Suryanarayanan op. cit). Though this possibly reduces the bias, the problem is not really solved. However, it is easy to see that this problem is more serious in the case of measuring inequali-

was estimated by interpolation on the assumption of even distribution of persons within an expenditure class.

It has been suggested that the problem of arbitrariness notwithstanding, the choice of a particular poverty line may not matter too much so far as comparisons over time are concerned.²¹ However, as we shall see, the choice of a specific line may be quite important if the pattern of change, or the strength of different effects on poverty, varies between different levels of poverty. We have already noted how the use of multiple lines, apart from getting around the problem of specifying the most appropriate norm, also helps us to capture the spread of the population below the poverty line. With these initial clarifications we can now turn to the pattern of changes as indicated by our exercise on Bihar.

Our estimates of the proportion of population *below, well below and far below* the poverty line for each year during the decade 1963-64 to 1973-74 in rural Bihar have been shown in Table 3.1. The proportion of population below

Table 3.1 Poverty, Production and Prices in Rural Bihar

Year	% Population Below the Poverty Line			Per capita Foodgrain Production (kg)	Agricultural Labourers Consumer Price Index
	Below (P_1)	Well Below (P_2)	Far Below (P_3)		
(0)	(1)	(2)	(3)	(4)	(5)
1963-64	58.26	49.21	33.00	155.69	118
1964-65	58.27	49.57	34.65	153.01	150
1965-66	63.10	54.25	38.60	142.42	179
1966-67	64.26	58.28	48.85	180.77	229
1967-68	75.39	67.99	55.83	165.39	250
1968-69	63.92	57.31	39.61	166.79	187
1969-70	42.65	34.88	21.92	139.17	202
1970-71	64.08	54.82	39.66	147.36	206
1971-72	62.26	53.12	39.05	160.89	207
1972-73	60.04	51.78	37.74	162.21	240
1973-74	62.03	52.91	37.32	132.56	337

Sources: Various issues of (i) National Sample Survey *Tables with Notes on Consumption Expenditure*.
(ii) Ministry of Agriculture *Area & Production of Principal Crops in India*.
(iii) Directorate of Economics and Statistics *Statistical Abstracts of India*.

Note: Per capita foodgrain production has been calculated by dividing total production of the state by total rural population of the state as estimated from the decennial censuses.

ties. In the case of a given poverty line, the ACPI is probably not a bad deflator to use for calculating the value in different years of a given basket of 'poverty line' consumption.

21 A. Saith op. cit.

the poverty line has been around 60 per cent for the period as a whole, though it was exceptionally high (over 75 per cent) in the year 1967-68 following a drought the previous year, and exceptionally low (less than 43 per cent) in 1969-70. Apart from these two years we see only mild fluctuations in the range of approximately 58 to 64 per cent and, while the proportion at the end of the period was higher than in the beginning of the period, our regression of P_1 on time shows no trend effect significantly different from 0. While the absolute proportions P_2 and P_3 are obviously lower, the pattern of fluctuations is similar to that of P_1 .

At the end of the period, approximately 53 and 37 per cent of the rural population were "well below" and "far below" the poverty line respectively, as compared to 49 and 33 per cent at the beginning of the period. But again, contrary to what these end point comparisons suggest, the trend effect is not significantly different from 0.

It was pointed out in the preceding section that two of the factors which are expected to influence the level of poverty are the level of agricultural performance and changes in the level of prices. Along with these variables the trend has also featured in the recent discussion on determinants of the level of poverty in India.²² The proportion of people below the poverty line has been regressed on these three variables to test for their effect on poverty in Bihar during the period 1963-64 to 1973-74.

It has been argued that, more than incomes, it is actually the effective availability of foodgrain itself which affects consumption levels of the poor, since even in a good year, in terms of income, their purchasing power would not suffice to cover distribution costs and attract the grain from outside if it is not available within the state.²³ Accordingly, foodgrain production has been used here, instead of total agricultural production, as the index of agricultural performance. Furthermore, to take into account the effect of population growth, the foodgrain variable has been introduced in per capita terms and the poverty level has been regressed on it with a one year lag since it is believed that fluctuations in the level of production reflect themselves in consumption with a lag of about a year. The price variable used is the ACPI for Bihar.

The regression results have been presented in Table 3.2. Sets of four equations are shown for each poverty index P_1 , P_2 , P_3 . The equations give respectively the regression of $P_{i,t}$ on time (2.1, 2.5, 2.9), on per capita foodgrain production and time (2.2, 2.6 and 2.10), on per capita foodgrain production and the consumer price index (2.3, 2.7, 2.11) and finally per capita foodgrain production and the consumer price index with a one year lag (2.4, 2.8 and 2.12).

As stated, the foodgrain production variable is lagged by one year in all cases. The results are reported here for linear functions only which were selected in preference to semi-log and double-log functions which were tried in

22 M. Ahluwalia op. cit.; K. Griffin and A. Ghose "Growth and Impoverishment in Rural Areas of Asia" *World Development* Vol. 7, 1979; and A. Saith op. cit.

23 Centre for Development Studies op. cit.

all cases but rejected as giving much poorer fits. P_i was also regressed simultaneously on foodgrain production, prices and the time variable. However, these equations were rejected because of very high multicollinearity between the price variable and time. The t -values for all variables were lower in the rejected functions compared to those in the linear functions reported here.

The results are as follows. In the case of all three poverty indices P_1 , P_2 , and P_3 , the effect of trend (time variable) is not significantly different from 0 even at the 10 per cent level of significance. Interestingly, the effect of the price variable is also not significantly different from 0 even at the 10 per cent level of significance. This holds even when the price index is introduced with a one year lag and the t -value shows a slight increase. The effect of per capita foodgrain production is significant at the 5 per cent level for all regressions of P_1 and P_2 , and at the 1 per cent level for regression of P_3 , with sign negative as expected. The constant term is highly significant at the 1 per cent level in all the equations. The coefficient of explained variation R^2 is close to 0 when P_i is regressed on time only for all three poverty indices. Otherwise it is between 57 to 56 per cent in the case of P_1 , 52 to about 58 per cent in the case of P_2 and 62 to about 66 per cent in the case of P_3 . The highest R^2 values are recorded in all three cases when the poverty index is regressed on foodgrain production and the price index with a one year lag.

The interpretation of these results seems fairly straight forward. For the period covered, 1963-64 to 1973-74, there was no trend increase or decrease in the level of poverty in Bihar. If secular forces were at work, they appear to have offset one another. Similarly, whatever effect price changes may have had on different segments of the rural poor in Bihar appear to have cancelled one another leaving a zero net effect of the price level on the level of poverty. Note that this has happened in spite of the ACPI being used as the best available price index for extrapolating the value of the poverty level consumption basket, which tends to build in a positive statistical correlation between poverty incidence and the price index independently of any real economic relationship between the two variables.

Evidently there are some segments of the rural poor, i.e., the net selling poor peasants, who are better off when the price of foodgrain and allied items rise as we have argued earlier. In the light of this, the presumed positive relationship between agricultural prices and poverty incidence needs to be examined with greater caution. In contrast to prices, the effect of foodgrain production was significantly and inversely related to the level of poverty i.e. a rise (fall) in per capita foodgrain output reduced (increased) the incidence of poverty. This confirms the expectation based on our earlier analysis that both major segments of the rural poor, i.e. the small cultivator and the agricultural labourer, are better off when there is improved agricultural production.

The positive and highly significant constant term in all equations would seem to indicate that there are systematic affects, not represented in our variables here and not necessarily associated with time, which tend to maintain the high level of poverty. This is also reflected in the fact that only a little over

Table 3.2 Regression of Poverty Incidence on Selected Explanatory Variables

Equation Number	Dependent Variable	Constant Term	Coefficient of Explanatory Variables				R ²	F
			Per capita foodgrain production	Agricultural Labourers consumer Price Index	Time			
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
2.1	P ₁	61.8249* (11.7726)	—	—	-0.8881 (0.1138)	0.001436	0.0129	
2.2	P ₁	94.8988* (8.0105)	-0.2350** (2.9523)	—	0.1899 (0.3298)	0.522111	4.3701	
2.3	P ₁	89.9574* (6.2158)	-0.2229** (2.8511)	0.0205 (0.6245)	—	0.538127	4.6601	
2.4	P ₁	87.0900* (5.9610)	-0.2190** (2.8640)	0.0349 (0.8950)	—	0.559695	5.0846	
2.5	P ₂	53.9789* (9.9804)	—	—	-0.1462 (0.1833)	0.003720	0.0336	
2.6	P ₂	88.0063* (7.2050)	-0.2417** (2.9461)	—	0.1399 (0.2356)	0.522159	4.3710	
2.7	P ₂	82.6502* (5.5640)	-0.2304** (2.8712)	0.0216 (0.6399)	—	0.542269	4.7388	
2.8	P ₂	78.4725* (5.3194)	-0.2247** (2.9099)	0.0416 (1.0560)	—	0.577712	5.4722	
2.9	P ₃	39.6744* (6.8170)	—	—	-0.1544 (0.1799)	0.00583	0.0324	
2.10	P ₃	79.5355* (6.7691)	-0.2832* (3.5876)	—	0.1807 (0.3164)	0.61806	6.4728	
2.11	P ₃	72.1301* (5.1728)	-0.2678* (3.5558)	0.0297 (0.9384)	—	0.651628	7.4828	
2.12	P ₃	70.8446* (4.9512)	-0.2662* (3.5548)	0.0386 (1.0080)	—	0.656865	7.6572	

Figures in parentheses denote *t*-values. The number of observations is eleven for all regressions. * and ** denote significance at 1 per cent level and 5 per cent respectively.

half the variation in the level of poverty is explained by variations in our selected variables. As to what these other factors making for a high incidence of poverty might be, we already have some *a priori* expectation based on our discussion in the preceding section. However, it was not possible to test for effects of land distribution, unemployment, etc. in this exercise since we don't have the necessary time series data on these variables. Such data that we do have will be analysed in the following sections.

The other implication of our regression results is that the factors which we have considered here have a stronger effect on the lowest poverty index P_1 than on the other two. The value of R^2 and the t -values of explanatory variables are highest for the third set of regressions. This would appear to suggest that the variables used here are better suited to explain changes in the condition of the really poor, those "far below" the poverty line, rather than those who are somewhat less poor.

It is noted in this context that at the mean level of observed per capita foodgrain consumption, the elasticity of poverty incidence with respect to per capita foodgrain consumption works out to 0.57, 0.67 and 1.08 for P_1 , P_2 and P_3 respectively.²⁴ In other words there is a greater proportionate reduction in the number of persons "far below" the poverty line compared to those "well below" or "below" the poverty line, for a given increase in per capita foodgrain consumption. Furthermore, if the relationship between poverty incidence and per capita production is indeed of the linear type represented in the regression equations, then for any poverty benchmark the elasticity rises as we move to higher levels of per capita production, i.e. there is an increasing proportionate reduction in poverty incidence for a given proportionate increase in per capita production.

Finally, in case these results are sought to be compared with those of Ahluwalia, Griffin and Ghosh or Saith,²⁵ it should be remembered that the time periods used are different both in terms of end points as well as missing data for intermediate years in the earlier studies. The measure of poverty used here is also different while the variables used are not always the same, e.g. Saith uses deviations from trend values rather than actual values of different variables. As such there is some question as to whether the results reached here can be easily compared to the results of the earlier exercises.

3. The Distribution of Land

The result that there are factors, other than production, prices or the trend variable, which have a significant effect on the incidence of poverty, is

²⁴ These elasticities are calculated from equations (2.2), (2.6) and (2.10) which give the highest t -values for the coefficient of per capita foodgrain production in the three sets of equations corresponding to P_1 , P_2 and P_3 respectively.

²⁵ M. Ahluwalia op. cit.; K. Griffin and A. Ghose op. cit. and A. Saith op. cit.

consistent with our earlier *a priori* reasoning which suggested that the distribution of land may be one such factor. Unfortunately a time series of observations on land distribution in Bihar is not available to enable us to test the effect of this factor statistically. Data on land distribution is available, however, for the three years 1953-54, 1961-62 and 1971-72 from large sample surveys of the 8th, 17th and 26th rounds of the National Sample Survey which enable us to say something about changes in the distribution over time.

While interpreting the data from these surveys it must, however, be remembered that in 1953-54 the state of Bihar included parts of the district of Purnea and Purulia which were transferred to Bengal in the States reorganisation of 1956 and are therefore not covered in the surveys of 1961-62 and 1971-72. The definition of ownership employed in the 17th round survey (1961-62) and 20th round survey (1971-72) was also wider than that of the 8th round (1953-54) in that ownership like possession, such as long lease etc., were treated as ownership in the later surveys. The comparison of land distributions over time are subject to these and other limitations.²⁶

The distribution of area owned, area operated and the leasing pattern by size class of holdings is shown in Table 3.3. The first point to be noted is the close correspondence between the share of a particular holding size class in area owned and in area operated in any of the three benchmark years (columns 1-3 and 4-6). The close correspondence between these two distributions would suggest that the extent of land leasing — at least across classes — is very small and that there is no clear pattern of any size groups being markedly "leasing in" or "leasing out" classes. However, comparisons of size class shares of area owned and area operated cannot really be used for drawing such inferences since the total area operated is not the same as the area owned either for a class or for the rural household sector as a whole. Land operated by rural households may in fact be leased in from urban owners of the land.

Actual share of operated area leased in and owned area leased out by size class is shown for the years 1953-54 and 1971-72 in columns 7 and 9 and 8 and 10 respectively. It will be evident that the proportion of operated area leased in is inversely related to the size of the operational unit such that for holdings of up to five acres the leased in proportion may be as high as 20 to 30 per cent whereas for larger holdings of size 15 acres or more, the proportion of area leased in is only around 5 per cent or less i.e., large operators own the bulk of the land which they operate.

Further, we note that for holdings of up to ten acres the proportion of operated area leased in is higher than the proportion of owned area leased out, whereas for holdings of size class 15 acres or more, the reverse is true. This tends to suggest that operators of small holdings are net leasers out. However we should be cautious in drawing this inference since, as it has already been pointed

26 For a detailed discussions of the landholding surveys, see S.K. Sanyal "A Review of the Conceptual Framework of Landholding Surveys" *Indian Journal of Agricultural Economics* July-September 1976; S.K. Sanyal "Trends in Rural Unemployment in India: Comments II" *Economic and Political Weekly* 29 January 1977 and S.K. Sanyal "Trends in Some Characteristics of Landholdings: An analysis for a few states" *Sarvekshana* July 1977.

Table 3.3 Estimated Share Distribution of Area Owned and Area Operated by Size of Holding in Rural Bihar

Size Class (acres)	Distribution of Area Owned (%)			Distribution of Area Operated (%)			Owned Area Leased Out (%)		Operated Area Leased In (%)	
	1953-54	1961-62	1971-72	1953-54	1961-62	1971-72	1953-54	1971-72	1953-54	1971-72
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
0.01- 0.99	3.54	3.75	4.75	3.52	3.87	4.48	8.80	12.76	26.86	30.64
1.00- 2.49	9.12	10.00	13.45	9.31	10.99	13.68	7.82	7.49	22.16	25.30
2.50- 4.99	18.04	20.25	23.43	20.25	21.53	26.24	5.90	5.82	20.69	20.05
5.00- 7.49	14.90	15.81	17.26	15.76	15.69	16.98	5.21	8.39	14.91	11.63
7.50- 9.99	11.35	10.16	10.81	11.47	10.65	11.86	4.60	3.55	7.28	8.85
10.00-14.99	15.63	14.17	12.28	15.73	14.37	11.00	5.33	6.93	6.87	7.48
15.00-19.99	8.99	6.97	7.34	8.63	6.92	6.82	6.55	6.20	5.56	4.78
20.00-24.99	4.74	4.75	4.01	4.44	4.72	3.20	12.22	6.37	3.62	3.57
25.00-29.99	3.72	3.50	1.65	2.97	2.48	1.45	8.62	2.69	4.72	3.38
30.00-49.99	5.02	5.10	2.67	3.97	4.52	2.47	7.92	1.10	2.46	0.26
50 and above	4.95	5.00	2.35	3.95	4.26	1.82	17.12	11.52	7.01	3.61
All sizes	100.00	100.00	100.00	100.00	100.00	100.00	6.95	6.78	12.39	14.50
Sample Size (No. of households)	6,689	4,926	2,849	6,689	4,926	2,849	6,689	2,849	6,689	2,849

Source: National Sample Survey Reports for 8th, 17th and 26th rounds.

out, the area operated is not the same as the area owned.

Finally, it will be observed that at least the reported incidence of tenancy is actually quite low, about 12 to 15 per cent of total operated area leased in or about 7 per cent of total owned area leased out, such that in spite of the differential leasing pattern across size classes, we still get the close correspondence between size distribution of owned and operated area noted earlier.

The second important feature of Table 3.3 is the concentration of the bulk of the land in a few small to medium sized holding classes and the relative stability of this pattern over time. Thus holdings in the category of 2.5 to 15 acres accounted for about 60 per cent of the total area owned (column 1) and 63 per cent of area operated in 1953-54 (column 3). In 1971-72 the share of holdings in the same size range was around 64 per cent and 66 per cent of owned and operated area (columns 4 and 6), the small gain in the share of these holdings having come from the reduction in shares of the largest holdings.

A more disaggregated comparison within the range of holdings of size 2.5 to 15 acres shows that it is really the subset of smaller holdings of less than 7.5 acres which increased their share while the share of holdings between 7.5 to 15 acres actually declined. This, in fact, is a reflection of a larger pattern of change in land distribution which comes into focus if we read the data a little differently.

Taking 7.5 acres as the observed cut off point, we see that the share of all holding sizes below this size increased while that of almost all holding sizes above this size decreased. On the whole the share of holdings of size 7.5 acres or more in total area owned declined from over 54 per cent to around 41 per cent between 1953-54 to 1971-72 while their share of area operated declined from over 51 per cent to less than 39 per cent over the same period. Conversely the share of holdings of size less than 7.5 acres in total area owned and operated rose from less than 46 per cent to nearly 59 per cent and less than 49 per cent to over 61 per cent respectively.

To judge what the size distribution of ownership and operational holdings described above imply regarding the inequality of land distribution, or landlessness, it is necessary to combine these observations with the distribution of households by holding size. This has been shown in Table 3.4 by both ownership holdings (columns 1 to 3) and operational holdings (columns 4 to 6) for the three survey years. The distribution of area operated has also been reproduced here for convenient comparison (columns 7 to 9). The first striking feature, predictably, is the extreme inequality of land distribution. Thus in 1953-54 we find that at the bottom of the distribution of operational holdings over 63 per cent of rural households in Bihar, operating holdings of less than 2.5 acres, operated between them less than 13 per cent of the total land whereas at the other end of the distribution only 3 per cent of rural households, operating holdings of 15 acres or more, operated nearly a quarter of the total land. The Gini index of land distribution for that year works out to 0.6615.

In 1971-72 the position was not much different with about 67 per cent of households, with holdings of less than 2.5 acres, now operating about 18 per

cent of the total operated area whereas at the other end of the distribution about 15 per cent of total operated area was accounted for by less than 2 per cent of rural households or over a quarter of the operated area by hardly 4 per cent of rural households. The Gini index of land distribution for the year works out to 0.6478. In other words, we get a picture of an extremely unequal distribution of land remaining more or less stable over time. The reader can easily verify for himself, by comparing columns 1 to 3 of Tables 3.3 and 3.4, that the pattern was very similar in the case of ownership holdings. The broad features of the comparison are maintained even if we drop the year 1953-54 on grounds of incomparability and compare only the years 1961-62 and 1971-72.

The second feature of household distribution which must be noted is the interesting redistribution of households between the two lowest holding size classes over time. In the case of ownership holdings we find that there is actually a decline in the proportion of completely landless households from 16.56 per cent in 1953-54 to only 4.34 per cent in 1971-72 whereas the proportion of households owning holdings of less than one acre went up from under 35 per cent to over 48 per cent over the same period. This may be partly attributed to the change in definition of ownership and other differences between 1953-54 survey and the later surveys.

However, since the same direction of change is maintained between 1961-62 and 1971-72 we may say that the decline in pure landlessness reflects a lagged positive effect of land reform laws passed during the late fifties. In the case of operational holdings we find a change of the opposite kind. The proportion of rural households operating small holdings of less than one acre declined from nearly 43 per cent in 1953-54 to about a quarter of all-rural households in 1961-62 or 1971-72. There was a corresponding increase from less than 4 per cent in 1953-54 to around 21 per cent in 1961-62 in the share of rural households not operating any land at all. This share was maintained in 1971-72. This change probably reflects the sharp negative effect of the land reform of the late fifties i.e., the pre-emptive eviction of tenants. However, the change may also reflect, at least partly, the differences in coverage etc. of the last two land holding surveys.

Finally, we can turn to the distribution of average households size by size of operational holding in columns 10 and 11 of Table 3.4. One feature we notice here is the positive association between household size and size of operational holding which implies that the distribution of land per capita is less unequal than the distribution of land per household. The more important feature, for comparisons over time, however, is the observed increase in average household size across all holding size classes between 1953-54 and 1971-72 which implies that for a given holding size per household the average land available per head has declined. However, we also know that the average holding size per household has declined since we saw in Table 3.3 that the entire structure of land distribution has shifted from larger to smaller holding size classes. This is also reflected in Table 3.5 which shows that the average area owned per household as well as average area operated per household has been declining.

Table 3.4 Estimated Share Distribution of Households by Holding Size in Rural Bihar

Size Class (acres)	Distribution of Households by Area Owned (%)			Distribution of Households by Area Operated (%)			Distribution of Area Operated (%)			Average Household Size by Area Operated	
	1953-54	1961-62	1971-72	1953-54	1961-62	1971-72	1953-54	1961-62	1971-72	1953-54	1971-72
(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Below 0.01	16.56	8.63	4.34	3.59	21.71	20.65	0.00	0.00	0.00	3.65	4.27
0.01-0.99	34.67	42.47	48.64	42.88	24.61	26.46	3.52	3.87	4.48	4.38	4.81
1.00-2.49	16.04	16.98	18.73	17.04	18.85	20.20	9.31	10.99	13.68	5.24	5.69
2.50-4.99	14.86	15.83	15.11	17.45	17.61	18.52	20.25	21.53	26.24	5.88	6.27
5.00-7.49	7.16	6.68	6.28	7.98	7.62	6.83	15.76	15.69	16.98	6.27	7.64
7.50-9.99	3.83	3.27	2.87	4.05	3.56	3.39	11.47	10.65	11.86	6.72	8.65
10.00-14.99	3.77	3.47	2.31	4.02	3.45	2.28	15.73	14.37	11.00	7.71	9.23
15.00-19.99	1.55	1.13	0.94	1.56	1.16	0.97	8.63	6.92	6.82	8.65	10.40
20.00-24.99	0.63	0.61	0.41	0.60	0.64	0.35	4.44	4.72	3.20	9.65	11.89
25.00-29.99	0.39	0.35	0.14	0.34	0.26	0.13	2.97	2.48	1.45	9.98	9.35
30.00-49.99	0.39	0.39	0.16	0.34	0.36	0.17	3.97	4.52	2.47	12.33	9.05
50.00 and above	0.15	0.19	0.07	0.15	0.18	0.05	3.95	4.26	1.82	12.91	19.09
All sizes	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		
Gini Index	0.70031	0.7021	0.6880	0.6615	0.6668	0.6478					

Source: National Sample Survey Reports for 8th, 17th and 26th rounds.

Table 3.5 Average Area per Household in Rural Bihar
(acres)

	Average Area Owned	Average Area Operated
1953-54	2.94	3.08
1961-62	2.78	2.89
1971-72	2.23	2.48

The declining availability of land per household along with rising average size of households reflects the increasing pressure of population on land or the declining land: man ratio in rural Bihar.

We can now summarise the principal features of the pattern of land distribution in rural Bihar. First, we have seen that the pattern of land distribution is extremely unequal with the large bulk of households being concentrated in operational or ownership holdings of less than 2.5 acres whereas the bulk of land owned or operated is concentrated in holdings of size 2.5 to 7.5 acres to 15 acres. The share of large holdings beyond 15 acres is also disproportionately large compared to the very small proportion of households falling in this range. The second important feature is the remarkable stability of this unequal distribution, the index of inequality having neither increased nor decreased substantially over time. This is consistent with the results of our regression analysis of the preceding section which indicated that while there were significant effects other than production, making for a high incidence of rural poverty in Bihar, the strength of these effects was not systematically increasing or decreasing over time.

Within this overall picture of a highly unequal but stable distribution of land, however, some important changes were also noted at the disaggregated level. One such change is the redistribution of households between the two lowest holding size groups, i.e. the decline in the share of households not owning any land and the increase in the share of households not operating any land. This redistribution would appear to reflect the positive and negative effects of the weak land reform introduced in Bihar in the late fifties. The other, more important, change is perhaps the perceptible downward shift in the whole structure of land holdings over time such that the share of holdings above 7.5 acres decreased over time while that of holdings smaller than 7.5 acres increased. This shift gets reflected in the declining average holding size per household for the set of all rural households. Taken together with the rising household size across all holding size classes, it adds up to a substantial decline in the per capita availability of land.

Our *a priori* reasoning would suggest that, other things remaining the same, this increasing demographic pressure on land or declining land-man ratio should result in an increasing incidence of rural poverty. So the question arises as to why this effect does not get picked up as a significant positive trend

effect on the level of poverty in our earlier regression analysis. First, we have to remember here that of our three points of observation the first observation is not really comparable with the other two because of differences in definition, coverage, etc. of that survey. While the direction of change is still maintained between 1961-62 and 1971-72, the small order of change between these two observations cannot be legitimately interpreted as reflecting a trend.

Of course it could be argued that since the distribution of land or the land: man ratio is not likely to fluctuate from year to year, the observed change does reflect a secular phenomenon. If so, then we must conclude that there are also other secular effects at work which tend to offset the effect of population pressure on land such that the net trend effect on poverty incidence remains insignificant in the regression equations.

Finally, we find that at least the reported incidence of tenancy or land leasing is quite limited, which accounts for the close correspondence between the size distribution of area owned and area operated. However, to the extent that leasing exists, we have seen that the proportion of operated area leased varies inversely with size of holding. Also the pattern of leasing across size classes would appear to be a net leasing out from large ownership holdings to smaller operational holdings of ten acres or less.

4. Wage Rates, Income and Employment of Agricultural Labour

We shall now turn to the factors affecting the level of income and poverty incidence among agricultural labourers. Our introductory discussion indicated that the major factors involved here are the level of wages in relation to prices, the earning strength and family size of agricultural labour households and the period of employment available per earner in a given year. The period of employment was of course seen as depending on the size of the agricultural labour population in relation to the total demand for labour input in agriculture, the demand factor being further broken down into the level of production and the productivity of agricultural labour.

Of these, the level of production has already been examined in Section 2, along with trends in consumer prices, while the productivity of agricultural labour in Bihar cannot be analysed since this appropriate data do not exist. We shall therefore confine our analysis here mainly to the supply of agricultural labourers and the availability of employment for them, the trends in wage rates, the earning strength and family size of agricultural labour households, all of which go to form the level of per capita income and hence the incidence of poverty among this strata.

We can start with the supply of agricultural labourers. It has already been noted in Table 3.4 that though the proportion of purely landless labourers has gone down, nearly half the number of rural households own tiny plots of less than an acre such that they may have to hire themselves out for wages as the

main source of their livelihood. This was confirmed by the distribution of households according to operational holding which showed that both in 1961-62 and 1971-72 about a quarter of all rural households operated plots of less than an acre while another 20 per cent of households did not operate any land at all.

Assuming that the bulk of these are rural labour households, we may say that 30 to 40 per cent of rural households depend wholly or mainly on wage income as their means of livelihood. Even these large proportions, however, only partially capture the increasing supply of agricultural labourers since the same proportion actually corresponds to a growing absolute number of agricultural labour households or agricultural labourers, in the context of a growing population.

The actual growth of labourers or labour households in the rural and agricultural sectors has been shown in Table 3.6. Data from two different sources have been used: decennial population censuses for 1961 and 1971 and the Rural Labour Enquiry (RLE) surveys conducted by the National Sample Survey Organisation on behalf of the Labour Bureau for the years 1964-65 and 1974-75. The RLE shows an increase of all rural households by around 15.7 per cent from 7.7 million households to about 8.9 million households over the decade 1964-65 to 1974-75 (Table 3.6, row 1, columns 1 to 4). This is very close to the census figures which show an increase of about 15.2 per cent from 7.6 million (row 1, columns 5 to 8) rural households to 8.8 million rural households over the decade 1961-72 (row 1, columns 5 to 8).

Corresponding to this increase in total rural households, the RLE shows the number of rural labour households to have gone up by 33 per cent and that of agricultural labour households proper to have increased by nearly 38 per cent. Landless rural labour households increased even more, by over 41 per cent, while landless agricultural labour households increased the most — by over 53 per cent.

The implication is of course that the proportion of landless labour households among all rural households has increased. It rose from about 12 per cent to around 15 per cent of all rural households. Landlessness in the RLE is defined to mean "not operating any land".²⁷ It will be recalled that the proportion of households not operating any land in the landholding survey data turned out to be over 20 per cent in both 1961-62 and 1971-72 (Table 3.4) which is higher than the proportion of landless rural labour households in the RLE. The proportion of households not operating any land in the landholding surveys is higher because they include also the *non-labour household* not operating any land, i.e. those engaged in trade, professional services, etc. It should also be noted that the bulk of rural labour households covered by the RLE, about 3 million out of the total 3.2 million, are in fact agricultural labour households. Our analysis here will be mainly confined to these agricultural labour households who accounted for about a third of all rural households in 1974-75.

²⁷ For the definition of households 'with land' or 'without land' See *Rural Labour Enquiry 1974-75: Final Report on Wages and Earnings* Labour Bureau, 1979, p. 6.

Table 3.6 Growth of Rural and Agricultural Labour Households and Labourers in Rural Bihar

RURAL LABOUR ENQUIRY

Category	1964-65	1974-75	Per cent change
(1)	(2)	(3)	(4)
Rural Households (000)	7,690	8,896	15.68
Rural Labour Households (000)	2,433	3,239	33.13
	(31.64)	(36.41)	
Landless Rural Labour Households (000)	940	1,326	41.06
	(12.22)	(14.91)	
Agricultural Labour Households (000)	2,150	2,960	37.67
	(27.96)	(33.27)	
Landless Agricultural Labour Households (000)	807	1,238	53.41
	(10.49)	(13.92)	
Male Agricultural Labourers in Rural Labour Households (000)	2,463	3,639	47.74

POPULATION CENSUS

Category	1961	1971	Per cent change
(5)	(6)	(7)	(8)
Rural Households (000)	7,639	8,802	15.22
Rural Male Population (000)	21,140	25,729	21.71
Male Workers in Rural Areas (000)	11,837	13,567	14.62
	(55.92)	(52.73)	
Male Cultivators in Rural Areas (000)	6,846	7,029	2.67
	(32.38)	(27.32)	
Male Agricultural Labourers and Workers in Other Services in Rural Areas (000)	3,357	5,375	60.11
	(15.86)	(20.89)	
Male Agricultural Labourers in Rural Areas (000)	2,545	4,870	91.36
	(12.02)	(18.92)	

Sources: *Rural Labour Enquiry 1974-75*, Final Report Vol. II: Wages and Earnings of Rural Labour Households.

Census of India 1961, Vol. IV (Bihar); Pt. II-A General Population Tables.

Census of India 1971 series 5 (Bihar); Pt. II-A General Population Tables.

Note: Figures in parentheses give percentage of Rural Households in columns 2 and 3 and percentage of Rural Male Population in columns 6 and 7.

The increase in the number of labour households in rural Bihar naturally reflects itself in an increase in the number of agricultural or rural labourers. A comparison of the 1961 and 1971 census results (Table 3.6, columns 5-8) shows that the number of male workers in rural areas increased by about 15 per cent

compared to a rural population increase of about 22 per cent²⁸ — implying a significant decline in the participation rate. Within male workers the number of male cultivators appears to have increased by less than 3 per cent while male agricultural labourers increased by over 91 per cent over the same period! This census comparison, however, cannot be taken too seriously since both the participation rate as well as the distribution of workers between categories are known to have been severely affected by a change in the criterion for identifying work status.²⁹ The only inference that we can perhaps safely draw here is a qualitative one that the number of agricultural labourers increased very substantially. This particular conclusion is in any case independently established by the RLE which shows that the number of male agricultural labourers in rural labour households increased by nearly 48 per cent.

The increasing supply of agricultural labourers, mediated by factors governing the level of demand for such labour, must ultimately reflect itself in the level of agricultural wages and the period of employment available per labourer in a given year. We take up first the trends in agricultural wages. For purposes of studying the trend of agricultural wage rates in different states, two main sources of data are available: the series *Agricultural Wages in India (AWI)* published by the Ministry of Agriculture and the periodic surveys conducted by the National Sample Survey Organisation on behalf of the labour bureau.³⁰

The main advantage of the AWI series is that it is the only available source which gives a continuous wage rate series year after year. However, as several researchers have noted, the basic data for the AWI series is collected in an unsystematic manner. Data is collected from one or more centres in each district without any proper design for selection of villages and the data is reported by minor village functionaries who have neither the necessary training nor proper instructions for collection of the data. As such there is an unknown order of bias in the series. Moreover, the data is given in a completely disaggregated manner; by operations in each month for each village selected in the district. The high frequency of missing data makes aggregation difficult in a number of states like Bihar and also different procedures of aggregation adopted by different researchers lead to different results.

28 The data used here is mainly confined to 'male' labour since the work force data for female labour is believed to be highly unreliable.

29 For a discussion of this definitional change and its effect on work force composition, participation rates and employment rates, see K. Bardhan "Rural Employment, Wages and Labour Markets in India: A Survey of Research" *Economic and Political Weekly* 25 June 1977, 2 July 1977, and 9 July 1977, see also K.N. Raj "Trends in Rural Unemployment in India" *Economic and Political Weekly* Special Number, August 1976; and P. Visaria "Trends in Rural Unemployment in India: Comments" *Economic and Political Weekly* 29 January 1977.

30 A third source; the Farm Management Studies, is not suitable for analysing state level trends. For discussions of the different sources of data and their problems, see N. Krishnaji "Wages of Agricultural Labour" *Economic and Political Weekly* 25 September 1971; V.M. Rao "Agricultural Wages in India: a reliability study" *Indian Journal of Agricultural Economics* Conference number, July — September 1972; P. Bardhan "Variation in Agricultural Wages: a Note" *Economic and Political Weekly* 26 May 1973; D. Lall "Agricultural Growth, Real Wages and the Rural Poor in India" *Economic and Political Weekly* 26 June 1976; K. Bardhan op. cit; A.V. Jose "Trends in Real Wages of Agricultural Labourers" *Economic and Political Weekly* 30 March 1974 and A.V. Jose "Real Wage Rates, Income and Employment of Agricultural Labourers" *Economic and Political Weekly* 25 March 1978.

In the case of Bihar, for instance, we have two alternative series of wage rates based on the AWI data constructed by Jose and Nayyar³¹ which have been reproduced here in Table 3.7. Jose took the prevailing wages of male field labour in major operations like ploughing in the peak month of December, computed a simple average of these figures for all centres to get the district wage rate and then took a weighted average of the district figures to arrive at the wage rate for the state. Nayyar has not stated the procedure of aggregation which she adopted. But the main point to be noted is that each arrived at a different wage rate for every year for which the two series can be compared.

However, while the absolute wage figures or seasonal variations as shown by the AWI probably do not mean very much, the series can still be used perhaps to say something about secular trends. Nayyar regressed the estimated rural wage rate on time and found that the trend was not significantly different from zero i.e. real wage rates were neither systematically rising nor falling. This is not inconsistent with the observed behaviour of the Jose series.

Table 3.7 Real and Money Wage Rates for Male Field Labourers in Bihar as Estimated from the AWI Series

(Rupees)

Year	Nayyar Estimates		Jose Estimates	
	Money wages	Real wages	Money wages	Real wages
(0)	(1)	(2)	(3)	(4)
1956-57			1.19	1.20
1957-58	1.20	1.18	N.A.	N.A.
1958-59	1.21	1.16	1.32	1.18
1959-60	1.08	1.06	1.19	1.17
1960-61	1.06	1.06	N.A.	N.A.
1961-62	1.30	1.27	1.24	1.20
1962-63	1.37	1.28	1.21	1.13
1963-64	1.51	1.26	N.A.	N.A.
1964-65	1.80	1.21	1.61	1.07
1965-66	2.31	1.29	1.90	1.06
1966-67	2.46	1.07	N.A.	N.A.
1967-68	2.32	0.93	N.A.	N.A.
1968-69	2.41	1.29	2.33	1.25
1969-70	2.73	1.35	N.A.	N.A.
1970-71	2.94	1.43	N.A.	N.A.
1971-72	2.87	1.39	N.A.	N.A.

Sources: R. Nayyar "Poverty and Inequality in Rural Bihar" in *Poverty and Landlessness in Rural Asia*, ILO, Geneva, 1977.

A.V. Jose "Trends in Real Wage Rates of Agricultural Labourers," *Economic and Political Weekly*, 30 March 1974.

Note: Money wage rates are converted to real wage rates in both series using the Labour Bureau's Agricultural Labourers Consumer Price index with 1960-61 = 100.

31 A.V. Jose (1974) op. cit and R. Nayyar op. cit.

The main advantage of the NSS wage rate data compared to the AWI series is that the former is collected on the basis of a scientifically-designed sample which minimises estimation bias. It is also collected by investigators specially trained for this purpose. Most researchers therefore consider the NSS series to be more reliable. On the other hand the NSS data suffers from the problem that we get too few observations here to draw any firm inferences about secular patterns.

We have, in all, the five observations shown in Table 3.8. Of these, the first two are from the two Agricultural Labour Enquiries while the third and fifth are from the two Rural Labour Enquiries. The observation for 1970-71 is from the survey of Weaker Section Households in Rural Areas conducted by the NSS in its 25th round. This particular observation cannot be compared with the others because the wage rate given here is for "non-cultivating, wage-earning households" which really corresponds to rural labour households as a whole and not just the subset of agricultural labour households for whom wages are known to be somewhat lower.

Furthermore, the kind component of wages in the NSS 25th round were converted to cash values at retail prices whereas in the years 1956-57, 1964-65 and 1974-75 this conversion was done at wholesale prices which are lower.³² The 1950-51 observation also has to be dropped for the same reason, such that we are ultimately left with only three observations covering a period of nearly twenty years. Clearly this is not enough to draw inferences about the *trend* of real wage movements.

Table 3.8 Real and Money Wage Rates (Average Daily Earnings) for Male Labour in Agricultural Labour Households in Bihar as Estimated in NSS Surveys

(0)	Agricultural Operations		Non-Agricultural Operations	
	Money	Real ^a	Money	Real ^a
(0)	(1)	(2)	(3)	(4)
1950-51 ^b	1.26	—	1.10	—
1956-57	0.91	0.91	1.15	1.15
1964-65	1.39	0.91	1.55	1.02
1970-71 ^b	1.91 (2.29) ^c	0.91	2.36	1.13
1974-75	3.22	0.81	3.38	0.85

Sources: *Agricultural Labour Enquiries* (1950-51 and 1956-57).

Rural Labour Enquiries (1963-64 and 1974-75).

National Sample Survey 25th Round Report No. 237.

Notes: ^a Real wage rates are calculated using the ACPI as deflator with 1956-57 as base.

^b The wage rates for 1950-51 and 1970-71 are not comparable with other years (see text).

^c The figure in parenthesis is that quoted by D. Lall op. cit.

³² See NSS Report No. 230/1 (mimeo), December 1972, cited also in Jose (1978) op. cit. footnote 9.

What we do observe from the remaining three observations is that the level of real wages in agricultural operations remained constant between 1956-57 and 1964-65 and declined slightly in 1974-75. In the case of non-agricultural operations the wage rate showed a decline between 1956-57 and 1964-65 and again between 1964-65 and 1974-75. While these few observations do not form a basis to suggest that there was a *trend* decline in real wages there is at least no evidence to suggest that agricultural wage rates have been rising in Bihar. Taken together with the earlier cited time series estimates based on AWI data, the pattern that seems to emerge, therefore, is one of real wage rates in Bihar either declining or fluctuating about a constant level.³³

This conclusion is at sharp variance with the conclusion of Lall³⁴ that real wage rates have been rising, especially between 1964-65 and 1970-71, for all states in India except West Bengal and the divergence needs to be explained. Lall's optimistic conclusions about rising real wages in agriculture, and his questioning of the "new orthodoxy" which claims that real wages have stagnated or declined, depended crucially on the NSS 25th round data for 1970-71. However, it appears that his use of the 25th round data is inappropriate. First, we have mentioned that the 1970-71 Weaker Sections survey of the NSS gives data on wage rates for "non-cultivating wage-earning households" which corresponds to rural labour households as a whole and not the subset of agricultural labour households for whom wage rates are generally somewhat lower. Moreover, we have also mentioned that kind wages in the 25th round were converted to cash at retail prices, not wholesale prices as he believes, and the total wage would be lower if appropriate adjustments were made for the retail-wholesale price spread.

Finally, at least in the case of Bihar, Lall has quoted the exceptionally high money wage rate of Rs.2.29 whereas the final money wage rate published by the NSS on the basis of all its subrounds for 1970-71 was only Rs.1.91 corresponding to a real wage rate of Rs.0.91 at 1956-57 prices for agricultural operations.³⁵ Lall's figures would appear to have been taken from an earlier unpublished report based presumably on only one or two subrounds of the survey.

It is easy to see that once all the appropriate downward adjustments are made, the real wage rate in 1970-71 would actually turn out to be lower than that of 1964-65, at least for agricultural operations. While we are here concerned only with the case of Bihar, the issues raised here obviously suggest a reconsideration of Lall's 1970-71 wage rate calculations for other states as well and hence also of his optimistic conclusions about rising real wage rates which are so crucially dependent on the figures for 1970-71.

33 It is tempting to attribute this stagnation of the real wage rate to per capita agricultural production which was also fluctuating without a trend increase during this period in Bihar. However, as even a casual comparison of their movements will show (Table 3.1 column 4 and Table 3.7 column 2) the two variables are not significantly correlated.

34 D. Lall op. cit.

35 See Table 3.8, column 1 for the year 1970-71. The data quoted here is based on NSS Report No. 237.

Our discussion of agricultural wage rates so far has been confined to daily earnings averaged over all operations. Table 3.9 gives data on agricultural wages by major operations as per the NSS survey estimates. As before, the figures for 1950-51 are not comparable because of differences in the method of conversion of kind wages to cash. For the other three survey years, it appears that the conclusion of stagnant or declining real wages is maintained when we move beyond the average to the decomposition of wage rates by major operations. Thus, between 1956-57 and 1964-65, wage rates increased for transplanting, weeding and harvesting while they declined in the case of ploughing. The 1956-57 figures are not available for sowing operations. In 1974-75 we find that real wage rates for most operations were not only lower than those of 1964-65 but also lower than the real wage rates of 1956-57.

Table 3.9 Daily Wage Rates by Operations for Male Agricultural Labourers in Rural Bihar

		1950-51 ^a	1956-57	1964-65	1974-75
(0)		(1)	(2)	(3)	(4)
Ploughing	MW ^b	1.03	0.94	1.37	3.23
	RW ^b		0.94	0.90	0.82
Sowing	MW	n.a.	n.a.	1.40	3.63
	RW	n.a.	n.a.	0.92	0.92
Transplanting	MW	1.30	1.02	1.86	3.82
	RW		1.01	1.22	0.96
Weeding	MW	1.04	0.89	1.40	3.01
	RW		0.89	0.92	0.76
Harvesting	MW	1.81	0.92	1.48	3.33
	RW		0.92	0.97	0.84
Others	MW	n.a.	n.a.	n.a.	3.11
	RW	n.a.	n.a.	n.a.	0.79

Source: *Rural Labour Enquiries* of 1963-65 and 1974-75.

Notes: ^a Figures for 1950-51 are not comparable with other years (see text).

^b MW & RW denote money and real wages respectively. Real wages have been computed using ACPI as deflator with 1956-57 as base.

It was pointed out earlier that the impact of a rapidly increasing population of agricultural labourers, mediated by demand conditions, would reflect itself in wage trends as well as employment such that the final impact on incomes of agricultural labourers would be a combination of both. The data on average wage rates have been brought together with data on wage paid employment for the four NSS survey years in Table 3.10. The year 1950-51 is left out of comparison for the reasons cited earlier.

Table 3.10 Annual Wage Paid Employment and Wage Income per Head of Male Labourers Belonging to Agricultural Labour Households in Rural Bihar

		1950-51 ^a	1956-57	1964-65	1974-75
	(0)	(1)	(2)	(3)	(4)
A Annual Wage Paid Employment in Agricultural Operations (days)		168	190	198	186
B Wages Paid in Agricultural Operations	M ^b R ^b	1.26	0.91 0.91	1.39 0.91	3.22 0.81
C Annual Wage Income from Agricultural Operations (Row A × Row B)	M R	211.68	172.90 172.90	275.22 180.18	598.92 150.66
D Annual Wage Paid Employment in Non-Agricultural Operations (days)		32	31	24	18
E Wages Paid in Non-Agricultural Operation	M R	1.10	1.15 1.15	1.55 1.02	3.38 0.85
F Annual Wage Income from Non-Agricultural Operations (Row D × Row E)	M R	35.20	35.65 35.65	37.20 24.48	60.84 15.30
G Annual Wage Income from All Operations	M R	246.88	208.55 208.55	312.42 204.66	659.76 165.96

Source: *Rural Labour Enquiries* 1963-65 and 1974-75. Final Reports.

Notes: ^a Figures for 1950-51 are not comparable with other years (see text).

^b M & R stand for money and real values. Real wages and incomes have been computed using ACPI as deflator and 1956-57 as base.

We find that while average real wages remained constant between 1956-57 and 1964-65 in agricultural operations, the average period of employment increased from 190 to 198 days such that the annual wage income from agriculture increased marginally. In non-agricultural operations, both the real wage rate as well as the average number of days of wage paid employment declined such that real wage income from this source declined. Taking both agricultural and non-agricultural operations together we find that the annual real wage income of the average male agricultural labourer was marginally lower in 1964-65 compared to 1956-57.

In the year 1974-75, real wage rates as well as the period of wage paid employment, and hence total real wage income, was lower than that of 1964-65 as well as 1956-57 in the case of agricultural operations. This is all the more so in the case of non-agricultural operations such that the total annual real wage income per male agricultural labourer in 1974-75 was about 20 per cent lower than that of 1964-65 or 1956-57.

The direction of change in annual real wage income of agricultural labourers would appear to suggest, even more than the trends in real wages, that the per capita real income of agricultural labour households has declined over time. However, the per capita income of an agricultural labour household depends not only on the annual wage income per earner but also on the number of earners, earning strength, per family and the average size of the family. Moreover, an agricultural labour household may earn income other than wage income during the year, especially if they own or operate some land.

The actual real and money incomes per household and per capita, along with earning strength and average household size, have been shown in Table 3.11 for the three NSS survey years 1956-57, 1964-65 and 1974-75, the year 1950-51 having been dropped on grounds of incomparability. Comparing households with and without land we find that while the average household size is larger for those with land, their real incomes were also larger at Rs.545 compared to Rs.418 for households without land in 1974-75, such that the per capita income of these households was higher than that of landless households. In 1964-65 however, the average annual income of households with land turned out to be lower than that of landless households.

It is also noted in this context that in 1970-71 the annual real income of rural labour households (defined as non-cultivating wage earning households) of Rs.481 at 1956-57 prices, was slightly lower than Rs.505 estimated for the poorest decile of cultivating households. In other words rural labour households, which accounted for about 32 per cent of the population of rural Bihar in 1970-71, form the poorest sections of the rural poor in the state.³⁶ Comparing this with alternative estimates of poverty incidence for that year (see Table 3.1) we may infer that rural labour households accounted for about half of the population "below" the poverty line or 80 per cent of those "far below" the line in the early seventies.

Finally comparisons over time for all agricultural households show that real incomes per household, or per capita, declined between 1956-57 and 1964-65 and then increased between 1964-65 and 1974-75. This happened in spite of the fact that both real wage rates as well as wage employment per earner actually declined during the second sub-period as we have seen. The opposite movements of real wages and real wage incomes per labourer on the one hand and per capita real incomes of agricultural labour households on the other seem to be accounted for by the increase in earning strength of these households in

³⁶ This ratio is calculated by estimating the population belonging to rural labour households in 1970-71 on the basis of an interpolation using RLE survey estimates for 1964-65 and 1974-75.

Table 3.11 Annual Income of Agricultural Labour Households in Rural Bihar

		1956-57	1964-65	1974-75
(0)		(1)	(2)	(3)
Earning Strength		2.00	1.98	2.24
<i>Money Income of Households:</i> (Rs.) Current	With land	401.00	600.83	2,160
	Without Land	358.00	614.29	1,654
	All households	420.00*	608.00	1,931
<i>Real Income of Households:</i> (Rs. 1956-57 prices)	With Land	401.00	395.28	545.45
	Without Land	358.00	404.14	417.68
	All households	420.00*	400.00	487.63
<i>Average Size of Households:</i>	With Land	—	5.13	5.03
	Without Land	—	4.19	4.39
	All households	4.8	4.8	4.8
<i>Per Capita Real Income of Households:</i> (Rs. 1956-57 prices)	With Land	—	77.05	108.44
	Without Land	—	96.45	95.14
	All Households	87.50	83.33	101.59

Source: *Rural Labour Enquiries* 1964-65 and 1974-75.

Note: Real incomes calculated using ACPI as deflator and 1956-57 as base. The annual income of All Households in 1956-57 (*) is larger than that for households with or without land since the latter pertain to casual labour households only.

1974-75. It underlines the importance of not drawing inferences about per capita income of agricultural labour households purely on the basis of wage rate and wage income data. On the other hand we should be equally cautious not to draw inferences about secular tendencies from only a pair of observations, especially in view of the decline in per capita incomes between 1956-57 and 1964-65.

Some Concluding Remarks

The main themes of our analysis can now be brought together in a brief summary. The distribution of land has remained highly unequal in rural Bihar throughout the period of reference. While only 4 per cent of all households operate over 25 per cent of total cultivated area at the upper end of the distribution, about 67 per cent of all households operate between them only 18 per cent of cultivated area at the other end. The large bulk of holdings is concentrated in size groups of 7.5 to 15 acres and especially 2.5 to 7.5 acres. The bulk of house-

holds are concentrated still lower down in size groups of less than 2.5 acres — including a large number who may own tiny parcels but do not operate any land at all. This was the position in 1971–72 and the distribution was no better in earlier years. Since land is still the principal productive asset in agriculture and the large bulk of households are able to operate only small plots or not even that, it is not surprising that around 50 to 60 per cent of the population of rural Bihar live below the poverty line, the precise number depending on how liberally or conservatively we choose to define the line.

Our statistical analysis suggests that improved agricultural performance would help to alleviate the worst effects of this poor land base of the large mass of households. There is a statistically significant tendency for the incidence of poverty to go down during years in which the per capita production is relatively high. But the fact is that there has been no sustained tendency of increased per capita production. The per capita production of foodgrains continues to fluctuate around the level of about 150 to 160 kg per head per annum, increases in aggregate production being largely offset by increases in population.

The increasing pressure of population is in fact the outstanding dynamic element — unfortunately a negative one — of an agrarian situation which is more or less unchanging. It would lead us to expect that, far from declining, the extremely high incidence of rural poverty should be rising still further, since the growing population squeezes further a land base which is already so small for the large majority of rural households. This demographic process is different from the classical pattern of peasant differentiation in that dispossession at the bottom rungs of land distribution does not occur along with, and as a consequence of, land appropriation and concentration at the top. In fact the share of operational holdings of size 7.5 acres or more has actually decreased in Bihar while that of all size classes below 7.5 acres has increased over time. In other words, with a declining land: man ratio the entire structure of land distribution has been shifted downwards while leaving inequality measures like the Gini Index more or less unaffected.

The effect of this demographic process is, however, much the same as that of the differentiation process in that it forces an increasing number of cultivating households, or a rising share of the rural work force, to join the ranks of agricultural labourers. Thus, while the total number of rural households increased from about 7.7 million to about 8.9 million over the decade 1964–65 to 1974–75 (an increase of about 16 per cent), the number of rural labour households increased during the same period by over 33 per cent from 2.4 million to over 3.2 million households. The total number of male agricultural labourers alone is indicated to have gone up from about 2.5 million in 1961 to nearly 4.9 million in 1971 — an increase of over 91 per cent — according to Census estimates. Even if the census figures are somewhat exaggerated, for reasons explained earlier, the phenomenal increase in the supply of agricultural labourers is obvious and this has led to predictable consequences such as a decline in real wage rates as well as the number of days of employment available per labourer.

A decline in real wage rates and wage employment per labourer would normally lead us to expect an increasing incidence of rural poverty since we have seen that rural labour households, who are somewhat poorer than even the bottom decile of cultivating households, account for the bulk of the rural poor. However, while the incidence of poverty remains extremely high it has not been actually increasing over time. The declining rates of real wages and employment per labourer appear to have been offset by the rising earning strength, which in effect amounts to an increase in employment *per household*, such that real income per household and per capita were in fact higher for agricultural labour households in 1974-75 compared to 1964-65. However, a small increase between two observations over a decade does not constitute a trend, nor does it warrant much optimism until we know a little more about the nature of demographic or economic processes underlying this rise in the earning strength.