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POVERTY TEN YEARS ON:
INCOMES AND WORK AMONG THE POOR
OF RURAL BIHAR

by

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Preface

This is a small study of a rather restricted group of wage labour households in rural Bihar. It is therefore limited both in scope and in ambition. A larger study of related issues, "The dynamics of poverty and employment in Bihar", is presently in progress at the A.N. Sinha Institute of Social Studies, Patna, and is directed by Professor P.H. Prasad and myself. Fieldwork for this larger study, which covers a sample of villages from the plains of Bihar, is now almost complete, and a series of papers is in preparation. Some of the rather tentative conclusions in the present paper will receive more systematic attention in the larger study.

I would like to thank Parashuram Sah, who worked with me in rural Bihar in 1970-71 and again in 1981, and greatly contributed to this study. Bachchoo Sharma of the A.N. Sinha Institute of Social Studies also assisted in 1981, and I would like to thank him, Professor P.H. Prasad, and other staff of the A.N. Sinha Institute of Social Studies for their comments and contributions to the present paper. Janine Rodgers was also engaged in separate fieldwork in several of the villages studied here, and has contributed substantially to this paper. Much of the analysis relies on her findings, especially in the areas of health, food and nutrition. Participants in an ILO seminar in January 1983 also made a number of helpful comments.

Gerry Rodgers

I. Introduction

In 1970-71, seven villages in the Kosi region of north-east Bihar were studied in the course of an analysis of the impact of public works on rural poverty (see Rodgers, 1973).   These villages were selected for their proximity to public works projects, and so are not statistically representative.   But they are geographically widely distributed, and cover a range of agricultural, cultural and economic situations.   Within each village, a random sample of agricultural labourers and other low income strata was surveyed, with a view to establishing asset, employment and income profiles.

In 1981, five of these villages were visited for a second time.[1]   A systematic attempt was made to relocate and reinterview households covered in 1971 (or successor households, where families had divided), and to obtain basic information on households which had vanished because of deaths or which had out-migrated.   The sample is small - about 50 households in 1971, of which 46 were traced in 1981 - but their fortunes over the decade illustrate the evolution of poverty and employment during this period.

Table 1 gives an idea of the basic economic, social and demographic characteristics of the Kosi region.   It is essentially agricultural, with a moderate level of irrigation and fairly high rainfall;   there is little industry, and a considerable agricultural wage labour population. There is a substantial Moslem minority - actually a majority over parts of the region.   The area is technologically and economically backward compared to the rest of Bihar, and even more so relative to other parts of India.

II. Demographic Changes

The growth in numbers of the sample population from 1971 to 1981 can be computed in several different ways.   For analytical purposes, the most interesting computation is the natural growth of the 1971 population, that is excluding in-migrants but including out-migrants

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[1]   Of the two villages not covered in 1981, one was inaccessible due to floods during the period of fieldwork, while the second was excluded because only two households had been covered in 1971.

Table 1: General statistics on the Kosi area
        (Purnea, Saharsa and Katihar Districts)

Population   1961 .... 4.8 million

             1971 .... 6.4 million

             1981 .... 8.0 million

Sex ratio   1981 .... 108 males/100 females

Urban (%)   1971 .... 5.6

             1981 .... 7.4

Literacy (%) 1971 .... 15.6 (male 24.7, female 6.1)

             1981 .... 19.8 (male 29.4, female 9.6)

% cultivators 1971 .... 41.4

              1981 .... 37.8[1]

% agricultural labourers 1971 .... 44.5

                         1981 .... 49.2[1]

% other occupations   1971 .... 14.1

                         1981 .... 12.4[1]

Area irrigated (%)   1976-77 .... 21.4

Major crops (% of gross area sown, 1975-76)

                        Paddy 58

                        Wheat 16

                        Jute 8

                        Maize 9

% of landholdings over 5 acres, 1970-71:   6

% of land in holdings over 5 acres, 1970-71: 39

% Moslem, 1961: 38

[1] Does not include "marginal workers" (6 per cent of total - mostly women).

Sources: Government of Bihar (1978, 1982); Census of India, 1981; Census of India, 1971.

(and their children). On this basis the population increased from 294 to 326 in 10 years (an 11 per cent increase) as a result of 84 surviving births and 52 deaths (among those present in 1971).[1] These figures have been adjusted to cover exactly a 10 year interval. Details are reported in table 2.

Table 2: Kosi labourers, populations 1971 and 1981

	Males		Females		Total		Mortality (%)
	1971	1981	1971	1981	1971	1981	1971-81
0-9	47	51	44	33	91	84	
10-19	39	44	29	37	68	81	(11)
20-29	20	34	25	27	45	61	(10)
30-39	17	19	19	21	36	40	(11)
40-49	11	14	14	17	25	31	(14)
50-59	15	7	6	12	21	19	(24)
60+	2	7	6	3	8	10	(66)
Total	151	176	143	150	294	326	

[1] For this calculation, children born after 1971 were counted if their fathers were in the 1971 population. Demographers usually compute growth through females, but in the male-dominated, patrilineal households which prevail in Bihar it is easier to work through males, rather than to try to obtain data on births to women who have out-migrated for marriage. Four out-migrant households, for which 1981 data were not available, were excluded from calculations of both initial and terminal populations.

If the 1971 sample is representative of the 1971 population, the same should be true in 1981; but concentration of the 1971 population in particular phases of the life cycle could bias the conclusions about changes over time. I have not detected any obvious biases, and the age pyramid in 1981 looks reasonably balanced, but the possibility of bias cannot be excluded. For instance, agricultural labour households may tend to have relatively young heads if population is increasing and land remains concentrated in households with older heads. In this case, the sample distribution in 1981 will no longer be representative of all agricultural labourers - new households will be under-represented. Since I have no hard information on this sort of bias, it is neglected in the remainder of this paper.

Of the original 50 households, 5 had out-migrated, and 3 had disappeared through deaths. Thirteen households had divided, forming a total of 28 new households: of the 15 additional households 3 had out-migrated to distant or urban destinations. This gave:

(i) Total households, 1981: 62

(ii) Total local households, 1981: 54

Average household size declined from 6.4 persons in 1971 to 5.6 in 1981.

Several points are worth noting. Firstly, mortality is high. Accurate mortality estimates can be obtained by comparing the population aged x in 1971 with the (same) population aged x + 10 in 1981. Percentage mortality rates for the decade are reported in the right-most column of table 2.

Secondly, the total population in the 0 to 9 year age group appears to have declined, contrary to the normal pattern in a growing population. There are several possible explanations. One would be reporting bias. This is always a possibility, but similar survey techniques were used in 1971 and 1981 so there is no reason to expect much more bias in the latter year.[1] The 1981 resurvey produced only one case of a household member incorrectly omitted in 1971. A second explanation would be low fertility; the age-sex structure shows a fairly normal concentration in childbearing ages, so this would have to be due to low intrinsic fertility rates. But the main reason would appear to be the high level of mortality; indeed, it is difficult to explain the change in age distribution from 1971 to 1981 unless we assume that mortality is rising. If it were high but stable, large changes in the age structure would be unlikely without substantial fertility changes.

Thirdly, the growth in the male population exceeded the growth in the female population, the difference being mainly accounted for by the 0-9 year age group - i.e. by births since 1971, and by deaths in this group - rather than by deaths in the adult population. In fact, the

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[1] Except perhaps for four households for which information was obtained from third parties in 1981.

shift in the sex ratio for 0 to 9 year olds is surprisingly large; it changes from 1.07 in 1971 to 1.55 in 1981. Among possible reasons one should again note reporting bias, but as mentioned above there is reason to think that this will not be a serious problem. This leaves two possibilities:

(i) chance: This cannot be ruled out, given the small sample size. The probability of obtaining 33 or less of girls out of 84 is 3 per cent if the numbers of girls and boys in the population are equal, and 6 per cent if the reported sex ratio for 1971 accurately reflects the population mean.

(ii) higher mortality among girls. This is a likely factor, and probably the most important. There is some supporting evidence in the data, in that the mortality rate for boys aged 0-9 in 1971 is 6 per cent, that for girls 16 per cent – the latter figure is significantly higher than the former at the 10 per cent level despite the small sample size.[1] A mortality differential of this order would be more than sufficient to generate the observed sex ratio among 0 to 9 year olds, on quite plausible assumptions.[2] Here again, it seems probable that sex differentials in mortality have been rising, since the sex ratio of the (surviving) population born in 1971-81 is much more male-biased than the sex ratio of (surviving) cohorts born before 1971. Substantial sex differentials in mortality were also reported in Bangladesh by d'Souza and Chen (1980); they found female mortality to be over 50 per cent higher than male mortality in the 1-4 year age group in a "normal"

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[1] However no such differential is observed in the adult population, nor is the adult sex ratio weighted against females. This might be the result of migration and marriage patterns prior to 1971, but it could also imply that high sex differentials in mortality are a relatively recent phenomenon.

[2] For instance, a crude birth rate of 45 per thousand would imply roughly 140 births over 1971-81. The choice of this CBR for the example was based on calculations reported below. With a plausible sex ratio at birth of 72 male to 68 female, the observed 1981 population would imply death rates of 29 per cent for males and 51 per cent for females, a ratio lower than that observed during 1971-81 for those aged less than 9 years in 1971, and not a great deal higher than that reported by other authors.

period, and over 60 per cent in a period of "food shortage". Substantial, although smaller differentials were also recorded in Bangladesh for all other ages above one month.

Overall indices of fertility and mortality have to be estimated indirectly from these data, because no direct information is available on children born after 1971 and died before 1981. This information was not collected because of its vulnerability to recall error. However, if we assume that the mortality pattern of those alive in 1971 follows one of the standard life tables, it is possible to estimate these unknown rates. For instance, model West table level 5 (Coale and Demeny, 1966) gives a probability for males aged 10-19 to survive to ages 20-29 of about 10.6 per cent, compared with the 11 per cent recorded in table 2 for the whole population aged 10 to 19. The same life table would imply mortality from age 0 to age 10 of some 45 per cent, and computing back one can work out the corresponding overall fertility rate.

An iterative procedure which finds the best fit between the population changes observed, and those predicted by different life tables, was used (Arriaga et al., 1976; program TWOCN). To reduce random fluctuations due to the small sample size, male and female populations were aggregated and the total then compared alternately with male and female mortality patterns. The results are quite startling. Whatever the assumptions used - male or female life expectancy, life tables North, South, East or West - no estimate of life expectancy at birth exceeded 30 years. The highest estimate was 28.6 years, using males, model West. This estimate also gives a crude birth rate of approximately 45 per thousand, a crude death rate of 35 per thousand, and an infant mortality rate in excess of 300 per thousand.

These results are dependent on inferences about mortality up to age 10. They are particularly sensitive to mortality in the first year of life, and unfortunately this is the measure on which there is least information in the data.[1] The infant mortality level thus has to be

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[1] We have infant mortality only for those aged 0 to 1 in 1971, i.e. only one year of data; for mortality in the eleventh year, by contrast, we have deaths in 1972 of those aged 10 in 1971, deaths in

mainly inferred from overall age-sex patterns of mortality, so increasing the margin of error in the results.

Nevertheless, the conclusion is clear that mortality among this group of the rural poor is exceedingly high, both absolutely, and, as table 3 shows, relative to other groups in India.[1]   It can be seen from table 3 that fertility levels also appear to be high, although here the difference, from the rest of Bihar at least, is smaller, so the net outcome is a population growth significantly lower than that of the population of India or of Bihar as a whole.   As we have seen, there is at least a hint in the data that this is partly due to rising mortality, particularly among girls.

It is often thought that households tend to be immobile, and that most migrants tend to be individuals.   In our sample, however, there is some household mobility - 5 out of 50, as noted above, plus 3 of the 15 new households.   Individual mobility is higher than this, but the rate of permanent out-migration is not much higher.   Excluding the out-migration of women for marriage, the individual migration rate comes to 13 per cent (as against 10 per cent for households)[2] - 16 per cent for males, 9 per cent for females.   Out-migration of those aged 20 to 29 in 1971 was 29 per cent, reflecting moves of young adults with newly formed (but small) households.

1973 of those aged 9 in 1971, etc. - ten observations in all.   As it happens, we have rather few observations of children aged 0-1 in 1971. This may be due to under-reporting, age misreporting, or chance; but it reduces the reliability of this estimate further - since mortality tends to be higher in this age group, and we have too few observations, our overall mortality estimates will tend to be biased <u>downwards</u>.

[1]   Some other estimates of infant or child mortality in the Kosi area are available for the population as a whole.   J. Rodgers (1976) estimated at least 195 per thousand mortality up to age 5 in 1971; Blaikie (1976) estimated 236 per thousand mortality up to age 5. These figures are both considerably below our estimates here (i.e. 300 up to 1 year), but they were estimated for a broader population cross-section, including better-off groups.   In addition, since both estimates were based on recall data, they are more vulnerable to underestimation than are our estimates here.   Blaikie only found slight excess female mortality, but this is again vulnerable to reporting bias.

[2]   Technically, migration should be adjusted for mortality in the intervening period.   This would raise the rate, roughly, from 13 to 14 per cent.

Table 3: Demographic indicators: Kosi labourers, Bihar and India

	Kosi labourers 1971-81	Bihar 1961-70[1]	India 1961-70[1]	India, most recent estimate
Life expectancy at birth	< 30	41	46	49
Infant mortality	>300	128[2]	129	123
Crude death rate	~35	22	17-20	15
Crude birth rate	~45	43	40-42	35
Population growth 1971-81 (%)	11	24	25	25

[1] Except population growth (1971-81)

[2] 1964-65 (rural only). Probably a substantial underestimate because an all-India estimate from same data source was 108, rising to 137-140 in 1968-69 as data quality improved.

Data sources: Mitra (1978); Census of India (1981): Population Reference Bureau (1982).

An interesting alternative measure of population growth would exclude these out-migrants, but include in-migrants. This is an indicator of pressure on local job and income possibilities. Since we only resurveyed known households, we have no figures for in-migrants. To compensate for this, it was assumed that local population movements offset each other, so that out-migrants to local (rural) destinations could be regarded as a proxy for in-migrants. "Permanent" out-migrants to urban areas, and to other states in India, were excluded on the assumption that there would be little return flow.[1] On the basis of these assumptions, an initial population of 308 in 1971 falls to 306

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[1] In the households studied there was no example of an in-migrant from these areas; however, in-migration of whole households from such areas would not have been picked up.

over the decade.[1]   The decline is not significant, but we may certainly conclude that there has been no significant increase in the study population.

Pressures on job markets and incomes do not come only from aggregate population growth, of course.   Among other demographic factors, changes in age and sex structure might affect the picture.   A simple way to assess the latter is to compute the fraction of household members who are "potential workers".   Counting the population aged 10 to 59 as potential workers, and weighting women by a half as a rough measure of their income earning possibilities, we obtain a figure of .51 in 1971, .55 in 1981 - a slight increase in pressure on the labour market.   More elaborate measures of dependency are discussed in later sections.   Although the demographic effects appear small, substantial changes in labour market pressures may still have occurred - notably through downward mobility into this group of the rural poor.   This issue is discussed further in the next section.

III. Work Status, Occupational Structure and Assets

The easiest way to visualise changing work status and occupational structure is through a matrix of occupations in 1971 against occupations in 1981 (table 4) for the 41 households for which this could be established (i.e. for which an occupation was defined in both 1971 and 1981).[2]   The occupational classification is defined for the household as a whole, allowing for the activities of all household members.   The "individuals" part of the table is defined in terms of the characteristics of their households.

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[1]   Including 14 out-migrants to nearby rural areas.   The figure of 308 differs from the 294 in table 2 because of the inclusion in 1971 of three out-migrant households for which 1981 data were not available (which does not matter here, but would have affected the results in table 2).   See also footnote 2.

[2]   For households which had divided, characteristics of all successor households are taken into account as far as possible except households which had out-migrated.   However, the respondent was usually a member of a "core" successor household, and in cases of doubt preference was given to information concerning this household.

Table 4: Occupations and work status in 1971
          and 1981

Vertical distribution: 1971;
Horizontal distribution: 1981*

	Households				Individuals			
	1	2	3	4	1	2	3	4
1. Wage labour only	12	4	2	0	81	31	20	0
2. Mainly wage, some cultivation/self-employment	7	8	1	3	49	46	7	15
3. Mainly cultivation/ self-employment, some wage labour	0	0	1	0	0	0	7	0
4. No wage labour	0	0	2	1	0	0	8	6

* E.g. of 18 households classified as "wage labour only" in 1971, 12 were still in this category in 1981, 4 in category 2, and 2 in category 3.

It can be seen that there is a degree of mobility, in that almost half of households and individuals move from one category to another (i.e. appear off the diagonal), but there is no clear direction to this mobility.   There is a tendency for marginal farmers (group 2) to move into group 1, but this is offset by an opposite tendency among wage labourers.   We do not have enough information to judge the situation for groups 3 and 4, which were little represented in our sample.

Another, related indicator of occupational change can be found in asset changes, which are summarised in table 5.   Again the picture is one of fairly substantial variation in individual fortunes, but on the whole, gains balance losses.   It can be seen, however, for both owned and sharecropped land, that there have been net losses among those who had access to land in 1971, compensated by net gains among those

Table 5: Changes in land and other assets (number of households)

A. Owned land

	Land owned in 1971	Land not owned in 1971	Total
Loss	8	..	8
No change	4	19	23
Gain	4	4	8

B. Sharecropped land

	Land share-cropped in 1971	Land not share-cropped in 1971	Total
Loss	7	..	7
No change	0	26	26
Gain	1	6	7

C. Owned land plus 0.5(sharecropped land)

	Land owned or sharecropped in 1971	Land not owned or sharecropped in 1971	Total
Loss	12	..	12
No change	3	15	18
Gain	5	4	9

D. Animals

	Animals owned in 1971	Animals not owned in 1971	Total
Loss	8	..	8
No change	0	17	17
Gain	6	5	11

Notes:

1. The figures do not incorporate loss of land through households dividing, since data from the new households are aggregated together.

2. The total number of households varies slightly because of missing or dubious data from one year or another.

3. The logic of dividing sharecropped land by 2 in the synthetic index (C) is that the usual output share to the tenant in the Kosi area is 50 per cent.

who did not.   We do not know how far up the land hierarchy this net loss occurs - we are here studying only the very bottom group.   If the pattern continues in higher land ownership classes, the net loss of land among marginal and small farmers would presumably greatly out-weigh the gains among pure agricultural labourers.

The pattern for sharecropped land is particularly strong.   The number of sharecropping households remains unchanged, but they are not the same households in 1981 as in 1971.   This would appear to support the view that some "rotation" of sharecroppers is occurring, in order to prevent tenants from acquiring legal rights to the land they cultivate.

There is some evidence of net moves from the "cultivator" to the "agricultural labourer" category during 1971-81 in the Kosi area, from the census data reported in table 1, with a rise of 4.7 percentage points in the agricultural labour category, a decline of 3.6 points in the cultivator category and a smaller decline in non-agricultural activities. One has to beware of using census data for this type of analysis, because subtle definitional changes can affect the results.   However, the share of agricultural labour in Bihar as a whole (and also in India as a whole) slightly declined between the censuses, both in relation to all occupations, and in relation to agricultural occupations, so there is no prima facie case to be made that the increase in agricultural labour in the Kosi area is a definitional one.   The rate of change amounts to a little under 1 per cent of cultivators becoming agricultural labourers per year.

Another indicator of changing occupational structure can be found in labour force participation in different types of activity.   Table 6 gives labour force participation in casual wage work, "permanent" wage work and all economic activity, broken down by age and sex.   There is a hint of increasing work among women, and also among 10 to 19 year olds, but no indication of substantial change in the balance between different types of labour.   An alternative age breakdown also

Table 6: Economic activity by age and sex (absolute numbers, % in brackets)

	1971				1981			
	Population	Casual wage	Permanent labour	All work	Population	Casual wage	Permanent labour	All work
Males								
10-19	39	3 (8)	18 (46)	22 (56)	38	7 (18)	17 (45)	29 (76)
20-49	49	41 (84)	6 (12)	49 (100)	43	32 (74)	8 (19)	42 (98)
50+	17	15 (88)	0 (0)	15 (88)	12	10 (83)	0 (0)	12 (100)
Females								
10-19	27	3 (11)	0 (0)	4 (15)	20	7 (35)	0 (0)	8 (40)
20-49	57	28 (49)	0 (0)	38 (67)	50	25 (50)	0 (0)	35 (70)
50+	14	2 (14)	0 (0)	2 (14)	10	3 (30)	0 (0)	4 (40)

suggests that there is some tendency for women's work to rise. Percentage female participation rates were as follows:

Age:	15-34		35-54	
	1971	1981	1971	1981
Casual wage work	42	49	54	61
All economic activity	60	60	63	87
(No. of observations)	(48)	(35)	(24)	(23)

The pattern across villages was very uneven; the aggregate increase was essentially due to rises in two out of five villages. In two other villages, female labour supply remained low, while in the fifth it remained high.

The relationship of female labour supply to several factors - potential dependency, household occupations, land owned, and land sharecropped - was explored by estimating linear models. However, no consistently significant relations were found, either with respect to the absolute levels of these variables, or with respect to their changes between 1971 and 1981. But increases in female labour supply may be associated with declining real wages; we shall return to this point below. It should be noted that caste and religion, and to a lesser extent class and landholding, were found to be strongly associated with female labour supply in another study of a dozen villages in Bihar (Prasad and Rodgers, 1983).

IV. Employment

Employment data were collected for all households in 1971, and for a subsample of 25 households in 1981. This sample is very small, and unevenly selected;[1] but if major shifts in employment and unemployment have occurred during the 1970s they are likely to show up in our data. Information was collected on days at work for all economically active household members by recall over the previous 12 months; questions went into some detail about individual activities and different

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[1] Because of time constraints in 1981, in one of the villages employment data were collected from only a single household; elsewhere, no attempt was made to collect employment data if the respondent was not the main income-earner of the household.

crop operations, but a substantial margin of error is doubtless present. One further relevant question is whether agricultural conditions were comparable in 1970-71 and 1980-81, since large differences in rainfall or other factors would generate year to year fluctuations in employment. I do not have detailed information on this as yet; a general impression is that both years were near to but a little above the trend, and therefore broadly comparable. An attempt will be made to document this in due course.

For the 25 households for which employment data were obtained in both 1971 and 1981, table 7 compares the days employed in 1970-71 with 1980-81 for the principal worker in the household (the person who worked the most days, excluding children and youths working as attached labourers; not necessarily the same person in the two years). Overall employment levels are quite high, averaging around 240 days in the year. Those on the diagonal in the table had roughly similar employment levels in the two years (10 cases); those above the diagonal increased their employment (7 cases); those below the diagonal decreased (8 cases). There is thus considerable mobility, which can be readily explained in terms of life cycle effects, illness, random factors in job access, availability of irregular work such as earthwork and so on. But there is no overall trend at all.

Table 7: Employment levels in 1970-71 and in 1980-81

Days worked in 1970-71	Days worked in 1980-81				
	Less than 200	201-225	226-250	251-275	More than 275
Less than 200	1	1	0	0	0
201-225	1	2	1	0	0
226-250	3	1	2	1	2
251-275	0	1	1	2	2
More than 275	0	0	1	0	3

An alternative way of looking at the employment data is to count the number of months with significant unemployment. Table 8 shows the distribution of households,[1] in 1970-71 and 1980-81, by the number of months in which the main worker was employed for less than 15 days. The conclusion is the same. There are eight observations above the diagonal and eight below.

Table 8: Unemployment levels in 1970-71 and in 1980-81

No. of months less than 15 days work in 1970-71	No. of months with less than 15 days work in 1980-81			
	0	1-2	3-5	More than 5
0	2	0	1	0
1-2	2	2	2	4
3-5	2	2	6	2
More than 5	0	0	2	1

The best way to analyse these employment levels would be in terms of production patterns and labour market structure; but on these we have only anecdotal evidence. We can however look at the relationships between employment levels and land owned and sharecropped, and also the relation with the availability of earthwork (the main form of casual non-agricultural work available to village labourers). In table 9 we report results of linear models along these lines in which the dependent variables are the employment level, and change in the level of employment (note that self-employment and employment are combined). Significance levels are low, but there is some indication of higher employment levels where land is sharecropped - about 25 to 40 days per year per hectare. This result is greatly strengthened by its being found three times: in both 1971 and 1981, and in the change between the two years. However, there appears to be no significant relationship between employment and land owned. Small amounts of land,

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[1] Data for two additional households were available for table 8.

Table 9: Determinants of employment[1]
Regression coefficients, t values in brackets.

Explanatory variables[2]	Dependent variables			
	Days employed 1981		Days employed 1971	Change in days employed 1971-1981
	1	2		
Land owned (decimals)	0.16 (0.60)	0.16 (0.60)	0.02 (0.13)	-0.03 (0.13)
Land sharecropped (decimals)	0.10* (1.37)	0.12* (1.59)	0.15 (1.02)	0.11* (1.42)
Earthwork (man-days)	–	0.25* (1.40)	–	–
Constant	237	229	221	-0.1
R^2	0.10	0.17	0.03	0.08
N	26	26	39	25

* Significantly positive at the 10 per cent level

[1] Employment here meaning days worked in all economic activities.

[2] Explanatory variables refer to the dates of the dependent variables; in the case of changes in days employed, the explanatory variables also measure changes.

whether owned or sharecropped, are unlikely to generate much additional employment; work on own land will be most productive at the times of the year when most wage employment is available, so that up to a certain landholding level self-employment is merely substituted for wage employment. However, the leasing in of land is often also associated with other forms of attachment to landlords, which will in turn lead to higher employment levels; this probably accounts for the higher overall employment levels associated with sharecropping.

The relation with earthwork (column 2) suggests a weak positive impact of earthwork availability on total employment. The coefficient suggests that around a quarter of the total days spent in earthwork represented net additions to employment.

Another aspect of employment worth examining is "permanent" - annual or longer term - work, mainly confined to male children and youths in our sample.[1] Age specific incidence rates for males for this type of work are given in table 10. It can be seen that 40 to 50 per cent rates for permanent labour are found among 10 to 19 year olds. There appears to be little change in the over-all incidence of permanent labour between 1971 and 1981, or in its age breakdown. The break-down by occupation of the household, however, suggests that the rate is rising in pure wage labour households, and falling in households where there is some non-wage employment.

V. Wages

A multitude of wage systems co-exist in rural Bihar. At harvest time, a crop share is traditional. In the villages surveyed, this varied from one-seventh to one-tenth. For the main crop, paddy, no confirmed changes in the share during the 1970s were reported. For the secondary cereal crop of wheat, no change was reported in four out of five villages; in the fifth village, no change was reported on unirrigated land, but it was reported that on irrigated land, one-ninth was now paid instead of one-seventh. For jute, however, in the three villages where shares (paid at the retting stage) were recorded, all had declined (from one-seventh to one-ninth or one-tenth); in one case the share system had been largely supplanted by a daily wage of Rs. 1.50 plus 1 kg. jute, reported to be worth significantly less than the previous share system. International jute prices rose little (in money terms) during the 1970s, so the wage changes can be interpreted as a response to declining real returns to jute cultivation. The decline in wage shares may reflect the fact that previous, institutionally determined

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[1] The original sample excluded adult permanent labourers so we understate the incidence of this type of labour contract in the adult population.

Table 10: Per cent of males in permanent wage labour by age,
          year and type of household

Age		Household type					
		1971			1981		
		Wage labour only	Some non-wage	Total	Wage labour only	Some non-wage	Total
0-9	No. of observations	29	22	51	14	29	43
	% of permanent labourers	3	5	4	21	0	7
10-14	No. of observations	16	10	26	9	7	16
	% of permanent labourers	38	50	42	44	43	44
15-19	No. of observations	7	6	13	14	8	22
	% of permanent labourers	57	50	54	50	38	45
20+	No. of observations	27	35	62	30	20	50
	% of permanent labourers	11	9	10	23	5	16

shares substantially exceeded the wage floor paid at other times of the year. The value of a daily wage of Rs. 1.50 plus 1 kg. jute was approximately the same as the "floor" wage for this village of Rs. 1.50 plus a meal and a breakfast. Where the share remains it appears to vary appreciably with the quality of the jute, but the value of a share payment is still reported to usually exceed the "floor" (varying from 2 to 5 kg. jute per day). Institutionally determined wages therefore do not seem to be immovible if market pressures become extreme; the one reported change for wheat indicates that substantial yield changes may induce declining shares. But on the whole, the subsistence crops of paddy and wheat show remarkable stability.

Casual daily wages for other crop operations in this part of Bihar usually include a cash component, which is of course more liable to change, in real terms, during an inflationary period. In one of the five villages studied, wages were paid entirely in kind; these had remained unchanged during the decade. In other villages, wages were paid partly in cash, partly in meals, both components varying from village to village. We report the evolution of these wages in table 11. Some seasonal variation in wages is reported in three villages out of five. In one this was a small, brief rise during peak seasons, reported only by two respondents out of eight. In the other two cases there was more fluctuation, and an average of the reported wages has been taken. In 1970-71 there was somewhat less wage variation. The increase in seasonal variation was due to observed wage fluctuations in one village where this had not been previously reported, although it was not clear whether this truly reflected seasonal excess labour demand, or was part of an unsteady upward step in wages to match rising prices.

Table 11 is complex, but this merely reflects the complexity of the wage systems. Comparing columns 1 and 2, we can see that the kind component of the wage has generally remained unchanged, while the money component has usually risen. There is one exception to the former rule - in Rampur-Belwa (i) a nasta (breakfast) has been added; but this merely brings this wage into line with the others, it previously being the only wage recorded without a nasta. The quality of the meals may have deteriorated (see below). There are also some exceptions to the tendency for money wages to rise, including the case where the nasta has been added. Column 3 gives an index for the money component, which varies substantially. The extremes of this variation are all found within one large village, where the labour market has at least five distinct segments; but the upper end of the range (200) is probably abnormal, since it refers to a group of in-migrant Bengali Muslims, reputedly very hard workers, in a rather tightly controlled labour market segment. Variation in the total wage (column 4) is distinctly less than in the money wage.

Table 11: Casual daily wages, 1971 and 1981

	1	2	3	4	5	6	7	8
Village	Wage in 1971[1]	Wage in 1981[1]	Money component index[2]	Total wage in money terms, index[2]	Total real wage index[3]	Calorie value 1971	Calorie value 1981	Calorie value index[2]
Pokharia	Rs 1 + N + M	Rs 1.50 + N + M	150	160	76	5700	5350	94
Dubaili-Biswaspur	Rs 1 + N + M	Rs 1.50 to Rs 2 + N + M	175	172	82	5700	5750	101
Rampur-Belwa (i)	Rs 1 + M	Rs 1 + N + M	100	149	71	4900	4600	94
(ii)	Rs 1 + N + M	Rs 1 + N + M	100	134	64	5800	4600	79
		(a) Rs 1 + N + 2M	100	137	65		5500	83
(iii) Rs 1 + N + 2M		(b) Rs 1.25 to 1.30 + N + 2M	130	149	71	6600	5950	90
		(c) Rs 2 + N + 2M	200	179	85		7050	107
Chanuar	average around Rs 1 + N + 2M	average around Rs 1.50 + N + 2M	150	162	77	6900	6500	94
Bhawanipur whole day	3 seers grain + N + (M or 1 seer rice)	3 seers grain + N + 1 seer rice	-	170	81	8000	8000	100
half day	2 seers grain + N	2 seers grain + N	-	170	81	5000	5000	100

[1] N = nasta (breakfast); M = meal. 1 seer = about 750 grams in Bhawanipur.

[2] 1970-71 = 100

[3] Deflated by price index for agricultural labourers, 1970-71 = 100 (value used for 1980-81 : 210 - interval actually about 10.5 years).

The agricultural labourers price index for Bihar, taking 1970-71 as 100, stood at 210 for the reference year.[1]   Most of the changes in money wages are much less.   If we deflate the total rupee wage by this price index, we obtain the "real" wage index (1970-71 = 100) in column 5.   The decline in real wages varies from 15 per cent (for the Bengali Muslims) to 36 per cent, averaging 20-25 per cent.   But this proves to be exaggerated.   An indication of the exaggeration can be seen in the bottom village in the table, Bhawanipur, where wages have remained unchanged in kind, but the wage index shows a 19 per cent decline (index 81).   The reason is simple.   Grain prices have risen much less than the general price index.   Wholesale prices from a market near Purnea indicate an index of 169 for paddy and 173 for wheat, compared with 210 for the overall index.   We discuss this point again below; here we should note that the wages in our sample are too low to permit much expenditure on anything other than calorie foods, so the overall agricultural labourers price index probably gives too high a weight to non-calorie foods, and to non-foods.

An alternative way of looking at wages which avoids these problems is to estimate calorie availability from a given wage, assuming that the wage is entirely devoted to calorie foods, given the prevailing local diet.   Estimates in these terms are given in columns 6 to 8 of table 11. This formulation distinctly moderates the wage decline.   We have two cases of wage declines around 20 per cent; apart from these (and again excluding the Bengali Muslims) we find wages which are stable (two cases) or declining by 6 per cent (three cases) or by 10 per cent (one case).

To interpret these results we need to also consider patterns of dependency and incomes; but first we can look at another aspect of the wage structure, that for permanent labour.   As noted above, in our sample permanent labour of adults is underrepresented, but we have sufficient observations (44) of adolescent permanent labour to examine wage patterns.   The standard, almost universal practice is for

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[1]   Source: _Indian Labour Journal_.

board and clothing to be provided to permanent labour, and in the case of single youths, lodging as well. In addition, there is an annual or monthly cash payment. The contract may be for either 10 or 12 months - in the former case, the two months excluded correspond to the paddy harvest. The institutional arrangements showed no sign of change from 1971 to 1981, so our analysis is confined to the cash component of the wage (adjusted where necessary for the length of contract), which varied from nil to Rs. 360 per year. It is difficult to value the kind component of the permanent labour wage, but adequate daily subsistence is likely to imply something approaching the equivalent of a kilo of grain, or say at least Rs. 2. Thus the cash component of the wage represents at most one-third of the total, and usually much less.

The mean cash wage rose from Rs. 91 in 1971 to Rs. 167 in 1981, which implies a decline in real terms of 13 per cent, using the 210 point index referred to above, or an 8 per cent rise using the 170 point index for cereals. However, the average age of the sample of labourers rose from 14.4 in 1971 to 15.5 in 1981, and age is strongly correlated with the cash wage. There are also fairly considerable village to village differences. If we deflate the cash wages by the standard price index, and regress this on age, and on dummy variables for 1981 and for two villages where significantly higher cash wages are recorded, we obtain the following:[1] (t values in brackets; * = significant at 5 per cent)

$$\text{Cash wage} = -45.0 - 24.7^* \text{ (Year 1981)} + 8.2^* \text{ (Age)}$$
$$(1.80) \quad (2.36) \qquad\qquad (4.76)$$

$$+ 30.8^* \text{ (Village 1)} + 54.3^* \text{ (Village 2)}$$
$$(2.74) \qquad\qquad (3.91)$$

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[1] This excludes six cases of ages under 8 or over 20, which would tend to undermine the linear approximation which suffices for the age relation between 8 and 20; 38 cases remain. Results for the (Year 1981) variable are very little changed if the village dummies are dropped.

A significant decline in the real wage emerges, amounting to Rs. 25, or 27 per cent, on average. However, if we use the grain price index instead of the overall index, we obtain the following relation-ships:

$$\text{Cash wage} = \underset{(2.23)}{-61.3^*} - \underset{(0.70)}{8.1} \text{ (Year 1981)} + \underset{(4.82)}{9.2^*} \text{ (Age)}$$

$$+ \underset{(2.77)}{34.3^*} \text{ (Village 1)} + \underset{(4.30)}{65.7^*} \text{ (Village 2)}$$

The decline in real wage is still present, but it is much smaller (9 per cent on average) and not statistically significant.

Our conclusions for permanent labour thus parallel those for daily casual wages rather closely: a substantial decline in the wage is observed when it is divided by a conventional price index, a small decline where the wage is related to grain prices, and there are considerable inter-village variations.

Is the grain price appropriate as a deflator of cash income? After all, the food requirements of the permanent labourer are already taken care of by payment in the form of meals. However, a substan-tial fraction of the cash wage appears to go to support other household members (cases were reported of the cash wage being paid directly to the household head), so the final use of the cash component paid to permanent labour is probably comparable to that of the cash component of the wage paid to casual labour.

VI. Incomes

Detailed income estimates were made for some 25 households; this included not only income from wage labour, but also from self-employment and other sources. In order to make such estimates comparable between households and between 1971 and 1981, it is necessary to standardise both for price changes between the two years and for differences in household size and age-sex composition. In 1971, incomes were computed in calorie terms; that is, the whole household income was assumed converted to its calorie value, on the

basis of the prevailing diet, and the outcome expressed as a percentage of recommended calorie intake levels for a household with its size and composition.[1]   Note that since the entire income is not devoted to calorie foods, this <u>overstates</u> the extent to which recommended intake levels are met. Its value is comparative - in so far as all households face approximately the same relative prices, it is a reasonable indicator of relative welfare which, because it is attached to an absolute standard, also gives an immediate sense of the absolute position.   Note that the computed income is implicitly on a "per adult equivalent" basis.

Similar calorie incomes have been computed for 1981, and the results, for all 25 households for which this was possible, are presented in table 12.[2]   Several points stand out.   First, there is tremendous variation between households in estimated incomes, even within the same village.   Second, the fortunes of individual households have been just as varied.   In one case the income has trebled; in another it has fallen by two-thirds.   Third, there has been a slight <u>increase</u> in average incomes.   This proves not to be statistically significant, but it is nonetheless remarkable given the <u>decrease</u> in wages.

The first point to make is that the increase in measured calorie income cannot be interpreted as an increase in welfare, because relative prices and the diet pattern have changed over the decade.   Table 13 gives some data on changes in prices of certain commodities consumed by agricultural labourers.[3]   It can be seen that, as noted above, the prices of calorie foods have risen distinctly less than those of other commodities.   Cereals account for less than 60 per cent of the weight

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[1]   As recommended by the Indian Council of Medical Research, with minor modifications (detailed in Rodgers, 1976).

[2] Where households had divided, an income estimate for all successor households taken together was made where sufficient detail was available.   Otherwise income was estimated only for the household of the respondent.

[3]   These figures come from a different source from those quoted above, and the values differ slightly; however, the qualitative picture is the same.

Table 12: Calorie incomes in 1971 and 1981 (% of recommended intakes)

	Income 1971	Income 1981		Income 1971	Income 1981
Pokharia			**Rampur-Belwa**		
	43	50 (38*)		70	23
	65	119 (91*)		70	51
	50	38		101	79
	45	144 (97*)		157	162
	84	94		70	98
	57	85 (64*)		61	68 (51*)
	70	35		65	86
				38	78
Mean:	59	81 (65*)	Mean:	79	81 (79*)
Dubaili-Biswaspur			**Chanuar**		
	95	111		117	123
	45	93		69	122
	91	66		84	96
	138	111		59	66
	94	54			
Mean:	93	87	Mean:	82	102
			Bhawanipur		
				51	71
			Overall	76	85 (80*)

* figures in brackets exclude (migrant) earthwork

Table 13: Prices in 1970, and in 1980-81

One year average of monthly retail prices from Monghyr, Bihar[1]
(Rs. per kg. except kerosene: per litre;   dhoti: per pair)

	1970	1980-81	Ratio 1980-81:1970
Rice	1.51	2.58	1.71
Wheat	1.07	2.05	1.92
Maize	0.89	1.52	1.71
Gram (pulse)	1.44	4.79	3.33
Arhar (pulse)	1.58	4.63	2.93
Mustard oil	5.54	15.59	2.81
Sugar	1.74	3.32	1.91
Kerosene	0.72	1.77	2.46
Dhoti (clothing)	11.39	49.05	4.31

[1] Source: Indian Labour Journal.   Monghyr is a town near, but outside the study area.   It was the nearest location for which comparable data for the two years were available.   Note that rural prices differ from urban, but the 1981/71 ratios should be broadly comparable, with perhaps some tendency for trade and transport margins to shift the prices of rural products towards the mean;   that is, in rural areas, we would expect the relative growth of cereal prices to be less.

in the Indian Labour Bureau's price index for agricultural labour.   If we adjust the calorie income estimates to allow for the increasing relative costs of these other goods, assuming that their weight in the index remains constant, then we would find calorie incomes at 69 in 1981, not 85 - i.e. a 9 per cent decline instead of a 12 per cent rise.[1]   Because of the primary role of calorie foods in subsistence, there has doubtless been some substitution of calorie foods for non-calorie food and non-food during the decade (for instance, there appears to have been a substitution of grains for pulses - on this see J. Rodgers, 1983), so that the

[1] This calculation uses an artificial price deflator for calorie incomes - the overall price index for agricultural labour divided by the grain price index, with 1970/71 = 100.   The 1981 figure of 69 should then be regarded as an index, with 1971 = 76.

calorie income figure for 1981 comparable with 1971 will lie somewhere between 69 and 85. We must clearly conclude that there has been no significant change from the value of 76 computed for 1971.

Four main components in income can be identified for our sample:

(i) wage levels

(ii) land and other non-wage income sources

(iii) dependency

(iv) employment levels.

Table 14 reports a series of regressions aimed at establishing the relative importance of these factors. We use wage levels measured in calorie terms; owned land plus half sharecropped land as a proxy for non-wage income; "potential" dependency defined in age structure terms (adults plus half children divided by males aged 10 to 59 plus half females aged 15 to 59); and employment in days of the main worker. Three series of relationships are estimated: for 1971, for 1981, and for the change between these two years. None of the explanatory variables is entirely consistent. However, both employment levels and dependency always have the expected sign, and are generally statistically significant (except the 1981 results for employment, and the change results for dependency). Since dependency here is defined purely in terms of age structure, and not in terms of actual labour force participation, the results can be interpreted as a combination of life-cycle effects and demographic differentials between households. Land is (marginally) significant only in 1981, and otherwise has an unexpected negative sign; however, as we saw in table 9, land sharecropped at least is associated with higher employment, thus generating an indirect positive income effect. It should also be commented that in our sample there are only very small landholdings - larger landholdings are obviously associated with higher incomes beyond a certain landholding level. The wage level is nowhere significant, and the relationship between wage change and income change has a negative sign. This surprising result is confirmed by simple correlations between wages and incomes: -0.05 for 1971, +0.09 for 1981, and -0.14 for the change between 1971 and 1981.

Table 14: <u>Regressions for the components of income</u>
Dependent variable: income expressed as a percentage
of calorie recommendations.   t values in brackets.

	Constant	Employment	Dependency	Land	Wages	Illness	R^2
<u>1971</u>							
	63.6**	0.27**	-31.9**	–	–	–	.35
	(1.83)	(2.15)	(2.47)				
	63.9**	0.27**	-31.8**	-0.02	–	–	.35
	(1.78)	(2.09)	(2.40)	(0.17)			
	38.8	0.27**	-33.1**	-0.01	0.004	–	.36
	(0.55)	(2.07)	(2.37)	(0.14)	(0.42)		
<u>1981</u>							
	105.6**	0.22*	-43.6**	–	–	–	.28
	(2.23)	(1.35)	(2.37)				
	113.7**	0.13	-40.7**	0.21*	–	–	.39
	(2.52)	(0.79)	(2.31)	(1.72)			
	37.1	0.09	-35.9**	0.22*	0.013	–	.43
	(0.44)	(0.57)	(1.99)	(1.82)	(1.07		
<u>Change</u>							
<u>1971-1981</u>	10.4*	0.28**	-14.2	–	–	–	.25
	(1.51)	(1.96)	(1.32)				
	10.2*	0.29**	-13.3	-0.04	–	–	.25
	(1.43)	(1.95)	(1.19)	(0.39)			
	1.6	0.26*	-13.7	-0.04	-0.029	–	.30
	(0.15)	(1.74)	(1.23)	(0.33)	(1.08)		
	5.8	0.06	-10.1	-0.04	-0.021	-52.4**	.54
	(0.64)	(0.39)	(1.06)	(0.45)	(0.94)	(2.76)	

** significant at 5 per cent; * at 10 per cent (1-tail tests)

N = 21 (the 25 households of table 12 less four households for which casual wages were not observed).

In our sample, two households in 1971, and two in 1981, had
severely reduced incomes because of illness or incapacity of earning
members.   The impact on income operates mainly through employment,
and adding an indicator of illness per se to the 1971 or 1981 relation-
ships does not contribute significantly to the explanatory power of the
functions.   However, the change in income between the two years
proves to be significantly associated with the change in illness status -
indeed, if a measure of change in illness is included it is the only
significant variable, and the independent effect of employment change
falls to almost nothing.

The results of table 14 can be used to explore components of the
change in incomes reported in table 12.   Wages and landholdings
appear to contribute little, and in practice nor does illness.[1]   Employ-
ment levels appear to be more important.   As we saw earlier, there
has been little change in average overall employment of the main worker
of each household.   However, employment in earthwork, negligible in
1971, had started in one village, where a gang of labourers had
migrated for several months to Assam;   one further case of the same
type was also found in another village.[2]   This had a double effect on
incomes - first it increased employment opportunities, especially for
secondary household workers (several members from the same household
commonly migrated);   and secondly, the wages paid for earthwork were
higher, even net of the calories burnt in the extra work effort.   The
impact on income was quite considerable in the village where this work
was most common (table 12);   and for the sample as a whole, incomes
would have risen from 76 to 80 per cent of calorie recommendations,
rather than 85 per cent, in the absence of this work.

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[1]   The illness variable in table 14 does not contribute to the
change, since its level is the same in 1971 and 1981 - two cases.   A
larger sample and more detailed health data would be required to assess
the effect of changing health on income levels.

[2]   This is an interesting development, associated with a general
increase in labour mobility in northern India.   In 1971 labourers in the
villages concerned generally refused to contemplate doing earthwork.

The impact of migrant earthwork apart, the main cause of higher measured income appears to be declining dependency. For table 14 we used "potential dependency", based on age structure. But several, more complex dependency measures can be constructed. If we measure household size in terms of equivalent adult male consumption units, taking as weights recommended calorie intakes, then different dependency rates can be computed with different denominators, as follows:

Denominator	1971	1981
(i) all adults	1.24	1.12
(ii) all adult males plus half adult females	1.62	1.44
(iii) all workers	1.80	1.47
(iv) all male workers plus half female workers	2.16	1.78

The decline in dependency varies from 10 to 18 per cent, depending on the measure used. Higher declines are observed for the measures using workers, partly because of the higher female labour supply in 1981, already noted above. These changes in dependency are enough to more than offset most of the declines in real wages reported in table 11.

These points can be illustrated by examining the fortunes of individual households. In the appendix to this paper, we briefly summarise the experience of 10 households - the five for which incomes rose most sharply, and the five for wich incomes fell most. The largest income rises are all associated with life cycle changes in households with several sons. In most cases, boys reach working age when their fathers are still economically active. Dependency falls, in some households dramatically - but temporarily, since marriage and withdrawal from work of older family members will ultimately drive it up again. Low dependency is then directly reflected in high income. In some cases, increased employment also seems to play a role, but all factors other than dependency are quite secondary.

The sources of income decline are more diverse. Two cases out of five are mainly due to illness. Rising dependency is important in the other three cases, but falling real wages also contribute to the reductions in income.

On balance, then, average incomes changed little over the decade, although there was much variation in the fortunes of individual households. The lack of change in average incomes, despite a decline in real wages, could be traced largely to a compensating decline in dependency, with a secondary contribution from migration for employment in earthwork.

VII. The "Efficiency" Wage Model

Analysis of the wage data in 1970-71 suggested that a nutritionally efficient subsistence level might be underlying wage determination in the Kosi area (Rodgers, 1975). This model has been discussed, mostly sceptically, by various authors (Bardan, 1979; Cain, 1981; Rosenzweig, 1978; Bliss and Stern, 1978), though none of them use data from Bihar in their empirical analysis; it is therefore interesting to assess the extent to which wage changes over the 1970s have been consistent with the nutritional model.

A "strong" version of the model would predict that wages vary considerably from worker to worker, for the "optimum" wage (optimum for the employer in the sense of maximising output per unit of wage cost) will vary with the physiological characteristics of the individual, the number of days he or she is employed, the dependency burden and the fraction of the wage directly consumed by the worker, the intensity of the work, and other factors. But in the casual labour market at least,[1] it appears to be unacceptable for employers to differentiate between individuals on this basis (this is also true in labour markets at higher wage levels - inter-worker productivity differentials doubtless tend to greatly exceed wage differentials, except where pure piece-rates are paid). We would therefore expect the wage to settle around an average, sufficient to maintain the labour force as a whole. This average may vary from place to place, or from group to group, depending on the characteristics (e.g. dependency) of the groups concerned.

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[1] We consider permanent labour below.

Geographical separation obviously assists, but segmentation along other lines - ethnic, for instance - is possible within geographically over-lapping labour markets.

The problem then, as Mead Cain among others has complained, is that it becomes difficult to rigorously test the model - few predictions are made by the "weak" efficiency wage model which cannot be accommodated as special cases by a "normal" competitive model. On the other hand, the competitive model can be stretched, by making increasingly implausible assumptions, to cover almost any conceivable situation, so that in a sense it is the competitive model which is untest-able, especially if we accept all sorts of traditional practices and labour market institutions (e.g. harvest shares, payments in cash or kind, and so on) as established outside the market. We shall consider some of the observations discussed above in this light.

The primary empirical issue is the evolution of wages over 1971-81. As we have seen, the outcomes are exceedingly mixed, but the tendency has been for wages to fall. This would be prima facie evidence against an efficiency wage, were it not for the relative constancy of incomes. For where the wage is shared between worker and dependents, the employer's optimum wage will tend to generate a constant household income (per person-equivalent), rather than a constant wage. Thus the average outcome of our very small sample is consistent with the efficiency wage: declining dependency has been associated with declining wage and constant real income. However, such an outcome is not excluded by a purely competitive model, which could generate this result as a special case.

The regression results in table 14 are relevant here. As we have seen, they show incomes as affected by employment and dependency, but not by wages, and even the effects of employment and dependency are weak when one examines income changes over 1971-81. We there-fore cannot exclude the hypothesis that some adjustment occurs between wages, employment and dependency to generate broadly constant incomes. Our sample proved to be too small to tackle these relationships at any acceptable level of statistical significance; but some anecdotal evidence can be cited. For instance, the efficiency wage model would predict

that provision of income sources from outside the agricultural labour market (e.g. earthwork) would tend to lower the efficiency wage. If we compare the adjacent villages, Pokharia and Dubaili-Biswaspur, wage levels in 1970-71 were identical. In 1980-81, labourers from Pokharia were extensively engaged in outside earthwork - and wages were now lower than in Dubaili Biswaspur, where no such outside work was reported.[1] The one case of earthwork observed in Rampur-Belwa was also found in a labour market segment which suffered a very substantial wage decline. This latter village had a highly segmented labour market; in 1980-81, as in 1970-71, the highest wages were paid in segments where female labour force participation was lowest, and inversely, suggesting that there was some compensation in the wage for differences in dependency. The same observation is valid for differences between villages, with the notable exception of Bhawanipur, where female labour force participation was relatively high and so, in calorie terms, were wages (but much work was half-day and paid a lower wage).

Village by village, the pattern is rather erratic because of the sample size. For three villages, changes in wages, dependency and employment more or less balance out if one neglects earthwork, leaving incomes little changed; in the other two villages, there is a net rise in incomes, associated with a particularly sharp fall in dependency (31 per cent in Chanuar and 24 per cent in Bhawanipur, compared with 18 per cent in the sample as a whole, using the measure of dependency on all workers), but the sample size is too small to judge whether this is meaningful.

Another aspect of the labour market which merits comment is the market for "permanent" or longer-term labour, which, as noted above, in our sample primarily concerns youths. It has been argued that

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[1] The competitive model could of course explain this as lower growth in labour demand in Pokharia leading to both slower growth in wages and to the search for outside work. But then the competitive model would also, presumably, forecast that labourers from Pokharia would walk the 2 or 3 kilometres to Dubaili for higher agricultural wages - which they do not.

wages paid to permanent labour are easier to "individualise" than casual wages, so that efficiency wage considerations would be more likely to generate inter-worker wage differences to compensate for household dependency in the permanent labour market. But the uniform practice is for permanent labour to be fed and clothed, and often lodged as well; thus the physical requirements of the worker are taken care of directly, and it is not obvious in what way the additional cash payment which is usually made can be justified in terms of the efficiency wage model; in any case, no relationship between this cash payment and household dependency was found, which is perhaps not surprising since youths employed as permanent labourers mostly only make a secondary contribution to household income.

Two possible explanations of this cash component of the wage are worth mentioning:

(i) If the cash is paid directly (as is often the case) to the household head rather than to the worker, it might be regarded as a quasi-rent received by the producers of sons, and an institutional mechanism whereby labour households are encouraged to produce sons, and thus ensure the reproduction of the wage labour force.

(ii) Alternatively, we might suppose that casual wages are at a level which permits both productive work and survival of dependents, whereas the remuneration of permanent labour of youths - without direct dependents - is based only on their ability to work. But with increasing age, youths will have increasing access to the casual wage labour market, so that normal market mechanisms will cause the cash component of the permanent wage to rise, if labourers can choose freely between casual and permanent labour. This can explain both the presence of a cash component of the wage, and its rise with age, up to age 18 or 20. However, since permanent labour is effectively guaranteed employment, while casual labour is not, the implied equivalent daily wage for permanent labour should stabilise at a level lower than the casual daily wage. This in fact proves to be the case,[1] except in Rampur-Belwa, where the peak wage reached by

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[1] On the basis of plausible assumptions about the value of kind payments made to permanent labour (similar to the assumptions used for casual labour).

'permanent labour was approximately the same as that received by casual labour (this was due to low casual wages, rather than high permanent wages); elsewhere the maximum equivalent daily wage for permanent labour was about Rs. 0.50 to Rs. 0.70 below casual wages (about 15-20 per cent).

Finally, we have to account for various "institutional" features of wage payments - in cash or in kind, harvest shares, and the like. It is difficult to explain these features in terms of either efficiency or competitive wage models, although it was earlier argued that providing meals to workers would doubtless tend to raise their share in household consumption and so lower the overall wage needed to maintain their efficiency. Harvest shares, in particular, generate wages which are erratically high or low depending on the crop and the yield. While it could be argued that high wages at the time of paddy or wheat harvest reflect high labour demand, there seems no competitive market or efficiency reason why the harvest share should settle at one figure - and stay there, since very little change in the share was observed for these subsistence crops.

One interesting feature of our results is the change in the traditional payment system for jute reported in section V. Declining real jute prices over the 1970s implied that the real value of the share payment to labour was also falling; if the equivalent daily wage fell much below casual daily wages for other tasks, this may have triggered a change in the system either to a daily wage, or to a variable share. The fact that jute is exclusively a commercial crop may thus have made the wage system more vulnerable to market fluctuations. An alternative explanation might be that declining real returns to jute cultivation reduced the area under jute and thus demand for jute labour, and the downward pressure on wages (at a time of the year where little other agricultural work is available) was sufficient to undermine the traditional wage system. Clay (1975) reports one observation of the share system for jute being replaced by a daily wage in 1971, so the process had apparently already started at that time.

To sum up, some aspects of our data are consistent with an efficiency wage; the constancy of real income, on average, would

appear to be a significant point in its favour. But the wage does not compensate for variations in the situation (notably dependency) of individual households, and it also appears to be subject to all sorts of other influences, some institutional, some related to market influences. For instance, in some villages a higher daily casual wage is observed during periods of peak labour demand, suggesting that market forces operate at least some of the time, in some of the villages. We are unable to adequately explain why some wages, partly paid in cash, are allowed to decline substantially in real terms, while others more or less keep pace with rising prices, within different segments of the labour market of a single village. Patterns of patronage and inter-class dependency, and interactions between labour and other markets (e.g. for land and credit), may be partly responsible. Nevertheless, it seems likely that the relationship between the wage and working efficiency remains essential to understanding the labour process in rural Bihar; but it is only one element in a complex wage system, part of which is surely designed to maintain control over workers by employers, part of which is responsive to market forces, and part of which is determined by social institutions rather than economic factors.

VIII. Conclusions

Strong conclusions cannot be drawn from a sample of households as small as that used for this paper; we have in effect only some case studies of change. An attempt is being made to remedy these deficiencies in the larger survey of Bihar mentioned above, which will be reported elsewhere. But to the extent that our data can tell us about the evolving situation of one group of the rural poor, the picture is not encouraging. In the 1960s, the Kosi area was viewed as an area with substantial potential for growth, because of flood control and the expansion of irrigation, and the potential for agricultural innovation. These hopes have yet to be realised. The canal system, which developed mainly in the 1960s, has failed to even approach target irrigation levels; expansion of tubewell irrigation in the 1970s, while rapid, still only covers a small fraction of the irrigable area. Small pockets of high-productivity capitalist agriculture have developed, but the semi-feudal mode of production which dominates the area has proved resistant to change.

The outcome for the cases described here, has been stagnation. Real incomes, which in 1970-71 were insufficient to meet calorie recommendations even if devoted exclusively to cereals and pulses, have changed little; the pattern of access to land, the occupational pattern, even total population size, are all much the same in 1981 as in 1971. In some respects the situation seems to have worsened. The quality of the diet has deteriorated; the real wage has declined; mortality levels, high in any case, seem to have risen in the 1970s, especially among girls. Census data show a growth in the proportion of the population mainly dependent on wage labour - which suggests some downward mobility among small cultivators. Subjectively, the situation can be summed up in responses to the question (in 1981), "Are you and your family better or worse off now than 10 years ago?". Out of 29 respondents who gave an answer to this question, 21 thought that things were worse, 8 thought they were about the same. No one thought they were better.

The basic problem, to judge by our case studies, is not lack of employment. Some seasonal unemployment exists, but average employment levels, in a normal agricultural year, are fairly high. Female labour force participation has increased a little over the 1970s, but there are limits to its increase, imposed partly by cultural factors, partly by substantial levels of unrecorded domestic and semi-domestic work. Youths are if anything overemployed, especially boys, usually in full-time work by the age of 10 or 12, often younger. There will doubtless be some benefits from increased employment opportunities, and in our results high employment levels were associated with somewhat higher incomes. But the main problem lies in low wages. Access to land is one possible solution; but access to the small plots recorded among our sample households does not seem to generate significant income gains - substantial land redistribution would be required to much affect the picture. Direct government action to affect wages seems quite unlikely to succeed; prevailing wages are systematically below unenforced and (under present circumstances) unenforceable legal minimum wages. There is little or no organisation of labour, so that wage-fixing is mainly controlled by a few larger landlords, acting as

wage leaders for the village as a whole, or for particular segments of
the village labour market. The interests of these landlords, taken
together with efficiency considerations, patronage, and traditional insti-
tutions generate powerful forces underlying wage-fixing, forces which
are often underestimated in the design of government policy. Some
changes in wage levels and systems do occur, as in the case of jute,
but they are not necessarily to the advantage of labour. The growth
of "capitalist" agriculture, long awaited and slow to emerge, will
probably eventually undermine or remould the pattern of wage deter-
mination; again, not necessarily to the advantage of labour.

A second basic problem is clearly insecurity. The households in
our sample had no independent mechanisms to resist crisis, nor indeed
to offset life cycle changes. Low dependency phases of the life cycle
could generate acceptable incomes. But households with young
children, aged dependents, and high proportions of females were
severely disadvantaged. It is clear that the survival of girls is
particularly at risk in this situation. Illness and death could generate
even greater problems, ending in some cases in the disappearance of
the household concerned through death and out-migration, in others
with loss of land and indebtedness. The survey happens not to pick
up the effects of drought or flood; but both are frequent, and
probably just as disastrous. Such situations greatly increase the
power of those with sufficient resources to resist crisis - mainly large
peasants, landlords, and to some extent traders. These classes can
provide loans, jobs for youths, perhaps land for sharecropping - all
giving a measure of security to labour households, while consolidating
relationships of patronage and dependency.

The Kosi area is in many ways peripheral to overall economic
development in India. It is true that, in one respect at least, it is
unusually close to the world market, through trade in jute; but much
of the gain from this trade is appropriated outside the region, and
accumulation is concentrated elsewhere. If the Kosi area (and much of
north Bihar) provides anything to economic growth in India, it seems
increasingly to be labour. Migration, much of it seasonal, to Punjab,
Assam, and major urban centres, provides a low wage, unorganised

labour force in areas of destination, while relieving the pressures on jobs and incomes in the areas of origin - and no doubt thereby assisting in the survival of semi-feudal production relations in Bihar.   The operation of this system as a whole has to be understood if effective policies to combat poverty in the Kosi area are to be designed.

Appendix

Some individual histories

Here we describe briefly what happened to ten households over the decade of the 1970s. We have chosen the five cases with the largest rise in incomes and the five cases with the largest falls.

1. Rises in Income

Baldeo Tatma (Pokharia village)

Calorie "income" (%) - 1971: 65; 1981: 119

Baldeo was aged about 30 in 1971, living with his wife and two young sons. Only he was working, as a full-time casual agricultural labourer, with no land, no assets. The rise in his fortunes can be traced almost exclusively to life cycle effects. By 1981, his sons were aged 13 and 16. The younger one was attached to a local landlord, bringing in Rs. 70 per year net. Both the elder son and the father were full-time agricultural labourers (the son also doing some earthwork), and Baldeo's wife had also started to do a little wage labour. No further children had been born and survived, all household members were working, and Baldeo had managed to save sufficient to acquire a buffalo, with the sale of milk bringing in around Rs. 30 per month more. This relative good fortune was only partly offset by a decline in the real wage. Note that Baldeo had only sons, and that his household was approaching its peak earning potential in 1981.

Gullar Tatma (Pokharia)

Calorie income (%) - 1971: 45; 1981: 144

In 1971, Gullar, aged 50, owned an acre of land, and had one bullock. He also did some agricultural wage labour. But he was disabled and able only to do light work; his wife only worked on their own land. Two sons, aged 14 and 12, were permanently employed, but he also had two younger sons and an unmarried teenage daughter, none of them working. Gullar died in 1976. By 1981, all his four

sons were in full-time wage employment - two were permanent agricul-
tural labourers, and two divided their time between casual agricultural
work and earthwork.   A four-month period of earthwork in Assam
accounted for more than half of the total income for the latter two.
The only dependents were the wife of the eldest son, and their mother,
neither of them working.   The household was probably at its peak
income level - marriage and childbearing would no doubt gradually
increase dependency over, time.

Mohammed Samir (Dubaili Biswaspur)

Calorie income (%) - 1971: 45; 1981: 93

In 1971, Md Samir, aged 35, was a full-time agricultural labourer,
with no other assets, supporting his wife, mother, and five children
(among whom only an 8 year old son was attached to a local landlord,
for a derisory cash income, food and clothing).   By 1981 the
dependency ratio was much reduced, partly through the death of his
mother and one daughter, partly because three sons were in full-time
employment, and partly because his wife and second daughter had
started doing harvesting work for wages.   No more children had been
born, and the rise in labour supply was more than enough to offset the
small decline in real wages.

Hamsher Ali (Rampur)

Calorie income (%) - 1971: 38; 1981: 78

Hamsher Ali's situation has a good deal in common with Md Samir's.
In 1971, aged 50, he was supporting his wife, three sons and four
unmarried daughters, from agricultural wage labour; among the other
family members, one son was permanently employed, while the others
were not economically active.   By 1981, two daughters had married and
left home and a third had died; this was somewhat offset, in terms of
dependency, because one son had married and his wife had joined the
household, and they had had one child.   But now three of Hamsher's
sons were in full-time wage labour in addition to himself, so the total
earning capacity of the household was much increased.   He had also
inherited half an acre of land, but this was leased out.

Bud Lal (Chanuar)

Calorie income (%) - 1971: 69; 1981: 122

In 1971, Bud Lal, aged 40, owned 2 acres of land and two buffaloes, but the land was mortgaged.   He and his eldest (15 year old) son were full-time agricultural wage labourers, supporting his wife and five younger sons.   Ten year later, four sons were in full-time permanent employment, generating a fairly substantial cash income. Bud Lal was still doing regular casual wage labour, and only his wife and two youngest sons were not working.   The substantial decline in dependency is directly reflected in the income figures.

2.   Falls in Income

Birman Lal Biswas (Pokharia)

Calorie income (%) - 1971: 70; 1981: 35

In 1971, Birman Lal (aged 30) and his brother Gunsi Lal were supporting a moderate sized household from a range of activities - some agricultural wage labour, a small owned plot, a little over an acre sharecropped, housebuilding, and selling of paan.   His mother and elder sister also did some harvesting wage work and work on their own land.   His wife, younger brother and daughter were not working. By 1981 his occupational pattern was little changed; the household had split but was still cultivating jointly, and was in fact sharecropping a little more land.   But dependency had increased.   Four more children had been born, and his mother was no longer working.   His brothers had married, and the three wives did little wage work (although they worked on sharecropped land).   This deterioration in dependency was accompanied by a decline in the real wage, which appeared to have had not only direct, but also indirect effects by reducing returns to the paan business, mainly directed at wage labourers.   But the main factor seems to have been worsening dependency.

Nuruddin (Dubaili Biswaspur)

Calorie income (%) - 1971: 91; 1981: 66

In 1971, Nuruddin was a full-time agricultural wage labourer (with a small owned plot); two teenage sons were permanently employed. Between them, they generated sufficient income to support Nuruddin's wife and three young children - two girls, one boy. Nuruddin died in 1976, aged about 45. Subsequently the household split; one son, his wife and two children out-migrated and we have no income details for this household. The eldest son, Jakir, remained with his wife, mother, younger sister and brother, and two children, one of whom subsequently died. In 1980, Jakir fell ill with TB; his remaining plot of land was sold to pay for medical expenses, but he died in mid-1981. Apart from the younger brother, now permanently employed, this left the women of the household to fend for themselves, their income sources being agricultural wage labour and domestic service. The outcome was a sharp decline in both income and social position, with little prospect of long-term improvement.

Fatkan Mochi (Dubaili Biswaspur)

Calorie income (%) - 1971: 94; 1981: 54

In 1971, Fatkan, aged 30, was in full-time wage employment (agricultural and coolying) with occasional work in his caste occupation, cowstripping; his wife also did occasional work as a midwife. They were supporting two young children. In 1981, there was essentially no change in employment pattern. Real wages had slightly declined, but the main effect on income had come through increased dependency - one more birth, together with the increased consumption needs of growing children who were not yet working.

Pusa Oraon (Belwa)

Calorie income (%) - 1971: 70; 1981: 23

In 1971, Pusa, aged 24, was a member of a fairly large wage labour household, with low dependency (four working members out of eight), low wages, and high employment. The net outcome was an income level close to the overall average. In 1981 the household had

divided; Pusa's household consisted of himself, his wife, and five children. This would alone have increased dependency, but the main reason for the disastrously low income - clearly too low for long-term survival - was the illness and eventual death of Pusa's wife, which at first prevented her from working, and in the later stages required continual care from Pusa as well. To ease the dependency and child-care burden, Pusa's 5 year old son had just been taken on as permanent employee by a local landlord at the time of interview.

<u>Lalji Mandal</u> (Rampur)

Calorie income (%) - 1971: 70; 1981: 51

In 1971, Lalji was 55; he, his brother and sister-in-law were all agricultural wage labourers, and his son-in-law was permanently employed. Only two daughters were not working. In 1981, the decline in income can be traced largely to life cycle effects. Lalji's brother had died, and he and his sister-in-law now did little wage work because of their age. The family was essentially reliant on the son-in-law, who had married and had two children in the meantime, and who was fully employed in a number of different types of wage labour. The income decline would have been steeper had the household not acquired several animals - it was not clear how - and developed a significant source of income from sales of milk.

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on ILO research with special reference to labour, employment and income
distribution (Geneva, April 1982), 4th edition, Reference WEP 2-21/PR.7.
(*)

    This report includes a full bibliography.   This publication (3rd edition,
summer 1981) is available in French. (*)

2.   Books and Monographs

    [A number of free copies are available for individuals and institutions in
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