University of Heidelberg

Department of Economics

Discussion Paper Series | No. 622

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Clive Bell

November 2016

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Clive Bell
Heidelberg University, INF 330, D-69120 Heidelberg
email: clive.bell@urz.uni-heidelberg.de

First version: April, 2016. This version: November, 2016

Abstract

The object of this essay is to describe and analyse contractual relations in two villages in North-east Bihar at a time when the so-called 'green revolution' promised much and the region had just started to benefit from canal irrigation. It is against this historical background that I will examine, with the benefit of hindsight, the functioning of the markets for labour and tenancies, and their interplay with those for draught power and credit. Theory sheds much light on why such richly diverse arrangements prevailed, but despite notable subsequent advances, it still leaves certain important questions without a fully satisfactory answer.

Keywords: agrarian contracts, Bihar, village studies

JEL Classification: J43, N55, O13, Q15

*Author's note: This is a provisional draft of a chapter for a *Festschrift* in honour of Kaushik Basu.

1 Introduction

Village studies are no longer in fashion among economists. In earlier times, taking a leaf out of the anthropologist's book, detailed inquiries into households' dealings had the aim not only of measuring them, but also of understanding why things functioned as they did – especially when viewed in the context of the village community. A notable example is Hopper's (1965) investigation of whether cultivators in a U.P. village were profit-maximisers. Two deservedly famous studies involved revisiting the original village, the better to understand processes of change and development: Bliss and Stern (1982), later joined by Drèze, Lanjouw and others (1998), have told the story of *Palanpur*; and then there are the six ICRISAT villages in the Deccan plateau, which have spawned enough literature to fill a small library.

Almost half a century ago, I studied two villages in North-east Bihar. The object of this essay is to describe and analyse the workings of their markets for labour and tenancies, at a time when the so-called 'green revolution' promised much – and certainly occupied the attention of academics and practitioners alike. The region had just started to benefit from the Kosi barrage and its extensive canal system, and new, high-yielding varieties of wheat and rice requiring irrigation were being introduced on a large scale. It is against this historical background that I will examine the then prevailing contractual relations in the light of the theoretical advances that were made in the decades that followed. In returning to this topic with the benefit of hindsight, I aim to provide an account not only of how things were in that backward part of the world, but also of why they were so.

The essay is structured as follows. Section 2 sets out, in a discursive way, some simple theory in order to provide the scaffolding for the empirical account. Certain departures from the standard Arrow-Debreu model occupy centre stage. Section 3 provides a sketch of the setting, namely, Purnea district, its climate, pattern of cultivation and

agrarian structure. The two villages and the sampling procedure are described in Section 4. With these preliminaries settled, labour contracts are taken up Sections 5 and 6. The former deals with attached farm servants, who were engaged for a year, and the latter with day-labourers. Tenancy is the subject of Section 7, followed by the closely related matter of draught power, the market for which was extremely thin, in Section 8. The pervasiveness of risk, in its various forms, and the ensuing consequences are discussed in Section 9. Some reflections on theory in the light of the world described by these villages follow in Section 10. The essay closes with brief remarks.

2 Employment and Markets

The term employment, as used here, carries the general meaning of an occupation: farming as an owner or tenant is just as much a form of employment as ploughing daily under an annual contract or working on a variety of tasks over the course of the agricultural cycle as a day labourer. This meaning, rather than the narrower connotation of working for wages, is the relevant one when describing the economic organisation of the village economy and attempting to understand why it takes the form it does. Without a sketch of this structure and how it functions, moreover, any account of the various contracts between employers and employees will tend to slip into becoming a mere list of things, full of detail but lacking analytical underpinnings.

In the standard Arrow-Debreu model, in which markets, including those for contingent commodities, are complete and all agents take prices as parametrically given, an agent's choice of occupation is superfluous. A man who owns 1and can cultivate it himself, hiring in labour at the going wage as he sees fit; or he can rent it out and work for others as a hired hand. Another may be landless, but desires to cultivate; so he rents in some land, perhaps also trading in the labour market. Yet these choices will have no effect on the value of their respective endowments at the ruling prices.

In reality, of course, economic organisation, as it arises from such choices, does matter; and it certainly matters a great deal in an Indian village, even without the restrictions imposed by caste. The reason why it matters is that some markets are imperfect and others are thin or even fail altogether. To illustrate with the two villages in mind, a household which desires to cultivate must have not only a holding, whether owned or leased in, but also some working capital, in the form of a stock of seed and a wage fund. It must also have access to draught power, either in the form of animals of its own or by being able to lease in the services of animals owned by others. Here the trouble begins; for at that time, the market for the services of draught animals was very thin.

The reason, briefly stated, lay in moral hazard. Draught animals, like most productive assets, must be handled with some skill and considerable care if they are to be kept in good condition, especially over the long run. If a pair of bullocks or buffaloes is rented out to another farmer, who also works them, any resulting injury to them from carelessness or abuse may well manifest itself only later, when it will be impossible to establish with reasonable certainty, in law or customary practice, who was at fault. The owner would therefore feel compelled, in order to protect his interests, to do the ploughing himself. Owners of draught animals, however, are themselves well-placed to be cultivators, if only as tenants; in which event, ploughing for others runs into conflict with the demands of their own schedule of operations. Since all farmers are bound to the same agricultural cycle, those without draught animals could hardly rely on getting such services when they need them – at a price that both they and the potential suppliers would find mutually acceptable. The upshot is that owning draught power is normally essential if a household is to choose cultivation.

That being so, why do would-be cultivators not simply buy a pair of bullocks? For trade in animals – as opposed to their services – is often well-established, the problems of moral hazard being less severe for outright purchases. It is now the failings in capital

markets, beset as they are by moral hazard and adverse selection, that come into play. For a pair of bullocks does not come cheaply; so that a poor household, which is almost surely unable to offer satisfactory collateral, will have scarcely a chance of persuading a lender to advance even a substantial share of the purchase price. With luck and prudence, such a household might, at length, be able to buy a cow, or a share in one; and so, eventually, it might get a male calf, which, if nothing untoward occurs, will be fully mature three years later. There is still the matter of getting the other animal to make up the pair; but in the meantime, there is at least the possibility of teaming up with another household in the same position or exchanging days with a household that has a bit of draught-power capacity to spare. Even so, this process of adjustment is tortuously slow.

It was these imperfections in the markets for credit and the services of draught animals in the two villages that governed the pattern of trading in the markets for tenancies and labour, both of which were very active, and so heavily determined households' choices of employment in the sense of occupation. As we shall see, some households owned a little land, but having no bullocks, leased it out; others owned no land, but owning bullocks, obtained tenancies; and as a further twist, some owned neither, but obtained small tenancies and access to bullocks and working capital as part of their annual contracts as ploughmen. These factors, with their resulting influence on the organisation of the villages' economies, were surely a salient feature of north Bihar's wider agrarian economy.

To complete these preliminaries, an outline of agricultural labourers' contracts is needed. Cultivators engaged workers either by the day or for a whole agricultural year. In what follows, such workers will be called day labourers and attached farm servants (AFS), respectively. The terms of their contracts varied not only by the task performed, but also by the degree of attachment to the employer, whereby some day labourers were subject to hiring on a first-call basis, whenever needed by a landlord who

had a particular claim on them. The latter typically had allowed some landless to build their huts on one of his plots, on the clear understanding that he had the right of first call. Piece rates generally ruled for some tasks performed by day labourers, daily rates for others. The seasonal cycle also had an influence on rates, independently of the task involved. AFS contracts involved only a few tasks and their terms were correspondingly less varied than those pertaining to the daily kinds. As will become clear, however, a majority of AFS contracts also involved elements of both share tenancy and daily hire at the prevailing spot wage rate, albeit on a limited scale.

3 The Setting

Purnea district lies in North-east Bihar, which forms part of the Indo-Gangetic plain. At the time, the district was separated to the east from West Bengal by the Mahananda river; the Ganges formed its southern boundary, the border with Nepal the northern one; and the neighbouring district of Saharsa to the west had, as its own western boundary, the river Kosi, an important tributary of the Ganges.[1] Even by Indian standards, the district was – and remains – poor. It also had an unenviable reputation for backwardness and hazards to health. Buchanan, in his classic reports on Bihar published between 1809 and 1813, speaks of lackadaisical cultivation. Many civil servants of my acquaintance seemed to view their posting to the district as something of a punishment. One common piece of gallows humour ran, 'If you want to commit suicide, just come to Purnea and drink the water'. It was rumoured that one District Collector in the colonial period had kept strictly to whiskey.

The climate is subtropical, with fairly abundant, though somewhat variable rainfall.

[1] At that time a populous and geographically large district, Purnea was subsequently divided into four. The south-eastern, north-eastern and northern parts became Katihar, Kishanganj and Araria districts, respectively, leaving a rump with Purnea town, now Divisional Headquarters, roughly at its centre. Saharsa suffered a similar administrative fate. In what follows, Purnea district will refer to the undivided administrative unit.

At the time of survey, the 30-year annual average was 1585 mm,[2] with the South-west monsoon (June-September) contributing all of 1293 mm (Bihar, 1970). The annual fluctuations are tellingly illustrated by the rainfall in the years 1964 to 1967, the middle two of which saw all-India droughts that led to famine: 1443 mm, 1291 mm, 1142 mm and 1117 mm, respectively in total; and 1278 mm, 1180 mm, 865 mm and 1020 mm, respectively in the South-west monsoon (Bihar, 1968, 1970). The tract's soils are largely of the light alluvial type, in many places rather sandy in quality. Although the landscape appears very flat to the eye, small variations in the topography and the accompanying soils matter a good deal when assured irrigation is lacking. Crops grown on up-lying plots, which tend to be sandy, do badly in years of poor rain. *Aghani* paddy, which is transplanted in the monsoon months and harvested from mid-November to early January, was far and away the most important crop. Wheat, pulses and oilseeds were grown in *rabi*, followed by jute, maize and *bhadai* paddy in summer.

Important changes in cultivation were afoot in the late 1960s. This was the beginning of the promised, so-called 'green revolution', which was to be brought about by the introduction of high-yielding varieties, especially of paddy and wheat. Getting the best out of them required timely irrigation and heavy doses of fertiliser. The government was to ensure adequate supplies not only of certified seed and fertilisers, but also of the credit needed to finance their purchase. All the farmers had to do was to adopt this fine package – and bear the risks it entailed.

By a happy coincidence, the government had also been active on the irrigation front. During the monsoon of 1953, the Kosi had made another of her sudden jumps to the west, causing catastrophic flooding and much loss of life. Six years later, a scheme of 150 miles of embankments designed to confine her to her newly adopted bed was complete. The second stage involved the construction of a barrage, which was finished in 1963, and the third stage completion of a canal system. Water was delivered to

[2]The 50-year average for 1951-2000 was 1600mm (India, 2016).

10,000 acres on an experimental basis in 1964-65, rising to about 300,000 acres by the late 1960s, and then just over 400,000 acres in the agricultural year 1971-72.[3] The real irrigable command at that time was perhaps 650,000 acres (gross), far short of the newly revised estimate of an ultimate potential of 1.1 million acres – and scarcely one-third of the original design command (Bell, 1976).

No description of the general setting would be complete without an account of the prevailing agrarian structure. What is now Bihar was covered by the Permanent Settlement of 1793, which created a class of *Zamindari* intermediaries between the state and the cultivator. The *Zamindars* had the direct legal obligation to pay the land revenue, which they, in turn, extracted from their tenants, known as *Raiyats*, in the form of rents, duly pocketing a share thereof for their troubles. These interests were abolished soon after Independence, leaving the *Raiyats* as revenue-paying tenants of the state – in effect, owners of their holdings. In the course of time, some *Raiyats* had leased part or all of their land to others, known as *Under-Raiyats*, almost invariably on a sharecropping basis. The Zamindari Abolition Acts therefore removed but the top layer of a system suffused with subtenancy.

Purnea district exhibited all this in full measure. There emerged from Zamindari Abolition legions, not only of peasant proprietors, a small group of whom were comparatively well-to-do and powerful figures in their respective villages (Wood, 1973), but also of *Under-Raiyats*, only a fraction of whom had their status formally recorded, with all the rights and protections the Tenancy Act conferred. The rest, called *Bataidars*, were effectively tenants-at-will of their *Raiyat* landlords. An official report on the problems confronting small farmers in the Kosi area (Bihar, 1969) provides a detailed picture.[4] Defining small farmers as those cultivating less than 20 acres of unirrigated land, a limit set so as to allow some variation in families' economic conditions, a ran-

[3]The agricultural year runs from July 1 in one calendar year to June 30 of the following one.

[4]No authorship is attributed, but the moving spirit and organiser was S.K. Chakraverty, the first Kosi Area Development Commissioner, who surely did most of the drafting.

dom sample thereof was drawn from combined household lists for pairs of villages with at least 100 such households, the pairs being selected from 14 Blocks. The size distribution of holdings by cultivators' tenure status is set out in Table 1. Following the usage in Bihar (1969), *Bataidars* are simply called sharecroppers.

The salient features are at once apparent. First, pure *Raiyats* comprised not quite one half of the whole sample, though this group's average holding was somewhat bigger than those of the other categories. Secondly, not much land was under recorded tenancy, and the overwhelming majority of the cultivators concerned also owned land. Thirdly, pure sharecroppers indeed had small holdings, but made up only 14 per cent of all cultivators with sharecropping contracts. Purnea's sharecroppers were, in fact, overwhelmingly peasant proprietors, who leased in to augment their own holdings. As for the distribution of the whole land area by status, 74.2 per cent was under *raiyatwari* and 23.4 per cent under *batai* (Bihar, 1969, p.7). What the report did not investigate was who owned the land leased in. One surmises that many of them were the big men owning 20 acres or more, but many others surely had more modest holdings. The schedule contained no questions concerning who actually cultivated the household's *raiyatwari* land, perhaps to avoid spoiling the interviews by raising fears about the legal consequences of revealing that leasing out was being practised. As will become clear in later sections, a fair number of those leasing out in the two villages I studied could not be classed as big men.

4 The Two Villages: Population and Sample

Two villages, hereinafter labelled A and B, were selected purposively from one administrative block. The proportions of their total cultivable areas that were irrigated were reckoned to be about 20 and 80 per cent, respectively; but whereas A's transport links were good, B's were rather poor. The Block Development Officer (BDO) and his staff

Table 1: The size distribution of holdings (acres) by cultivators' tenure status

Size class	0 - 0.99	1.00 - 2.49	2.50 - 4.99	5.00 - 7.49	7.50 - 9.99	10.00 - 14.99	15.00 - 19.99	total
Tenure status								
Raiyat (R)	9	150	171	132	71	102	57	692
Under-Raiyat (U)		9	4					13
Sharecropper (S)		39	38	12	2	1		92
R-U		11	17	19	7	2	1	57
R-S	4	78	199	147	54	45	5	523
U-S		3		3		1		7
R-U-S		6	19	9	4	12	1	51
Total	13	296	448	322	138	163	64	1,444

Source: Bihar (1969, p.99).

generously conducted a household census of these villages, in which they canvassed the name of the household head, his father's name, the numbers of adults and children, and the family's landholding, broken down into its irrigated and unirrigated components. The size distributions of the households' ownership holdings, as reported to the enumerators, are set out in Table 2. At the first stage, I drew a 15 per cent simple random sample from each village: the corresponding size distributions are likewise set out therein. All the interviews I conducted myself over a period of almost five months, ably assisted by the BDO's eldest son, who acted as both interpreter and local guide.

The questions covered the household's endowments and its dealings in the markets for labour, tenancies, draught-power and other farm inputs, together with the full details of its cropping pattern and the associated cultivation practices, as in a farm management survey. Consumption was not covered systematically; still less attention was paid to the more delicate matter of borrowing and lending. The plan was to cover

the whole of the *rabi* (January-June) season of the agricultural year 1968-69, and as much as possible of 1969-70 up to my departure at the end of April 1970. As it turned out, the task of canvassing the whole sample of 79 households proved to be beyond us in the time available. We managed to interview 56 of them, most on two, well-spaced occasions to reduce the interval of recall and check various details, although a few cultivating households and many of those without land were interviewed but once. At the close, the record for the entire period from January 1969 to mid April 1970 was more or less complete for some 40 households and substantially so for another 10. It was rather fragmentary for the remaining six or so, but still usable for present purposes. The distribution of these 56 households by size of ownership holding, as reported in the village census, conformed quite closely to that of their respective villages, albeit with some over-sampling of those with ample holdings in both villages. There were, however, a fair number of households whose ownership holdings according to the census differed strongly from those reported to us: a number of those reporting substantial holdings in the census round reported even larger ones during the interviews. I shall comment on these discrepancies as needed below. For the present, it should be noted that all the households owning 40 acres or more were Hindu joint families, ranging in size from 15 to 20 members or more.

5 Attached Farm Servants

There were two variants of these contracts. In the more extreme one, the employee lived in the employer's household, ate from the 'common pot', and so, according to the standard definition, was a member of that household. He worked seven days a week and had to answer his master's every beck and call. In short, he was a servant; and that is what he will be called, in keeping with the usage of the time and the need to distinguish him from those attached farm servants (hereinafter AFS) that did not live

Table 2: The size distribution of ownership holdings (acres): population and sample

Size class	0 - 0.99	1.00 - 2.49	2.50 - 4.99	5.00 - 9.99	10.00 - 14.99	15.00 - 19.99	20.00 +
Village A							
Population	87	75	48	46	14	19	17
Sample:							
drawn	17	9	10	0	7	1	3
interviewed	11	6	5	0	5	1	3
per interview	13	3	7	2	1	0	5
Village B							
Population	100	25	16	26	10	8	9
Sample:							
drawn	20	4	2	3	0	0	3
interviewed	15	3	1	3	0	0	3
per interview	14	0	5	2	0	0	4

in.[5] If an adult, his main job would usually be ploughing, though there were carters, too; but whatever the main job, he had to undertake other tasks, especially keeping watch over the household and ripening crops, at his master's bidding. If a child – and many were pitiably young – he would tend the cattle or buffaloes. In return, the man received three meals a day, a monthly sum in cash and some items of clothing twice a year; the boy got his daily meals and clothing, but the cash usually went to his father, who had indentured him.

Under the second, looser arrangement, the worker did not live in, and so was not counted as a member of the employer's household, neither by the contracting parties themselves, nor according to the standard definition. Most of these workers were engaged as ploughmen, who put in six mornings a week for 10 months a year in exchange for breakfast, a monthly sum in cash and a small plot of land to cultivate in the *kharif* season under 50:50 sharecropping. One month's cash payment (or even a bit more) would be docked in lieu of sundays; but the ploughman was free to work for a half-days' wage in the afternoons, if offers came his way. In the remaining two months, namely, the peak season for harvesting the *aghani* paddy crop from mid-November onwards, he was free to engage in the harvest work as a day labourer under the prevailing terms, though he and his family members might be subject to a first call by the cultivator who had hired him as a ploughman at the beginning of the ploughing cycle (normally, mid-February). In what follows, such employees will be called 'other AFS', to distinguish them from their more closely tied fellows who lived in.

So much for the two variants in outline. We now turn to the details of the prevalence of such contracts, the kind of households which engaged in them and the payments in question.

[5]Only a single maid servant appeared, as an unnamed employee, in the whole sample.

5.1 Servants

Since the sampling unit was the household, with an adult male almost invariably as its head, the only servants likely to appear among households supplying labour were the children or young teenagers engaged as cowherds. Of the 13 households canvassed in village A that owned less than an acre, only one supplied a cowherd; of the corresponding 15 households in village B, none did so. Nor, unsurprisingly, did any household owning more than an acre in either village so indenture any of its children. For an account of the contracts involving servants, therefore, we must rely on the reports of the households that engaged them. Five of the six households in village A that owned at least 10 acres, and all four of those in village B, reported at least one such contract. No other household did so. These nine households engaged 37 servants in all: Table 3 gives the breakdown by their stipulated tasks.

Table 3: The numbers of servants engaged, by stipulated task

Main task	ploughman	carter	watchman	cowherd	maid	other
Village A	7	2	2	10	1	1[a]
Village B	2[b]	1	3	8	0	0

[a]A tutor. [b]One was a tractor driver.

What wages were they paid? The terms for adults in village A, whether engaged as ploughmen, carters or watchmen, were Rs15 a month, three meals a day and various items of clothing, usually given twice a year. The only exceptions were monthly cash payments of Rs18 and Rs20, respectively, to a carter and a ploughman, by two different employers. For cowherds, the cash payment was Rs10 a month, with the exception of one employer who paid his only cowherd just Rs5 a month. Although the number of observations is small, it seems clear, at first glance, that there was a going rate for each job. The payments to the maidservant and tutor, who were engaged by the household with the largest holding (100 acres or so) in the whole of the canvassed sample of 56,

are not known.

The payments in kind made up a large part of the total value of the wage. What sort of fare could a servant expect to have for his three meals a day? No direct information was gathered; but it is virtually certain that breakfast and lunch were just like those given to other AFS and day labourers, all of whom took their meals together. In this connection, there was no dispute among all those interviewed, employee and employer alike, about the main elements: 250 grams of rice or (wheat) *chapatis* for breakfast, and 500 grams of rice for lunch. This austere menu might be augmented – and enlivened – by a serving of 100 grams of *dal* or vegetables, occasionally even both, to accompany rice at lunch, depending on the season and tightness in the daily labour market. There was less agreement among the parties about the exact quality of this improved lunch and the frequency with which it was provided; as expected, employers made much of both. Dinner for servants, claimed two employers who happened to remark on the matter, was just like lunch.

The items of clothing comprised a *dhoti*, shirt, vest and sometimes a towel, usually given twice a year and with a blanket in winter. Estimates of the costs were obtained from three of the five employers. These differed quite wildly. One employer reported Rs31 per set twice a year, plus Rs6 for a blanket; the second, Rs27.5 once a year, including Rs7 for the blanket; and the third, Rs50 per set twice a year, plus Rs20 for the blanket. What is one to make of all this? As it turns out, there is an indirect check on the third's account; for the canvassed sample also happens to include the household of one of his non-resident ploughman, one of whose sons was indentured to the employer as a live-in cowherd. The father reported that the cash payment was Rs6 a month, thereby (unwittingly) contradicting his employer's claim of Rs10 a month – and added that this sum was paid to him, not the boy. The father's account strikes me as the more plausible, and it is tempting to assume that the Rs50 actually refers to the cost of two sets rather than one. Given this much, and accepting that the blanket

in question was an especially warm and fine one, we arrive at an annual cost of Rs70, which is essentially identical to the first employer's, of Rs68 ($= 2 \times 31 + 6$). At the other extreme, the second employer's niggardly terms, namely, just one set a year, departed strikingly from the usual practice in both villages. This might be reconciled with the other contracts if there was a larger cash payment by way of compensation. Accepting the second employer's claim of Rs10 a month at face value yields a combined annual cost of Rs147.5. The first employer reported just Rs5 a month in cash, which yields a combined annual cost of Rs128. The 'adjusted' estimates for the third yield Rs142. Summing up, it seems that in village A, the going rate in cash and clothing for a cowherd, who was often a boy not yet in puberty, was worth about Rs11 to Rs12 a month.

There were fewer observed contracts involving adult servants in village B. The tractor driver got no less than Rs60 a month, the premium presumably reflecting both his skill and an incentive to take due care of the machine. The other two servants received Rs12 and Rs15 a month, respectively, roughly in line with their counterparts in village A. Of the cowherds, four were paid Rs4 monthly, one Rs5.5 and six Rs8, whereby the latter group's employer referred to them as teenagers drawn from (attached) landless labour households which were settled on a plot of his land. It seems likely that the difference in these rates lay in the servants' respective ages, the low-paid being almost surely young children. The meals provided were exactly like those in village A. All four employers claimed to have provided two sets of clothing a year, the items also being exactly those in village A. No estimates of the annual costs thereof are available; but these cannot have departed much from those deduced above for village A.

5.2 Other AFS: ploughmen and cowherds

As Sections 2 and 5.1 would suggest, a fair number of adult males reported that they were employed as ploughmen. For adult males, indeed, this was the only form of 'other AFS' contract reported by labour households: two in village A and seven in village B. Both of those in village A actually owned land, each about half an acre; but owning no bullocks, they had sharecropped out their plots. One of them was mentioned in Section 5.1: he got three meals a day, worked six full days a week for 10 months, was paid Rs 15 a month for eight and a half months (the deduction for Sundays off) and received two sets of clothing. The other worked seven mornings (half days) a week for 10 months, received breakfast daily, Rs 8 a month for all 10 so engaged, but no clothing. He was also free to seek daily work in the afternoons, though this cannot have been a great comfort. In compensation – one presumes – for his more meagre pay and the risk of involuntary unemployment after the morning's ploughing was done, he was given a small plot of land to sharecrop: 0.6 acres in *bhadai* (the summer season) and 0.4 acres in *kharif*, crucially with the landlord allowing him the use of the bullocks and supplying some seed and an advance of wages to cover the costs of hiring in additional hands. The pay-off was, of course, a risky one. The seven ploughmen in village B all belonged to landless families. All reported half-day contracts like the one in village A, albeit with minor variations, and all ploughed six mornings a week. Two received Rs 8 a month, with no deduction for Sundays; four Rs 10 a month, one with a deduction of a month and a half; and the seventh Rs 15 a month, with one month's deduction. The plots of land were somewhat larger than in village A: 0.8 acres instead of 0.6 acres in one season or the other, with the exception of the seventh ploughman, who had 0.4 acres in both. It is interesting that the latter had the same employer as two of the others.

On the employers' side, five households in village A had nine ploughmen under

this looser form of contract, one of them engaged for full days; the corresponding numbers in village B were three households and also nine ploughmen, again one full-time. There were no 'matching' interviews to yield an exact check; but the contractual terms squared well with those reported by households supplying ploughmen to others. In village A, one employer paid his four ploughmen at the rate of breakfast, Rs 8 a month (deduction unknown) and a total of 1.2 acres spread over two seasons; another paid the same, but allocated just 0.4 acres in each season. Two other employers paid a more generous Rs 15 a month, but one of them allocated just 1 acre of land. The fifth's full-time ploughman got his three meals a day, Rs 9 a month, two sets of clothing and, surprisingly, 0.4 acres to sharecrop in *bhadai*. The terms in village B were similar. One employer paid his five ploughmen the monthly cash rate of Rs 10 (deduction unknown), with 1 acre to sharecrop in *each* of the two seasons. Another paid his three ploughmen the same monthly rate, with one month's deduction for Sundays, with an allocation of 1.2 acres in total. The third's full-time ploughman was contracted for 6 days a week over the whole 12 months, for breakfast and lunch daily and Rs 10 a month for 10 months, but without clothing or land to cultivate.

Four of the five said employers in village A had holdings of at least 20 acres; of the three in village B, one had 13 acres, and the other two 50 acres or more. The exception was the one in village A whose terms seem to be rather generous. He possessed but 3 acres, and reported that he was dependent on one of his sons for support. It is likely that poor health prevented him from ploughing himself, and his modest holding would have placed him in a relatively weak position when bargaining with potential ploughmen – to the extent that there was any scope for hiring them in this market.

To complete the picture, only one employer reported engaging cowherds who did not live in, namely, the cultivator in village A who had engaged a single full-time ploughmen. He reported paying his two cowherds three meals a day, Rs 4 a month and the standard set of clothing twice a year, terms which are close to those reported by

the ploughman who had indentured his son as a live-in servant (see Section 5.1).

For the ploughmen, the important question arises as to whether the terms of the looser contract were sufficiently attractive to offset the security offered by an engagement as a live-in servant. If they were free to choose, the hypothesis of individual rationality tells us that this must have been the case. Yet this answer seems a bit pat. To address the question fully, it is necessary to go into the details of how the market for day labourers functioned and what income could be derived from sharecropping an acre or so over two seasons; for the ploughmen with the looser contract were perforce engaged in both.

6 Day Labourers

The great majority of those who worked for wages were engaged on a daily basis, but only for a certain set of tasks, as the agricultural cycle dictated. Cultivators or their AFS did the ploughing and, with the exceptions of potatoes and sugar-cane, the sowing. Twenty to thirty days after sowing, more hands were needed, either to weed the crop or to undertake the main task in the monsoon season, namely, to transplant paddy seedlings. Another weeding might follow some twenty days later; but local varieties of *aghani* paddy were rarely weeded. The cultivators themselves almost always dealt with the tasks of irrigation and applying a top-dressing of fertiliser – the latter investment seldom made and almost never on unirrigated plots. The crop was then left to ripen, increasingly watched over as the harvest approached. Hired hands were engaged in large numbers to cut and bring in the crop, but many cultivators, especially the smaller ones, threshed the crop themselves. Jute had to be bundled and then transported for immersion in pools on low-lying land for at least 30 days (an operation called retting), so that the fibres would loosen sufficiently for them to be stripped from the stalks. Hired hands were usually needed at these stages. The same held for the post-harvesting

operations for tobacco, though it should be recalled that this crop was not widely grown.

6.1 Wage rates

Two central questions concerning such contracts are, was there a 'standard' rate for each task, and if so, were any deviations from it associated with the season and the characteristics of the parties involved? The wage rates for transplanting and weeding were time-rates, as were almost all those for the harvesting, bundling and retting of jute, and the harvesting of, and the post-harvest operations on, tobacco. Piece-rates applied to the harvesting of all other crops and the stripping of jute: each labourer received a fixed share of the gross output he or she brought to the cultivator's yard. Another fixed share applied to threshing, and those cutting cane were paid by the weight cut. These shares were highly uniform (see below), but not the labourers' daily earnings. For these rewards depended not only on their individual efforts, but also on the yields of the plots they harvested, whose levels were the combined outcomes of their employers' performance as cultivators and whatever state nature happened to contribute.

Paddy transplanting constituted a 'labour-peak', starting in July with the onset of the monsoon and ending by mid-September. Wheat and *rabi* vegetables were weeded from late December until mid-February, and the main *bhadai* crops – summer paddy, jute and maize – from mid-May to mid-June. The harvesting and retting of jute stretched over the period from late July until mid-February, depending on the variety. Since oilseeds and legumes were harvested in February and March, wheat in April and *aghani* paddy from mid-November until early in January, time-rate operations did not come into conflict with the piece-rate ones of harvesting, except from the middle of July until the end of August and again late in the calendar year. To this it should

be added that many plots under *bhadai* paddy, *dacca* and maize were subsequently prepared for transplanting with *aghani* paddy, a hurried operation that intensified the peak in question. It is arguable, therefore, that with these exceptions, time-rates were not heavily influenced by the timing of piece-rate operations. It should noted, however, the parties were not restricted to full-day contracts; for there were two half-day rates, one each for a morning and an afternoon, respectively, the last rate being the lowest, albeit for slightly fewer hours, and not so frequently observed. Employers therefore enjoyed the option of offering full- and half-day contracts, an option that conferred advantages in scheduling operations and reducing costs in the slacker periods. The only labourers who might have welcomed such flexibility were the tied ploughmen, whose contracts left them 'free' to search for work in the afternoons.

All time-rates involved payments in kind as well as cash, with the sole exception of half-days worked in the afternoons, which usually occurred in the short winter days. The kind component took the form always of breakfast, and frequently of lunch, too. By all accounts, the former consisted of 250 grams of food-grains, usually wheat *chapattis*. Lunch was somewhat variable. At a minimum, it comprised 500 grams of food-grains, usually rice, and a good measure of salt; but there could be a welcome supplement of lentils, vegetables or even yoghurt, alone or in some combination, each of 100 grams or so. Such improvements in quality were more frequent at transplanting time. Employers made much of them as inducements to attract labourers in the peak season, and most labourers agreed – though less emphatically – that the quality of lunch was better then.

In view of such variations, arriving at an exact money-value on lunch is impossible; but three respondents in Village B provided the basis for a persuasive estimate. One cultivator said he provided his AFS with a regular lunch comprising 625 grams of rice and 125 grams each of lentils and vegetables, putting the combined cost at more than Rs1. Another with a fairly substantial holding, but no tied labourers, reported that his hired hands got the same dish, at a cost of about Rs1, though the quantities may

have been a bit smaller. A small cultivator, who struck me as a particularly serious and reliable informant, claimed that the daily rate for hiring a pair of bullocks and ploughman – if any were available – was at least Rs3 with lunch, or Rs4 without. It seems safe, therefore, to value lunch at Rs1. If lunch in village A was much like that in B, this estimate would be consistent with the fact that labourers in village A preferred the package of Rs0.5 in cash, breakfast and lunch to Rs1 and breakfast, whereas the converse held for employers.

Two further remarks are in order. First, the preparation of food made claims on the time and energies of the employer's womenfolk and the household's stock of rather precious cow-dung for cooking. Even if the labourers placed little value on their womenfolk's time, cow-dung was to be husbanded carefully. Second, while the option to receive uncooked measures of grains or flour was on the table, very few even referred to it. Those who did the work almost invariably consumed the meals on the spot. They could, of course, have made smaller claims on the common pot back in the family hut, but it seems doubtful that those family members who did not work for wages that day could expect substantial concessions from those who did – if, indeed, there was anything in the pot to share that evening.

[Table 4 about here.]

So much for the detailed preliminaries. Table 4 sets out the wage rates by operation and village, as reported by employers and labourers, respectively. The number in each cell is the count of respondents who were involved in the operation at the specified rate. Some households contributed to more than one cell. To give examples, weeding potatoes in *rabi* or summer crops were lean season activities, but weeding irrigated wheat could overlap with the late phase of the main paddy harvest. Likewise, the jute varieties *dacca* and *tosa* were harvested during the transplanting peak, but *mesta* in January or February. The picture has some striking features.

First, wages were higher in village B. The lowest rate for a full day, Rs1 plus breakfast, was reported only in village A. When both meals were provided, the cash component was also frequently lower in A: indeed, its modal value of Rs0.5 was reported but five times out of a grand total of 58 in village B. There is also the option of a half day's work, which employers regarded as generally cheaper. The half-day rates were the same in both villages, but whereas such engagements were very common in A, they were a comparative rarity in B.

Second, viewed as a whole, employers' reported rates look a bit higher than those of labourers in both villages – as one might expect. The few instances of both parties reporting on the same transaction yield a useful check. One big cultivator in village A reported paying full-day rates of Rs0.5 plus both meals for transplanting paddy and Rs1 plus breakfast for weeding. These were confirmed by three labourers and disputed by none. Another cultivator with an even bigger holding claimed almost always to pay the top rate of Rs1 plus two meals, with a great improvement in the quality of lunch during the transplanting peak. The sole exception, he added, was paying the standard rate for a morning's work weeding potatoes. The former claim was contradicted by the only labourer in the sample to have had dealings with him: the rate for weeding was the usual Rs1 plus breakfast. In an interview much later, which covered the *rabi* crops of 1970, the cultivator reported engaging labourers only at the half day rate. At my request, he had also kept a diary of daily hirings from the middle of December until the end of February: there were no entries for full-day hires. 'Matches' for two big cultivators also occurred in village B. The first reported the invariable rate of Rs0.62 plus two meals, a claim confirmed by four labourers and disputed by none. The second insisted adamantly that he paid the top rate of Rs1 plus two meals, a claim contradicted by the only labourer in the sample to have dealt with him: according to the labourer, he had been paid the bottom rate of Rs0.5 plus two meals. The latter claim is indirectly supported by a small cultivator, who reported paying the big man's

tied labourers Rs0.62 plus two meals. When they were available for hire by others, a premium rather than a discount would be expected. Further support came from a labourer tied to another big cultivator, who said that the big man in question paid his labourers Rs0.62 plus two meals. This labourer added that his own boss had started to pay Rs1 in cash instead of Rs0.62 from the start of paddy harvesting in November, a concession made under pressure from his labourers. It is quite possible that other big men were coming under like pressure at the same time. Perhaps what was adamantly reported to me as Rs1 in general, had in fact taken hold just before our first interview in December.

To sum up, if one can speak of such a thing as the going rate for the jobs in question, in village A it was Rs1 plus breakfast for a full day off-peak and Rs0.5 plus two meals at peak times, whereas for tied labourers paid by their masters in village B, it was Rs0.62 plus two meals at all times, albeit with some movement in *rabi* 1970 towards a cash component of Rs1.

Third, there were variations within each village. As is clear from Table 4, the wage rate for transplanting was generally higher than that for other time-rate operations. Yet there are clear variations both within and outside the peak at transplanting time, and these must be discussed. As noted in Section 4, big cultivators almost invariably had a pool of labour from tied or quasi-dependent landless households upon which to draw when needed, so that those with smaller holdings had to compete for a much shrunken residual supply at busy times. The data give a hint that the latter had to pay a premium to labourers engaged in transplanting. Outside this peak, the picture is only superficially uniform; for as noted above, there were separate rates for a full day's work and each of a morning's and an afternoon's, respectively.

Turning to harvesting, there was one striking uniformity, namely, the single rate of one-ninth of the gross yield, with the sole exceptions of potatoes (one-twelfth) and sugar-cane (Rs 0.25 per *maund*). For threshing and winnowing, the rate was one-

sixteenth. What varied, of course, were the daily earnings. A full day put in on a good crop of *aghani* paddy would yield a better return than the wage received for transplanting it in July or August. Then again, harvesting a poor crop of oilseeds or legumes in the slack time of February or March would entail a few hours of work for a meagre reward. Some cultivators, indeed, complained that they could not induce labourers to harvest plots whose yields were very low, which indicates that the rate of one-ninth was regarded by all concerned as a norm not to be disregarded.

The resulting variation in earnings prompts the question, who had the right to harvest a plot? Big cultivators had their captive pools of labourers on first call, but even this source might not always suffice. For much of the year, it seems that harvesting was largely open to all-comers. The great exception was the main crop, *aghani* paddy: those households that had transplanted a plot usually had the exclusive right to harvest it. As it was explained to me, this gave the labourers an incentive to do the job well, by planting the fragile seedlings carefully and properly spaced, thus relieving the cultivator of some of the burden of close supervision while he was also busily engaged in organising the uprooting of other batches of seedlings from their nurseries or puddling other plots in preparation for transplanting. This, then, was what has come to be called an *interlinked* transaction in labour at different dates. Through this contractual arrangement, the two parties bound their fortunes together, in some measure. How was it enforced? Several cultivators told me that the labourers themselves kept out any hopeful intruders, sometimes coming to blows in the process. On the other side, what happened if labourers on first call had turned a deaf ear to instructions to turn up for transplanting duties? An anecdote supplies the likely consequence. One big cultivator related that some of 'his' people had gone off to work on the roads instead. When they reappeared at harvest time, sickles at the ready, he told them that since they had transplanted on the roads, they were welcome to harvest on the roads. His account was confirmed by one of the labourers in question, who added that his mother,

who had heeded the call, was allowed to harvest the crop.

Some idea of the variation in individual earnings from harvesting and threshing a plot of paddy is conveyed by an operation I witnessed elsewhere in the district in the company of the cultivator, a man whose western manners and Ph.D. in agronomy from a Scottish university caused him to cut a distinctly exotic figure. The plot in question, of about 2.2 acres in extent, bordered on a river, which regularly overflowed its banks during the monsoon and receded but slowly afterwards. To cope with these conditions, cultivators sow or transplant so-called deep-water varieties of paddy, which can grow up to 15 cm. a day, and so keep their heads above water. The accompanying drawback is that once the supporting waters have largely retreated, the plants tend to lodge over, exposing the heads to rotting and rats. In fact, the yield turned out to be quite satisfactory, at almost 16 *maunds* per acre; but there was extensive lodging and heavy weed growth, so that harvesting was a relatively onerous job.

Forty-five labourers working in twenty-two separate family groups took one whole day to bring in the crop and the next morning to thresh and winnow it, for which they received a total of 172 kg. of wheat, or 12.4 per cent of the gross yield. Eight groups comprised a single individual, seven of them females; there were seven pairs, five of them all-female, one all-male and a married couple; the five trios and two quartets were all-male. The summary statistics for the all-male, all-female and couple groups are set out in Table 5. The average amounts received by the individuals falling into these categories were 4.85, 2.23 and 5.0 kg., respectively, with a grand average of 3.81 kg. The men were clearly much more productive, on average, though there was a substantial dispersion in both categories.[6] Yet age also played a part. Some of the women looked distinctly old, perhaps prematurely worn out by child-bearing and

[6]For the plot in question, the story is complete. If, to go further, what happened is regarded as a set of random draws from some population of labourers' earnings from harvesting and threshing paddy in that neighbourhood, perhaps restricted to deep-water varieties, then standard inference can be employed.

drudgery. The smallest of all payments went to a woman who could only be described as a crone. She had heaped a sheaf of paddy around a bamboo staff, and leaning on it for support, she trampled slowly with her gnarled feet to separate the grains from the stalks. The men meanwhile were driving pairs of bullocks in circles on the threshing floor, or vigorously thrashing thick bundles, grain-heads downwards, against wooden benches.

It should be noted that averaging within each family group to produce the levels of individual payments reported in Table 5 suppresses variations in individual levels of productivity within groups. The table gives a picture of individual earnings under the reasonable assumption that participating members of each family group had equal claims on the group's pooled payment. In doing so, it understates variations in productivity among all those engaged in the task in question.

6.2 Wages: other evidence

It is natural to ask whether the structure of daily wage rates described above held more widely. The salient system of wage payments by shares in harvesting operations prevailed over much of Northern India in the early 1950s (India, 1955). Indeed, this practice held in the much-surveyed West U.P. village of Palanpur some 20 years later (Bliss and Stern, 1982). Villages A and B seem not, therefore, to have been exceptional – in this respect at least.

Where the going daily rate for the other main operations in Purnea district is concerned, Wood (1973) reports Rs. 0.5 plus breakfast and lunch, with a combined kind component of 750 grams, in his study village of 'Desipur' in 1971. In several other villages I visited in 1970, the said rate varied between Rs. 0.5 and Rs. 1 plus breakfast and lunch. This all suggests a picture of some uniformity, subject to the caveats arising from the detailed discussion above.

For the most intensive investigation of wages, one must turn to Rodgers (1975), who conducted a study of five villages in 1971, with particular emphasis on the calorific value of the wage. In two villages, there was no cash component: a fixed weight of grain was paid in addition to breakfast and/or lunch, variations in whose quality and quantity are not reported. In the other three, the cash component ranged between Rs. 0.75 and Rs. 1, with substantial seasonal variations in one village. As seasonal movements in the prices of foodgrains were fairly strong, the real (calorie) wage is unlikely to have been constant in those villages where the cash component was seasonally invariant. For unless there were offsetting changes in the calorific value of the meals provided or appropriate changes in the prices and availability of particular types of foodgrains so as to keep the money price of calories constant when the cash component was fixed, the real wage, so defined, would certainly have varied throughout the year and not just at the seasonal peaks.

7 Tenancy

The heavy concentration of landownership revealed by Table 2 – a few households owning a great deal of land and very many owning little or none at all – would lead one to expect the classical adjustment through trade, with the former group leasing out some part of their holdings to the latter group. This expectation is broadly confirmed by the patterns in Table 6. In both villages, the distribution of operational holdings by size, taking no account of the small plots leased to AFS as part of their employment contracts, which can be regarded a form of minor subcontracting, is indeed a bit less concentrated. Yet there is much more than meets the eye in the modest (net) reallocations so described; for other forces were also at work, which produced a rather complicated pattern of transactions.

What can be said at once is that there was a good deal of leasing activity. Two of

the five big owners in village A reported leasing out land, 25 acres in all. One of them owned 10 acres in another village so far off as to make self-cultivation an unattractive option. This sub-holding was parcelled out among no fewer than 10 tenants, monitoring all of whom must have been a substantial task in itself. The other three claimed not to have leased out any land, but one of them leased in an acre from the biggest landlord in the whole village. His own holding was overwhelmingly sandy upland, and less than a third of it was irrigated; the plot leased in was fertile lowland. Only one of the four big owners in village B reported leasing out – some 10-15 acres in all to five or so tenants; and two of the other 21 households claimed to be leasing in from him, one tenancy comprising 4.1 acres and going back a decade in time. Another household reported leasing in land owned by one of the other big three.

At the other end of the distribution, four of the 13 households in village A owning less than one acre leased in an additional acre or two, and two others 3 and 6.6 acres, respectively; but two others leased out their entire holdings – a mere 0.4 acres each. Among the 13 owning between 1 and 15 acres, nine were leasing in a total of 19 acres, and two others were leasing out about 0.3 acres each. Adjustments in village B were more limited. Two of those households owning less than 1 acre cultivated about three acres, another nearly nine acres. The other 11 relied on wage labour alone. Four of those with modest holdings leased in roughly 1 to 2 acres, but two of them also leased out almost 4 and 6 acres, respectively, the sub-holdings in question being in villages somewhat far off. The larger of the two sub-holdings had been legally settled on the tenant under the Tenancy Act 15 years back, presumably with the rent limited to 25 per cent of the output.

The usufructuary mortgage also put in an appearance; even so, such transactions were probably under-reported. In village A, four households had each mortgaged out between one half and one acre, two others had mortgaged in a like amount; four of the six owned less than 3.3 acres. There was only one reported contract in village B.

The household had mortgaged out its entire 0.8 acres to one of the big four in the interviewed sample, but had managed to recover the holding by repaying the loan after the recent paddy harvest. While under contract, the household had leased back the land under sharecropping terms – a common arrangement, so I was told. The big man in question made no mention of any of this.

As noted in Section 3, the overwhelming majority of Purnea's tenants were peasant proprietors, i.e., owner-tenants. Those in villages A and B were no exception: all but three of the 23 households leasing in owned some land, though six of them had holdings of less than an acre. A striking feature of these dealings is that no fewer than 15 of the 23 had more than one landlord; indeed, 10 had at least three (see Table 7). Since all the contracts but one were on a sharecropping basis,[7] landlords were confronted with a potentially serious problem of moral hazard. For tenants owning land have clear incentives to devote their efforts and resources more intensively to their own holdings, whether they have one, two or even more landlords; and of the nine owning less than one acre or no land at all, five had two or more landlords. In other words, at most three of the 22 sharecroppers can be construed as having had an *exclusive* contract with a landlord, in the sense that the latter, and no other party whatsoever, including the tenant himself, possessed land cultivated by the tenant. This is an awkward finding for many of the theoretical contributions to the vast literature on sharecropping, a point to which we return in Section 10.

The contractual parameters were unswervingly uniform. The landlord received 50 per cent of the *net* output after deduction of the harvest and threshing shares. If the tenant and his family took part in these operations, they had the usual claims to such payments. It was the tenant's responsibility to supply all inputs needed in production, whether through the efforts of family labour and his own draft animals, or through market purchases, the choice being his. With the exception of harvesting

[7] One landless household was leasing 3 acres from the railways at Rs10 per acre.

and threshing operations, the landlord reimbursed none of these costs, monetary or imputed. In short, the tenant's cost-shares for ploughing, seeds, compost, fertilisers and pesticides, and all pre-harvest inputs of labour were 100 per cent, whereby not a single tenant applied fertilisers and pesticides to leased-in plots.

What did vary was the quality of the plots leased in and the duration of the associated contracts. Taking the latter first, the tenants in villages A and B reported a total of 42 and 22 contractual relationships, respectively, the distributions of whose elapsed times from the start until the time of interview are set out in Table 8. Where the number of seasons is given, the duration is a minimum: in just over one half of the cases, the exact start is unknown, but the cultivation data reveal the latest possible dates. In addition to these dealings, two tenants in Village A reported that a landlord of theirs had repossessed a tenancy in the course of *kharif* 1969, after two and three years, respectively. One tenant in village B reported a repossession after three years. To sum up, there was clearly some, but hardly rapid turnover.

In fact, landlords had two good reasons to keep leases short. First, by frequently rotating plots among tenants, they could circumvent those provisions of the Tenancy Act conferring security and a rental share of one-quarter on registered tenants. Secondly, the threat that a tenancy might not be renewed at the end of each season should have been a goad to good performance, thereby mitigating the moral hazard problem discussed above. Since about one-half of all contractual relationship stretched over at least two years, it appears that landlords took a rather relaxed attitude to the potential dangers posed by the Tenancy Act. If this be so, it may have reflected their assessment of the how the legal system operated in practice. It is harder to draw firm conclusions about the efficacy of the ever-present threat of non-renewal. One could argue that, in equilibrium, such threats would not be carried out: tenants would be kept in line and the costs of finding others to replace them would keep landlords from making changes. Yet this seems a little too pat. For a landlord dissatisfied with the performance of

any of his existing tenants did not enjoy the advantage of being able to resort to a large pool of qualified candidates with cultivating capacity to spare as replacements, a drawback made more acute by the presence of other landlords confronted with the same problem. These peasant proprietors had some bargaining power; however modest its extent, it surely put a brake on non-renewals – whatever the motive for them.

With output- and cost-shares seemingly quite uniform, the other margin on which the contracting parties could operate was the quality of the plots in question. The three essential characteristics defining a plot's quality are its soil type, its access to assured irrigation and its distance from the parties' respective hamlets. Land owned in adjoining villages was sometimes under self-cultivation or leased to tenants in the owner's home village; but land outside this immediate neighbourhood was almost invariably leased to tenants living close by. Soil type and access to irrigation were substantially bound up with topography; for at that time, the sole source of irrigation was the canal system.[8] Upland soils were generally sandy and not especially fertile, though some tracts were sandy-loam. Even if irrigable, many such plots were not properly levelled. They were, of course, well-drained; but compost and artificial fertilisers were needed to get the best out of them, and the supply of water from the canal was not always reliable. Land at lower elevations tended to be loamy, clayey or a mixture of the two. Gravity duly did its job if there was water in the canal, but sometimes all too well; for the engineers had largely neglected the construction of drainage works. As a result, some low-lying land had become permanently waterlogged, and those plots that did dry out in the course of the *rabi* season were subject to assured flooding in *kharif*, even in years of normal rainfall.

With these cautionary remarks, the 'quality' of the tenants' owned and sharecropped

[8]The widespread introduction of relatively inexpensive, private tube-wells constructed out of bamboo and coir, which tapped a groundwater rarely more than 10 meters deep, was only just in the making. For an account of this whole development, placed in its 'green revolution' context, see Clay (1975), Dommen (1975), and Clay and Biggs (1981).

holdings are set out in Table 9. It should also be recalled that this picture involves only the 15 and 7 tenants sampled in villages A and B, respectively, which is further cause not to draw strong conclusions. The proportions of owned and leased-in land that were irrigated in village A were about one-quarter and one-third, respectively. (Omitting the potential 'outlier' household that owned 25 acres of upland and leased in an acre of lowland leaves them essentially unchanged.) The corresponding proportions in village B were both just over one-half. Where elevation and soils are concerned, lowland plots made up a larger proportion of the total area leased in than that of owned land in village A, though the substantial area of unirrigated, leased-in land for which the classification is missing leaves the matter in doubt. In village B, this lack of classification is so substantial as to rule out any conclusion. In short, there is no compelling evidence that tenants as a group were leasing in land inferior in quality to their own; if anything, it might have been a little better.

8 Draught Power

Cultivation on any scale beyond a household plot and garden requires draught power, and any household that wishes to cultivate must have an assured supply when needed, whether through ownership, exchange or hire. In South Asia, such power is produced by a pair of bullocks or buffaloes and a ploughman, or a tractor and its driver. The traditional 'technology' was still utterly dominant in the Kosi command area in the early 1970's, but the stirrings of mechanisation were already apparent. None of the big men sampled in village A owned a tractor, though one of them, frustrated by frequent breakdowns and the difficulty of getting spares, had sold his ancient machine a year ago. Two of their four counterparts in village B owned tractors; one had just bought his machine second-hand for Rs.8300.

In order to understand how the need for draught power influenced cultivation and

tenancy, it is essential to begin with the work-rates of these two technologies. The local bullocks were small beasts, a pair of which could draw the 'country' plough, a shaped wedge of wood tipped with a flat steel spike, over a normal working lifetime, but not the so-called steel 'Bihar plough', which was a touted improvement. The consensus was that a team would normally manage a single ploughing (i.e., in one direction) on $0.40 - 0.48$ acres in a four-hour day, though one big cultivator in village A put it lower at 0.32 acres. Up to 0.6 acres a day could be managed when puddling plots for the transplanting of paddy, the soil being softened by the monsoon rains. A couple of respondents said that the animals were weaker in winter. To convey a general idea of what this implied for cultivating, say, an acre of summer crops or an acre of wheat in *rabi*, four cross-ploughings were held to be the minimum level of preparation to get a satisfactory crop. The consensus work-rate implies a total input of 16 to 20 team-days. By way of comparison, the owner of the second-hand machine in village B reckoned its capacity at 20 teams of bullocks or buffaloes, where it should be noted that most ploughing by tractor was done with a cultivator, a disc-plough being used normally only on clayey lowland. The other owner claimed that he sometimes ploughed for 24 hours at a stretch. Perhaps he fortified himself with a special brew, but there was no way of overcoming the animals' need for rest.

At first sight, the market for draught-power services in cultivation looked fairly active. Of the 31 households sampled in village A, 24 (excluding AFS) were cultivating directly, and of these, only five engaged neither in hiring in, nor in hiring out, nor in exchanges. On closer examination, however, a rather different picture emerges. Of the ten households that reported hiring in, three were big cultivators, who made limited use of hired tractors at peak times for certain crops, chiefly wheat. The rate for a team-day ranged from Rs2 to Rs3 in cash, usually plus breakfast; the rates for tractors were Rs9 per acre with a cultivator and Rs13 for deep ploughing with a disc. Three other cultivators, owning no draught animals, managed to cultivate small holdings by

exchanging their labour for the use of the employer's teams: the rates were, respectively, 30 days of ploughing for 8 days use, 3 half-days of daily labour for 1 team-day, and 2 full days for 1 team-day, all as ploughmen on the days hired. Three households reported hiring out. Another seven reported exchanging with neighbours or relatives, but only two of these exchanged for the purposes of ploughing up to sowing operations, and this was forced; for both households possessed but one bullock, and so had to find a partner in similar straits in order to make up a team. The other five exchanged for threshing or sowing certain crops, operations whose efficiency can be improved by getting them done in a short space of time.

Village B presented a still sharper picture. Of the 25 sampled households, 14 (excluding AFS) were directly cultivating, and of these, five engaged neither in hiring in, nor hiring out, nor exchanges. Only three of the said 14 hired out: two owned tractors; the third had a ploughman with a small holding of his own, who had to put in 3 unpaid days for each team-day's ploughing on his own plots. Only three hired in, two of them exclusively tractor services, for which the going rate with a cultivator was Rs9 per acre. These two were big cultivators; one of them had not yet acquired his second-hand machine. The third, a small farmer who owned but a single bullock, enjoyed the comparatively favourable rate of 2 bullock-days for each full day's work for his employer, one of the tractor-owners and some sort of relative. Four engaged in exchanges: one had a single bullock, the others had partners only for sowing and threshing operations.

Quantitatively speaking, these sundry transactions amounted to very little in comparison with the total requirements for draught power in cultivation. In aggregate, the 31 sampled households in village A reported a gross cropped area of 402 acres over the three seasons *rabi* 1968-69, *kharif* 1969-70 and *rabi* 1969-70. Subtracting the 32 acres cultivated by others under lease, but excluding all AFS contracts, the aggregate direct requirement arose from 370 acres. Using the norm estimated and discussed above,

the implied ploughing requirement was therefore between 5940 and 7400 team-days. The number of team-days actually hired in for this purpose was a mere 76, or just about enough for 4.5 acres under the norm. Hired tractors made a bigger, albeit still very modest, contribution. Forty-two acres of wheat and paddy received a single such ploughing, which is estimated as equivalent to one cross-ploughing by bullocks. Dividing by the norm of four cross-ploughings per acre, we obtain a total contribution of 10 acres. There were also the three households that exchanged their labour for team-days: their aggregate gross cropped area was 6.9 acres. Thus, teams of bullocks hired in or exchanged for labour and hired-in tractors combined to meet the ploughing requirements of 22 out of the total of 370 gross cropped acres – or just 6 per cent.

The sampled households in village B had a gross cropped area of 200 acres. No households reported hiring in teams for normal payment, and the two households owning a single bullock had a gross cropped area of 7.2 acres. The two big cultivators hired in tractors to prepare land for wheat – in aggregate, the equivalent of a single ploughing on 19 acres, or 5 acres of gross cropped area when normed. Hiring and exchanging therefore accounted for about 6 per cent of the total requirement, strikingly enough, the same as in village A.

Where land preparation is concerned, therefore, the stock of draught animals and tractors produced an essential intermediate good, which was tradable in principle, but scarcely traded in practice: the market was thin. This fact had important repercussions on the market for tenancies. For with sharecropping as the only contractual form, no household would lease out land to a tenant owning neither draught animals nor a tractor; and any household considering leasing in would need to match its own stock of draught power with the size of the operational holding that would result from taking on a tenancy if such a move were to be profitable. What, then, prevented would-be tenants from simply purchasing bullocks? The answer lay in the credit market. A pair of good bullocks – it should be noted that assessing an animal's quality always

involved some uncertainty – cost about Rs.500, or about 200-times the daily wage; and a loan on this scale could not be had without collateral. An enterprising ploughman who had gained much experience in cultivation under the direction of his employer, but owned little or no land, therefore faced an almost insuperable barrier to becoming a cultivator in his own right. Households with a single bullock were still stuck with exchange arrangements, which enabled both parties to cultivate, but severely limited their combined operational holding. For their part, those households whose managerial capacities and husbandry skills were not up to the mark in relation to their landholdings faced a smaller pool of qualified potential tenants to whom they could lease out.

Difficulties in getting credit also reinforced the thinness of the market for draught-power services. Some cultivators said that they had sometimes wanted to plough more thoroughly by hiring bullocks, but lacked the cash to do so. Here, it is noteworthy that only the big men hired in tractor services; for them, liquidity was much less of a problem. That imperfections in the credit market arguably had effects of a still more pervasive kind can be seen by examining the textbook case where credit is a 'standard' commodity traded in arbitrary quantities at a parametric price. Would-be tenants could then borrow to offer rental payments in advance, thus introducing fixed-rent contracts as an alternative to sharecropping. Nor would there be problems financing the hiring of tractors, whose sheer capacity and spatial mobility promote competition in the market for their services.

In practice, other adjustments were possible, but they were slow and rather tortuous. Even very poor households owning little or no land sometimes had a calf. If male, the animal would be able to plough from the age of about three, thus opening the door to an exchange arrangement. If female, it would produce calves after reaching maturity; one or two might be male, and so forth. To give a happy example of such success, the three bullocks owned by the household renting in land from the railway were all offspring of a single cow owned much earlier and since deceased. In any event, animals

have to be fed and cared for, which is a costly business. All in all, tenancy, draught power and credit were caught up in a complicated interplay.

9 Risks

The catalogue of hazards is weighty and diverse. We begin with the weather – more precisely, with the rains –, since this had such a powerful influence on the well-being of cultivators and labourers alike. As noted in Section 3, annual rainfall averaged 1585 mm, but with substantial variability and very heavily concentrated in the monsoon months of June, July, August and September. At the all-India level, the good rains and crops of 1964-65 had been followed by severe droughts in 1965-66 and 1966-67, which hit the upland tracts of Bihar south of the Ganges with particular force. Many died there in the resulting famine, and hunger must have been widespread in Purnea district, too; for the area effectively commanded by the Kosi canal system was still limited at that time. After poor monsoons in 1966 and 1967, the good one in 1968 led to a recovery. These recent events were surely fresh in the villagers' minds as they went about their business at the time of survey in 1969-70, with the great flood of 1953 more likely but a distant memory.

What can be called the common component of monsoonal shocks was undoubtedly very large, but the resulting effects on output also depended on the elevation of the land. Low-lying plots were almost always clayey: local varieties of deep-water paddy usually did well in years of poor rainfall, but could be washed away in 'good' ones. The converse held for upland plots, even those with loamy soils: crops were stunted or withered altogether when rainfall was meagre, but usually did well when rains were plentiful. The caveat had to do with timing. For rain also falls outside the monsoon months, varying sharply in time and place; and these showers – or their absence – can have a big effect on yields. Heavy rains at flowering time can do much damage

to crops in any season. Late monsoon showers in October and early November can reduce the yields of *aghani* paddy, spoil what is always a substantial investment in a crop of potatoes and wash away pulses broadcast over the ripening paddy. In 1969, such showers did much damage to *aghani* paddy and *rabi* crops in both villages. Many farmers complained of poor yields, with some plots washed away completely. Eight farmers in village A reported a total of 6.9 acres completely lost, comprising 3.8 acres of paddy, 0.6 acres of pulses, 0.2 acres of wheat and 2.3 acres of potatoes, the last involving especially heavy investments in seeds, compost, fertilisers and labour. In village B, three farmers suffered a total loss of 7.6 acres of pulses. The *bhadai* crops – jute, paddy and maize – need the moisture provided by summer showers; but a heavy shower just after sowing can result in poor germination, and three plots sown to jute and maize in 1969 were ploughed over. In a final twist, unusually persistent and widespread downpours in April and May in 1971 so hampered the threshing and drying of the wheat harvest that much of that crop rotted.

As if all this were not enough, the rains also create the conditions for pests to thrive. The dense plant populations of monsoonal agriculture are naturally vulnerable to viral, bacterial, and fungal blights and diseases, as well as hordes of insects in need of nourishment. These common property 'resources' do not plague all cultivators equally, but the ensuing losses are certainly widespread. They threaten, moreover, to grow with more intensive cultivation, which makes outbreaks of such epidemics more probable. The use of pesticides was very sparing in Purnea district at that time. A few of the big men in villages A and B applied them, but only to commercial crops like sugar-cane, which had only a bit part in the larger scheme of things.

So much for the natural hazards afflicting cultivation. Nor were the man-made ones to be taken lightly. Bovine livestock was brought in by nightfall, to be guarded against thieves; but if not harnessed to the plough or cart by day, they ranged freely in search of fodder, often tended only by a child or juvenile cowherd. According to custom, they

could graze on the village's waste land, if any, and grazing on fallow fields seems to be have been tolerated. In the wholesale absence of fencing between fields, the cowherd's main job was to keep them off standing crops, which were so much more inviting than scanty weeds and stubble. It is no surprise that the animals sometimes succeeded in munching some of the better fare. In village B, one small farmer reported thus losing most of one-third of an acre of jute, another all of half an acre of barley; and a big man suffered substantial damage to an acre and a half under high-yielding wheat – as he put it, the neighbouring plots were fallow and so offered no protection. These examples vividly illustrate the costs of unenforced property rights when enforcement is prohibitively costly. Even fenced vegetable plots were not wholly safe. One ploughman in village A occupied his time in the afternoons with cultivating a variety of vegetables on sharecropped holdings. He had fenced in a fifth of an acre with materials provided by the landlord and then sown the plot to peas and chillies. Yet animals later broke in all the same and devoured the lot. Was it just the cowherd's carelessness, or perhaps a deliberate act of vandalism?

Returning to water, the canal system was closed for maintenance in the *bhadai* season of 1969. This was properly announced in advance. When officially in operation, the system was not always reliable, as a number of cultivators complained. Nor was a lack of water always the outcome of some impersonal, chance process. It was claimed during one interview in village A that the engineers were withholding water from the local tributary at a sensitive phase in wheat cultivation in order to extort some bribes. I took the opportunity to have a brief word with the Kosi Commissioner a day or two later, merely indicating that there seemed to be some problem with supply to that village. Water flowed soon afterwards. Waterworks are a possible source of fun as well as venality. One big man in village B told that some children had given one of his largish plots under high-yielding wheat an extra, heavy irrigation, which did the crop no good at all.

The theft of animals and standing crops was a permanent concern, and though no incidents were reported, it must be added that I failed to pursue this topic. One small farmer in village B, who was not prompted in any way, declared that he was virtually certain that at least 50 kg of his jute had been stolen from a pool while retting.

Surely not less important than hazards to cultivation were those to health. Purnea's reputation on this score has already been mentioned in Section 3, and to have neglected the topic of health in the investigation was a signal omission. Some respondents mentioned in passing that they had been too sick to work for a while at some stage in the year. While checking on some details in a second interview of one household, it emerged that a toddler had died since the first. As for the animals, Purnea's environment must have been as inimical to them as it was to their owners.

Confronted with such an array of hazards, there is every reason to suppose that villagers must have calculated and acted with much caution in all their dealings, perhaps to the point of fatalism in some domains. Such a burden of risk surely imposed some of the burden of their poverty. It seems a small wonder, in some ways, that they were prepared to try out new things at all.

10 Reflections on Theory

This is not the place for a disquisition on the body of theory related to our topic – there are already fine surveys, such as Singh (1989) and Otsuka et al. (1992). Rather my purpose is to sketch a theoretical structure in the light of the foregoing empirical account, paying particular attention to what assumptions seem to be defensible.

I begin with four general observations. First, the inhabitants of communities like those considered here know a great deal about each other's business and doings, including their endowments of productive resources. Screening behaviour and its associated

equilibria can therefore be ruled out as irrelevant. Secondly, the notion that landlords can both stipulate what tenants are to do and enforce these detailed instructions at tolerable cost, as vigorously promoted by Cheung (1968), seems far-fetched. They can certainly influence the cropping pattern, both directly by negotiation and indirectly by choosing the quality of the plots under lease, but there are too many other margins on which tenants can operate to make the full-blown version of private rights doctrine tenable. Where it does seem quite defensible is in AFS contracts, wherein the plots in question are small, the contracts are exclusive, and the landlord provides not only seeds and the use of bullocks, but also supervises the key operations. Thirdly, keeping tenants up to the mark by awarding only short-term leases and making renewal dependent on satisfactory performance (Johnson, 1950) is certainly an option open to landlords; but the scale and pace of rotation seemed quite modest in practice, and with a limited pool of qualified tenants, there will have come a point where old offenders had to be considered once more. Fourthly, keeping the tenant to his tasks through an exclusive contract, as in Stiglitz (1974) for example, was not an option, because the great majority of qualified tenants also owned land, and a good majority had more than one landlord. The conclusion must be that moral hazard was a serious problem, with potentially substantial effects on allocative efficiency.[9]

It emerges from Section 8 that a key distinction to be drawn is between households that possess an assured supply of draught-power and those that do not; for only the former can cultivate independently. In addition to owning draught animals, the former will possess some husbandry and managerial skills, which can be put to good use only when the household cultivates directly, there being no market for such skills. Together with the household's draught animals, these skills constitute a bundle of non-tradable factors that are essential in production. The household's endowment of labour, in contrast, is fully tradable; but those of its members who possess the special skills in

[9]See Bell (1977) for empirical evidence to this effect.

question make no use of them when employed by others as workers. The vital role of non-tradables in practice would lead one to expect their having a prominent place in any theoretical treatment of the incidence and terms of tenancy contracts, with particular reference to the scope for bargaining; but this is not so. Non-tradables do play a central role in Bell and Zusman (1976), wherein a single landlord lacking them can deal with n identical landless tenants who do possess them. The very real complications stemming from the possibility that a tenant owns land and may contract with more than one landlord are therefore ruled out by assumption.

Those households that lack the requisite non-tradable factors can cultivate only on the strictly limited scale afforded by an AFS contract. This brings us to the matter of labour-tying and seasonality. In the standard model (Bardhan, 1983), landless households can engage themselves to an employer at a fixed wage in both seasons; the risky alternative is to work as day labourers in both seasons, the peak-season wage being higher on average, but also variable. The former looks, at first glance, like the contract of a live-in farm servant. Yet only one member of the family is so engaged; the others work as day labourers, tied in some degree to the employer (one might be a ploughman), with all the risks that attend it. Even in this case, therefore, risk is far from banished. The simplification in the standard model can be defended as anchoring the analysis; but it seems rather strong if the aim is to explain the more varied choices observed in Purnea, all of which involved labour households bearing some risk.

11 Concluding Remarks

The foregoing account can be thought of not only as a pair of miniatures, no doubt incomplete in certain respects, but also as two small elements of the larger mosaic constituting the rural economy of India's lower gangetic plain half a century ago. It has been argued that the rich array of contractual forms and terms that ruled in both

villages at that time lends the account a significance that goes beyond mere historical interest. Yet various developments were soon in train that surely threatened to remake those arrangements, with winners and losers.

First, there was rapid agricultural growth in Punjab and Haryana, which sucked in droves of Bihari labourers as migrants: better to be exploited there than oppressed back at home. This improvement in the outside option – in place of the off-chance of getting work on the roads – must have had a measurable effect on wages and labour contracts. Accelerating growth and urbanisation at the national level from the early 1980's onwards would have maintained this general pressure, with the specific intervention of NREGS to follow in 2005. Secondly, a principal aim of the 1969 Act nationalising the banks was to extend organised banking to rural areas. To the extent that it improved access to credit, it would have had effects on the market for tenancies, including the contractual terms. Thirdly, the mechanisation of agricultural operations was getting under way, adding an 'endogenous' factor to influence wage and tenancy contracts. Fourthly, there was the humble, 'home-grown' innovation of the bamboo tube-well, whose rapid adoption was bound up with the emergence of a market for irrigation water.

This essay provides the 'then', but there is no accompanying 'now', only the general conjectures just sketched. Perhaps there are some younger scholars with a taste for such an enterprise to undertake it.

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Table 4: Daily wage rates by operation: numbers of employers and labourers reporting

	employers				labourers			
Operation	trans.[a]	weed[b]	jute[c]	plant[d]	trans.[a]	weed[b]	jute[c]	plant[d]
A: full-day								
1 + br		9	2	4		5		1
0.5 + br+ ln	10	6	6	3	6	4	6	
0.75 + br+ ln	2							
1 + br + ln	5	2	3	2	1	1	1	
A: half-day								
0.5 + br (am)		13	5	3		4	1	
0.5 (pm)		1				2		
B: full-day								
0.5 + br+ ln	1	1	1			1	1	
0.62 + br+ ln	3	5	1	1	6	7	6	1
0.75 + br+ ln		1	3	1		2		
1 + br + ln	5	4	4	1	1	1	2	
1.25 + br+ ln		1						
A: half-day								
0.5 + br (am)						1	1	
0.5 (pm)				1		2		

[a] Transplanting of *aghani* paddy.

[b] Weeding, all crops. [c] Harvesting, bundling and retting. [d] Planting of potatoes and sugarcane.

Table 5: Harvest wages (in kg.)[a] from 2.2 acres of lowland paddy

Groups	no.	indi-viduals	mean	s.d.	min.	max
Male only	10	24	4.85	0	1.5	5.2
Female only	11	19	2.23	0	0.8	5.0
Both	1	2	5.0	0	–	–
All	22	45	3.81	0	0.8	5.2

[a]Total payment 172 kg. Share of total output 0.124.

Table 6: The size distributions of ownership and operational holdings (acres)

Size class	0 - 0.99	1.00 - 2.49	2.50 - 4.99	5.00 - 9.99	10.00 - 14.99	15.00 - 19.99	20.00 +
Village A							
ownership	13	3	7	2	1	0	5
operational	7	6	4	8	1	0	5
Village B							
ownership	14	0	5	2	0	0	4
operational	11	0	8	2	0	0	4

Table 7: Distribution of tenants by numbers of landlords

Number	1	2	3	4	5 +	total
Village A	7(5)	3(3)	3(3)	1(0)	2(2)	16(13)
Village B	1(1)	2(2)	2(2)	1(1)	1(1)	7(7)

Numbers in parentheses are those tenants owning some land.

Table 8: Distribution of current contracts by their duration since start: tenants

Duration	1 season	2 seasons	3 seasons	2−3 years	5−10 years	10+ years	total
Village A	7	10	16	2	5	2	42
Village B	6	2	8	2	3	1	22

The number of seasons denotes, in many cases, the minimum duration since the start of the contract.

Table 9: The quality of tenants' holdings, owned and leased (in acres)

Type	irrigated				unirrigated			
	upland[a]	lowland[b]	n.a.	total	upland[a]	lowland[b]	n.a.	total
Village A								
Own land	12.4	1.5	0.2	14.1	33.4	7.7	0.2	41.3
Leased in	6.9	5.0	1.8	13.7	13.9	5.0	9.2	28.1
Village B								
Own land	3.2	0	2.0	5.2	0.8	1.3	2.1	4.2
Leased in	0.8	1.0	8.7	10.5	1.5	2.6	5.9	10.0

[a] Nearly always rather sandy soils, very occasionally sandy loam.

[b] Mostly clayey, sometimes clayey loam.