

Ownership and Distribution of Land

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# Ownership and Distribution of Land\*

## I

A characteristic feature of most agrarian economies is a high degree of concentration in the ownership of land. This reflects not only inequality in the distribution of wealth but also the fact that it is the main form in which wealth is desired to be held in these economies. Depreciation being negligible the costs of holding land are low; it generally maintains its capital value over time and offers more security than most other assets; and if leased out it also yields a rent. In societies exposed to various kinds of risk, and with few means of insurance open to them, land is an attractive asset to hold even if the pecuniary rate of return on the investment happens to be low.

There is no reason however why the units in which production is organized should correspond in size to the ownership holdings. The optimal size of the operational holdings (i.e., the actual units of production and management) will depend on the other factor endowments and the technical conditions of production. One would expect those who have holdings above this size to lease out land, the others to lease in, and the pattern of operational holdings to be correspondingly different from that of ownership.

The difference should be particularly marked in economies in which land is scarce relatively to labor and in which the capital equipment used in agriculture does not offer significant economies of scale due to indivisibilities. The need to use land intensively as well as the problems of management of labor—which usually grow more than proportionately with size—ought to favor then relatively small holdings and promote transfers of land in this direction.

That transfers do take place is not in question, but there is reason to doubt the extent to which the pattern of distribution of land is modified by such transfers in the less developed agrarian economies. In general, tenancy itself appears to grow only with commercialization of agriculture,

\* This forms one chapter of a book on *Accumulation and Growth in Agrarian Economies* under preparation. This part (which was completed in March 1968) is being published separately as the analysis is self-contained and can stand independently of the other parts of the book.

and so in the earlier stages of commercialization the scale of leasing is often very limited.<sup>1</sup> Even when tenancy develops on a more extensive scale the ability of agricultural households to lease in land seems to be not infrequently related to the area of land they own already, the totally landless being often able to lease in no land at all or only small holdings. While the small and medium-sized holders of land might be able to increase somewhat the area under their operation by leasing in land, and the large holders to diminish correspondingly the size of their holdings if they wish to, the extent of the redistribution brought about might be therefore marginal.

This is well illustrated by the data available on ownership and operational holdings in India. As will be evident from Table 1, the only change noticeable as a result of leasing is a slight gain in the share of holdings between 5 and 50 acres in size at the expense of holdings above and below this size range.

This is in spite of leased-in land accounting for over a fifth of the total area operated. While it is true that land reform legislation might have contributed to a greater reluctance on the part of owners to lease out land there is no reason to believe that the size-distribution of operational holdings was materially different in earlier years.

If this hypothesis then is correct—that the ownership of land is highly concentrated and the size-distribution of operational holdings differs from that of ownership holdings to only a limited degree in many of the less developed agrarian economies—it has important implications. For the size of operational holdings must be expected to have some effect on the intensity of use of land, the productivity of labor, the kind of investments that are undertaken, the purposes and the scale on which saving is done, as well as on the need and ability to borrow or lend.

We shall therefore begin by investigating more closely the factors governing the direction and extent of leasing of land in agrarian economies and their likely effects on distribution of land.

1. In Japan, for instance, tenancy was of no importance until the eighteenth century. "Typically they (the land registers) show in each village a few large holdings, somewhat more middling holdings, and a great many more small holdings, with some large holdings bulking many times the size of some small—ten or twenty times was very common and even a hundred or more not unknown . . . Rarely was the shift to tenant cultivation noticeable before 1700 and in many instances it did not begin until considerably later, in any case it started only under the stimulus of commercial farming, which cannot be dated, as a powerful movement in most parts of the country until well into the eighteenth century." Thomas C. Smith, *The Agrarian Origins of Modern Japan* (1959), pp. 3-5.

TABLE I  
PERCENTAGE OF HOLDINGS BELOW SPECIFIED SIZE AND THE  
CUMULATIVE PERCENTAGE OF AREA OWNED AND  
OPERATED BY THEM IN INDIA, 1954-55\*

<i>Holding size (in acres)</i>	<i>Ownership holdings</i>		<i>Operational holdings</i>	
	<i>% of house- holds</i>	<i>% of area owned</i>	<i>% of house- holds</i>	<i>% of area operated</i>
0.00**	23.09	—	10.87	—
Below 1.00	47.26	1.37	41.55	1.24
„ 2.50	61.24	6.23	56.12	5.90
„ 5.00	74.73	16.32	71.64	16.55
„ 7.50	82.55	26.28	80.46	26.73
„ 10.00	87.23	34.72	85.92	35.69
„ 15.00	92.28	47.50	91.42	48.37
„ 20.00	94.94	57.08	94.39	58.10
„ 25.00	96.40	63.83	96.00	64.87
„ 30.00	97.40	69.55	97.10	70.57
„ 50.00	99.06	82.46	99.00	84.17
<i>All sizes</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>

\* Source of data: The National Sample Survey, *Reports on Land Holdings (3) and (5)*, Report Nos. 36 and 74, Table 5.6 of each report. Ownership was associated in this survey with the right of permanent heritable possession of land with or without right to transfer of title; nearly 19 per cent of the total area under ownership holdings was therefore really "owned" by permanent heritable occupancy tenants (though almost all of such tenants defined as owners were confined to two regions, East and North-West India). Tenancy in India is therefore more extensive than is indicated by these data, and to that extent perhaps also the change in the distribution of land brought about by tenancy.

\*\* Households owning no land or less than 0.005 acre were considered to constitute ownership holdings of zero size; households operating land below 0.005 acre are also shown in this size-group under operational holdings.

## II

Let us assume a society in which rights of permanent heritable possession, mortgage, leasing, eviction and sale are all associated with owner-

ship of land, and further suppose that (a) there are no factors of production other than land and labor,<sup>2</sup> (b) all land is of equal fertility and all households have equal number of adult labor units available for work, (c) the area of land owned by different households varies considerably in size and some households own no land at all, and (d) there is only one product, with a given technique of production. We shall consider initially, on the additional assumption of perfect certainty, what alternatives are open to the different households to maximize their income and what kind of allocation of the two factors of production can be expected to emerge.

If the supply of labor within each household is taken as given, it is evident that, as increments of land are applied to this fixed labor input, the marginal productivity of land will tend to decline beyond a point and ultimately fall to zero when the area of land cultivated by this labor becomes large. For households owning considerable areas of land it would be therefore advantageous if the alternative were available of leasing it out at a rent higher than the product that could be obtained by self-cultivation. Such an alternative could be expected to be available if there are other households with little or no land, since the marginal productivity of land for them would be relatively high and it would be worth their while to lease in land as long as the rent payable is not higher than this marginal product. Following this line of reasoning it can be easily shown that if no cost is attached to input of family labor, the market for land is competitive (neither the land-owning nor the landless households being in a position to fix the rent), and there are also no economies of scale, all households would gain by reallocating land through such transfers till they have operational holdings of equal size.

In Diagram 1, *PM* and *PA* represent the marginal and average productivity of land when increments of it are applied to the labor within each household. Since *PM* represents the additional output that Household *X* can secure by leasing in land, and it will be advantageous for it to do so as long as the rent payable is no higher than the marginal product, *PM* can be described also as the demand-for-land curve of this household. For Household *X*, on the other hand, the *PM* curve indicates the opportunity cost of leasing out land when its own operational holding is of any specified size, so that if it cultivated all its land with own family labor

2. The management needed for the coordination of the two is assumed to be available along with labor as long as family labor alone is involved.

the loss of marginal product at the margin would be  $YN$  and this is what it would have to be compensated for at the minimum by rent in order to make leasing out of land worthwhile at this margin. It is therefore

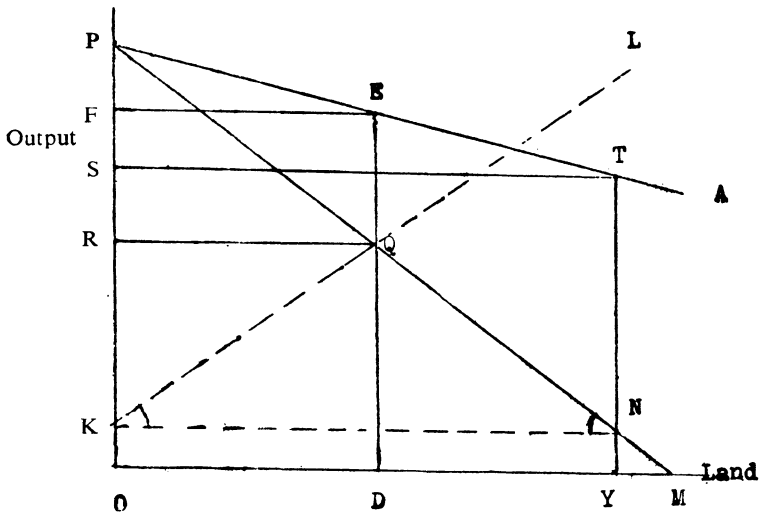


Diagram 1.

possible to draw a supply-of-land curve,  $KL$ , which starting from  $K$  (such that  $OK = YN$ ) reflects the slope of the  $PM$  curve. The point of intersection of the  $PM$  and  $KL$  curve indicates then the equilibrium position.

At this point the size of the operational holding of each household would be exactly the same (*i.e.* equal to in this case one-half of the area owned by Household  $Y$ ). With equal amounts of land and labor in the two holdings, the marginal product of each factor of production will be the same in both and total output will be therefore at its maximum. And while Household  $X$  will be better off to the extent of the difference (equal to  $RQP$ ) between its total output after leasing in land ( $ODQP$ ) and the rent it has to pay for this land ( $ODQR$ ), Household  $Y$  will also be better off to the extent of the difference (equal to  $KQR$ ) between the rent receivable ( $ODQR$ ) and the loss of product due to leasing out the land ( $DYNQ = ODQK$ ).

With a competitive market for land the rent obtainable (or payable) has to be taken as given by each household. But confronted by such a market-determined rent the households will have excess demand for, or excess supplies of, land—depending on their initial endowments—and it is at the level of rent at which excess demands and excess supplies of land

are equal that the system would be in equilibrium. All this is familiar economic reasoning. The only point that needs to be emphasized here is that, on the assumptions stated, the market will redistribute the total endowment of land such that all households have holdings of equal size and that this will come about irrespective of the pattern of ownership of land obtaining initially. The pattern of ownership will affect only the distribution of income between households.

It might seem that what transfers of land achieve here can in principle be brought about also by transfers of labor in the reverse direction if this labor is available at a wage corresponding to its marginal product. The larger ownership holdings need not then get broken up into small-sized operational holdings, and the initial distribution of land could be substantially retained with employer-employee relationships between households replacing owner-tenant relationships. But on the assumptions we have made there is no reason why this alternative should appeal at all to the land-owners, since the hiring and deployment of wage employees in large number would pose problems of management additional to those involved in organizing production with family labor and since a surplus corresponding to the marginal product of land can in any case be secured by them by merely leasing out the land.

It follows that if operational holdings do in fact vary considerably in size in agrarian economies the explanation has to be found in the untenability of one or other of the assumptions made above. Obviously, being only assumptions made to simplify the analysis initially, they are not close approximations to reality and do need to be modified. But to point to the unrealism of any or all of these assumptions is not enough; their modification should make it possible to offer a more satisfactory explanation of the distribution of land actually observable in these economies.

For instance, the assumption that no cost is attached to labor is obviously unrealistic. But if this is dropped, and replaced by the assumption that while the marginal disutility of labor might be low (and even constant) until a certain amount of effort is reached it rises beyond that point, no difference will be made to the conclusions reached earlier unless the marginal disutility schedule is also assumed to be different for different households. Even if it is different as between rich and poor households it would not explain large differences in the size of operational holdings. For this would only mean that the households with considerable land would retain little or no land for cultivation with own family labor; that the excess supplies of land being larger the rent on land determined by the market would be lower than otherwise; and that therefore the other



households with excess demand would be able to lease in more land and form correspondingly larger operational holdings. Of course, if the initial land endowment relatively to labor is large and the marginal disutility of labor rises sharply beyond a point, the demand for additional land in the market may not be adequate to absorb all the land that the larger holders are willing to supply and the residual might make the operational holdings of the latter seem larger than they really are.

Nor would the introduction of instrumental capital into the model as a factor of production help by itself to explain large differences in the size of operational holdings. As indicated earlier, only if there are significant indivisibilities of such capital—making for increasing returns—would the situation be altered. One would therefore have to show that such indivisibility does exist in the kind of instrumental capital that is appropriate, and in fact used, with the factor prices obtaining in these economies. *Prima facie* this does not seem likely.<sup>3</sup>

Similarly, though it is true that there are differences in the size of families (larger-sized families being generally associated with larger holdings of land) and seemingly even in the quality of land (the quality apparently deteriorating with the size of holdings)<sup>4</sup>, one must be careful not to offer them as explanations since these could be the result rather than the cause of differences in the size of operational holdings. The same applies to the possible consequences of different products requiring different intensities of use of land since, in any limited area with soil and climatic conditions that are broadly similar, the choice of the product-mix is more likely to follow than determine the size of the operational holdings.<sup>5</sup>

3. This is not to deny the existence of indivisibilities in certain items of capital used in agrarian economies such as livestock; but, as will be shown later, the indivisibilities associated with livestock are not adequate to explain observed differences in the size of operational holdings, since the amount of livestock held and arrangements in regard to its use often adjust themselves to the size of the holdings.
4. See A.M. Khusro, "Returns to Scale in Indian Agriculture", *The Indian Journal of Agricultural Economics*, Vol. XIX, Nos. 3 and 4, July-December, 1964. "...as farm-size expands the proportion of bad and indifferent land to total land increases...This hypothesis is worthy of close examination in as much as the behavior of land revenue (land tax) data seems to substantiate it...clear trends, in almost all States, of declining land revenue per acre as farm-size expands...confirms the hypothesis of decreasing soil fertility."
5. There are of course products which require more land and less labor per unit of output than others and which, if preferred, would lead to more land being leased in. But one would then have to explain why such products are preferred only by some households and not the others.



## III

A more promising explanation of the differences in the size of operational holdings in agrarian economies, and of the resulting pattern of allocation of resource endowments, begins to emerge however once the assumption of perfect certainty is dropped. For there are risks associated not only with agricultural production but with institutional arrangements like leasing of land and hiring of labor. There are also differences in the capacity to bear risks and in the willingness to bear them. All this can weight the scales in favor of alternatives different from those one might expect under conditions of certainty.

The choices open to different households and the risks associated with them can be stated simply. The land-owning households with relatively large holdings have mainly three alternatives to choose from : cultivation of land with own labor, organizing cultivation with hired labor, and leasing out the land. To the first are attached the usual risks associated with production, such as variability of output and fluctuations in product prices; the second carries with it additionally the risks of hiring labor, such as non-availability of labor in the busy seasons and labor disputes; the third makes it possible to avoid carrying both the risks of production and the risks of hiring labor but involves bearing the risks of leasing out land, more particularly default of rent and the probability of not being able to regain possession of the land. But the choice for the landless households (as well as households owning very little land) is essentially only between leasing in land and hiring out labor, the former carrying with it the risks of organizing production (the same as for the land-owning households) and the latter the risks of unemployment.

Ordinarily, in a traditional agrarian society that is politically tranquil, the risks of leasing out land and of hiring labor may be minimal. So, if there are no significant economies of scale, the problems of management of hired labor and the risks associated with production could become decisive considerations in favor of the alternative of leasing out land. For the landless households also, if the opportunities for wage employment are limited or largely seasonal as is often the case in agrarian economies (more particularly when the land-owning households prefer not to organize production themselves with hired labour), the risks of leasing in land and undertaking cultivation with own family labor could appear smaller by comparison. This suggests that, under these conditions, it would be to the interest of both the land-owning and the landless households to have recourse to transfers of land through leasing—the former to

avoid the risks of production and the latter to avoid the risks of unemployment.

However, even in such a society, there are risks in leasing out land. For one thing, leasing out can only shift from the lessors to the lessees the risks associated with the variance of production and prices, not eliminate them, and they could be shifted back in part by defaults of rent. But these risks apart,<sup>6</sup> the probability of default of rent would be greater the lower the income accruing to tenant families (after payment of rent) relatively to their maintenance requirements. Land-owning households therefore find it advantageous to lease out land in larger parcels, or to those who have already some land of their own, though this might require a reduction in the average rent. If the reduction in the average rent required to eliminate this risk is larger, they might even find it worthwhile to cultivate a part of the land themselves with hired labor. In either case significant differences in the size of the operational holdings would ensue. What is more, these two courses could be mutually supporting since preference for the more substantial tenants might result in some landless households not being able to secure any land at all on lease and they could be the source of wage labor for both the land-owning households and the larger-tenants.

These alternatives can be seen clearly in Diagram 2 which depicts (on the assumption of constant returns to scale) the average and marginal productivity of land in two situations corresponding to two different levels of input of labor, the input of labor in the second situation being twice as high as in the first.

We shall suppose that (i) if land were equally distributed in this community the size of an operational holding would be  $OL_1$ , (ii) the risks associated with production (hereafter denoted by  $\lambda$ ) are non-existent, (iii) at the level of tenant income corresponding to a holding size of  $OL_1$  ( $P_1N_1M_1$ ) the risk-premium attached by land-owners on account of the probability of default of rent is  $\gamma$ , and (iv) this risk-premium falls to zero when the size of the holding is doubled. This means that if a land-owning household has  $OL_2$  of land to lease out it could either lease it in equal-sized holdings to, say, two landless households and expect to secure rent from each equal to  $OL_1M_1N_1$  with a probability corresponding to the assumed risk of default or lease the whole of it to one household and expect to secure  $OL_2M_2N_2$  as rent with complete certainty. Let us assume that the risk

6. We shall consider in Section V of this chapter the effect of the risks of production on transfers of land and labor and on the size of operational holdings.

attached by the land-owning households leasing to small holders is in fact so high that the latter alternative is preferred.

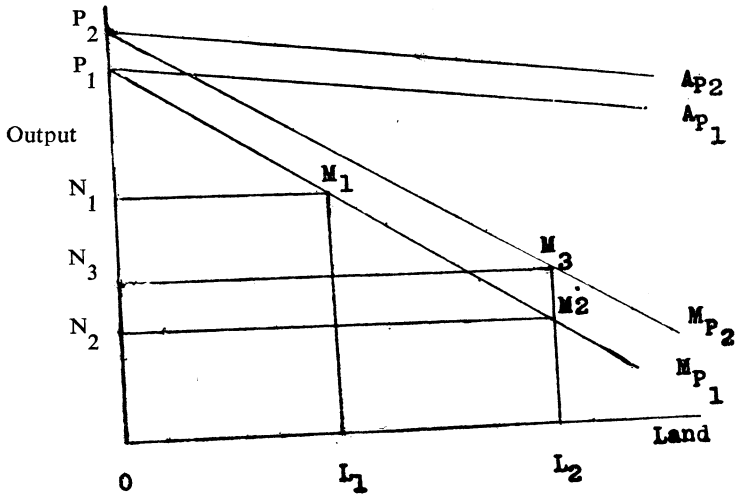


Diagram 2

The tenant household which leases in  $OL_2$  of land has then two alternatives before it. It could cultivate it wholly with its own labor and secure a total income for itself equal to  $P_1N_2M_2$ ; or it could engage in addition the labor of the landless household which is unable to get land on lease, raise a larger output equal to  $OL_2M_3P_2$  from the same area of land,<sup>7</sup> and increase its own income to the extent that the wage payable for this labor (say,  $W$ ) is less than its marginal product (which would be equal to  $P_1M_2M_3P_2$ ). Obviously, the higher the risk attached by the tenant family to the employment of hired labour (let us denote it by  $\rho$ ) the lower will  $W$  have to be relatively to its marginal product in order to make the latter alternative preferable.

It will be evident that if either institutional rigidities prevent wages getting adjusted to this level, or if the risk attached to hired labor is on account of the likelihood of its not being available when needed so that it is worth paying a higher wage to retain such labor,<sup>8</sup> the result would be a degree of unemployment in the landless households and a lower volume

7.  $OL_2M_3P_2$  would be, on the assumption of constant returns to scale, twice as high as  $OL_1M_1P_1$ .

8. The category of landless households thus absorbed in employment in the larger farms is referred to in India as "attached labor" and distinguished from "casual labor".

of total output than could otherwise be secured from the given area of land. The main point to note however is that the risks attached to leasing out land to small tenants and to the employment of hired labor could make the size of operational holdings very different from that one might expect to find in the absence of such risks.

Much depends here on the rate of decline of the marginal productivity of land in the relevant range. Obviously the steeper the slope of the marginal product of land curve the greater would be the cost to the land-owning households of avoiding the risks of default through leasing out to larger tenant holdings. Even if therefore the risk-premium attached to leasing out land to small tenants ( $\gamma$ ) is high, it is unlikely in this situation that the size of the tenant holdings preferred by the land-owning households will be much larger than in the absence of such risk. The opposite would be the case if the marginal productivity of land falls only very gradually as more land is applied to any given stock of land, the probability then being that the preferred size of tenant holdings would be much larger than in the absence of this risk even if the value of  $\gamma$  is relatively low.

Given the assumption of constant returns to scale, a steeply falling marginal productivity of land implies also that the increments to output that can be secured by applying more labor to the land would be relatively large. If therefore the land-owning households choose to keep large holdings of their own or to lease out land to tenants with large holdings, these large holders of land will have considerable incentive to employ labor from the landless households (unless the risk premium attached to the employment of hired labor happens to be very high). On the other hand, if the marginal productivity of land falls only very gradually, the implication is that the gains to be secured by applying more labor are relatively low; and so the larger holdings which this situation induces are unlikely to be significant sources of demand for hired labor except to the extent that their own family labor is not available for work on the land.

#### IV

We have so far assumed competitive markets in both land and labor. The competition is of course not perfect since there is uncertainty. It is also clearly limited by the assumed ability of land-owning households to discriminate and decide whom they will lease out land to and to whom they will not (though the way in which this might be done can be easily visualized if we suppose that land owned by the land-owning households

vary in size all the way from the very large to the very small and that those who have some land of their own are preferred to those who have no land at all). But we have *not* assumed that the number of land-owning households is so small that they can exercise monopolistic (or oligopolistic) power in fixing the rent on land and monopsonistic (or oligopsonistic) power in fixing the wages of labor.

The assumption of competitiveness even in this limited form may not however be realistic when the degree of concentration in the ownership of land is very high. It is therefore necessary to consider what difference would be made by its removal.

The effect of monopoly in the land market on the allocation of resources can be demonstrated fairly easily if we retain the rest of the assumptions made earlier (including that of perfect certainty) and analyze the problem in terms of the relevant margins. Even under this kind of market structure it will pay a landless household to lease in land only if the rent payable is not higher than the marginal product of land. But the difference between a situation in which the market for land is competitive and one in which there is monopoly is essentially that in the latter case the land-owning households can fix the rent on land at a level which maximizes their income and do not have to take it as given to them by the market. This would affect the supply of land.

Diagram 3 (which is constructed on the same assumptions as Diagram 1) shows how the rent on land and the amount of land transferred from

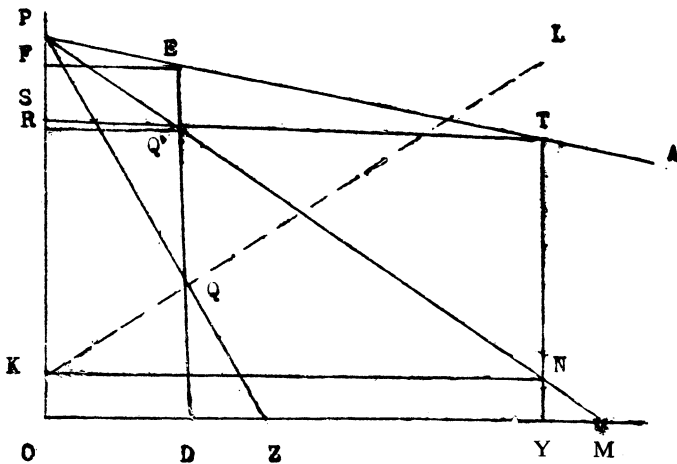


Diagram 3

a land-owning to a landless household will be determined in such a situation.

Since land will be demanded only if the rent payable is not higher than the marginal product of land,  $PM$  can not only be described as the demand-for-land curve but as depicting the average rent that would have to prevail for holdings of different sizes to be demanded by the landless household. As the average rent on land falls, the rent obtainable by the land-owning households on the increments of land leased out will fall even more sharply;  $PZ$  represents this marginal rent on land. Obviously, when the marginal rent on land becomes zero, there is nothing to be gained by the land-owning household by leasing out more land. But if leasing out land involves it in loss of other income this point where it does not gain from further transfer of land may be reached even earlier.

It follows that on the assumptions made in Diagram 1—that the land-owning household has the alternative of cultivating the land with its own family labor and that no cost would be attached to such labor—it would, in a monopolistic situation, want to lease out land only to the extent of  $OD$  and will be able to maximize its income by charging an average rent on land equal to  $DQ'$ . But if the alternative before it is really to leave unutilized all the land that is not leased out, it would be to its advantage to lease out more till the size of the tenant holding is equal to  $OZ$ .

The effect of monopoly then is to raise the average rent on land and make the tenant holdings smaller in size than they would otherwise be. How significant these effects are would however depend again on the slope of the marginal product of land curve in the relevant range. The steeper the slope the stronger would be the tendency to restrict the supply of land.

It should also perhaps be added that the marginal productivity of land might decline not only because the application of more land to a fixed stock of labor would lead to diminishing increments of physical output but possibly also due to fall in the value of the product as more of it becomes available in the market. If the market happens to be small and isolated, this could be a major factor influencing the decision of land-owners to restrict the area of land leased out.<sup>9</sup>

Raising the average rent on land may not however be the best course to adopt if the size of tenant holdings is thereby reduced so much as to

9. This has been specially emphasized in explanation of the high proportion of unutilized land in large private holdings in some countries, particularly in Latin America. See Anthony Bottomley, "Monopoly Rent Determination in Underdeveloped Rural Areas", *Kyklos*, Vol. XIX, Fasc. 1, 1966.



increase greatly the probability of default of rent. Nor would it be the most profitable alternative open to the land-owning households if the situation is one of shortage of labor relatively to the available land and if, in addition, the marginal disutility of labor rises so steeply beyond a point that the demand for leasing in land ceases long before the growing size of the holdings reduces the marginal rent to zero. For the supply of labor from landless households is not fixed as we have assumed so far (any more than the supply of labor from the land-owning households is) but is governed by the disutility of labor and the utility of income at the margin.<sup>10</sup> If the land-owning households have also monopsonistic (or oligopsonistic) power in the market for labor—as they would have if the landless have no other means of livelihood open to them—it could be therefore more in their interest to use this power to lower wage rates and, by thus increasing the marginal utility of income for the landless households, extract a larger supply of labor from them. The smaller the number of families to whom land is leased out, and the larger the number who are unable to lease in any, the more effectively can this monopsonistic (or oligopsonistic) power be used to lower wage rates. The lower wage rates could also compensate in part for the risks associated with the hiring of labor. What may therefore be found in reality under these conditions is not higher rents and smaller-sized holdings than when the market for land is competitive but lower wage rates and a larger supply of labor than would otherwise exist and the hiring in of such labor on a correspondingly larger scale by the land-owning households.<sup>11</sup> Even such land as is leased out may then be more in the nature of tie-in allotments to secure cheap labor.

Latin American experience shows in a striking way the circumstances in which owners of land could exercise monopolistic (or oligopolistic) power even when land appears to be available in plenty and how, under conditions of labor shortage, such power might be used to keep wages down and extract a larger supply of labor.

“In principle, the supply of land could be considered unlimited, and starting at a certain distance from the urban centers, land

10. For a fuller discussion of the factors affecting the supply of labor in agrarian economies see Amartya K. Sen, “Peasants and Dualism with or without Surplus Labor”, *The Journal of Political Economy*, Vol. LXXIV, No. 5, October 1966.
11. That the operational and strategic control offered by ownership of land within a given social and legal framework can be used to achieve solutions different from those suggested by a consideration of production functions alone has been long recognized. The strategic possibilities actually analyzed have however been confined to a few illustrative and highly simplified cases. See L. S. Shapley and Martin Shubik, “Ownership and the Production Function”, *The Quarterly Journal of Economics*, Vol. LXXXI, No. 1, February 1967.



also could be considered as a free good . . . . However, the peasants' subsistence depended on his ability to sell part of his own production, however small, so as to make it possible to acquire in the market such things as salt, fuel and others considered essential within his cultural pattern. This explains why the peasant preferred to settle in lands benefitting from external economies, even though he was compelled to divide his production with a member of the proprietary class. From the landlord's point of view, or from the point of view of the landlord class, the land always constitutes a factor of unlimited supply, whose degree of utilization depends on the availability of labor. Since the surplus created by one family generally permits another family to be maintained, whenever the availability of labor is increased it makes it easy to open new lands, to prepare pastures, to plant new crops, to build feed roads, etc. This explains why the *fazendeiro* of the pre-capitalist economy is always referring to the shortage of labor. In effect, each new family incorporated into the system means an increase of the global surplus which benefits the land proprietor. Since it falls to each individual family to provide for its own subsistence, the admission of new families into the *fazenda* does not result in an increase in administration costs. Even if the new peasant should produce a surplus much smaller than the pre-existing average, his incorporation into the *fazenda* constitutes an advantage to the landowner. In this way, the structure of a pre-capitalist economy under conditions of unlimited supply of land—the land being the property of a small minority—causes a permanent shortage of labor, without contributing to the increase of the wage rate above the subsistence level. The problem can be looked at from another angle: the control of the land by a small minority, under pre-capitalist conditions, enables this minority to levy a tax on everyone who works the lands benefitted by external economies."<sup>12</sup>

While it would be incorrect to suggest that this is characteristic of the situation in many agrarian economies today, it is probable that such control is exercised to some degree in isolated communities and regions

12. Celso Furtado, *Development and Stagnation in Latin America: A Structuralist Approach* (Yale University Economic Growth Center, Center Paper No. 95, 1966).

in which the conditions essential for its effectiveness are partially satisfied. To that extent this could also account for the existence of relatively large-sized holdings operated with hired labor in essentially pre-capitalistic environments.

## V

Still another feature relevant to allocation of resources in agrarian economies is the widespread practice of determining payments to land and labor on the principle of sharing the product in agreed proportions. We need to consider what difference such pricing based on the average principle would make compared to systems in which factor prices are governed (as we have implicitly assumed so far) by the marginal costs and returns to the parties concerned.

It can be shown that, if no cost is attached to labor and there is perfect certainty (as assumed earlier), there would be, corresponding to each marginal-product-of-land schedule, one particular size of holding at which the respective shares of land and labor would be the same whether the payments to them are based on the marginal or the average principle; that below this size the share of land would be lower (and of labor higher) under share-cropping (or share-leasing);<sup>13</sup> and that above this size the share of land would be higher (and of labor lower) under such sharing arrangements.

In Diagram 4,  $PM$  represents the given marginal productivity of land schedule. If  $n$  is the proportion of the gross product that is the agreed share of the owner of the land (this taken to be greater than zero but less than 1) the rent that would accrue to a land-owning household from tenant holdings of different size can be read off from the area below  $EM$ .

[  $\frac{OE}{OP} = n$ , is assumed in this particular illustration to be equal to  $1/2$ . ]

Thus, if the size of the holding is  $OA$ , the rent payable by the tenant under share-cropping would amount to  $OABE$  (equal here to one-half of the gross product,  $OACP$ ). If, on the other hand, the rent payable is not any particular proportion of gross output but a fixed absolute amount

13. A system under which labor is paid a fixed proportion of the produce is usually described as 'share-cropping', and this is distinguished from one in which rent is fixed as a proportion of the produce (referred to as 'share-leasing'). There is however no need to make this distinction if (as we have assumed) there are only these two inputs to be considered in the production function.

(in money or kind) per unit of land, this average rent on land happens to be  $AC$ , and tenants lease in land till its marginal product is equal to  $AC$ ,

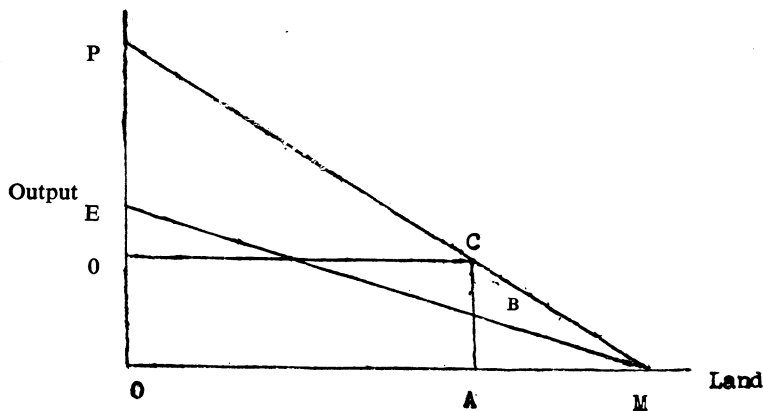


Diagram 4

the total rent payable on a tenant holding would amount to  $OACD$ . What has to be determined is the condition under which  $OACD$  would be equal to  $OABE$  and the size of the tenant holding corresponding to it.

Now, if  $OACD$  is equal to  $OABE$ ,  $OACD/OACP$  must be equal to  $n$ . This can be rewritten as :

$$\frac{OA \cdot OD}{OA \cdot OD + \frac{OA \cdot PD}{2}} = n$$

Dividing both numerator and denominator by  $OA \cdot OD$ , we have :

$$\frac{1}{OA \cdot OD + \frac{OA \cdot PD}{2}} = n$$

$$\frac{1}{OA \cdot OD} \cdot \frac{1}{1 + \frac{OA \cdot PD}{OA \cdot OD} \cdot \frac{1}{2}} = n$$

$$\frac{1}{1 + \frac{PD}{OD} \cdot \frac{1}{2}} = n$$

So, if  $n$  is given, the average rent on land which would yield the same amount of total rent as under share-cropping can be determined ( $AC$  being equal to  $OD$ ), and from it can be found the size of the holding corresponding to this rent.

Let us assume that  $OA$  in Diagram 4 corresponds to this size. For all

sizes of tenant holdings below  $OA$ ,  $OACD$  would be then less than  $OABE$ , and it would be greater only for larger holdings. This suggests that though the rent payable by tenants would be smaller under crop-sharing until this critical size is reached, and tenants would find it worthwhile to lease in land even beyond this point until their share is reduced to zero (i.e. when the size of their holdings is  $OM$ ), it would not be advantageous to the landowners to lease out land on a crop-sharing basis unless the size of holdings under the alternative system of fixed rents appears likely to be larger than  $OA$ .

But crop-sharing is usually regarded as an arrangement for coping with the risks of agricultural production and we must therefore drop the assumption of perfect certainty and see what difference it makes. If the uncertainty introduced is due to fluctuations in output (or prices) it should get reflected in the marginal-product-of-land schedule. The greater the uncertainty the higher would be the risk-premium attached, and so  $PM$  in Diagram 4 would in effect shift downwards. As can be seen from Diagram 5 such a shift will tend to reduce the critical size of tenant holdings at which the crop-sharing and fixed-rent systems would

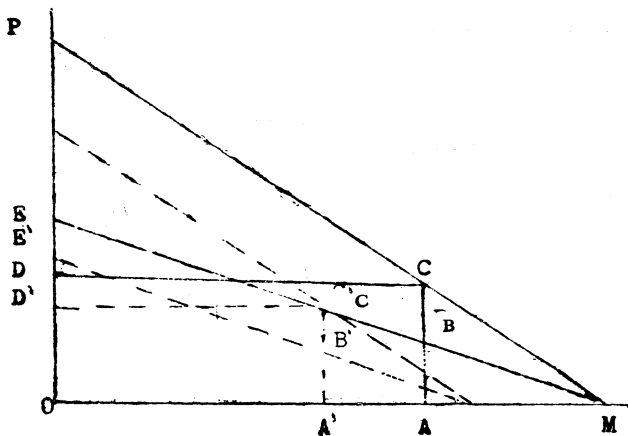


Diagram 5

yield the same total rent to the landowner. In other words, the higher the risk, the smaller would be the size of the tenant holdings above which it would be advantageous for the landowners to adopt crop-sharing.<sup>14</sup>

The risk-premium, needless to say, will depend not only on the change

14. In Diagram 5 we have allowed for risk by assuming an uniform absolute risk premium over the entire size-range, and this is what makes  $P'M'$  parallel to  $PM$ . In reality the risk-premium may vary for different-sized holdings and alter not only the position but the slope of  $PM$ , and this again would affect the critical size of holdings referred to above.

in the mean value of the expected output caused by random events but on the range of dispersion of the probable values. So even if the average expectation is the same in two regions the risk-premium will be higher in the region in which the amplitude of fluctuations happens to be greater.

Further, since the subsistence requirements of tenant households are in the nature of a fixed cost (or at any rate variable only within narrow limits), their ability to pay rent will vary more than proportionately with fluctuations in output and prices. The probability of default of rent on account of such variance is therefore likely to be greater under a fixed rent system. This again would work in favor of crop-sharing, particularly in the smaller size-range of tenant holdings.

The ability to pay rent under conditions of uncertainty raises, in fact, a larger issue which touches the core of the phenomena under discussion in this chapter. For the risks on account of unexpected changes in output and prices would affect not only the supply of land but also the demand for it. Those who have little or no land of their own might be prepared to lease in land even if the risks are considerable, since the risks associated with the alternative courses open to them appear to be even greater; in their case, therefore, the main constraint—at least within a certain size-range—would be the willingness of landowners to lease out land to them. But operating households that have more land or other assets of their own, and which they could lose, would be concerned with at least maintaining intact the equity element in their capital and would therefore avoid borrowing either land or other capital requirements (including finance) for their enterprises to a point where unexpected debt-wealth positions might actually reduce this equity element.

In other words, just as business firms normally seek to maintain a 'safe' debt-equity ratio in their portfolios, operating households in agriculture might want to preserve a certain ratio between leased-in and owned land. This ratio would depend on the degree of uncertainty regarding output and prices in the given situation; on the extent to which the prevailing system of leasing exposes tenant households to unexpected debt-wealth positions; on the compensations it offers for the risks borne; and on the rest of the items affecting their portfolio balance such as the amount of other liabilities incurred (by borrowing of finance for short and long-term purposes) and the value of the money balances and other liquid assets held.

Obviously the risk of the equity element being reduced by the variance of output and prices would be greater for tenant households under a fixed-rent system. If the rents are fixed in kind, variations in the product

price would not of course affect the real burden of the rental obligations, but such a system would be difficult to administer if there is more than one product (which is why it is generally adopted only when the choice open in regard to the product-mix is either limited by natural factors or can be restricted by agreement). If on the other hand rents are fixed in cash, the risk that tenant households are exposed to might be considerable—the extent of the risk depending on the variability of output and prices of the products concerned—and could act as a serious disincentive to leasing in land unless the anticipated rates of return on the land leased in are high enough to compensate for this risk. Crop-sharing however reduces the risk greatly, since the rent payable varies with the quantity and value of output, though like the system of rents fixed in kind it becomes difficult to administer when there is a wide choice of products.

In sum, crop-sharing might be advantageous to landowners under widely different conditions. If land is available in plenty, the supply of labor is given, and tenants have to be induced to lease in more land, crop-sharing will not only provide this inducement (up to the point that the marginal product of land is zero) but will yield a larger total rent to the landowners than a system of fixed rents. It may therefore be preferred even when uncertainty is not the decisive factor governing the choice. Alternatively, crop-sharing could become attractive without these conditions being satisfied if the extent of variance of production and prices is considerable for climatic or other reasons and exposes both landlords and tenants under the fixed-rent system to a high degree of risk of default. The greater the concentration in the ownership of land, and the more the aversion of the landowners to bearing the risks of production, the more extensively crop-sharing is likely to be resorted to in such situations to induce others to lease in land.

This possibility of crop-sharing being advantageous to landowners under widely different conditions is probably what explains the persistence and widespread prevalence of crop-sharing not only in the less developed agrarian economies but in countries like the United States until recently. It is significant that in most regions in which both fixed (cash) and share-renting systems have been found together in the United States the farms leased in under the former tended to be smaller in area.<sup>15</sup> Moreover, the share-rented farms were larger despite the rental return per acre to the

15. Earl O. Heady, *Economics of Agricultural Production and Resource Use* (1952), p. 597. Apart from the greater risk of the equity element in the capital of tenants being reduced under the fixed rent system and this restraining them from leasing in land extensively, a crop-sharing tenant can with advantage rent land until the marginal product of the land  
(Contd . . .

landowners being higher on these farms<sup>16</sup>—which is what one would expect if, on the assumptions underlying Diagram 5, the size of the tenant holdings exceeds  $OA'$ .

This does not of course mean that crop-sharing is likely to be found only in regions which satisfy either of the two sets of conditions outlined above. As a traditional system of taxation *cum* rent payment—adopted originally perhaps for its flexibility and administrative convenience, and before markets had developed in land, labor or even in commodities to any significant extent—it tends to persist in the less developed agrarian economies until the factors which gave rise to it are materially altered. But the implication is that, even when agrarian economies get commercialized and the taxation aspect of the levy recedes into the background, the shift to a system of fixed rent (whether in kind or in money) is likely to proceed slowest in the regions where the conditions specified above are satisfied.<sup>17</sup> Moreover, whatever the specific circumstances responsible for the persistence of crop-sharing, the tendency under the system would be to encourage more land to be leased in than under a system of fixed rent and for labor to be applied less intensively to any given area of leased-in land.<sup>18</sup>

rented is zero. The land-owners will of course try to curb this latter tendency under crop-sharing by placing constraints and conditions of various kinds to force more intensive application of other inputs to the land leased out by them. (See D. Gale Johnson, "Resource Allocation under Share Contracts", *The Journal of Political Economy*, Vol. LVIII, February-December 1950.)

16. *Ibid.*, Heady, p. 631.

17. In the United States the decline of share-cropping in the last three decades has been due primarily to mechanization of agriculture and changes in the crop pattern reducing labor requirements. In the early 1930's, areas like the Mississippi Delta in the South were dominated by share-croppers hand-picking cotton and corn and dependent on mule-powered cultivation. By stages most of the operations were mechanized in the subsequent period, and the relatively labor-intensive crops like cotton and corn were also substituted to some extent by labor-saving crops like soyabbeans. "... the decision to invest in machinery also meant a decision to change the status of the share-cropper . . . . (The) consequence (of complete mechanization) was to eliminate virtually all hand labor except for the summer weeding and fall harvesting seasons. This meant that the maintenance of share-croppers the year round became uneconomic. Instead, a combination of resident wage labor and labor hired from nearby villages was favoured." See Richard L. Dav, "The Economics of Technological Change and the Demise of the Share Cropper", *The American Economic Review*, Vol. LVII, No. 3, June 1967. Mechanization is likely to have had the same effect on share-leasing in the United States by increasing the optimal size of the holdings.

18. Inoptimality in the allocation of resources can of course be checked to some extent if (1) shortage of land is a serious constraint and sets low ceilings to tenant holdings, (2) if the marginal disutility of effort happens to be zero and tenant families will therefore work up to the point where the marginal product of labor becomes zero, (3) landowners are in a position to impose on tenants lease contracts specifying in detail what they are required to do and to grant only short-term leases to them which could be terminated if the contracts are not fulfilled, and (4) landlords share in expenses to the same extent as in output. *Op cit.*, Gale Johnson. See also James O. Bray, "Farm Tenancy and Productivity in Agriculture: The Case of the United States", *Food Research Institute Studies* (Stanford University), Vol. IV, No. 1, 1963.



## VI

The upshot of the analysis of the preceding sections is that even if there are no economies of scale, and no differences in the fertility of the soil or in the amount of family labor within households, there may be considerable differences in the size of operational holdings due to essentially institutional factors such as a high degree of concentration in the ownership of land, imperfections in the market structure (such as oligopoly and oligopsony), and the effect of uncertainty (more particularly the risk of default of rent) on the preferences of wealth holders.

The preference of landowners for leasing land out to larger tenant holdings would however tend to be counteracted by the cost they have to bear in the form of cuts in the average rent chargeable. The extent of such cuts would depend mainly on the rate of decline of the marginal productivity of land as the size of operational holdings is increased in relation to a given stock of labor; for the steeper this decline the larger would normally have to be the cut in average rent required to make it worthwhile for tenants to lease in larger holdings. Differences in the rate of decline of the marginal productivity of land should therefore get reflected not only in the scale but in the direction of land transfers through leasing.

The marginal productivity of land would decline faster the greater the intensity of the labor input required for production, which in turn depends on the choice of products and the associated technology. In general, when labor is short relatively to the available land, the choice of products shifts in favor of those that are relatively labor-saving—to the extent of course that shifts in this direction can be sustained by the size of the market for the products concerned.<sup>19</sup> On the other hand, when land is short relatively to labor, it becomes worthwhile to shift in favor of products which are more labor-intensive if the demand for them is adequate to yield a high value productivity per unit of land.<sup>20</sup> One should

19. An example is the preference for using land for livestock production in countries of Latin America with abundant land resources; this is sustained largely by the considerable demand for livestock products from North America and Europe. The tendency to use land for maintaining livestock, in preference to crop production, is evident also in large operational holdings in countries in which land is not so abundant relatively to labor; but when the market for these products is relatively small the scope for shifts in land-use in this direction becomes limited, and even such land as is devoted to the maintenance of livestock is not infrequently an efficient use of resources dictated by a particular size-distribution of holdings.

20. The best example of such a product is rice; until a stage of development is reached when relative factor prices make it economically efficient to substitute capital for labor the technology of rice cultivation tends to be highly labor-intensive. Sugarcane and jute are also close approximations to rice as crops requiring intensive input of labor and for which demand is high enough to warrant shifts of land to them when there is adequate supply of labor.

then expect the marginal productivity of land to decline rapidly as the size of operational holdings is increased with a given stock of labor and this in turn to weight the scales in favor of leasing to smaller-sized holdings.

In other words, when the physical and market conditions are favorable for the choice of products requiring intensive input of labor, transfers of land to small tenant holdings might take place counteracting to some extent the forces working in the opposite direction. The preference for small-sized holdings would get further strengthened if climatic factors and/or the availability of irrigation narrow also the range of variation of output and thereby reduce the risk of default of rent. One could therefore expect to find the concentration of land in the larger-size groups of operational holdings to be lower in regions with these characteristics even if the concentration in the ownership of land in these regions happens to be greater.<sup>21</sup>

However (as noted earlier), steeply falling marginal productivity of labor implies that the increments to output that can be secured by applying more labor to large-sized operational holdings would also be large. If therefore the landowning households should still choose to keep large holdings of their own for other reasons (as for fear of not being able to regain possession of the land when needed),<sup>22</sup> or if their risk-aversion is so great that they choose to reduce the average rent and lease out land to only the larger tenants, the larger operational holdings so constituted would have considerable incentive to employ wage labor from households with little or no land to cultivate unless the risk attached to the employment of hired labor happens to be high. This means that, if under these conditions land is not leased out to small-sized tenant holdings, capitalist farming<sup>23</sup> could also develop more easily and the limits to the size of operational holdings would then be set only by the problems of manage-

21. With less variability of output and higher value productivity land is likely to be an even more preferred asset (compared to other assets that could be held) in such regions; the degree of concentration in the ownership of land may therefore reflect more fully the concentration of wealth in these societies and be greater than in other regions.
22. Inability to regain possession of the land would affect the marketability of the asset and might not only reduce such liquidity as is attached to it but expose the owner to the possibility of capital loss. This is why the possibility of land reform giving a greater degree of security to tenants and/or the right to purchase the land from the owners at stipulated prices leads to eviction of tenants and to the owners seeking to cultivate the land themselves with hired labor.
23. Capitalist farming connotes here farming based on regular employment of workers at a wage, irrespective of their number, with the employer undertaking the risks of production as well as the supervisory responsibilities. If the employment of wage labor is only for short periods (such as for seasonal operations) or if the labor is not free to seek employment elsewhere (as in the semi-feudalist type of estates and plantations) the institutional set-up cannot really be described as capitalist.

ment of hired labor and such constraints as there are on substitution of labor by capital.

But even in regions where there is an abundant supply of labor, products that do not require intensive input of labor may be chosen because climatic and soil conditions offer no other alternative or because these products are remunerative.<sup>24</sup> In that case, the marginal productivity of land might not decline sharply over a considerable size-range of holdings and the landowners can lease out land to larger tenant holdings without suffering a significant cut in the average rent realizable. If the risks of production due to the variability of output and prices happen to be also greater in the case of these products, the tendency to prefer larger tenants would be further strengthened. Under conditions such as these, arrangements like crop-sharing would be advantageous to landowners by helping to overcome the risk-aversion of tenants and inducing them to lease in more land.

If the marginal productivity of land does not fall rapidly, the compulsion to hire labor would be also correspondingly weaker. This means that under these conditions a large supply of labor seeking wage employment would tend to lower the wage-rate sharply till those who have land to operate find it worthwhile to employ them. If the variance of output and prices happens to be also considerable the employers might in this kind of situation prefer to fix payments to labor in kind and as pre-determined proportions of total output in order to minimize the risks borne by them—in which case the arrangement might not be easily distinguishable from that of crop-sharing tenancy.<sup>25</sup>

## VII

Detailed data are available in India on the size-distribution of ownership and operational holdings in different zones as well as on the percentages of area leased in and leased out in different size-groups, on the mode of rent payment (i.e. whether fixed in kind, fixed in cash, fixed

24. For instance, areas with limited availability of water can produce only 'dry' crops like oilseeds, tobacco and millets; some of these crops—particularly tobacco and some of the oilseeds—could however be more remunerative than crops requiring more intensive input of labor.
25. "The line of demarcation between the share-croppers who are mere tenants at will and the agricultural workers who are employed on crop share basis is rather thin." *Agricultural Wages in India*, Vol. I, Report of the Agricultural Labour Enquiry of 1950-51, Ministry of Labour, Government of India, 1952, p. 29. The percentage share of agricultural workers employed on crop-sharing basis is however often lower than of tenants.

on a proportional crop-sharing basis, or on other terms), and the nature of the leasing arrangements (i.e. whether they are based on formal contracts or on informal understandings). Since the conditions vary significantly from zone to zone, it is possible to test to some extent the validity of the hypotheses outlined in this chapter by examining the inter-zonal differences in the scale, direction and the form of land transfers revealed by these data. Admittedly the zones in respect of which the data are available are still too aggregated to be wholly satisfactory for this purpose, since they often encompass regions with different climatic and soil conditions, land tenure systems, etc. Nevertheless, some of the zones have sufficiently clear and contrasting characteristics to warrant such a comparative study; and moreover, data on certain aspects of leasing of land are available also for individual States, some of which are more homogeneous in character than the large zones of which they are a part. We shall therefore present below very briefly some of the more significant features relating to leasing of land revealed by these data, with supporting material on related issues.

Table 2 shows by size of holding the percentage distribution of the total operational holdings in India, reporting land owned and leased in, and of the area owned and leased in by them.<sup>26</sup> It will be seen that (a) the size-distribution of holdings reporting land leased in corresponds closely to the size-distribution of households reporting owned land (there being a significant difference only in the case of holdings in the size-group 0.01—0.04 acres, which are more likely to be holdings used for residential constructions than for cultivation); and (b) the percentage share of the different size-groups in the total area leased in also corresponds closely to their percentage share in the total area owned.

But though there is close correspondence for India taken as a whole—which supports our initial observation that the extent to which agricultural households lease in land seems to be related to the area of land they own already—there are some striking differences between zones in the extent of such correspondence. This will be evident from Table 3 which shows the percentage share of broad size-groups in the total area

26. Source of data: The National Sample Survey, No. 74, *Report on Land Holdings (5); Rural Sector (Some Aspects of Operational Holdings—Population Zones and All India)*, Appendix III, Table 78 (Cabinet Secretariat, Government of India).

TABLE 2  
 PERCENTAGE DISTRIBUTION OF THE NUMBER OF THE TOTAL  
 OPERATIONAL HOLDINGS REPORTING AREA OWNED AND  
 LEASED IN, AND OF CORRESPONDING AREAS OWNED  
 AND LEASED IN, BY SIZE OF OPERATIONAL  
 HOLDING IN INDIA, 1954-55

Holding size (acres)	Percentage of households reporting		Percentage of area operated	
	Land owned	Land leased in	Land owned	Land leased in
0.00	—	—	—	—
0.01— 0.04	11.45	18.52	0.04	0.11
0.05— 0.09	3.38	2.78	0.04	0.05
0.10— 0.49	7.38	6.60	0.30	0.46
0.50— 0.99	6.72	6.32	0.70	1.07
1.00— 1.49	6.20	5.93	1.09	1.63
1.50— 2.49	10.48	9.87	2.94	4.10
2.50— 4.99	18.31	17.76	9.44	12.35
5.00— 7.49	10.79	10.05	9.67	10.68
7.50— 9.99	6.85	6.05	8.68	8.66
10.00— 14.99	7.03	6.01	12.77	11.34
15.00— 19.99	3.90	3.49	9.92	9.89
20.00— 24.99	2.12	1.80	7.02	6.10
25.00— 29.99	1.49	1.24	6.01	4.93
30.00— 39.99	1.59	1.45	8.19	7.62
40.00— 49.99	0.87	0.84	5.58	6.04
50.00— 74.99	0.89	0.79	7.75	6.98
75.00— 99.99	0.30	0.28	3.52	3.48
100.00—249.99	0.23	0.20	5.01	3.43
250.00—499.99	0.02	0.02	1.00	0.37
500.00 and above	0.00	0.00	0.33	0.71
<i>Total</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>	<i>100.00</i>

leased in by operational holdings in the different zones.<sup>27</sup>

27. Source of data: *Ibid.*, The National Sample Survey, No. 74, Appendix III, Tables 79-84. A more detailed table based on the same source is given in the Statistical Appendix at the end. "North-West India" covers the States (as existent prior to their reorganization in 1956) of Rajasthan, Punjab, Pepsu, Jammu and Kashmir, Ajmer, Delhi, and Himachal Pradesh; "Central India" of Madhya Pradesh, Madhya Bharat, Hyderabad, Bhopal and Vindhya Pradesh; "West India" of Bombay, Saurashtra and Kutch; "North India" of Uttar Pradesh; "East India" of Bihar, Orissa, West Bengal, Assam, Manipur and Tripura; and "South India" of Travancore-Cochin, Coorg, Andhra, Madras and Mysore.

TABLE 3  
PERCENTAGE DISTRIBUTION OF AREAS OWNED AND LEASED IN BY SIZE  
OF OPERATIONAL HOLDINGS IN THE DIFFERENT POPULATION ZONES OF  
INDIA, 1954-55

Holding size (acres)	North West India		Central India		West India	
	Owned	Leased in	Owned	Leased in	Owned	Leased in
0.01— 7.49	12.4	13.1	10.6	12.7	11.7	17.5
7.50—24.99	36.5	41.1	35.9	40.1	38.3	37.8
25.00—49.99	23.1	23.9	26.2	28.8	29.3	24.8
50.00 and above	28.1	21.9	27.3	18.4	20.7	20.9
<i>All holdings</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

Holding size acres	North India		East India		South India	
	Owned	Leased in	Owned	Leased in	Owned	Leased in
0.01— 7.49	45.3	65.9	44.9	62.9	33.3	50.7
7.50—24.99	41.1	27.2	41.7	27.8	39.2	31.9
25.00—49.99	10.4	2.9	8.9	3.7	15.0	9.7
50.00 and above	3.2	4.8	4.4	5.5	12.5	7.6
<i>All holdings</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

It will be seen that while in North-West, Central and West India the share of the larger holdings in the total area leased in is nearly as high as their share in the total area owned, it is much lower in North, East and South India.

The tendency in some regions for small holdings to be much more dependent on leased-in land than large holdings, and in other regions for large holdings to be relatively almost as dependent (if not more) on leased-in land as small holdings, will be evident also from Table 4 which shows leased-in land as a percentage of the total area operated in each size-group in a few selected States in India.<sup>28</sup>

28. Source of data: The National Sample Survey, No. 66, *Report on Land Holdings (4), Rural Sector—States*, Appendix III.

**TABLE 4**  
**PERCENTAGE OF LEASED-IN LAND TO TOTAL OPERATED AREA IN**  
**DIFFERENT SIZE-GROUPS OF OPERATIONAL HOLDINGS IN**  
**SELECTED STATES OF INDIA, 1954-55**

<i>Size of holdings (in acres)</i>	<i>Punjab (N. W. India)</i>	<i>Rajasthan (N. W. India)</i>	<i>Madhya Pradesh (Central India)</i>	<i>Bombay (W. India)</i>
0.01— 0.99	32.6	28.6	37.4	27.3
1.00— 2.49	35.5	28.5	22.8	32.1
2.50— 4.99	35.1	22.6	20.7	30.2
5.00— 7.49	40.1	17.8	14.2	30.2
7.50— 9.99	49.5	26.3	13.0	23.4
10.00—14.99	45.6	19.0	20.8	22.4
15.00—19.99	32.8	21.6	23.7	29.2
20.00—24.99	40.6	21.8	17.8	22.1
25.00—29.99	36.2	17.8	21.5	24.3
30.00—49.99	48.3	19.7	20.4	28.1
50.00 and above	29.9	21.3	14.4	28.6
<i>All holdings</i>	<i>40.4</i>	<i>20.9</i>	<i>18.6</i>	<i>26.8</i>

<i>Size of holdings (in acres)</i>	<i>Uttar Pradesh (N. India)</i>	<i>Bihar (E. India)</i>	<i>W. Bengal (E. India)</i>	<i>Andhra Pradesh (S. India)</i>	<i>Madras (S. India)</i>
0.01— 0.99	22.3	26.9	30.5	25.7	42.0
1.00— 2.49	18.2	22.2	28.3	29.2	36.6
2.50— 4.99	16.3	20.7	32.9	23.5	35.1
5.00— 7.49	12.5	14.9	33.8	27.2	29.9
7.50— 9.99	8.0	7.3	28.6	24.5	28.6
10.00—14.99	8.0	6.9	17.8	17.1	8.0
15.00—19.99	7.2	5.6	10.1	16.6	7.2
20.00—24.99	8.2	3.6	6.6	16.1	8.2
25.00—29.99	2.6	4.7	13.0	22.1	12.7
30.00—49.99	4.1	2.5	4.2	13.4	17.8
50.00 and above	16.2	7.0	5.5	10.3	23.9
<i>All holdings</i>	<i>11.4</i>	<i>12.4</i>	<i>25.4</i>	<i>19.1</i>	<i>27.5</i>



There is also evidence that the average household size and the number of permanent farm servants employed increase more rapidly with the size of operational holdings in zones in which there is a greater concentration of operational holdings in the smaller size-groups and more land is leased in by them (we shall refer to them as Zonal Group A) than in the zones in which large proportions of both owned and leased-in area are accounted for by the bigger size-groups of operational holdings (to be referred to hereafter as Zonal Group B). Table 5 presents the available data on the average household size<sup>29</sup>, and Table 6 on the number of permanent farm servants employed in the different size-groups of operational holdings.<sup>30</sup>

TABLE 5  
AVERAGE HOUSEHOLD SIZE BY SIZE OF HOUSEHOLD OPERATIONAL  
HOLDINGS IN INDIA, 1954-55

Size of house- hold operational holding (in acres)	Average household size					
	N. W. India	C. India	W. India	N. India	E. India	S. India
0.00	4.24	3.66	4.00	3.89	3.29	4.00
0.01— 0.99	4.09	3.99	4.28	4.16	4.13	4.20
1.00— 2.49	4.54	4.16	4.70	4.84	4.91	4.99
2.50— 4.99	5.14	4.62	5.17	5.22	5.44	5.35
5.00— 7.49	5.29	5.02	5.53	6.16	6.10	5.82
7.50— 9.99	5.49	5.42	5.99	6.46	7.03	6.44
10.00—14.99	5.88	5.45	6.01	6.89	7.68	6.44
15.00—19.99	6.26	5.66	6.89	7.70	8.57	7.10
20.00—24.99	6.52	6.04	6.52	7.96	9.42	7.53
25.00—29.99	6.50	6.17	7.07	8.48	9.81	8.52
30.00—49.99	6.82	6.56	7.12	7.83	10.72	8.99
50.00 and above	7.35	7.96	8.95	7.13	10.54	10.52
<i>All holdings</i>	<i>5.16</i>	<i>4.76</i>	<i>5.23</i>	<i>5.07</i>	<i>5.09</i>	<i>4.90</i>

29. *Ibid.*, The National Sample Survey, No. 74, p. 48, Table 5.9.

30. *Ibid.*, The National Sample Survey, No. 74, p. 70, Table 5.

**TABLE 6**  
**AVERAGE NUMBER OF PERMANENT FARM SERVANTS BY SIZE-**  
**GROUPS OF OPERATIONAL HOLDINGS FOR DIFFERENT**  
**POPULATION ZONES IN INDIA, 1954-55**

<i>Holding size</i>	<i>Number of permanent farm servants per 1000 operational holdings</i>					
	<i>N. W. India</i>	<i>C. India</i>	<i>W. India</i>	<i>N. India</i>	<i>E. India</i>	<i>S. India</i>
0.01— 2.49	32	11	22	17	19	14
2.50— 4.99	34	61	35	47	85	124
5.00— 7.49	36	110	55	114	179	229
7.50— 9.99	19	128	58	163	297	444
10.00—14.99	54	211	89	355	545	523
15.00—19.99	81	334	147	478	919	847
20.00 and above	167	1145	396	1083	1414	1725
<i>All sizes</i>	<i>59</i>	<i>255</i>	<i>109</i>	<i>90</i>	<i>122</i>	<i>157</i>

This suggests that enlargement in the size of holdings creates a larger demand for labor in the former zonal group than in the latter, presumably because the marginal productivity of land tends to fall more rapidly in one case than in the other as more land is applied to a fixed stock of labor. If this presumption is correct the conditions in Zonal Group A conform more closely to those in which, according to our earlier analysis, land-owning households would prefer to lease out to small tenants in spite of the higher risk-premium that might be attached to leasing out land to them; the conditions in Zonal Group B, on the other hand, approximate to those in which the probability is that the preferred size of tenant holding would be much larger than in the absence of risk of default of rent even if the risk-premium attached on this account happens to be itself low.

It seems probable that the risk attached to leasing out (and leasing in) land is also higher in Zonal Group B than in Zonal Group A. For, a high percentage of the area in East and South India has heavy and fairly assured rainfall while a large part of North-West, Central and even West India is relatively dry; and there is some evidence that the coefficient of variation of rainfall bears an inverse relationship to the level of normal

rainfall.<sup>31</sup> Moreover, the percentage of total operated area under irrigation is much higher in North, South and East India than in Central and West India.<sup>32</sup> The product-mix selected in the areas with limited rainfall and irrigation may of course be less sensitive to variations in the supply of water than the product-mix in areas with more abundant rainfall and irrigation, but again there is some empirical evidence that, though this could be the case in some regions, the variation in productivity per acre is generally greater in the former.<sup>33</sup>

There is however no clear indication of share-cropping as a system of tenancy being more widely prevalent in zones in which agricultural production appears to be exposed to greater uncertainty (one could argue that it enables the tenants to share the risks with the land-owning families unlike in a fixed rent system) or of its being more widely prevalent in which there is relatively less uncertainty (since the argument could be turned also the other way around and it might be contended that the system is likely to be adopted more in areas where tenants have greater

31. C. H. Hanumantha Rao, "Entrepreneurship, Management, and Farm Tenure Systems", unpublished paper presented at the Agricultural Economics Workshop of the Department of Economics, University of Chicago, on February 2, 1967.

32. The percentage of area under irrigation in agricultural holdings in the different zones in 1953-54 was as follows: North-West India: 16.3; Central India: 5.3; West India: 5.2; North India: 34.0; East India: 15.5; and South India: 24.3. The National Sample Survey, No. 74, Table 4.5.

33. *Op. cit.*, C. H. Hanumantha Rao.

<i>State and Zone</i>	<i>Normal rainfall (in inches)</i>	<i>Coefficient of variation of rainfall, 1950-62</i>	<i>Coefficient of variation in pro- ductivity, 1952-62</i>
Kerala (South)	116.4	1.8	0.94
West Bengal (East)	89.0	1.7	3.53
Punjab (North-West)	24.0	3.2	1.47
Assam (East)	92.0	1.3	3.94
Madras (South)	38.4	1.7	1.60
Mysore (South)	42.0	4.1	3.71
Maharashtra (West)	34.8	4.0	7.41
Andhra Pradesh (South)	33.6	6.8	3.36
Madhya Pradesh (Central)	48.0	4.0	7.49
Orissa (East)	57.6	3.2	7.82
Rajasthan (North-West)	19.2	8.8	2.37
Gujarat (West)	37.2	10.1	12.88
Uttar Pradesh (North)	38.4	6.2	3.50

capacity to bear the risks).<sup>34</sup> Table 7 presents the available data on the percentage shares of the different systems of tenancy in India in the various zones.<sup>35</sup>

TABLE 7  
PERCENTAGE SHARES OF DIFFERENT SYSTEMS OF RENT IN INDIA  
IN THE TOTAL AREA LEASED IN, 1954-55

Zone	Area leased in as % of area operated	Proportionate crop rent area as % of area leased in	Fixed crop rent area as % of area leased in	Cash rent area as % of area leased in
North-West	26.5	38.0	2.9	33.3
Central	18.7	37.7	3.4	37.7
West	22.4	32.7	9.7	32.6
North	11.4	27.6	4.6	36.5
East	20.1	49.6	8.3	29.4
South	21.9	26.0	22.4	39.3

It will be seen that the zone in which the area leased in on proportionate crop rent basis as a percentage of the total area leased in is highest (East India), as well as the zone in which it is lowest (South India), fall in Zonal Group A and in both cases cover regions with a relatively low coefficient of variation of rainfall.

Moreover, as will be evident from Table 8, the percentage of area leased in on proportionate crop rent basis does not in all cases increase with the size of the operational holdings<sup>36</sup> as one might expect if the prevalence of this system of leasing were positively correlated with the capacity of tenants to bear risks. In East India, in particular, the percentage of area leased in on proportionate crop rent basis is significantly higher in the smaller size-groups of holdings than in the larger.

34. "The incentive for shifting uncertainty through crop-sharing would exist only where the scope for entrepreneurship is limited and where the tenants can bear uncertainty. The capacity for bearing uncertainty may itself be determined by the yield levels and their variance. It thus turns out that crop-sharing arrangements are extensive under relative economic certainty and fixed contractual payments where the degree of uncertainty is high." *Op. cit.*, Hanumantha Rao.
35. Source of data: The National Sample Survey, No. 74, Appendix III, Tables 121 to 126. Apart from proportionate crop rent, fixed crop rent and cash rent, some land is shown as leased in on "other terms" and "on unspecified terms"; they account for the residual in all the zones.
36. Source of data: The National Sample Survey, Report No. 74, Appendix III, Tables 121 to 126.

TABLE 8  
 AREA RENTED IN ON PROPORTIONATE CROP RENT AS PERCENTAGE  
 OF THE TOTAL AREA LEASED IN BY DIFFERENT SIZE-GROUPS OF  
 OPERATIONAL HOLDINGS IN INDIA, 1954-55

<i>Size of operational holding (in acres)</i>	<i>North-West India</i>	<i>Central India</i>	<i>West India</i>	<i>North India</i>	<i>East India</i>	<i>South India</i>
0.01— 0.99	24.4	18.8	27.2	16.8	36.6	13.7
1.00— 2.49	37.0	16.1	25.2	28.0	59.8	23.0
2.50— 4.99	37.0	21.6	27.7	33.1	59.4	27.5
5.00— 7.49	40.7	30.8	23.1	32.0	58.8	27.8
7.50— 9.99	50.6	33.8	24.7	40.8	53.6	22.8
10.00—14.99	4.74	35.8	26.9	23.0	42.9	29.4
15.00—19.99	43.6	36.0	31.2	25.0	29.3	30.6
20.00—24.99	39.9	46.0	24.3	13.9	35.1	31.3
25.00—29.99	38.9	38.9	33.5	21.4	24.0	32.1
30.00—49.99	37.3	44.8	31.8	2.1	8.0	29.4
50.00 and above	23.7	38.6	49.7	—	0.7	17.7
<i>All holdings</i>	<i>38.0</i>	<i>37.7</i>	<i>32.7</i>	<i>27.6</i>	<i>49.6</i>	<i>26.0</i>

It is also clear that, though the land leased in on crop-sharing basis tends to form a larger proportion of the area rented in through informal agreements than of the area rented in through formal contracts, the difference between these proportions is generally not any greater in the small-sized holdings than in the larger. Given below in Table 9 are the data for Central and East India<sup>37</sup>—the former a zone in which the area leased in on crop-sharing basis (both through formal contracts and otherwise) as a percentage of the total area leased in rises with the size of holdings, and the latter a zone in which it falls with the size of holdings.

37. Source of data: The National Sample Survey, No. 74, Appendix III, Tables 122 and 125. The total area rented in without formal contract forms 54.2 per cent of the total area leased in in Central India and 53.7 per cent in East India.

**TABLE 9**  
**AREA LEASED IN ON PROPORTIONATE CROP RENT BASIS AS**  
**PERCENTAGE OF THE TOTAL AREA LEASED IN THROUGH**  
**FORMAL CONTRACTS AND INFORMAL AGREEMENTS**  
**RESPECTIVELY IN CENTRAL AND EAST INDIA, 1954-55**

<i>Size of operational holding (in acres)</i>	<i>Area under PCR leased in through formal contracts as % of total area leased in through formal contracts</i>		<i>Area under PCR leased in through informal agreements as % of total area leased in through informal agreements</i>	
	<i>Central India</i>	<i>East India</i>	<i>Central India</i>	<i>East India</i>
0.01— 0.99	6.3	21.4	4.1	78.0
1.00— 2.49	11.1	39.4	40.4	84.5
2.50— 4.99	22.8	33.8	34.9	80.5
5.00— 7.49	27.1	33.7	52.9	86.5
7.50— 9.99	8.6	25.7	56.6	86.2
10.00—14.99	22.8	23.6	54.2	77.7
15.00—19.99	17.4	11.6	60.5	81.9
20.00—24.99	30.8	32.8	65.0	82.9
25.00—29.99	35.7	5.7	53.7	70.0
30.00—49.99	31.6	2.8	59.2	46.2
50.00 & above	25.6	—	66.1	0.8
<i>All sizes</i>	<i>25.3</i>	<i>24.8</i>	<i>58.1</i>	<i>75.6</i>

The high percentage of the area leased in on proportionate crop rent basis by small operational holdings in East India cannot therefore be attributed simply to a greater desire on the part of the land owners to avoid formal contracts.

A more plausible explanation is that both the high density of population and the intensive input of labor required for the crops grown in this zone make for small-sized holdings<sup>38</sup> and the scope for product and factor substitution is perhaps less than elsewhere. Crop-sharing could therefore be relatively more acceptable to the tenants—since the risks that would have to be borne by them would be less than under a fixed rent

38. Rice accounts for over 65 per cent of the total area under agricultural holdings in East India compared to less than 6 per cent in West and North-West India, about 14 per cent in Central India, less than 20 per cent in North India and about 25 per cent in South India (see the National Sample Survey, No. 74, Table 4.9). Rice-growing not only requires intensive input of labor but the land devoted to it tends to have a high degree of specificity of use. Jute, which is the main alternative to rice in East India, also requires intensive input of labor.

system—as well as to the landlords, since the disincentive effects of crop sharing on tenants is less likely to result in a significant reduction of labor and other inputs.<sup>39</sup>

It is significant however that in South India—where land is leased out on a large scale to small tenant holdings—over 60 per cent of the total area of land leased in by all holdings is on a fixed (cash or kind) rent basis (see Table 7). Land leased in on fixed rent is also fairly evenly spread as between the big and small size-groups of operational holdings. In other words, the small size of holdings does not by itself prevent tenants from leasing in land on this basis and bearing the risks involved. It is also important to note that it is in this zone that the number of permanent farm servants employed increases most rapidly as the size of the operational holdings increases (see Table 6), which indicates that the larger holdings have the incentive here to employ wage labor on a bigger scale. The large scale on which land is leased out from large to small holdings in East India (resulting in no more than one-eighth of the total

39. “The relative fixity of crop pattern and of factor proportions may provide an incentive for land owners to shift uncertainty through share-renting, because the tenants cannot bring down the marginal product of land to any significant extent by varying the amounts of other inputs. In situations where factor proportions can be varied significantly, the incentive to shift uncertainty may still exist if share-tenants cannot restrict labor input by readily moving a part of it into alternative uses.” *Op. cit.*, Hanumantha Rao.

It must however be added that, even in regions in which greater product substitution appears possible, crop-sharing is widely prevalent. Thus investigations undertaken in Madhya Pradesh (Central India) show that a high proportion of the total area leased in on share rent basis was under cotton, oilseeds and other cash crops.

“...the cropping pattern in the area was more or less independent of the size of holdings. On the average, about half of the cultivated area was under food crops. Out of the area under cash crops about 80 per cent was under cotton and about 12 per cent under oilseeds. In the smaller size of holding, the proportionate area under cereals was a bit less than in other groups. This leads one to infer that the subsistence needs of the cultivator play little part in determining his crop pattern in this tract...But the cropping pattern was a bit different in the area leased-in for cash rent and that which was owner-cultivated or leased-in for share rent. Out of the area leased-in for cash rent, 60 per cent was under food crops and only about 30 per cent under cotton. While in the owner cultivated land or that leased-in on share rent basis about 50 per cent of land was under food and about 40 per cent under cotton. Oilseeds have been grown proportionately to the largest extent on the land leased-in for share rent and to the proportionately smallest extent of that leased-in for cash rent.” *Studies in the Economics of Farm Management in Madhya Pradesh, Report for the Year 1956-57*, by P. N. Mathur (published by the Ministry of Food and Agriculture, Government of India), pp. 9-11.

Similarly, studies conducted in Bombay (West India) reveal that, though the regions investigated had only a very small proportion of cropped area under rice and wheat, the bulk of the land leased in was taken on share rent. *Studies in Economics of Farm Management in Bombay, Report for the Year 1955-56*, by P. N. Driver and D. K. Desai, p. 8, Table 2.7.



operated area being in operational holdings of more than 25 acres in size) and the high proportion of land leased in on a crop-sharing basis in this zone cannot therefore be explained simply in terms of the risks involved in production compelling the landowners to share them in part with tenants than bear all the risks themselves. The phenomena found in East India are perhaps rooted to some extent in other historical factors specific to the region affecting both the system of land tenure and the attitudes of the larger landowners in regard to the use of land.<sup>40</sup>

In contrast to both East and South India stand Central and North-West India. In these zones, not only does the bulk of the land leased out go into medium and large-sized holdings but, as noted earlier, the percentage of area leased in on crop-sharing basis rises with the size of holdings. The number of permanent farm servants employed also increases only to a small extent as the operational holdings become larger in size. Moreover, a certain proportion of such farm servants appears to be 'attached labor' remunerated mainly in terms of a fixed share of the produce (not on a regular cash wage basis) and therefore not easily distinguished from crop-sharing tenants.<sup>41</sup>

40. It is perhaps not without significance that "Greater Bengal" is the only region of British India in which the output of foodgrains and of other crops declined over the period 1891-1947. See George Blyn, *Agricultural Trends in India, 1891-1947: Output, Availability and Productivity* (1966), Chapter V. Whether this is the cause or the effect of the institutional set-up in agriculture in this region is not clear and needs to be investigated further.
41. "The line of demarcation between the share croppers who are mere tenants at will and the agricultural workers who are employed on crop share basis is rather thin." *Agricultural Wages in India, Volume I, Report of the Agricultural Labour Enquiry of 1950-51*, Ministry of Labour, Government of India, 1952, p. 29.

In 1950-51, 'attached' agricultural labor households formed nearly 25 per cent of all agricultural labor households in Madhya Pradesh (Central India), 54 per cent in Punjab (North-West India), and 18 per cent in Rajasthan (North-West India) and Bombay (West India). However, in Madras (South India), they formed only 1½ per cent of the total, in West Bengal (East India) 9 per cent, in Mysore (South India) 5 per cent, in Uttar Pradesh (North India) 10 per cent, and in Bihar (North India) 1 per cent.

It would also appear that there are significant differences in the method of payment of this labor. For instance, in Madhya Pradesh, under the system most widely prevalent, "attached laborers are employed on a definite contract and they get 25 per cent of the produce"; moreover, "they are not paid any perquisites". In the Punjab too attached laborers under some of the systems "get one-fifth of the total produce and perquisites like meals", and "if the attached laborers use their own bullocks for cultivation purposes the share is increased to one-third of the produce"; there are however also other systems in vogue involving a fixed remuneration.

In Madras, on the other hand, payment of a fixed daily wage is the rule rather than the exception: "Attached laborers are given small strips of land for self-cultivation free of rent on condition that they should work on employer's farms whenever required. Bullocks and other implements are supplied by the land-holder and the attached workers are paid daily wages which are lower than the wages paid to casual laborers." The position is similar in Andhra Pradesh where attached laborers are employed generally on contract on a fixed annual wage.

SOURCE: *Agricultural Labour in India: Report on the Second Enquiry, Volume I—All India* (Labour Bureau, Ministry of Labour and Employment, Government of India), Statement 4.2. and pp. 75-86.

These, as we have seen, are characteristics one might expect in regions in which intensive input of labor is not called for (either because natural factors make it wasteful or because the product-mix chosen does not require such intensive input) and there is also considerable uncertainty attached to production. But if these features are altered by, say, large-scale investment in irrigation (as in the Punjab in North-West India), and if either adequate labor is not available (due to relatively low density of population) or the big operational holdings attach a considerable risk-premium to the employment of hired labor on a larger scale, one could expect more intensive cultivation of land to develop along with the adoption of labor-saving techniques of production.

K. N. RAJ

PERCENTAGE DISTRIBUTION OF ESTIMATED NUMBER OF TOTAL OPERATIONAL HOLDINGS REPORTING AREA OWNED AND AREA LEASED IN AND OF CORRESPONDING AREAS OWNED AND LEASED IN BY SIZE OF OPERATIONAL HOLDING

Holding size (acres)	North-West India						Central India						West India					
	Percentage of holdings reporting		Percentage of area operated		Percentage of holdings reporting		Percentage of area operated		Percentage of holdings reporting		Percentage of area operated		Percentage of holdings reporting		Percentage of area operated			
	Land owned	Land leased in	Owned	Leased in	Land owned	Land leased in	Owned	Leased in	Land owned	Land leased in	Owned	Leased in	Land owned	Land leased in	Owned	Leased in		
(1)	(14)	(15)	(17)	(18)	(14)	(15)	(17)	(18)	(14)	(15)	(17)	(18)	(14)	(15)	(17)	(18)		
1. 0.01—0.04	5.58	7.27	0.01	0.01	13.30	18.18	0.02	0.07	8.49	12.87	0.02	0.02	8.49	12.87	0.02	0.02		
2. 0.05—0.09	2.21	1.42	0.02	0.01	2.38	3.08	0.01	0.04	1.34	1.34	0.01	0.01	1.34	1.34	0.01	0.01		
3. 0.10—0.49	3.22	2.34	0.07	0.06	4.02	3.68	0.08	0.15	2.69	2.04	0.08	0.15	2.69	2.04	0.07	0.08		
4. 0.50—0.99	2.85	2.23	0.11	0.18	2.68	3.24	0.15	0.33	3.52	3.09	0.15	0.33	3.52	3.09	0.23	0.29		
5. 1.00—1.49	3.74	3.66	0.39	0.44	3.07	2.90	0.30	0.52	3.95	4.66	0.30	0.52	3.95	4.66	0.42	0.73		
6. 1.50—2.49	8.00	6.81	1.30	1.33	5.65	5.62	0.89	1.37	7.90	8.74	0.89	1.37	7.90	8.74	1.30	2.16		
7. 2.50—4.99	15.52	15.39	4.68	5.25	11.86	11.91	3.46	4.84	14.88	15.08	3.46	4.84	14.88	15.08	4.32	6.27		
8. 5.00—7.49	11.43	10.62	5.73	5.81	10.85	9.82	5.69	5.42	10.40	11.82	5.69	5.42	10.40	11.82	5.31	7.91		
9. 7.50—9.99	10.06	11.99	6.47	8.98	9.70	8.07	6.78	6.42	8.57	8.15	6.78	6.42	8.57	8.15	6.22	6.95		
10. 10.00—14.99	12.50	12.95	11.89	13.19	11.09	10.40	11.02	11.90	11.61	8.97	11.02	11.90	11.61	8.97	12.01	10.19		
11. 15.00—19.99	8.25	8.74	11.20	11.31	7.52	7.03	10.28	13.20	7.66	7.45	10.28	13.20	7.66	7.45	10.44	13.09		
12. 20.00—24.99	4.04	4.27	6.91	7.59	4.42	4.10	7.79	8.54	5.21	4.02	7.79	8.54	5.21	4.02	9.64	7.52		
13. 25.00—29.99	2.92	2.85	6.22	5.56	3.44	2.95	7.60	7.48	3.55	2.80	7.60	7.48	3.55	2.80	7.80	6.17		
14. 30.00—39.99	3.49	3.71	9.47	9.93	3.89	3.63	10.59	11.86	4.19	3.55	10.59	11.86	4.19	3.55	12.66	10.91		
15. 40.00—49.99	2.08	2.24	7.36	8.44	2.31	2.17	8.05	9.45	2.47	2.15	8.05	9.45	2.47	2.15	8.86	7.72		
16. 50.00—74.99	2.35	1.83	11.58	8.67	2.31	2.04	11.01	9.99	2.39	2.10	11.01	9.99	2.39	2.10	11.11	10.81		
17. 75.00—99.99	0.92	1.02	5.53	5.68	0.75	0.63	5.16	4.35	0.75	0.70	5.16	4.35	0.75	0.70	4.98	4.39		
18. 100.00—249.99	0.77	0.61	8.52	6.19	0.71	0.47	8.78	3.94	0.40	0.40	8.78	3.94	0.40	0.40	4.12	4.66		
19. 250.00—499.99	0.07	0.05	1.65	1.37	0.04	0.08	1.60	0.13	0.03	0.00	1.60	0.13	0.03	0.00	0.48	0.12		
20. 500.00 and above	0.00	—	0.81	—	0.01	0.00	0.74	0.00	—	—	0.74	0.00	—	—	—	—		
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		

Holding size (acres)	North India				East India				South India			
	Percentage of holdings reporting		Percentage of area operated		Percentage of holdings reporting		Percentage of area operated		Percentage of holdings reporting		Percentage of area operated	
	Land owned	Land leased in	Owned	Leased in	Land owned	Land leased in	Owned	Leased in	Land owned	Land leased in	Owned	Leased in
	(14)	(15)	(17)	(18)	(14)	(15)	(17)	(18)	(14)	(15)	(17)	(18)
0.00	—	—	—	—	—	—	—	—	—	—	—	—
0.01-0.04	12.51	10.26	0.07	0.13	8.89	18.71	0.06	0.22	16.61	28.90	0.08	0.29
0.05-0.09	3.54	1.58	0.06	0.06	5.11	4.53	0.10	0.16	2.86	2.14	0.05	0.05
0.10-0.49	6.35	5.80	0.40	0.90	11.98	10.44	0.80	1.25	8.38	7.69	0.54	0.97
0.50-0.99	8.15	9.83	1.34	3.10	8.93	7.89	1.62	2.37	8.17	7.39	1.25	2.23
1.00-1.49	7.96	8.89	2.23	4.53	7.13	6.18	2.19	2.93	7.37	7.46	1.76	3.69
1.50-2.49	13.37	14.60	6.13	9.97	11.22	10.94	5.31	8.09	12.13	10.65	4.81	8.20
2.50-4.99	21.93	25.77	18.34	27.77	21.53	21.54	18.67	28.22	17.32	14.95	12.64	18.37
5.00-7.49	11.35	11.45	16.75	18.59	10.82	10.15	16.19	19.63	9.92	8.57	12.19	16.89
7.50-9.99	5.53	4.25	12.00	8.11	5.45	4.08	11.87	10.97	5.95	4.99	10.73	11.63
10.00-14.99	4.93	4.39	15.13	10.28	4.89	3.28	15.41	10.14	4.86	3.41	12.61	10.58
15.00-19.99	2.09	1.55	9.09	5.47	1.81	1.25	8.86	5.31	2.39	1.41	9.18	5.47
20.00-24.99	0.87	0.63	4.88	3.37	0.89	0.40	5.56	1.57	1.33	0.77	6.67	4.26
25.00-29.99	0.60	0.39	4.32	0.90	0.53	0.24	3.84	1.83	0.82	0.54	4.89	3.55
30.00-39.99	0.50	0.25	4.40	0.96	0.37	0.19	3.52	1.15	0.84	0.47	6.44	3.35
40.00-49.99	0.15	0.11	1.68	1.07	0.13	0.06	1.56	0.68	0.39	0.24	3.62	2.83
50.00-74.99	0.11	0.14	1.57	1.84	0.16	0.08	2.70	0.70	0.40	0.28	5.21	4.22
75.00-99.99	0.04	0.07	0.73	2.33	0.03	0.00	0.64	0.31	0.14	0.08	2.53	1.51
100.00-249.99	0.02	0.04	0.88	0.62	0.01	0.02	0.51	0.04	0.11	0.06	3.74	1.88
250.00-499.99	—	—	—	—	0.01	0.00	0.59	0.00	0.01	0.00	1.06	0.03
500.00 and above	—	—	—	—	0.01	0.02	0.00	4.43	—	—	—	—
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

SOURCE: The National Sample Survey, No. 74, Report on Land Holdings (5), Rural Sector (Some Aspects of Operational Holdings — Population Zones and All India), Tables 79-84.

## ERRATA

P. 4, 3rd line from below

Read “For Household Y” *instead of* “For Household X”

P. 17, Diagram 4, legend on the vertical axis

Read “ODEP” for “OOEP”

P. 59, against the authors’ names insert

“Delhi School of Economics, University of Delhi”

P. 61, last line

Read “P(•)” for “P<sub>0</sub>”

P. 84, equation (5)

Read “ $\Delta E = \frac{1}{1-c(1-t)} \cdot \Delta g - \frac{c(1-t)}{1-c(1-t)} \cdot T = \Delta B$ ”

for “ $\Delta E = \frac{1}{1-c(1-t)} \cdot \Delta g - \frac{c(1-t)}{1-c(1-t)} \cdot T = \Delta B$ ”

P. 98, 3rd line from top

Read “**will**” for “will”

P. 109, 5th line from top

Read “ases” for “asses”

P. 125, 3rd line from below

Read “implementation” for “implemation”

P. 134, 12/13th lines from top

Read “N.S.S. data for Rounds. . .” *instead of* “N.S.S. data for retail Rounds. . .”

P. 137, footnote, last line

Read “in October, 1967” for “I October 1967”