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**INSTITUTE OF ECONOMIC GROWTH**

*Occasional Papers No. 2*

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**DISTRIBUTION OF THE MARKETED SURPLUS OF  
AGRICULTURAL PRODUCE BY SIZE-LEVEL OF  
HOLDING IN INDIA: 1950-51**

**INSTITUTE OF ECONOMIC GROWTH**

***Occasional Papers***

1. *Petroleum Industry and the Third Plan* by P. N. Dhar
2. *Distribution of the Marketed Surplus of Agricultural Produce by Size-Level of Holding in India: 1950-51* by Dharm Narain
3. *University Education and Employment—A Case Study of Delhi Graduates* by V. K. R. V. Rao

*Distribution of the  
Marketed Surplus of  
Agricultural Produce by  
Size-level of Holding  
in India*

*1950-51*

*Dharm Narain*



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## *Foreword*

As part of its research programme, the Institute of Economic Growth proposes to bring out, from time to time, a series of occasional papers setting out some of the results of the research work of its staff and scholars. These papers will mainly concentrate on some of the major current economic problems of India.

This paper by Shri Dharm Narain is the result of the research work he undertook as junior research fellow in the Institute. It deals with one of the most obscure problems in the Indian economy, namely, the distribution of marketed surplus of agricultural produce by size of agricultural holdings. In the absence of a census of agricultural production and disposal by holdings, the author has had to fall back on a series of indirect data furnished by the National Sample Surveys on land holdings, and family expenditure, the Agricultural Labour Inquiry, the Farm Management Surveys, the Rural Credit Survey, the National Income Committee and contributions by individual writers. A great deal of intellectual and statistical ingenuity has been shown in the manner in which the miscellaneous statistical material has been linked together and made to yield the final results, which constitute an original contribution to the literature on Indian Economics. The caution must be added that greater reliance attaches to the proportions and percentages by size distribution of holdings that the study arrives at rather than the absolute magnitudes of either production or retention or surplus.

The significant result that emerges from Shri Dharm Narain's study is the mixed character of the marketed surplus in terms of its response to changes in agricultural prices and incomes. Thus, marketed surplus as a proportion of the value of produce declines up to the 10-15 acre size-group, after which it records a steady increase. Holdings below 5 acres account for 24.9 per cent or 26.0 per cent of the entire marketed surplus, according to the two alternative estimates given by the author, corresponding

figures for holdings between 5 and 10 acres being 16.4 per cent and 20.5 per cent respectively. On the other hand, what may be called the large holdings, i.e., those of over 30 acres account for 35.0 per cent or 27.1 per cent of the entire marketed surplus. If we place the size of the economic holding at 15 acres and above, the proportion of marketed surplus accounted for by economic holdings comes to 53.6 per cent or 45.6 per cent according to the two alternative estimates given by the author. It is clear therefore that, broadly speaking, only half of the marketed surplus is what may be called a commercial surplus, while the other half is what may be called a *distress surplus* or a surplus that is necessitated by the basic cash obligations of the agricultural producer rather than by the excess of his production over his desired consumption. In other words, part of the marketed surplus would show normal economic response to price changes and give the supply curve a forward-sloping character, while part of the surplus is likely to show negative response to changes in price and give the supply curve a backward-sloping character. The finding that these two diametrically different kinds of surpluses constitute almost equal proportions of the marketed surplus of agricultural produce explains the complexity of the behaviour of agricultural production and disposals in response to price changes and underlines the difficulties inherent in formulating an appropriate price policy for agricultural produce, especially foodgrains, in India. Incidentally, it also lays at rest the ghost constantly raised in connection with land ceilings, namely, that a reduction in the size of the larger holdings will automatically reduce both agricultural production and agricultural disposals in India.

The many assumptions that Shri Dharm Narain makes in the course of his study and the ingenious statistical devices that he has used to bring order out of his composite data will certainly not command universal approval and may indeed cause some controversy. But I have no doubt that his broad findings about the nature of the marketed surplus do have validity. In any case, it is a pioneering attempt at tackling a vexed problem in our rural economy, and the Institute will be satisfied even if it only leads to further thinking and research on what is undoubtedly

a crucial factor in the understanding of our agricultural structure and the formulation of an appropriate agricultural policy.

*June 1961*  
*Institute of Economic Growth*  
*Delhi 6*



*Director*



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## *Introductory\**

This is an effort at estimating the proportions in which holdings in different size-groups contribute to the value of the agricultural produce marketed. The enquiry is suggested by the need to analyse the effect of changes in cultivators' incomes on marketed surplus. When these changes in incomes are occasioned by changing prices, our estimates will also give an idea of the likely distribution of this income between different households, based as it would be on their relative share in the total value of the agricultural produce marketed. And the "income effect" will be different according as the major fraction of the increase (or decrease) is shared by the upper or the lower income classes.

\* This revised version of an earlier draft owes many improvements to Professor Simon Kuznets, Harvard University.

## The Concept

Agricultural produce here refers to the produce of crop husbandry. Marketed produce refers to that which enters monetised exchange. Marketed surplus is restricted to only the quantities *cultivating families* market. It excludes, for instance, not only what is paid to landless agricultural labour in kind but also that part of it which eventually flows back to the market. It is thus to be distinguished from the surplus which actually enters the market and more so from the surplus that becomes available to the urban<sup>1</sup> consumer. It is useful to recall here that since cultivators buy back later in the year a part of what they market soon after the harvest, the term 'marketable surplus', often denotes the surplus that is net of the "buy back". The concept of marketed surplus here adopted, distinct from that of marketable surplus, includes the "buy back".

For an individual cultivating family production receipts form only a part of its total receipts of agricultural produce in kind, the other part consisting of kind payments received from other cultivating families. And, its marketed surplus is the difference between its total receipts and total retentions.

Information on the total receipts of cultivating families by size-level of holding being not available, we must explore the concept further.

Since the non-production receipts of agricultural produce of one cultivating family must necessarily be a part of the kind payments of another, such payments and receipts, in the aggregate, cancel themselves out. For the sum total of all cultivating families, therefore, marketed surplus reduces itself to the difference between the total value of agricultural produce and such part of

<sup>1</sup> Urban here includes the foreign consumer.

their total retention as is not occasioned by kind payments made to cultivating classes.

For the families comprising a holding size-group such cross-cancellation may not, indeed it seldom will, be complete. Whereas, all such intra-group payments and receipts will, all intergroup payments need not, cross-cancel. Intergroup payments do completely offset only to the extent of reciprocal give and take. And, all payments by a group to another in excess of the receipts from that other group are defined "net outflows". By the same token, all receipts by any group from another in excess of payments to that group are defined "net inflows." Marketed surplus of each holding size-group then resolves itself into its total agricultural produce minus that part of its retention which is not occasioned by payments made to cultivators plus "net inflows" (minus "net outflows").

We must categorise the items of retentions<sup>1</sup> accordingly.

<sup>1</sup>This list of retentions is not exhaustive. Producers' stocks and kind loans, apparently of minor importance, have been ignored.

Where carryover of the stocks from the preceding year is equal to the carryover into the ensuing, retentions for stocks of the current year can be ignored. It is only when there is a difference between them that the net change needs to be taken into account. A significant change, however, may be expected only when there is a considerable difference between the harvests of the two years or their prices. Since in the year 1950-51, the year considered here, compared to 1949-50, changes were not large in either respect, agricultural production in 1950-51 being a little below and agricultural prices not much above those of 1949-50, retentions for stocks have been ignored.

As for kind loans, the data pertaining to those districts where grain loans are important (*All India Rural Credit Survey: The Survey Report*, Vol. I, Part I (Rural Families), table 8.12, p. 343) suggest that we place the value of grains borrowed during the year 1951-52 at Rs. 35/- per family. And since on average the quantity repaid exceeds the quantity borrowed by about 30 per cent (*ibid.*, p. 330), the excess repaid works out to Rs. 10/8 per family.

The quantities borrowed and repaid within the same year do not concern us. Not only most kind loans are of short duration, repaid within a twelve month period (*ibid.*, p. 330), but also a high percentage of them are repaid within the same agricultural year (*ibid.*, p. 345). And since the quantities outstanding at the end of the current year are not likely to significantly diverge from those outstanding at the end of the preceding

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Agricultural production is retained for:

- (a) the consumption of the family.
- (b) the consumption of the livestock maintained by it.
- (c) its seed requirements.
- (d) kind payments to artisans and other miscellaneous purposes.
- (e) payments of kind wages to agricultural labour.
- (f) payments of kind rents.

Since a large number of agricultural labourers are small sized cultivators also, and many a rent receiver also an occupier, a fraction of payments made to them emerges as non-production receipts of agriculturists, so that (e) and (f) fall in one category, and all the rest in another.

Having a breakdown of neither the value of output nor that of retentions by holding size-groups, we have perforce to begin with the overall estimates of their total values. This implies a twofold task: of apportioning the total values between holding size-groups on the one hand and effecting the breakdown of utilisations into purchased and owned (retained) components, on the other. Of the two, it is the search for the bases of apportionment which involves the more difficult questions of method. To an exploration of these, therefore, we now turn.

year, unless either of the years happens to be abnormal, kind loans have been ignored.

Having estimated the retentions an expost justification for the same was secured in the fact that the excess embodied in debt service worked out to only 1½ per cent of the retentions considered here and since this figure is based on the value of grains borrowed per family in districts where grain loans are important, the actual percentage may well be lower.

## *Bases of Apportionment*

The distributions both of total produce and total retentions are likely, in varying measures, to be associated, often directly, sometimes indirectly, with the distribution of cultivated area between size-groups of holdings. Distribution of produce is a function partly of area and partly of per acre output of different size holdings. Production inputs and retentions induced by them are partly dependent upon the area cultivated and partly upon factors which cause per acre variations in them. Consumption of a family is more directly conditioned by its size and its annual income. But we find a persistent and positive correlation between the size of the holding and that of the family, although increases in the family size are far more modest compared to increases in the size of the holding. One would expect therefore not only larger family, but also larger "per capita", incomes to accompany larger holdings. The distribution of the total cultivated area therefore comes to constitute the major plank on which our estimates need to rest.

Our interest then lies in the distribution of the total area held for agricultural purposes by size-level of operational, rather than ownership, holding. This information is available from the NSS on land holdings.<sup>1</sup> Its major shortcoming derives from the fact that the term operational holding refers here not only to an agricultural operational holding but includes non-agricultural lands<sup>2</sup> and covers purely non-agricultural holdings also. The difficulty is less serious than it appears at first sight. For apart from the fact that they occupy a very small fraction of the total area, pure-

<sup>1</sup> The NSS, *First Report on Land Holdings, Rural Sector, Eighth Round: July 1954-March 1955.*

<sup>2</sup> Such as house-sites, brickfields, cultivable waste, pastures, barren land etc.

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ly non-agricultural holdings belong to the lowest size-groups, so that if we exclude them, "the household operational holding is likely to be an agricultural holding and may roughly be considered to be the same as the 'cultivators' holding".<sup>1</sup> A comparison with similar distribution available from the Report of the Agricultural Labour Enquiry,<sup>2</sup> shows that "if one restricts to holdings of size, say, greater than 0.1 acre then the proportions of holdings in different size-classes are more or less in agreement between the two enquiries."<sup>3</sup> Unlike the Agricultural Labour Enquiry, the NSS gives the size and distribution of the number of households by size-level of holding, an information we vitally need. We have, therefore, used the data of the NSS, after excluding holdings of less than 0.1 acre.<sup>4</sup>

To pick up a previous thread, although associated with it, neither output nor retentions are an exclusive function of holding size, much less can they be assumed to vary in proportion to it. If they did so vary there would be no per acre variations in them between size-groups of holdings. And, the apportionment of aggregate output and retention between the several size-groups would then, based on the proportionate share of each size-group in total area, be a relatively simple matter.

Since this proportionate relationship cannot be assumed, information on how output and retentions on a per acre basis vary with the size of holding becomes necessary. By far the most extensive, albeit far from adequate, information on these is available in the several Reports of Farm Management Surveys.

This information derived from a sample of farms is available for six centres each located in a typical region of India and falling within one of the six population zones into which the country is divided. The sample for each region is drawn from two con-

<sup>1</sup> *op. cit.*, p. 38.

<sup>2</sup> *Rural Manpower and Occupational Structure*, pp. 522-23.

<sup>3</sup> The NSS, *First Report on Land Holdings*. Rural Sector, Eighth Round: July 1954-March 1955, p. 39. It may be of further interest to note in this connection, that the percentage distribution of the total cropped area, available from the Second Round of the NSS, is more or less similar to the distribution of the total operated area from the Eighth Round used here.

<sup>4</sup> The data is set out in the Statistical Appendix, Table 1.

typical districts selected in such a way "that they represent the most important and typical soil crop complexes in the state concerned and these six regions taken together represent the major cropping patterns in the country."<sup>1</sup> The patterns and relationships (to the exclusion of absolute magnitudes) disclosed in these surveys have, appropriately averaged, been treated here as representative of all India conditions.

This information relates to production inputs and, therefore, bears only on retentions occasioned by them. These surveys provide no information on the values retained for family consumption and it must be obtained elsewhere.

From NSS<sup>2</sup> data on consumer expenditure we get itemised information on the consumer expenditure of rural households by size-levels of total consumer expenditure. From this the agricultural produce components of their consumption can be estimated, if we assume, what only seems reasonable to assume, that the value of this component in the consumption of the cultivating households varies with the level of total expenditure in about the same way as does that of the rural households in general.

If then we knew the levels of expenditure associated with different holding size-groups we could tie up the value of this component with the values of gross produce and other retentions belonging to each holding size-group. It is here we come up against a sizeable difficulty, for the relationship which obtains between holding size-groups and expenditure levels we do not know.

But although we do not know this exact relationship we can safely assume a property of it: *that rising levels of per capita expenditure will be associated with increasing size of per capita holding.* This simple property is found on reflection to be highly significant. The starting point of this reflection is grounded in the fact that exactly that same population which lies interspersed between different size-groups of holdings also lies interspersed between different expenditure classes. And, this fact gives us a common denominator to tie them up with.

<sup>1</sup> *Studies in Economics of Farm Management in U.P.*, Report for the year 1954-55, p. iii.

<sup>2</sup> NSS, Fourth Round: April-September 1952.

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The argument may be developed with the aid of an illustration. Let all occupiers stand in an ascending order of their holdings and mark off their respective positions on a straight line. Now let them rearrange themselves in an ascending order of their total expenditures along the same line. Inasmuch as a rise in expenditure is associated with an increase in the size of holding, each one of them is bound to find himself in his old place. Alternatively put it implies that whether we rank the occupiers by the size of their holding or the level of their expenditure, the rank of each individual must remain the same. Each position on our line (OX) is now associated with two values (measured along OY), one pertaining to the holding size and the other to the expenditure level of one and the same occupier. And since both values are related to the same occupier they stand related to each other. We know now the expenditure which corresponds to each holding.

The fact that information on the distribution of population is available by expenditure, and holding, size-groups creates, in principle, no difficulty for what is true of individuals is true of the groups. Indeed the validity of the assumption is reinforced when we deal not with individuals but with groups. The fact that the proportions of the total population (measured along OX) belonging to different holding size-groups need not be, in fact are not, the same as the corresponding proportions for different expenditure groups, when both are arranged in an ascending order, only introduces the additional step of obtaining a smooth curve of expenditure such that the area enclosed by the perpendiculars drawn on OY from any two points on the smooth curve gives the total expenditure of the population represented by the intercept of OX lying between the perpendiculars.<sup>1</sup>

The solution which in principle is obtained with one assumption needs in practice another: that the 'cultivating population' with which we are here concerned is distributed between different expenditure groups in the same proportions in which the total rural population is distributed between them. This is not likely to be entirely true. For the non-cultivating population may not

<sup>1</sup> See pp. 23-24.

be distributed between different expenditure classes in exactly the same proportions in which the cultivating population is distributed between them. Indeed if we include landless labour in the former category, there is evidence to suggest that compared to the cultivating, the non-cultivating population clusters more heavily in the lower income (and therefore the lower expenditure) classes. Nevertheless our assumption derives its essentially reasonable character from the fact that cultivating population constitutes the major bulk of the rural population and the non-cultivating population is distributed between occupations of varying earning capacities. And so long as this latter fact is broadly true, the precise difference in the quantitative distributions of the cultivating and non-cultivating populations loses in significance and our assumption gains in validity in the measure that our cultivating population enlarges its weight in the total. This then is a consideration which must figure along with others, in a decision regarding the coverage of our term "cultivating families".

The task presents certain complexities. For if we classify the population on the basis of its principal means of livelihood, a great many from the class of agricultural labourers would automatically stand excluded, even when they cultivate, in however small a measure, on their own account so that their consumption would include a retained component. Similarly many from the class of non-agriculturists who practise cultivation as a subsidiary source of income would stand excluded. Again, if we confine ourselves to only rural population cultivators who reside in urban areas will be eliminated. Each of these classes account for certain proportions of cultivators' (operational) holdings and include within their consumption a retained component. There is, of course, no ambiguity about that class of cultivators (owning or not owning land) who derive their principal income from cultivation and reside in rural areas. And, this is the hard core which must account for an overwhelming proportion of the total that our concept, however defined, must necessarily include. Decisions in regard to the inclusion of one class or the exclusion of another thus belong to the periphery. On principle we should include all the three categories, although we have here included only the first two, not the last. The reason for its exclusion is in the fact

that the data, both on consumer expenditure as well as land holding, cover only the rural sector, thus leaving us uninformed about the holding size-groups and expenditure classes in which the urban component of the cultivating population lies. We have included instead landless agricultural labourers. Their inclusion may appear paradoxical but, without doing violence to our objective, it is possessed of an advantage. Their exclusion would increase the difference between the expenditure group-wise distribution of the cultivating and non-cultivating population. And, since they constitute a numerically significant class, their inclusion enhances the validity of our assumption, and makes our estimates of per capita consumption of cultivators in the larger holding size-groups bear a closer approximation to reality. On the other hand, its capacity to vitiate the estimates can be negated completely. Secure in the knowledge of having placed them in the lowest holding size-group, we apply to that group's total consumption a retention ratio in the framing of which we assume landless labour to retain nothing for self-consumption at the same time as we allow to the consumption of others a weight which corresponds to their numbers.

Let us now turn to the class of retentions represented by the net outflows or inflows of each holding-size category.

To begin with wage payments, since agricultural labour belongs entirely to the lowest holding size-group, payments of kind wages do not enter into the kind receipts of any other category. For these other categories then the net outflows of kind wages are the same as their gross wage outflows. Like all other holding size-groups the total wages paid in kind by the lowest holding size-group are known. We could, if we knew its total receipts of kind wages, calculate its net inflows on this score. Since wages paid out by other categories are received in by this class, this quantity—outflows in kind wages of all other categories—would appear to be known also. This, however, is not correct, for a substantial part of total kind wages goes to landless agricultural labourers. We have already excluded their retentions by assuming the retained fraction of their consumption to be zero, in arriving at the overall retention ratio for the lowest holding size-group. Their kind receipts must be excluded also. One

half of agricultural labourers being landless,<sup>1</sup> only a half of the total wages paid in kind by 'other' holding size-groups has, therefore, been treated as the gross inflow and only a half of what is paid by the lowest holding size-group as the gross outflow, of this holding-size category.

Turning to kind rents we run up against a more serious difficulty. As an approximation the net amounts of kind rents paid out or received in by the several holding size-groups may be assumed<sup>2</sup> to vary in proportion to the net area leased in or leased out by them. By dividing the total amount paid in kind rent (an estimate of which is available) by the total area leased in by all size-groups taken together, we could calculate kind rent per acre. By multiplying this with the net area leased in or leased out by each holding size-group, we could then arrive at the required estimates. Our problem stems from the fact that information on the net areas leased in or leased out by size-groups of holding is not available.

If we knew, for each size-group of operational holding, the total areas operated and owned, the net area leased in or leased out could be calculated. But whereas total operated area is available by size-groups of operational holding, total owned area is available by size-groups of ownership holding and there appears to be no reasonable way of marrying the two. There is no reason to believe that the total owned area in a size-group of ownership holding is the same as the total area owned by households which belong to the same size-group of operational holding. A household which does not own may yet operate a holding. A landless household belonging to the class of zero ownership holding can, by leasing in, move into any size-group of operational holding, even as a big land owner can lease out all his land and enter the class of zero operational holding. And, what is true of a household is true of a group comprising a holding-size category. Indeed,

<sup>1</sup> cf. *Rural Manpower and Occupational Structure*, p. 9.

<sup>2</sup> The justification for this assumption derives partly from the fact that differences in per acre rents are more likely to be a regional rather than holding-size phenomenon (and with the former we are not concerned) and partly from the fact that the bulk of rents paid by this class of lessees (referred to later) are kind rents.

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that the two areas belong to two different sets of households is implicit in the difference in the number of households belonging to the same size-group of operational and ownership holdings. It is only through some assumption (and several variants are possible) to the effect that the total owned area of households belonging to an ownership category, who lease out so much as to drop out of the corresponding operational class, is equal to the total owned area of households who lease in enough to enter it, that the owned area of an ownership group can be identified with the total owned area of the corresponding operational category. Since the owned area which moves into one operational category moves out of another, a possible error arising as a result of such identification for one holding size-group will bodily become an error for the other. In the absence of a basis, therefore, to suggest that such discrepancies, in the case of individual holding-size categories, are not likely to be large, it is a drastic assumption to make.

Closer reflection once again suggests a way out. Since our interest lies in the total area owned by households belonging to an operational category, it rests in areas owned by operators, for else these owners would belong to zero operational category. Total area owned by owner-operators is available by size-group of 'owned area self-operated' holdings. But 'owned area self-operated' and operational size-groups are two different things: and, the problem of marrying them remains.

The problem arises because we cannot assume that the households belonging to an operational category necessarily belong to the corresponding 'owned area self-operated' class. If we could arrive at the numbers of those that do, we would know the numbers of those that belong to other 'owned area self-operated' categories. So that if we could identify the categories whence these latter come, we could, on the basis of their respective per household owned areas, estimate their total owned area, as also, on the same basis, the total owned areas of households that belong to the corresponding 'owned area self-operated' class. The two together would then give us the total owned area of an operational category.

*The clue to the solution is in the fact that although an owner*

*is free to move into any operational category, an owner-operator is not. An owner-operator is free to step into a higher operational category but not a lower one. This limitation is grounded in the definition of the 'owned area self-operated' class: an owner-operator belonging to it though free to lease in any area, can, by definition, not lease out enough to drop out of it.*

This unidirectional character of inter-operational group movement of owner-operators is of crucial significance, for it enables us to calculate the number of entrants into an operational category, i.e., numbers by which an operational group exceeds the total in the corresponding 'owned area self-operated' class. This we can do by starting from the highest 'owned area self-operated' size-group. Since this is the highest size-group and since households belonging to it cannot step into a lower operational category, it follows that they remain in the corresponding operational class. If we assume that the excess in this operational category is entirely fed by the owner-operator class just below it, we can subtract their number and total owned area from those of this latter 'owned area self-operated' category, as we add their total owned area to the owned area of those who already belong to the highest operational class. Thus the total owned area of the highest operational class and the number and total owned area of households who remain in the class just below it are simultaneously determined. In exactly the same way we move down the ladder and estimate the total owned area of each operational class. Total operated area being known, and owned area having been estimated for each operational category, the total net area leased in (or leased out) is now easily obtained.<sup>1</sup>

The assumption that the excess of households in each operational category is fed by the owner-operator class just below it seems reasonable since the capacity of a household to augment the size of its operational holding, by leasing in more land, is likely to be limited by its resources and, therefore, by the size of the holding it already owns and operates. One may argue that even in the case of actual operators, for whom it is advanced, the proposition that large resources and large owner-operated holdings will tend to go together, is not likely to be true, on the

<sup>1</sup> See pp. 29-31.

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ground that owners of land being generally disinclined to part with its ownership may not and generally will not part with it except under compellingly adverse circumstances so that cultivators with even large resources may remain content with operating only large rented and not owned holdings. This objection would be based on a misunderstanding, however. Under the definition adopted in the NSS—a definition helpful to our purpose and underlying our data—these big tenants with occupancy rights are owners. They are not included in our category of lessees and happily so for it is only this latter category which consists of sharecroppers and others who pay kind rents and in which, therefore, we are interested.

It is thus far more unrealistic to assume that the excess of a large operational size-group is fed by owner-operators belonging to a class which is very much further removed from it than to assume that it is fed by a class which is not so far removed. The wider the class-intervals, therefore—and our class-intervals seem reasonably wide in this context—the greater the probability that this assumption corresponds with facts.

For convenience, the basis of apportionment of retentions arising out of payments made to artisans and others is discussed later.<sup>1</sup>

Our estimates will now be framed in the following order:

- (a) We shall begin by obtaining the total values of each of the items involved in this estimation.
- (b) On the bases discussed above we shall apportion them between size-groups of holdings.
- (c) We shall derive and then apply retention ratios to the values so apportioned, to obtain, by holding size-groups, their retained components. This will be done for all items of retention except rents and payments made to artisans and others. The total kind payments pertaining to these latter will be directly apportioned.
- (d) Finally, by subtracting the total retention from the total value of output of each holding size-group, we shall arrive at the required estimates.

<sup>1</sup> p. 32.

## *Total Values of Output and Items of Retention*

The gross value of the agricultural produce of an agricultural year must be dovetailed with the values of retentions likely to take place out of the produce of that year. For livestock and human population consume during an agricultural year the produce partly of the previous and partly of the current agricultural year. Seed comes almost entirely from the previous year's crop. As for payment of kind wages, casual harvesting labour, being paid after the harvest, would be recompensed out of the current year's agricultural production but permanent labour would be paid from both the production of the previous and of the current agricultural year. This inevitable lack of synchronism between the periods of production and consumption gives rise to a twofold problem: that of obtaining a correspondence between the quantities produced and the quantities consumed or utilised out of them, and a valuational problem. The latter arises because the correspondence which can be assumed between the quantities produced and the quantities consumed can no longer be assumed when we pass from quantities to their values, the latter being the outcome of the price levels of two different periods. Since retentions must be valued at the same set of prices at which production is valued, the values of retentions when inferred from the values consumed, need to be corrected for changes in the price level that occur during the period which intervenes between production and consumption.

Considering all available data we have opted to proceed on the basis of the gross value of agricultural output for the year 1950-51. This value, adjusted for the lower value of procured

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food grains and for the net output of rice millings in factory establishments, has been estimated by the National Income Committee<sup>1</sup> at Rs. 4,805 crores. Adding to it 4 per cent of the adjusted value for non-reporting areas<sup>2</sup> we get Rs. 4,997 crores as the gross value of agricultural output. It is to the retentions out of this produce that our estimates must seek to approximate.

Since seed retained out of it is used in the ensuing agricultural year, there is the temptation to use the total value of seed input for this latter year, after subjecting it to value correction. Reflection suggests this procedure is possessed of only doubtful virtue. For the seed consumed during 1951-52 is a function partly of the area cropped and partly of the crops to which it is devoted in that year. At the time the retention decision is taken, neither is known. Both must be anticipated. The cultivators may retain in the current year more or less than they actually use in the following, the difference being made up by purchase in a year of excess requirement and by sale (or alternative consumption) in a lean year. Since requirements seldom are correctly anticipated, seed retained is likely to be the result of customary estimation, influenced by the state of the current year's harvest—a good year inducing the farmer to retain more and a bad year compelling him to retain less than the customary quantities. This consideration favours the use of the current year's figure valued at current year's prices. The total value of seed input for 1950-51, obtained from the Report of the National Income Committee, is Rs. 254 crores.<sup>3</sup> Adding to it 4 per cent of this value for non-reporting areas, we get Rs. 264 crores as the figure required here.

Casual labour (employed mostly at the harvest time and accounting for the major fraction of wages paid in kind) will be paid out of the produce of the current year. As for permanent labour, kind payments being customary are not likely to vary significantly with the state of the crops and, therefore, as between two successive years. In any case the total output (at constant prices) of the two years was about the same, the difference being around two per cent and for food grains still less, not exceeding

<sup>1</sup> *Final Report of the National Income Committee, 1954, p. 45.*

<sup>2</sup> On the same basis as is adopted in the estimates of national income.

<sup>3</sup> *op. cit.*, p. 45.

even 1 per cent.

*Index No. of Agricultural Produce*<sup>1</sup> (1949-50 = 100)

<i>Year</i>	<i>Food grains</i>	<i>All commodities</i>
1950-51	90.5	95.6
1951-52	91.1	97.5

Cash wages being sticky vary much less. It follows that the difference which matters, if we use the figure of 1950-51 rather than that of 1951-52, is likely to be the result mainly of the difference in the prices of these two years. And the prices relevant for valuation from our point of view being those of 1950-51, it is the figure of this year which is relevant for us. The total wages bill for hired agricultural labourers as estimated by the Agricultural Labour Enquiry Committee, for the year 1950-51, is Rs. 500 crores.<sup>2</sup> And this is the figure adopted here.

Turning to feed cost, once again the quantities fed to livestock are likely to be customary—almost entirely a function of the numbers to be fed and varying, except in abnormal years, only secondarily with the state of the crops. Since the years under consideration are about similar, and numbers are not likely to change significantly between two successive years,<sup>3</sup> the total quantities fed are also not likely to change much. Any significant difference between feed cost of these two successive years is therefore likely to be almost entirely the result of the difference in the prices of feed-stuffs between the two years. Again the prices relevant for us being those of 1950-51, we use the total feed cost also of this very year. The total feed cost for livestock maintained by the agriculturists is not available. But the total feed cost for all livestock, estimated on the basis of the total supply of fodder and concentrates, is available from the National Income estimates. This estimate for the year 1950-51 has been modified to yield an estimate of the former, on the following basis:

<sup>1</sup> *Indian Agriculture in Brief*, p. 30.

<sup>2</sup> *Agricultural Labour: How They Work and Live*, p. 21.

<sup>3</sup> Not until an extensive calamity abnormally enhances cattle mortality, a fact not true of the years considered here.

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The distribution of the total livestock population between rural and urban areas, available from the Livestock Census for 1945, shows that about 95 per cent of the total bovine population and 95.5 per cent of all livestock is confined to rural areas.<sup>1</sup> Of the 67 million estimated to be the total working animals in the country, 65.4 millions are used for cultivation in addition to their employment in other operations connected with agriculture. As for milch cattle about 95.8 per cent of milch cows and 94.3 per cent of milch buffaloes belong to rural areas.<sup>2</sup> Thus even when we make an allowance for the livestock maintained by non-cultivators, it appears safe to assume that about 90 per cent of the total livestock population is maintained by the cultivators.

Total feed cost of all livestock for 1950-51 is estimated by the National Income Committee at Rs. 768.2 crores.<sup>3</sup> Nine-tenths of it, i.e., Rs. 691 crores has, therefore, been taken as the relevant feed cost of livestock maintained by cultivators in India.

Turning to family consumption, output of the agricultural year 1950-51 becomes available only after the Kharif harvest of 1950 and has to last till the following Kharif. Total value of agricultural produce consumed during this entire period is not available. We have instead the data on consumer expenditure from the 2nd and 3rd rounds of the NSS carried out during April-June, 1951 and August-November, 1951, respectively. If the relevant data could be assumed to be reasonably free from the element of seasonality in consumption, the figures obtained from these could be inflated to arrive at an annual estimate. It will be seen from the following table that the figures of consumer expenditure, per person, on food grains including pulses, obtained from the 2nd and 3rd rounds, are close to each other and when we correct the figure from the 3rd round so as to correspond to the prices prevailing during the period of the 2nd round, the difference between the two almost disappears. The same is true of the figures of per person consumer expenditure on all food articles.

<sup>1</sup> *Livestock Census of India, 1945.*

<sup>2</sup> *cf. Report on the Marketing of Cattle in India, 1956, pp. 21-3.*

<sup>3</sup> *op.cit.*, p. 51.

*Total Values of Output and Items of Retention* 19

*Consumer Expenditure Per Person in Rupees (For 90 days)*

<i>Items</i>	<i>2nd round</i>	<i>3rd round</i>	<i>Figs. of 3rd round after correction for changes in prices</i>	<i>Index Nos. of Wholesale Prices (1939 = 100)</i>	
				<i>Mean April-June 1951</i>	<i>Mean August-November 1951</i>
Foodgrains	29.04	28.93	29.29	488.3	482.3
Pulses	2.96	2.83	2.86	507.3	501.3
<b>Total</b>	32.00	31.76	32.15		
All food articles	48.59	47.63	48.17	412.7	408.1

Revealing a very high order of stability<sup>1</sup> in consumption (when the effect of price changes is removed) these figures suggest that their use carries no risk of vitiation from seasonality. Since agricultural production between the years 1950-51 and 51-52 remained almost constant, it follows that consumption (at constant prices) for the period following Kharif harvest of 1950 can be assumed to be the same as that during April-June, 1951, following the Rabi harvest. In view of the fact that compared to the prices during April-June, 1951, the prices in the preceding period were somewhat higher and those in the succeeding period somewhat lower and the fact that the changes were in any case modest, no correction on this score seems necessary. The total of consumer expenditure on items of agricultural produce<sup>2</sup> as obtained from the 2nd round<sup>3</sup> and inflated to an annual basis comes to Rs. 174.7 per person.

<sup>1</sup> There is no suggestion in the above to the effect that there is any longer-term stability in the per person consumption of these items. The stability which emerges from the results of these two rounds appears to derive very largely from the near stability of the period in respect both of production and prices.

<sup>2</sup> The items included are foodgrains, pulses, edible oil, vegetables, fruits, spices, sugar, pan and tobacco. The fact that the values of some items includes the value added by processing need not disturb us for it is looked after by the retention ratio to be applied subsequently.

<sup>3</sup> NSS, 2nd Round: April-June, 1951, table (2), p 18.

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An estimate of the total rent paid in kind is available.<sup>1</sup> This estimate is framed on the basis of the gross value of agricultural output which is not adjusted so as to include the non-reporting areas. On the same basis, therefore, we have worked out an alternative estimate.

According to the Rural Credit Survey about 15 per cent of the total produce is disposed of by cultivators as kind wages or rent.<sup>2</sup> On the basis of the gross value of agricultural output, inclusive of non-reporting areas (i.e., Rs. 4,997 crores) the total of kind rents and wages thus works out to Rs. 750 crores. According to the Agricultural Labour Enquiry Committee the total wage bill for agricultural labourers for 1950-51 is Rs. 500 crores, of which 42 per cent was paid in kind. The total of kind wages thus amounts to Rs. 210 crores and the total of kind rents to Rs. 540 crores.

<sup>1</sup> The Distribution of the National Income of India, 1950-51. *The Indian Economic Review*, Feb., 1956, p. 4.

<sup>2</sup> cf. The Committee of Direction, *All India Rural Credit Survey, Vol. II; General Report*, 1954; p. 23.

## *Distribution of Total Values by Size-Groups of Holding*

As mentioned earlier, the total values of agricultural output, seed, livestock feed and wages paid to hired labour have to be apportioned between holding size-groups on the basis of the distribution of the total area held, on the one hand, and variations in per acre values of these items pertaining to different holding size-groups, on the other. These per acre values, when available, are obtained and when not, are worked out or estimated from the information contained in the Reports of Farm Management Surveys. The information for all the six centres, however, is not available on a uniform basis.

Even in respect of holding size-groups uniformity is lacking as between the various centres. Class-intervals are not uniform nor does the information extend to the same highest size-group. These difficulties have been overcome thus: where information has been available for class-intervals shorter than those we use, total values relating to each given class-interval have been obtained by multiplying per acre values with their respective areas. These total values are then aggregated to yield the totals for the required class-interval and per acre values corresponding to them worked out afresh. In the opposite case where information has been available by class-intervals wider than those we use, available values have been plotted and intermediate values read off from the graph. Finally, in cases where information has not extended to a large enough holding size-group, drawing support from the fact that the evidence discloses a general tendency for differences between the per acre values of adjacent holding size-groups to diminish with an increase in the size of the holding, the values

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available for the largest holding size-group have been repeated so as to extend to the required holding size-group.

Since per acre values for Madhya Pradesh relate not to the area cultivated or held but to gross cropped area, these values too have been reduced to a uniform 'per cultivated acre' basis.

Where information has been available on the basis of both, the cost accounting and survey methods, a simple average of the two values has been taken.

Finally, an overall weighted average of each item and for each size-group, for all the six centres has been obtained, by weighting the value of each centre on the basis of the share of the corresponding population zone in the total operated area of a holding size-group.

The value of seed input per acre is available for all the six centres. And with the exception of West Bengal so is the value of hired labour per acre. For West Bengal this latter has been derived from the information available on (a) the value of human labour per acre and (b) the value of family labour per farm. Cost of livestock feed per acre is not available for any. And, what information bears on it is not available on a uniform basis.

In some cases (as Madhya Pradesh and the Punjab) the information relates to the feed cost of cattle while in others (as U.P., Madras, Bombay and West Bengal) to their total maintenance cost. Again for some centres (like Madhya Pradesh, Madras and West Bengal) it is available both for draught and milch cattle while for others (like U.P., Bombay and the Punjab) on only a per bullock basis. Available evidence shows that feed cost accounts for an approximate 6/10ths of the total maintenance cost. In all cases, therefore, where maintenance cost is, but the proportion of it accounted for by feed cost is not, available the same has been derived on the above basis. And where information is available on only a per bullock basis, a cow or a buffalo like a bullock being an adult animal unit, on the basis of the numbers of draught and milch cattle, the total feed cost and thence the feed cost per acre has been worked out. In the absence of more comprehensive information, our estimates relate to draught and milch cattle and do not represent the total feed cost of all livestock maintained by the agriculturists. Nevertheless, in view of the fact that draught

and milch cattle together account for the major part of the total feed cost of all livestock, these estimates provide a basis, reasonable enough, for the limited purpose of apportionment for which they are used.

On the basis of the All-India weighted averages of the per acre values<sup>1</sup> pertaining to each of these items, the total values, obtained earlier, are now apportioned between different holding size-groups.

Let us now turn to family consumption. Consumer expenditure per person on agricultural products in rural areas by size-level of total consumer expenditure is obtained from the NSS, 4th Round.<sup>2</sup> Correcting these values, on a uniform basis, for the change in the figure of consumer expenditure per person on agricultural products according to the 4th round over the corresponding figure of the 2nd round,<sup>3</sup> estimates of the values of agricultural produce component in the per capita consumption of the several expenditure groups for the year 1950-51 are obtained.

Measuring the values of the agricultural produce component in the per capita consumption of the several expenditure groups along OY and the percentages of total population corresponding to each of these values along OX, the former are plotted in an ascending order. To each height along OY there corresponds a length along OX and, since it makes no difference as to whether we consider this latter as representing a percentage or the actual population corresponding to it, the two together yield a rectangle the area of which is taken to represent the value of the total agricultural produce component in the consumption of each expenditure class. Free hand smoothing is then applied to the curve joining these heights in such a way that the area enveloped by the smoothed curve, in the portion lying within the width of each rectangle, approximates, as nearly as possible, to the area of that rectangle. The percentages of the total 'cultivating' population, lying in different holding size-groups, when the latter are arranged in an ascending order, are now marked off along OX. To each of these lengths there corresponds a certain area enveloped by the

<sup>1</sup> Set out in the Statistical Appendix, Table 2.

<sup>2</sup> NSS, 4th Round: April-September 1952.

<sup>3</sup> See p. 19.

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smoothed curve. Such areas represent the respective consumptions (of agricultural products) of the populations belonging to different holding size-groups. The process is now reversed so as to reduce these areas back into rectangles. Visually this is done by moving a line parallel to OX up and down till the area enclosed by the smoothed curve but excluded by a rectangle is found to become equal or nearly equal to the area enclosed by the rectangle but lying outside the smoothed curve. The values of the agricultural produce component in the per capita consumption of the population lying in each holding size-group, represented by the heights of the new rectangles, are now read off from the graph.<sup>1</sup>

To obtain from these per capita the total values, we need the distribution, by size-level of holding, of the total 'cultivating' population of 1951, as defined above. Information both on the number, and average size, of households, by size-level of holding is available from the NSS Report on Land Holdings.<sup>2</sup> Using this as the basis the required distribution of the 'cultivating' population for 1951 is worked out thus:

Making an adjustment so as to include Jammu and Kashmir, the total rural and 'cultivating' populations of India for 1951, work out to 298.3 and 241.00 millions respectively: the total 'cultivating' population being 80.79 per cent of the total rural population. On this basis, the total rural population for 1952-53 being 321.45 millions,<sup>3</sup> the total 'non-cultivating' population for 1952-53 works out to 61.75 millions. Since this population belongs to the holding size-group of less than 0.5 acres, it has been subtracted from the total population of 0.5 holding size-group. This gives us the holding group-wise distribution of the total 'cultivating' population for the year 1952-53.

On a proportionate basis then we work out the holding-wise distribution of the total 'cultivating' population for 1951.<sup>4</sup> The estimates for the total consumption of agricultural products by holding size-groups are now easily obtained.<sup>5</sup>

<sup>1</sup> These are presented in the Statistical Appendix, Table 2.

<sup>2</sup> *op. cit.*, pp. 103 and 40.

<sup>3</sup> Worked out from the information on the number and size of rural households, available in the NSS *Report on Land Holdings*.

<sup>4</sup> Presented in the Statistical Appendix, Table 1.

<sup>5</sup> These are presented in the Statistical Appendix, Table 3.

## *Retention Ratios and Retained Values by Size-Groups of Holding*

When we turn for information on retention ratios we find the most disconcerting gaps in available data. With the exception of U.P. scarcely any information on these is available for any other centre. And on the face of it there would seem little warrant for treating the figures for U.P. as typical of all India. A possible alternative that we arrive first at the retained component of total values on an overall basis and then apportion them on the assumption of a uniform retention ratio for all holding size-groups, is no better. For this assumption is obviously not true. Available evidence shows that in respect of food, feed and seed larger holdings generally tend to be more self-sufficient than smaller ones. In case of hired labour a reverse situation obtains—the ratio of cash to kind wages rising with an increase in the size of the holding. Thus although we lack information on the quantitative magnitudes of retention ratios, on a qualitative plane at least, we do know, albeit only in a broad way, how they are likely to behave with an increase in the size of the holding. And a procedure which incorporates at least the qualitative drifts, when unable to claim a quantitative precision for its magnitudes, has claim to superiority over a procedure which does neither. And so we draw on the information available for U.P.<sup>1</sup> to frame tentative estimates, which must admittedly be subjected to a process of verification, with a view not to their quantitative precision (of this they may have but little) but to their ability to reflect, however broadly, the drift of variations in the retention ratios.

<sup>1</sup> *Studies in Economics of Farm Management in U.P.*, Report for the year 1954-55, pp. 59 (table 4.11), 113 (table 8.3).

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The procedure we adopt can now be listed as follows:

- (a) to obtain itemwise overall retention ratios for the country;
- (b) to take (from the information available for U.P.) the extreme values of retention ratios pertaining to the lowest and highest holding-size categories,<sup>1</sup> and then to interpolate, on the hypothesis of linearity, the values of intermediate holding-size categories;
- (c) by applying the ratios so obtained to all-India figures to obtain overall retention ratios;
- (d) by comparing these latter with the overall retention ratios alternatively obtained, to see how close an approximation they bear to each other; a near equality being rated to indicate usable approximations to all-India ratios have been reached.

From the Report of the Rural Credit Survey we find that the values of farm expenditure on seed per family in cash and kind (owned seed) are Rs. 29<sup>2</sup> and Rs. 57<sup>3</sup> respectively. The percentage of total value retained thus works out to 66.28.

According to the same Report the wages paid per family in cash and kind are Rs. 68<sup>4</sup> and Rs. 45.6<sup>5</sup> respectively; the corresponding retention percentage being 40.14. On the basis of the information available from the Report of the Agricultural Labour Enquiry Committee<sup>6</sup> it works out to 42.0.

<sup>1</sup> Since for wages one of the extreme values pertains not to the lowest but to the lowest but one holding-size category this has been used.

<sup>2</sup> *All India Rural Credit Survey: The Survey Report*, Vol. I, Part I (Rural Families), table 15.4, p. 839.

<sup>3</sup> *ibid.*, table 15.11, p. 849.

<sup>4</sup> *ibid.*, p. 830.

<sup>5</sup> *ibid.*, p. 849 and 854. This figure represents the total of wages paid in kind and disposals in kind as wages paid to labour after harvest.

<sup>6</sup> *Agricultural Labour: How They Work and Live*, All-India Agricultural Labour Enquiry Committee. On the basis of information provided on pp. 19, 21 and 58, the kind component of the total wage bill can be worked out as follows:

An estimate of the proportion of cultivators' family consumption retained from self-production is not available. Information on the proportions purchased in cash and received in kind, available from the 2nd, 3rd and 4th rounds of the NSS, relates to rural rather than agricultural households. And in respect of the consumption of agricultural products retention ratios for agricultural households must be higher than those for rural households. In the 2nd Report on the Poona Schedules of the NSS,<sup>1</sup> however, information on the total receipts from and total disposals of different commodities is available for agricultural and non-agricultural families separately. The latter exclude the values that remain at home for family consumption or otherwise. Although the values not disposed of may not necessarily be consumed by the family, yet for all agricultural families taken together, they cannot fall short of, though they may well exceed, the family consumption. If we could apply to the difference between the values of total receipts and total disposals a correction on this score, and then add to it the cash expenditure we could arrive at an approximation of total consumption. By expressing cash expenditure as a percentage of this total we could then work our way back to the proportion purchased in cash and that obtained in kind. In respect of food grains,<sup>2</sup> which account for the bulk of the agricultural produce component in consumption, the value of this difference per rural family works out to Rs. 16.015 per week, which exceeds, as expected, the corresponding figure of Rs. 13.20 obtained from the 2nd round of the NSS by 21.2 per cent. We accordingly deflate, taking this as the measure of correction required, the total value of food grains not disposed of per agricultural family. On the

Wages paid in kind (32% of the total)	=	Rs.	160 crores.
One half of wages paid in cash and kind	=	Rs	25 crores.
Value of perquisites attached to wages			
paid in cash	=	Rs.	25 crores.
Total =			
		Rs.	210 crores.
		=	42% of the total

wage bill

<sup>1</sup> V. M. Dandekar, *Second Report on the Poona Schedules of the National Sample Survey (1950-51)*, Tables 57, 58 and 59.

<sup>2</sup> including pulses.

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basis of the cash expenditure on food grains and the estimate of the total value of food grains consumed per agricultural family, the retention percentage works out to 76, which compares very closely with 77.54, the corresponding figure for U.P. Comparable retention percentages for rural families, from the 2nd, 3rd and 4th rounds of the NSS are given below:<sup>1</sup>

<i>Items</i>	<i>2nd round</i>	<i>3rd round</i>	<i>4th round</i>
Foodgrains	61.8	64.8	72.6
Pulses	57.5	60.9	66.5

In view of the fact that retention ratios for agricultural families must exceed those of the rural, our estimate would seem to be correct. Making an allowance for items other than food grains, for which retention ratios are lower, the retention percentage for the consumption of agricultural products in general would seem to lie between 70 and 75 per cent.

These (A) and the alternative estimates, worked out on the bases outlined above (B), are now brought together in the table below:

	<i>Seed</i>	<i>Wages to hired labour</i>	<i>Family Consumption</i>
(A)	66.28	(1) 40.14 (2) 42.0	Between 70 & 75
(B)	66.54	40.47 <sup>a</sup>	72.06 <sup>b</sup>

<sup>a</sup> So as to correspond with the figures in row (A) this figure has been worked out on the basis of the total of gross and not net payments made to hired labour.

<sup>b</sup> Likewise this ratio is worked out by excluding the consumption of landless labour from the total consumption of 0.5 holding-size class.

This remarkable correspondence between the two sets of estimates lends an unexpected measure of support to our method of arriving at retention ratios.

As for livestock feed qualitative evidence suggests that compared to food the proportion of livestock feed retained is likely

<sup>1</sup> NSS, 4th round, p. 14.

to be much higher. Quantitative information contained in Gadgil's *Economic Effects of Irrigation*<sup>1</sup> suggests that this proportion may well be in the neighbourhood of 85 to 90 per cent. Assuming somewhat arbitrarily, therefore, that between the lowest and the highest holding size-groups, it varies between 80 to 95 per cent we have, on the basis followed for other items, worked out the retention ratios.

Applying the retention ratios so obtained<sup>2</sup> to the total values of each of these four items pertaining to different holding size-groups, we have worked out the values of their retained components.<sup>3</sup>

Net values of kind rents paid out or received in by the several holding size-groups are obtained by multiplying the overall value of kind rent per acre with the 'net' area leased in or leased out by each holding-size category. The method for deriving these latter has already been outlined. The procedure, as shown in the appended table, is as follows.

Since households belonging to an 'owned area self-operated' size-group can enter into a higher but, *ex definitione*, not a lower operational size-group, it follows that the households belonging to the highest 'owned area self-operated' size-group belong to the corresponding operational category. Their total owned area (listed in column I) is known. The excess in the number of households who operate 50 acres or more over the number of those who, of their owned area, operate 50 acres or more, is entered against the highest size-group in column F. Since this excess is assumed to be fed by the 'owned area self-operated' size-group immediately preced-

<sup>1</sup> D. R. Gadgil, *Economic Effects of Irrigation*, pp. 48-51.

<sup>2</sup> Set out in the Statistical Appendix, Table 5.

The retention percentage for the consumption of the 0-5 holding size-group is 68.5. So as to exclude the consumption of landless labourers who constitute a third of the population of this holding-size category, two thirds of 68.5, i.e. 45.7, is the retention ratio applied to the total consumption of this class. (see p. 10).

<sup>3</sup> Set out in the Statistical Appendix, Table 6.

For reasons mentioned earlier (see 10-11) one half of total wages paid in kind by the 0-5 holding size-group have been subtracted from one half of those paid out by other holding size-groups to obtain the 'net' receipts of kind wages of the 0-5 holding size-class.

Net Area Leased in or Leased out by Holding-size Groups

Operational holdings		Owned area self-operated holdings										
X	A	B	Y	C	D	E	F	G	H	I	J	K
Size of operational holding (in '000s)	Total operational area (in '000s)	Total operational area (in '000s)	Size of self-operated holding (in acres)	No. of house-holds (in '000s)	Total owned area (in '000s)	Owned area per house-hold (D/C)	No. of house-holds in X category (A-G)	No. of holds in Y category which belong to the preceding Y category (A-G)	Total area of house-holds (F × E of the preceding holding-size group) (in '000 acres)	D-H of the holding-size group (in '000 acres)	Total area of operational holding (H + I) (in '000 acres)	Net area leased in (+) or leased out (-) by size-groups of operational holding (B-I) (in '000 acres)
0.1-5.0	28693	58497	0.1	25544	15035.65	0.59	7817	17727	4240.33	10795.32	53514.59	+ 4982
5.0-10.0	9764	68813	5-10	25028	59072.98	2.36	4152	20876	9798.72	49274.26	51798.24	+ 17015
10-15	3630	44120	10-15	2972	38041.60	12.80	2189	1441	16395.61	18444.80	34840.41	+ 9280
15-20	2174	37568	15-20	1564	29325.00	18.75	1531	643	19596.80	12056.25	31633.05	+ 5915
20-25	1098	24594	20-25	856	20860.72	24.37	921	177	17268.75	4313.49	21582.24	+ 3012
25-30	784	21369	25-30	667	19596.46	29.38	679	105	16547.23	3084.90	19632.13	+ 1737
30-40	802	27566	30-40	537	19460.88	36.24	562	240	16511.56	8697.60	25209.16	+ 2357
40-50	390	17198	40-50	286	14345.76	50.16	297	93	10763.28	4664.88	15428.16	+ 1770
50 & above	597	50600	50 & above	404	35713.60	88.40	193	404	9680.88	35713.60	45394.48	+ 5206

Note: Excluding area of households operating less than 0.10 acres.

ing the highest size-group, by multiplying the number of such households with the owned area per household of this preceding category, their total owned area is worked out and entered in column H. From column J (the horizontal summation of columns, H and I) we get the total owned area of the highest operational size-group. Subtracting this total owned area from its total operated area (shown in column B) we get in column K the 'net' area leased in by the highest size-group.

Now subtracting the number and total owned area of households which step into the highest operational category from the total number and total owned area of the 40-50 acre 'owned area self-operated' class, we get the number (entered in column G) and total owned area (entered in column I) of those who remain in the 40-50 acre operational class. The excess in this operational class over the number of those of the corresponding 'owned area self-operated' class who remain in it is entered in column F. Thus the number of households in columns F and G equals the number of households in column A. The total owned areas of households in columns F and G having been entered in columns H and I respectively, column J (the summation of columns H and I) gives the total owned area of the 40-50 acre operational category. Subtracting it from the total operated area of this class we get in column K the 'net' area leased in by this operational category. Likewise we move down the ladder and work out the 'net' area leased in or leased out by each operational category.

The fact that all the size-groups are seen, on balance, to lease in areas provokes the question as to who leases out those areas. A part of the answer is in the total owned area of those households (shown in column I against 0-0.1 size-group) who operate very little of their owned area, and the other part in the fact that "on the assumption that practically all areas owned by rural households were also operated by them half (12 per cent of operated area) of the total area leased in (24 per cent of operated area) comes from outsiders, that is, from those who do not belong to the category of rural households of India."<sup>1</sup>

<sup>1</sup> The NSS, *First Report on Land Holdings, Rural Sector, Eighth Round: July 1954-March 1955*, p. 31.

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Excluding the area of households operating less than 0.1 acre total operated area comes to 350,325 thousand acres. Of this total area leased in works out<sup>1</sup> to 84,953.8 thousand acres. Total kind rent having been estimated at Rs. 540 crores,<sup>2</sup> kind rent per acre works out to Rs. 63.5. Multiplying it with the number of acres ('net' area) leased in by each holding size-group, total kind rent paid out by each holding size-group is obtained. The item that remains to be dealt with is kind payments made to artisans and others. For this category the only available information consists of the value of such kind payments per family; the figures for lower and upper strata cultivators being Rs. 10.9 and Rs. 34.9 respectively.<sup>3</sup> Therefore, in dealing with it a different procedure has had to be adopted. Having worked out the gross value of output per family for these two classes of cultivators<sup>4</sup> we examined the relationship such kind payments bear to the former. Despite the fact that the absolute values of such payments diverge significantly, their relation to the corresponding values of output is remarkably constant, the figures for the two classes of cultivators being 2.87 and 2.90 respectively. Even though the information relates to only two strata of cultivators (classified according to the size of their holdings) it, nevertheless, suggests that as between holdings of different size-groups the relationship is not likely to diverge significantly. Applying the relationship so obtained to the holding group wise distribution of total output, we have accordingly worked out the retentions for this item.

<sup>1</sup> On the basis that 24.25 per cent of total operated area is leased in by cultivating households. (*vide*, the NSS, *First Report on Land Holdings, Rural Sector, Eighth Round: July 1954-March 1955*, table 6.2, p. 30.)

<sup>2</sup> See page 20.

<sup>3</sup> *All India Rural Credit Survey, The Survey Report, Vol. I, Part I (Rural Families)*, pp. 854-55.

<sup>4</sup> *ibid*, pp. 821-22. This has been worked out by excluding the families that did not report any value of gross produce.

## *Distribution of Marketed Surplus by Size-Groups of Holding*

Aggregating, on the basis of holding size-groups, the values of all retentions, and subtracting them from the corresponding values of output, we obtain the required estimates. In view of the fact that the accuracy of the total values of output and items of retentions, adopted from diverse sources, cannot be assured, these estimates aim not so much at uncovering the absolute values of marketed surplus as at reaching the proportions in which different holding size-groups contribute to it.

Since, however, the proportions themselves are influenced by the total values adopted, and since the estimates of consumption drawn from the NSS have been found to be obviously inconsistent with the official statistics of production, we have worked out two sets of estimates. In doing so we have been prompted, in a first approximation, not to tamper with the available estimates of total values, by a desire to present the picture that these lead up to alongside of that which emerges when they are, subsequently, corrected.

The mutual inconsistency between the estimates of consumption and output can be the result of errors in either of them or both. In view of the fact, however, that the evidence presented in the NSS Report leads to the presumption of an under estimation in production rather than an over estimation in consumption, we have tentatively taken the estimates of consumption at their face value and corrected the estimates of production for the degree of under estimation suspected in the NSS Report.<sup>1</sup> By virtue

<sup>1</sup> "The official statistics of food production are probably underestimated by something of the order of 20 or 25 per cent for India as a whole." (The National Sample Survey, *General Report on the First Round*, p. 31.)

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of the manner of their estimation the total values of four out of the six items of retention (seed, livestock feed, kind rents and payments to artisans) are tied to a given value of agricultural output and should, therefore, vary with it. While shifting from one value of output to another, therefore, these have been revised also. Since the estimates of others, independently obtained, are not tied to any given value of output adopted, these remain unchanged.

The values of agricultural output by holding size-groups are inflated by 30 per cent on a uniform basis. Kind payments to artisans and others, representing a constant proportion of the value of output of each holding size-group are, on the basis of the revised values of output, worked out afresh. Likewise the values for seed, an almost constant proportion of the gross value of output in the National Income Estimates,<sup>1</sup> have been revised. The value of livestock feed, estimated on the basis of the supply of relevant feed stuff, assumed, in the absence of a better basis, to suffer from a like degree of underestimation, is inflated in the same proportion as the total agricultural output. The total of kind rents is now the difference between that part of the revised value of output (derived on the basis of the same proportion as earlier adopted) which is paid out as kind wages and rent and the unchanged estimates of total kind wages. On the basis of the revised value of kind rent per acre total kind rent paid out by each holding size-group is worked out afresh.

Aggregating the revised values of these four items and the previous values of the other two and subtracting the total from the revised values of output, the second set of estimates is obtained.

The two sets of estimates are set out on p. 35.

Having obtained them we now ask ourselves: (a) which of the two sets of estimates is to be preferred, and (b) what degree of reliability is to be attributed to the preferred estimates which, having emerged through a circuitous route involving many assumptions, are hedged in by an equal number of qualifications.

Happily a countercheck on the overall proportion of the agricultural produce marketed by cultivators is available from the

<sup>1</sup> *cf. Final Report of the National Income Committee, 1954, Table 8, p. 45.*

Size of Marketed holding Surplus (acres) (Rs. crores)	I			II		
	(1) as % of value of output	(1) as % of Total Marketed Surplus	Marketed Surplus (Rs. crores)	(4) as% of value of out-put	(4) as% of Total Marketed Surplus	
	1	2	3	4	5	6
0-5	266.7	20.7	24.9	564.0	33.6	26.0
5-10	175.8	14.1	16.4	444.8	27.4	20.5
10-15	54.7	9.7	5.1	170.1	23.1	7.9
15-20	80.1	18.2	7.5	172.8	30.1	8.0
20-25	54.0	20.4	5.0	111.0	32.2	5.1
25-30	65.4	28.9	6.1	116.8	39.7	5.4
30-40	80.5	29.9	7.5	139.6	39.8	6.4
40-50	67.8	38.0	6.3	107.8	46.4	5.0
50 and above	228.0	44.8	21.2	339.9	51.4	15.7
<b>Total</b>	<b>1073.0</b>	<b>21.5</b>		<b>2166.8</b>	<b>33.4</b>	

findings of the Rural Credit Survey. As a broad general percentage, the Report observes, "about 35 per cent of the total production is sold by the cultivator."<sup>1</sup> This is remarkably close to 33.4, the overall percentage of total agricultural produce marketed by the cultivator, obtained in the second set of estimates here. So close a correspondence may well be fortuitous but in the light of the aforesaid it appears sufficient to commend the second set of estimates as providing better approximations to the true values.

As to the second question, even though no quantitative margins of error can be adduced, it appears that as approximations broadly reflecting the proportions underlying the distribution of the marketed surplus, these (second set) estimates are reliable enough. This suggestion stems from the close correspondence between the overall percentages above noted and is supported by (a) the reflection that some of the foundations on which they rest are fairly firm. Possessed of the minimum assurance implicit in these foundations, we have sought, as we have traversed, supporting and corroborative evidence for the assumptions we have had to make to ensure, so far as it could be done, that they do not unduly

<sup>1</sup> *All India Rural Survey, Vol. II, The General Report, 1954; p. 23.*

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suffer in their character of reasonable approximations. And (b) the fact that they reveal, consistently with expectations, a rational pattern.

Indeed the pattern here ~~uncovered~~<sup>revealed</sup> is highly significant. Marketed surplus as a proportion of the value of produce declines up to the 10-15 acre size-group, after which it steadily increases.

The pattern reveals even as it pinpoints the working of those pressures which flow from the onerous character the farmer's money requirements assume in the context of his meagre resources, and compel a lower-strata cultivator to market more of his produce than he would if the constraining influence were not there. These pressures arise from certain money obligations of the farmer like land revenue, rent and debt service and the need to purchase such necessities of life as salt, kerosene and cloth. They derive their onerous character from the poverty of the farmer and the institutional set up in which he operates. His weaker economic position is turned to their own advantage by the trading-money-lending community and social considerations compel him to incur expenses on marriage and other ceremonies which in many cases are out of all proportion to his income earning capacities. And once he falls into the clutches of the money-lender it becomes difficult for him to get out of them, so that his debt obligations become a continuing source of pressure to acquire more cash, through a 'distress sale' of his own produce. If in stinted consumption we have one, in the compulsion to borrow (reflected, at least partially, in the character of borrowings) we have another, facet of the same phenomenon. It is interesting to observe that "the proportion of borrowings for capital expenditure on farm and current expenditure on farm decreases as we move from the big cultivators to the small cultivators, while an increase is seen in the proportion of borrowings for family expenditure."<sup>1</sup>

Since what compels a farmer to stint his consumption may also drive him to exert harder, in the higher value of output per acre in the smaller compared to the larger holding size-groups<sup>2</sup> also,

<sup>1</sup> *All India Rural Credit Survey: The Survey Report*, Vol. I, (Rural Families), p. 293.

<sup>2</sup> See Statistical Appendix, table 2.

one may read the reflection of the same phenomenon.

A reasonably good test of the reality of this phenomenon would be in the increase (in physical quantities) of per capita consumption of food grains with a rise in income in lower income brackets. Reproduced below is some data on the per capita consumption of cereals according to levels of living which has emerged from an All-India Survey of the conditions of agricultural labour in India:<sup>1</sup>

<i>Levels of living</i> Rs.	<i>Quantity consumed</i> (ounces per day)
51-100	11.0
101-150	14.4
151-200	17.7
201-250	19.8

This data relates only to agricultural labourers—and (incidentally) many of them are small cultivators also—but it does show that there is a section of the rural community which, when below a certain income level, is not able to afford the minimum quantity of foodgrains required to satiate hunger. The consumption pattern of this strata living below the point of satiety in respect of even the physical consumption of food grains appears to bear a conclusive testimony to the operation of those pressures the reflection of which we perceive here.

The decline in the marketed surplus as a proportion of the gross value of output as we pass from a lower to a higher holding size-group thus reflects the easing off of this pressure. The critical point where this pressure ceases and more normal tendencies start asserting themselves is seen to lie somewhere in the 10-15 acre size-group.<sup>2</sup> This fact placed alongside another that holdings below 15 acres contribute an approximate half of the total marketed surplus, constitutes perhaps the most significant of our findings.

<sup>1</sup> *Agricultural Labour: How They Work and Live*, p. 40.

<sup>2</sup> The author of a study of food economics expresses for Bihar the opinion that families with holdings above 15 acres and to some extent those between 5-15 acres may be expected to contribute to the market a real (as distinguished from "distress") surplus. (See Gorakh Nath Sinha, *An Introduction to Food Economics*, 1956, pp. 79-80, 96).

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From the point of view of the marketed surplus the region of the first three holding-size categories constitutes the range to which the most embarrassing developments flowing from a rise in agricultural prices may be expected to belong.

# *Statistical Appendix*

*Table 1*  
*Distribution of Population and Area by Holding Size-Groups*

<i>Size of holding (acres)</i>	<i>Total area operated All India (‘000 acres)</i>	<i>Agricultural Population 1952-53 (Millions)</i>	<i>Agricultural Population 1950-51 (Millions)</i>
0-5	58497	139.0	129.0
5-10	68813	56.7	52.6
10-15	44120	22.5	20.9
15-20	37568	14.4	13.4
20-25	24594	7.9	7.2
25-30	21369	5.6	5.1
30-40	27566	5.4	5.0
40-50	17198	2.8	2.5
50 and above	50600	5.3	4.9
<b>Total</b>	<b>350325</b>	<b>259.6</b>	<b>240.6</b>

*Table 2*  
*Values Per Acre by  
Holding Size-Groups (Rs.)*

<i>Size of holding (acres)</i>	<i>Gross value of output per acre</i>	<i>Value of livestock feed per acre</i>	<i>Value of seed per acre</i>	<i>Wages to hired labour per acre</i>
0-5	199.7	95.6	13.0	27.7
5-10	164.5	57.8	9.8	22.4
10-15	116.0	43.5	7.1	19.7
15-20	106.3	40.4	6.8	15.6
20-25	97.6	36.3	6.1	14.5
25-30	95.8	32.7	5.7	12.6
30-40	88.4	33.2	5.0	11.5
40-50	93.9	27.2	4.7	13.3
50 and above	91.0	27.3	4.9	14.5

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*Table 3*

### *Consumption Expenditure on Agricultural Products Per Person (Rs.)*

<i>By level of expenditure</i>			<i>By size of holding</i>	
<i>Household expenditure categories (Rs.)</i>	<i>Monthly expenditure 1952</i>	<i>Monthly expenditure 1951</i>	<i>Size of holding (acres )</i>	<i>Annual expenditure 1951</i>
1-50	7.01	8.46	0-5*	132.0
51-100	10.27	12.40	5-10	192.0
101-150	12.68	15.31	10-15	216.0
151-300	15.10	18.24	15-20	229.2
301-500	18.43	22.26	20-25	244.8
501 above	23.96	28.94	25-30	261.6
All expenditure levels	12.05	14.56	30-40	285.6
			40-50	312.0
			50 & above	345.6

\* Includes expenditure of landless agricultural labour.

*Table 4*

### *Distribution of Total Values by Holding Size-Groups (Rs. Crores)*

<i>Size of holding (acres)</i>	<i>Output</i>	<i>Family consumption</i>	<i>Livestock feed</i>	<i>Seed</i>	<i>Wages to hired labour</i>
0-5	1291.2	1702.7*	222.6	73.2	124.3
5-10	1250.8	1010.2	158.4	64.9	118.0
10-15	565.8	451.0	76.5	30.3	66.6
15-20	441.3	306.3	60.3	24.5	44.9
20-25	265.3	177.2	35.5	14.5	27.3
25-30	226.1	133.5	27.7	11.6	20.6
30-40	269.5	143.1	36.4	13.2	24.2
40-50	178.5	78.2	18.6	7.8	17.5
50 and above	508.8	170.0	55.0	24.1	56.2
Total	4997.3	4172.2	691.0	264.1	499.6

\* Includes the consumption of landless agricultural labour.

Table 5  
Retention Percentages

<i>Size of holding (acres)</i>	<i>Family consumption</i>	<i>Livestock feed</i>	<i>Seed</i>	<i>Wages to hired labour</i>
0-5	45.7*	80.0	55.5	48.1
5-10	70.2	81.5	59.6	45.5
10-15	71.9	83.0	63.6	43.0
15-20	73.5	84.5	67.7	40.4
20-25	75.2	86.0	71.7	37.9
25-30	76.9	87.5	75.8	35.3
30-40	80.3	90.5	83.9	30.2
40-50	83.6	93.5	92.0	25.1
50 and above	85.3	95.0	96.1	22.5

\* See page 10, 29 (footnote.)

Table 6  
*Distribution of Retained Values by Holding Size-Groups (Rs. Crores)*

Size of holding (acres)	Family consumption	Livestock feed	Seed	Wages to hired labour	Payments to Artisans & others	Rent	Total
0-5	778.1*	178.1	40.6	—41.3	37.4	31.6	1024.5
5-10	709.2	129.1	38.7	53.7	36.3	108.0	1075.0
10-15	324.3	63.5	19.3	28.7	16.4	58.9	511.1
15-20	225.1	51.0	16.6	18.1	12.8	37.6	361.2
20-25	133.2	30.6	10.4	10.3	7.7	19.1	211.3
25-30	102.7	24.3	8.8	7.3	6.6	11.0	160.7
30-40	114.9	32.9	11.1	7.3	7.8	15.0	189.0
40-50	65.3	17.4	7.2	4.4	5.2	11.2	110.7
50 and above	145.0	52.2	23.1	12.6	14.8	33.1	280.8
<b>Total</b>	<b>2597.8</b>	<b>579.1</b>	<b>175.8</b>	<b>101.1</b>	<b>145.0</b>	<b>325.5</b>	<b>3924.3</b>

\* Excludes the consumption of landless agricultural labour.

Table 7(1)  
Distribution of Marketed Surplus by Holding Size-Groups

Size of holding (acres)	Total gross value of output (Rs. Crores)	Total value of retentions (Rs. Crores)	Total value of marketed surplus (Rs. Crores)	Marketed surplus as percentage of gross value of output	Marketed surplus of each holding size-group as percentage of total marketed surplus
0-5	1291.2	1024.5	266.7	20.7	24.9
5-10	1250.8	1075.0	175.8	14.1	16.4
10-15	565.8	511.1	54.7	9.7	5.1
15-20	441.3	361.2	80.1	18.2	7.5
20-25	265.3	211.3	54.0	20.4	5.0
25-30	226.1	160.7	65.4	28.9	6.1
30-40	269.5	189.0	80.5	29.9	7.5
40-50	178.5	110.7	67.8	38.0	6.3
50 and above	508.8	280.8	228.0	44.8	21.2
Total	4997.3	3924.3	1073.0	21.5	100

Table 7 (II)

Size of holding (acres)	Total gross value of output (Rs. Crores)	Total value of retentions (Rs. Crores)	Total value of marketed surplus (Rs. Crores)	Marketed surplus as percentage of gross value of output	Marketed surplus of each holding size-group as percentage of total marketed surplus
0-5	1678.6	1114.6	564.0	33.6	26.0
5-10	1626.0	1181.2	444.8	27.4	20.5
10-15	735.5	565.4	170.1	23.1	7.9
15-20	573.7	400.9	172.8	30.1	8.0
20-25	344.9	233.9	111.0	32.2	5.1
25-30	293.9	177.1	116.8	39.7	5.4
30-40	350.4	210.8	139.6	39.8	6.4
40-50	232.1	124.3	107.8	46.4	5.0
50 and above	661.4	321.5	339.9	51.4	15.7
Total	6496.5	4329.7	2166.8	33.4	100









