METHODOLOGY, OBJECTIVES AND HYPOTHESES

In the preceding chapters, we gained broad familiarization with agriculture in Orissa, largely on the basis of secondary sources of information. There are, however, many more and crucial aspects which are generally left out by other studies on Orissa. The detailed, indepth analysis of tenants, especially the modus operandi of their exploitation, is generally missing from contemporary studies on Orissa agriculture. The present study is a modest attempt to fill this gap.

A few studies on the theme of tenancy relations in Orissa may better be taken note of. Immediately, we briefly take note of an important study by Bharadwaj-Das on the tenurial conditions and mode of exploitation in Orissa. A few major findings of the study are as under:

Firstly, the limited employment opportunities for family wage labour compels those who own very little land or no-land at all, to lease-in land under a number of stringent conditions. The land lease market is inter-locked by imperfections in the credit and labour markets in such a way that the voice of tenants is held down.

Secondly, among the lessees, the small and medium tenants figure quite significantly, both numerically as well

as area-wise. The big landlords lease out particularly to the small lessees. Small tenants leasing-in from bigger landlords are usually under obligation to after gifts such as fuel wood besides rendering labour services, often gratis or highly underpaid. The smaller tenants face greater insecurity with constant threats of eviction. Almost always, the leases are renewed for short durations.

Thirdly, gross productivity per acre was generally higher under fixed rent tenancy than that under share crop tenancy. For example, in Mendhakia village (tribal area), while the gross output per acre on leased-in land, under share crop system was Rs.470.00, it was Rs. 705.00 under fixed cash system. Similary, in Nalabanta village (cash crop area: there was no perennial irrigation availability), the value of gross output per acre for the tenant cultivator (operating below 5.50 acres) was Rs.1142.00 under share cropping, it was Rs.1317.00 under fixed kind system and Rs. 2500.00 under fixed cash system; and for those tenants who operated land between 5.50 and 10.00 acres, the value of gross output per acre was Rs. 893.00 under share cropping, Rs.1187.00 under fixed kind system and Rs.1769.00 under fixed cash system.

Finally, the smaller tenants pay higher rents per acre of leased-in land than their bigger counterparts. For example, in Nalabanta village (there was no perennial irrigation availability), the gross productivity per acre of the tenants operating land below 5.00 acres was Rs. 1509 and for those who operated land between 5.00 and 10.00 acres, it was Rs.1476; on an average, the former size group of tenants
paid rent per acre of amount Rs. 694.00 and the latter size group paid rent of amount Rs. 670.00 per acre. For another instance, in villages Atabira, Parmanpur and Balebira, (there was perennial canal irrigation) the gross productivity per acre was higher for the big tenants (above 10.00 acres), than that for the small tenants (below 5.00 acres). Whereas the gross productivity per acre of the tenants operating land below 5.00 acres was Rs. 1528.00 that for the big tenants operating land above 10.00 acres, it was Rs. 1572.00. In spite of that, the small size group of tenants paid rent as high as Rs. 642.00 per acre, whereas the big size group of tenants paid rent only Rs. 611.00 per acre. That means that although the productivity of the big tenants, especially in the irrigated villages, was relatively higher than that of the small tenants, yet the former group paid lower rent per acre than that paid by the latter group.

The Bharadwaj-Das study simply indentified the existing problems without finding its causes and probable solutions. For example, it did not say why the gross productivity per acre was generally higher under fixed 'rent system than under share crop system? Why productivity per acre of the small tenant cultivators was higher than that of their big counterparts? Why did the big tenant cultivators in the irrigated villages raise relatively high produce per acre? Moreover, it failed to distinguish between the magnitude of these problems in the agriculturally advanced regions and agriculturally backward regions, and it did not say much about the severity of inter-locked 'lease market', rate of tenant exploitation and so on.
The present study is undertaken to fill the above gaps besides bringing out the technological, institutional and economic constraints which are responsible for keeping agriculture in Orissa extremely backward. As we explain a little later, the analysis will focus on two separate districts, Balasore which, in terms of inter-district ranking for agricultural development, is fairly advanced and Kalahandi which is among the least developed districts of Orissa. The two districts are surrogates of distinct levels of agricultural technology, land productivity, per hectare farm incomes, general rural welfare, and so on. It may be rewarding to look into the land distribution and tenancy structure in these two distinct development scenarios. In broad terms, our study attempts to:

(a) analyse the incidence of tenancy, for various categories of farm operators, both in the irrigated and unirrigated villages randomly chosen in the two districts;

(b) examine the structure of ‘lease market’ vis-a-vis ‘labour market’, ‘lease market’ vis-a-vis ‘credit market’ and ‘lease market’ vis-a-vis ‘labour market’ and ‘credit market’ separately, and terms and conditions of lease and mode of exploitation;

(c) approximate the rate of exploitation and its relation to the incidence of tenancy and severity of inter-locked lease market;

(d) estimate the supply and the demand structure of lease under different forms of inter-locked lease markets;

(e) discuss input-use patterns and structure of the cost of production of the cultivators, size class and agrarian category-wise;
(f) estimate the degree of correlation between the size of leased-in land, use of inputs, use of family labour and output, size class wise, separately for owner cultivation system, fixed rent tenancy and share crop tenancy both in the irrigated and unirrigated villages;

(g) bring out the underlying relationships between the size of farm and yield rate and between yield rate and use of new inputs and family labour separately for fixed rent tenancy and share crop tenancy; and

(h) test the relationship between farm size and economic standard of the cultivating household under owner cultivation system and tenant cultivation system.

METHODOLOGY:

The proposed study is based on primary data collected through a mixture of purposive and random sampling techniques. The ultimate sampling unit is a farming household. The sample districts, blocks and villages are chosen on the basis of certain well defined criteria, as is explained below. But the final sampling units (farming households) are chosen randomly without replacement, strictly adhering to the principle of simple random sampling.

The selection of the two districts has been done on the basis of the level of agricultural development, so that one sample district (Balasore) represents agriculturally advanced district and the other (Kalahandi) is an agriculturally backward district. The selection of the two blocks from each of the chosen districts is based on the same criteria as in the selection of the two districts. Next, we selected one village from the progressive block which is
agriculturally better-off with higher incidence of tenancy, and another village from the backward block which is agriculturally backward as well, also with a higher incidence of tenancy. Higher incidence of tenancy thus stays as an overriding criterion in the choice of villages.

For choosing the two among the thirteen districts of Orissa, we undertook an exercise (Chapter-III) in ranking all the districts in terms of certain agricultural indicators like intensity of land utilisation, irrigation, use of inputs and productivity of land. However, taking all these indicators into consideration, we conclude that the districts of Balasore, Cuttack, Puri, Ganjam (Coastal districts) and Sambalpur (Western district) will be accorded relatively higher ranks, and the districts of Kalahandi, Koraput, Keonjhar and Sundargarh will be set in a lower ranks. We chose the district of Balasore from the higher rank group (i.e. from agriculturally advanced districts), and the district of Kalahandi from the lower rank group (i.e. agriculturally backward districts). Among the group of agriculturally progressive districts, we settled on Balasore because the incidence of tenancy\(^2\) was relatively higher in this district compared with that in the other districts in this group. For example, in the year 1970-71, whereas the incidence of tenancy was about 8.04 per cent in Balasore district, in all other districts of this group, it was around 7.22 per cent, 6.56 per cent, 6.56 per cent and 3.91 per cent in districts of Cuttack, Ganjam, Puri and Sambalpur respectively. Similarly, in the year 1976-77, it was around

\(^2\) Incidence of tenancy is defined the percentage of leased-in land to operated land area.
3.60 per cent, 3.13 per cent, 2.77 per cent, 3.51 per cent and 1.34 per cent in Balasore, Cuttack, Ganjam, Puri and Sambalpur districts respectively. Among the group of agriculturally backward districts, we settled on Kalahandi because, here too, the incidence of tenancy was comparatively higher compared with that in other districts in this group. For example, in 1970-71, the incidence of tenancy was about 3.59 per cent in Kalahandi district, whereas in all other districts of this group, it was 3.06 per cent, 1.21 per cent and 2.68 per cent in Keonjhar, Koraput and Sundargarh districts respectively. Similarly, in the year 1976-77, it was 2.34 per cent, 1.40 per cent, 1.54 per cent and 0.87 per cent in districts of Kalahandi, Keonjhar, Koraput and Sundargarh respectively.

Then, we selected two blocks from each sample district, where one block is agriculturally backward and the other is agriculturally progressive. For identifying one block as agriculturally backward and another as agriculturally progressive, we formally considered the percentage of land (net sown area) under irrigation. This information was collected from the district agricultural offices and the information relating to incidence of tenancy was obtained from the respective tehsil offices.

Next, we selected one village from the agriculturally most advanced block but with higher incidence of tenancy, and another from the agriculturally backward block, where the agricultural position is fairly poor, again

4. Source: Ibid.
with higher incidence of tenancy. Thus, we selected a total of two villages from the agriculturally advanced district and another two villages from the agriculturally backwad district.

Taking a sample of 75 agricultural households from each of the four sample villages, we gathered detailed data from a total of 300 households. The selection of sample units in each stratum is done on the basis of random sampling in such a way that the ratio of sample units to total households is about same for all strata in a sample village. In other words, we strictly adhere to the principle of uniform sampling fraction in selection of sample households from each stratum.

In sum, we adopt the stratified and selective sampling up to the village level and thereafter, we follow the stratified random sampling without replacement.

The methodology for dealing with the various objectives of our study would be somewhat along the following lines:

(a) We considered a number of size classes of tenants and for this purpose, operational holding criterion is used to measure the size class. The cultivating households are broadly put into four size classes:(i)marginal farm (operating or owning land upto 2.50 acres), (ii) small farms (operating or owning land from 2.51 acres to 5.00 acres), (iii)medium farms (operating or owning land from 5.01 acres to 10.00 acres) and (iv) large farms (operating or owning land above 10.00 acres).
From the point of view of ownership/tenancy status, the cultivating households were initially put into five agrarian categories: (i) pure owner cultivators, (ii) owner-cum-lessor cultivators, (iii) pure lessors, (iv) owner-cum-tenant cultivators and (v) pure tenant cultivators. Later on, we dropped the category 'pure lessors' from our study, since this category is a pure 'rentier class' which does not strictly fall in the purview of our study which largely deal with cultivating households of various descriptions.

(b) In order to comprehend the process of exploitation embedded in inter-locked market mechanisms, we make some departure from the conventional terminology and devise a few terms of our own. We may hasten to add that these terms are essentially the offspring of our field experiences, and we are convinced that some of the agrarian realities witnessed during the survey work must be brought to bear on our arguments. The exercise has no other pretensions or claims.

**Actual Rent Received and Acceptable Rent:**

The amount of rent actually received by a lessor for leasing out a unit of land is actual rent. On the other hand, 'acceptable rent' is the minimum amount of rent that the lessor would expect to receive for leasing out his land. If the rent offered is less than the notional minimum, the lessor would rather keep the land with himself and refrain from the act of leasing out. In other words, the 'acceptable rent' plays the role of inducing a prospective lessor to become actual lessor.
Our field experience led us to believe that there was no rigid method on the part of the lessor for arriving at 'acceptable rent'. The prospective lessor keeps in mind the value of output obtained by him last year, and accordingly works out a notional minimum that would induce him to let out this year as well. In most cases, the acceptable rent quoted by the lessor was 50.00 per cent value of last year's gross output per acre.

**Actual Rent Paid and Desirable Rent:**

The distinction between 'actual rent paid' and the desirable rent relates to the demand side of the land lease market. Actual rent is that amount of rent which is actually paid by the lessee to the lessor. On the other hand, desirable rent is the amount of rent paid to a lessor who is not involved in any kind of inter-locked market operations. In other words, desirable rent in many cases is only a notional concept that captures a situation of a lessee being free from market bondages; as if he was dealing with a lessor only in the land lease market. Quite often, one tenant cultivator leases in land from a number of lessors, some among whom are involved in inter-locking lease arrangements. If one of the lessors is outside the interlocked market mechanism, the rent actually paid by the tenant to his lessor is defined as 'desirable rent'. For notional convenience, we call the single lessor referred to above (ie. the one who does not operate in interlocked arrangements) as the 'simple lessor', essentially representing simpleness from the lessee's point of view. Within the above format, the example below clarifies our formulation of the concept of desirable rent.
Suppose A and B are two tenant households, A being neighbour of B. A is included in our sample, whereas B is not. B leased-in land from the 'simple lessor', whereas A leased-in land from the lessor who was operating in inter-locked land lease market. Tenant-B paid Rs. 500.00 as rent per acre to his lessor, whereas tenant-A paid Rs. 600.00 per acre to his lessor for the same grade of land. Now, in terms of our formulation, desirable rent for tenant-A would be Rs. 500.00 (the amount actually paid by B).

For yet another example, consider a sample tenant-A who leased-in land from lessors X₁, X₂ and X₃, where X₃ did not operate under inter-locking lease market, whereas X₁ and X₂ did. Let A pays rent Rs. 500.00 to X₁, Rs 475.00 to X₂ and Rs. 400.00 to X₃ per acre for the same grades of land. Now, the amount of rent paid to X₃ (i.e. Rs. 400.00) is desirable rent per acre for the tenant-A.

**Contracted Wage Bill and Warranted Wage Bill:**

These concepts relate to land-labour inter-locking arrangements. The amount of wage income actually received by a tenant household for rendering services to his lessor (or lessors) for a specified time period is contracted wage bill. It is estimated simply by multiplying the number of days worked by the members of tenant's household for the lessor through contracted wage rate agreement. The wage rate for the tenant labourers is pre-fixed, especially at the time of striking lease-labour inter-locked contract between the lessee and the lessor. For our convenience, we call this pre-fixed wage as contracted wage rate. On the other hand, 'warranted wage bill' is the
notional amount of wage income that the tenant worker expected to receive under the conditions of non-inter-locking arrangements. In other words, warranted wage bill is generally estimated by multiplying the number of days worked by the tenant household for lessor (or lessors) by the wage rate prevailing in the open rural labour market in the tenant's area. The example below clarifies the distinction between contracted wage bill and warranted wage bill.

Suppose two adult male workers of a tenant household work for 250 days in a year for the lessor at a pre-contracted wage rate of Rs. 7.00 per day under land-labour inter-locking arrangements. The contracted wage bill of the tenant household will be Rs. 1750.00. Further, let the prevailing wage rate in the tenant's area be Rs. 10.00 per day for adult male agricultural worker in the local labour market. The warranted wage bill of the above tenant household will thus be Rs. 2500.00. With the above format, the contracted wage bill of the tenant household is less than the warranted wage bill by an amount of Rs. 750.00 (Rs. 2500.00 - Rs. 1750.00). This is to be attributed largely to land-labour inter-locking arrangements.

Contrasted Debt and Commensurate Debt:

We use these concepts for estimating the rate of 'usury exploitation' under land-credit inter-locking arrangements. Contracted debt is the amount of borrowing including interest, that is paid to the lessor by the tenant borrower; and the amount of interest for this borrowing is estimated at the rate actually charged by the lessor. On the other hand, commensurate debt is the notional amount that the
lessee would be expected to pay to the creditor under conditions of non-interlocking lease arrangements. In other words, commensurate debt is estimated notionally at the rate of interest prevailing in the local non-institutional credit market. We site an example below to clarify the distinction between contracted debt and commensurate debt.

Suppose a lessee borrows Rs. 500.00 from his lessor at 60.00 per cent simple interest rate. After one year, the contracted debt of the lessee will be Rs. 800.00 (including interest of amount Rs. 300.00). Further let the prevailing local non-institutional interest rate be 40.00 per cent. Now, commensurate debt of the above lessee for the same time period will be Rs. 700.00. That means that the lessee would pay an extra interest of Rs. 100.00 to the lessor, because he is obliged to work under an interlocked land-credit arrangements.

**Inter-Locking Lease Market and Modes of Exploitation:**

On the basis of modes of contracts and conditions between the lessor and the lessee for a particular area of lease, we simplify the complexity of land market under semi-feudal modes of production by classifying it into four market forms:

(i) land-labour inter-locked markets,
(ii) land-credit inter-locked markets,
(iii) land-labour-credit inter-locked markets, and
(iv) land lease market free of any inter-locking.

Under land-labour inter-locking, we study two ways (dual modes) of exploitation of tenants: in terms of excess
rent over and above desirable rent and in terms of wage income less than warranted wage bill. For our convenience, we call the former mode of exploitation of tenant as 'rental exploitation' and the latter as 'remuneration exploitation'. Similarly, under land-credit inter-locking, there are two-ways of exploitation of the tenants: in terms of 'rental exploitation' and in terms of 'interest rate exploitation'. The latter mode of exploitation, we call 'usury exploitation'. Under the more extended land-labour-credit inter-locking, there are three ways (triple modes) of exploitation of tenants: 'rental exploitation', 'remuneration exploitation', and 'usury exploitation'. Lastly, under non-inter-locking arrangements only 'rental exploitation' of tenants is taking place.

(c) We also devise a statistical technique in our study to lend effectiveness to our comparison between the distribution of ownership holdings and the distribution of operational holdings in respect of its degree of concentration and dispersion. Formally, we call this as 'coefficient of highest mean deviation' of concentration ratios.

Mean deviation is a conventional measure of dispersion, and generally, it is computed as the simple arithmetic mean of the deviations of $x$ from its arithmetic average. 'Gini's mean difference'\(^5\) (measure of dispersion) is based on all possible mutual differences of the values of $x$. For $n$-number of observations 'Gini mean difference' is the mean of the absolute values of $n^2$ mutual differences.

In our study, variable $x$ is the estimated value of concentration ratio and we estimate mean deviation of $x$ about its highest value. We are interested in knowing the difference between lower values of concentration ratios and the highest value of concentration ratio, which would indicate the highest possible degree of skewness in the distribution of holdings. If we take mean deviation of $x$ in the conventional way by taking deviation from a pre-assigned value of $x$, say, mean other than the highest value of $x$, the value of mean deviation would be lower. That would not serve our purpose of estimating the highest possible degree of dispersion of concentration ratio.

Proof:

Let values of $x$ variable be $X_1, X_2, X_3, X_4, \ldots, X_n$, whereas $X_n$ is the highest value and $X_1$ is the lowest value.

Mean Deviation (MD) = $\frac{1}{n} \sum_{i=1}^{n} |x_i - X_n|$

$n$ : number of observations.

We have to prove that $\sum_{i=1}^{n} |x_i - X_n| > \sum_{i=1}^{n} |x_i - X_1|$

Now, the sum of deviations from the highest value:

$\sum_{i=1}^{n} |x_i - X_n| = |(x_1-X_n) + (x_2-X_n) + \ldots + (x_{n-1}-X_n) + (x_n-X_n)|$

$= |(x_1+x_2+\ldots+x_{n-1}+x_n) - nx_n| = D_n$

Further, the sum of deviations from the lowest value ($X_1$):

$\sum_{i=1}^{n} |x_i - X_1| = |(x_1-X_1) + (x_2-X_1) + \ldots + (x_{n-1}-X_1) + (x_n-X_1)|$

$= |(x_1+x_2+\ldots+x_{n-1}+x_n) - nx_1| = D_1$
Since $x_n > x_1$.

We can write $x_n = Kx_1$ (K-multiplier, $K > 1$)

or $n x_n = Kn x_1$

Replacing $n x_n$ by $Kn x_1$ in $D_n$, we see that $D_n > D_1$

or

$$|(x_1 + x_2 + \ldots + x_{n-1} + x_n) - K n x_1| >
\left|(x_1 + x_2 + \ldots + x_{n-1} + x_n) - n x_1\right|$$

or

$$\sum_{i=1}^{n} |x_i - x_n| > \sum_{i=1}^{n} |x_i - x_1|$$

Similarly, we can prove the sum of deviations from $x_2, x_3, \ldots, x_{n-1}$ will be less than $D_n$.

Coefficient of the highest mean deviation (from the highest value):

$$S = \frac{1}{nh} \sum_{i=1}^{n} |x_i - h|$$

Whereas $h$ = highest value of $x$.

$n$ = number of observation,

$S$ = coefficient of the highest mean deviation.

Limiting values of $S$: $0 \leq S \leq 1$.

Proof:

Let $n$ be the number of observations of $x$. The coefficient of the highest mean deviations $S = \frac{1}{nh} \sum_{i=1}^{n} |x_i - h|$

Deviations from the highest value ($X_n$):

$$(x_1 - x_n), (x_2 - x_n), (x_3 - x_n), \ldots, (x_{n-1} - x_n)$$

Thus

$$\sum_{i=1}^{n} |x_i - x_n| = \left|(x_1 + x_2 + x_3 + \ldots + x_n) - nx_n\right|$$

If $x_1 = x_2 = x_3 = \ldots = x_{n-1} = 0$ (under extreme form of skewness)

then,

$$\sum_{i=1}^{n} |x_i - x_n| = |x_n - nx_n| = \left|(1-n) x_n\right|.$$ 

So,

$$\varepsilon = \frac{1}{n x_n} \left|(1-n) x_n\right| = \frac{(n-1) x_n}{n x_n} = \frac{n-1}{n} \cdot \varepsilon$$
or \( s < 1 \); and the extreme value of \( s \) is based on the value of \( n \).

If \( X_1 = X_2 = X_3 = \ldots = X_n \) (under equal distribution of concentration ratio), then

\[
\sum_{i=1}^{n} |X_i - x_n| = |(X_1 + X_2 + X_3 + \ldots + X_n) - n x_n| \\
= |(x_n + x_n + x_n + \ldots + x_n) - n x_n| \\
= nx_n - nx_n \\
= 0
\]

Thus \( s = \frac{1}{nh} \cdot 0 = 0 \)

we conclude that \( 0 \leq s < 1 \)

In our study, when \( S=0 \) (the values of concentration ratio in all size classes or in all agrarian categories will be equal), it implies that the percentage of holdings is proportional to the percentage of land area owned (or operated) by the different size classes or by different agrarian categories. In other words, there is no skewness in the distribution of holdings. On the other hand, when \( S \) is the highest, but less than one, it indicates the highest degree of skewness in the distribution of holdings. Under this condition, the ownership land area or operational land area will be concentrated to only one size class or one agrarian category. In practice, the value of '\( S \)' varies between 0 and 1, which indicates various degree of skewness in the distribution of holdings.

HYPOTHESES:

A number of hypotheses are put to empirical testing. A few major ones among them are:

(i) In agriculturally backward areas, the incidence of
tenancy is relatively higher in the lower size class holdings (marginal holdings) than in the higher size classes.

(ii) Big lessors prefer leasing-out land in small parcels to tenants with larger families than to other type of tenants.

(iii) The supply of land in the lease market and the rate of rent are positively related; such relations are relatively tighter and inelastic in the irrigated than in the unirrigated villages.

(iv) The incidence of inter-locked land lease market (percentage of tenant cultivators entering into inter-locking lease arrangements) is relatively higher in the irrigated villages than in the unirrigated villages; moreover, a relatively larger number of petty cultivators enter into the inter-locked lease markets compared with high categories.

(v) The rate of exploitation of tenants is the highest under the land-labour-credit inter-locked markets and is the lowest under the lease market free of any inter-locking.

(vi) The petty cultivators, in general, take much initiative to adopt new technology in the process of production. The petty cultivators particularly under fixed rent tenancy, compared with their counterpart tenants under share crop tenancy and owner cultivation system, are forerunners in the use of new technology in the production.

(vii) There is an inverse relationship between the size of leased-in land and the use of new inputs and the
intensity of family based-farming. Consequently, the intensity of family based-farming and the use of new inputs are positively related, and such relations are significant under fixed rent tenancy.