

SOME ASPECTS OF FARM ECONOMICS UNDER VARYING
TENURIAL CONDITIONS : A COMPARATIVE STUDY

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Summary

Effects of temurial conditions on agricultural development is an age old question which acquired special importance in the context of agricultural development of the countries of the Third World, characterised by almost absolute dependence on a particularly backward agriculture. A general impression is that the backward condition of these countries in general and then agriculture in particular is aggravated by the existence of tenancy as a form of temure. The whole discussion on this topic hinges on the basic question of how alternative forms of temure promote or retard economic development.

In spite of the general acceptance of the idea of tenancy being inefficient there are some theoretical and empirical findings which do not fully support this view.

The existence of these conflicting theories and empirical evidence on the subject warrants a critical survey of the existing theories as well as thoroughgoing statistical investigation into the problem.

In this thesis we have made such a review of the existing theories and carried out some factual and statistical investigations to see how far and in what ways farming conditions differ under varying temurial conditions in different parts of India as well as in different countries.

Our review of the existing theories show that none of the theories adequately represent the reality while a few of them involves abstractions devoid of any factual evidence corroborating them. In any case, none of these theories is individually sufficient to prove or disprove arguments relating to the effectiveness of different forms of temure.

We pass on to make a factual survey of agriculture in relation to land tenure for the specific cases of three selected countries e.g., Japan, Egypt and China. We attempt to show how in each case the socio-economic positions of the different classes of farmers have affected and have been affected by changes in the institutional framework, in particular the tenurial system. It is seen that small-scale peasant farming was initially considered to be an improvement upon tenant farming in all these three countries. It is also seen that the short-run consequence of the policy of replacing tenant farming by small scale owner farming was to increase productivity and income and decrease inequality in the distribution of income and wealth; but in each case small scale peasant farming gave way, in the long run, either to capitalist farming or to the formation of large scale farming through co-operativisation or collectivisation of agriculture. The system of peasant farming is not therefore suggested by the example of these countries as a long run and permanent solution to the problem of concentration of wealth and income.

Next we come to the specific case of India. We have made a statistical investigation into the inter-regional differences in economic conditions, natural endowments and infra-structural facilities taken in conjunction with the inter-regional differences in the conditions of tenure. It is seen that it is not possible to arrive at any firm conclusions from such analysis regarding the relative effectiveness of the tenancy and owner farming systems. It appears that the inter-regional differences in performances could be better explained in terms of differences in the historical backgrounds

as well as differences in climatic and other conditions. This suggests that different tenurial systems ought to be compared in the context of common historical backgrounds and common climatic conditions.

With this end in view, we have carried out extensive statistical and econometric exercises to compare the performances of farms under different tenurial systems within the same socio-economic conditions and common historical backgrounds. We have carried out various statistical tests of hypotheses regarding the comparative performances of the two systems. We have compared production function fits and also carried out Analyses of Variance tests. By and large our test results reject the hypothesis that tenant farms are run more inefficiently than owner farms under all circumstances. Our results suggest that in the very small size group of farms tenants often perform less efficiently than owners, but among the medium and large farms tenants do not perform any worse than owners.

Chapter I

Agricultural Development under Different Forms of Tenure : Generally Held Ideas

Throughout the world a great deal of controversies and discussions centre round the problem of economic development of the underdeveloped countries. In this regard, an important section of policy makers as well as researchers are seriously preoccupied with the idea that adoption of "New Technology" involving better inputs and advanced scientific methods of production may serve as an appropriate method of achieving a substantial rate of growth in agricultural sector. Though it is often accepted that institutional and organisational changes affect agricultural growth, this factor is sometimes given only secondary importance^{1/}. However, the importance of land tenure as a factor affecting agricultural growth is indisputable. In the first place, since a system of tenure depicts a particular man-land relationships it obviously affects the socio-economic conditions of the agricultural population and relative economic and social positions of different classes of farmers. Thus society's welfare and social justice greatly depend on the existing tenurial relations. Secondly, since a system of tenure affects relative socio-economic positions of different classes of farmers, it gives rise to certain incentives as well as disincentives. Within a particular system of tenure neither the owner nor the actual tiller may find any incentive to undertake investment to improve the conditions of cultivation; thus it may affect agricultural growth. On the contrary, a system of tenure may help to

1/ T. W. Schultz, Transforming Traditional Agriculture. New Haven and London University Press, 1964.

achieve a higher rate of agricultural growth by creating necessary incentives for productive investments. Thirdly, importance of tenure may reside in the likely interdependence of technological and institutional changes. As we have already seen, a system of tenure, by affecting the relative socio-economic conditions of different classes of farmers, gives rise to certain incentive as well as disincentives; from this it follows that the incentive and ability of the farmers to adopt a better technology involving better inputs and advanced scientific methods of production, greatly depends on the existing institutional frame work, or more particularly, the existing form of tenure. On the other hand, imposition of a new and progressive land relations incorporating necessary incentives for enterprise and for productive investment may necessitate the introduction of an advanced technological condition in which the farmers find it possible and profitable to accept the new relations of production. It follows then that just as technological changes can not be given too much importance without giving any consideration to the institutional framework or tenurial conditions that characterise the institutional framework, one can not attach too much importance to the question of institutional or tenurial changes without any consideration of the technological conditions.

In support of this way of looking at the importance of tenurial relations affecting agricultural growth let us quote here the recent opinions of some writers expressed while describing the prospects of "Green Revolution" in India. Discussing some of the possible effects of Intensive Agricultural District Programme one writer^{2/} comes to the conclusion that "The results of

2/ D. K. Desai, "Intensive Agricultural District Programme - Analysis of Results", Economic and Political Weekly, Vol. IV, No. 26, 1969.

IADP indicate that the strategy of intensification of effort on an area basis has not achieved the objective of rapid increase in agricultural production". He explains the reason behind this failure (?) as that 'the whole strategy of IADP is supply based and it does not take into consideration the demand aspect of inputs'. 'Unless a strategy is evolved to combine scarce technical, financial, administrative inputs with the managerial inputs of efficient farmers rapid growth in agricultural production is unlikely to be achieved'. In explaining the 'opportunities of Green-revolution' another writer^{3/} concludes, 'Modernisation in agriculture in terms of new and modern inputs alone is in effect a limited and partial modernisation Use of modern inputs is neither a necessary nor a sufficient condition for modernisation of agriculture. The rationale for this view is obvious. In a modern agriculture the farms are integrated with the world through the linkages provided by the product and factor markets'. Again, it is shown in a recent study^{4/} that bigger sized farms can adopt better type technology to a greater extent. The study shows that in Punjab during 1967-68 farmers with 75 to 150 acres of farm size employed tractors and other machinery to a greater extent than the smaller ones. Another observer^{5/} comes to the conclusion that in Punjab 'a very small percentage of share-croppers has adopted the new strategy to a very limited extent'. All these observations seems to suggest that introduction of improved technology presupposes suitable temurial conditions.

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- 3/ B. Sen, 'Opportunities of Green Revolution', Economic and Political Weekly, Vol. V, No.13, 1970.
- 4/ Ashok Rudra, 'Big Farmers of Punjab : Second Instalment of Results', Economic and Political Weekly, Vol. IV. No. 52, 1969.
- 5/ Wolf Ladejinsky, 'Green Revolution in Punjab', Economic and Political Weekly, Vol. IV, No.26, 1969.

We may here also consider Francine R. Frankel's observation on 'India's Green Revolution'^{6/}. From Frankel's study it follows that she considers the agro-economic backwardness as a factor responsible for limited acceptance of modernisation programmes almost in all the cases. Thus analysing the results of the new programme in case of Burdwan (West Bengal) she comes to the conclusion that, '..... and taking into account the poor performance of the IADP over the last six years, the major obstacles to agricultural modernisation appear to lie less with unsuitable topography or inefficient utilisation of water, serious as these problems are, than with an extremely unfavourable agro-economic pattern. Uneconomic farms, often cultivated in several tiny fragments, combined with a very high rates of rental for leased land have left the majority of the agriculturists with neither the means nor the incentives to invest in modern methods of production'. For Palghat (Kerala) and West Godavari (Andhra Pradesh) Frankel concludes similarly that it is the uneconomic size of the holdings and high rate of rental percentage which served as a limiting factor in the way of introducing modern technology in these districts.

Let us now consider the opposite view point expressed, for instance, by Schultz^{7/}. Schultz recognises the importance of tenurial relations as a factor affecting growth, but he does not want to attach too much importance to it. He holds that differences in contribution of agriculture to overall growth among different countries do not depend much on the differences in

6/ Francine R. Frankel, 'India's Green Revolution - Economic Gains and Political Costs'. Princeton University Press, 1971.

7/ T. W. Schultz, *ibid.*

conditions of tenure in these countries. For instance he points out that the main reasons behind Japan's higher rate of growth of agricultural production compared to that of India are, in the first place, that quality of the material factors in agriculture in Japan is far better than that in India; and secondly that the Japanese people have acquired a higher level of farming skill and receive greater amount of schooling in general than the Indian people. As to the main reasons behind Japan's higher rate of growth compared to that of India, it is, however, possible to hold a different view, namely, that in Japan after world war II there were major changes in her land relations (which did not happen to India) and which served, possibly, as the main factor behind her agricultural growth. This important factor is not taken into account by Schultz in explaining the difference in the rates of growth in India and Japan.

In fact, it appears more reasonable to explain economic development of a country in terms of the interplay of institutional and technological changes rather than in terms of either institutional or technological change alone. To put it in Marxian terminology, it can be said that society develops through the contradictions between relations of production and the forces of production; at a particular stage of development of society relations of production favours development of the forces of production while at certain other stage when forces of production are developed to a certain degree existing relations of production retards further development of the same forces of production. It seems, therefore, essential to analyse the stage of development of a society in terms of whether the existing relations of production favour further development of the forces of production or retards

them. To judge it in a particular geographical and historical context would itself call for a study of the characteristics of different forms of tenure and their relative effectiveness.

The important question is, how to judge the relative effectiveness of different forms of tenure. To judge relative effectiveness it may not be sufficient only to consider the relative economic efficiency of the different systems. Generally, in economics, one understands by 'efficiency' ^(in a static sense) ~~maximisation~~ of production or net income or profit. Thus a particular form of tenure may be 'efficient' in this sense, if it helps to attain the conditions for 'optimal allocation of resources' and 'optimal intensity of resource use' (both in a static sense) by individual production units. However, attainment of the static optimality conditions by individual production units may not necessarily lead to the highest welfare for the society as a whole — it may not help to establish greater 'social justice' — nor lead to the highest rate of growth. We, therefore, think that relative effectiveness of different systems ought to be judged not only from the point of view of how far a particular system helps to attain some optimality conditions by individual farms but also from the point of view of how far the socio-economic conditions of different classes of farmers arising out of the particular system are consistent with some specific goals to be attained by the society.

If one meaningful way to judge the relative effectiveness of different systems may be to look at the problem from the point of view of some specific goals, it is good to recognise that these goals are, again, different at different stages of society and different for different social classes. It is

Therefore essential to be clear about the characteristics of the existing society under consideration; in particular, to judge the relative effectiveness of different forms of tenure in an underdeveloped country, one has therefore to know about the characteristic feature of that country's agriculture.

Now, most of the countries of Asia, Africa and Latin America are characterised by a stage of development which can neither be termed as purely capitalistic nor purely feudal^{2/}. In these countries development has been conditioned by Colonial subjugation, as a result of which they are now industrially backward and primarily agrarian, the so called underdeveloped countries with very low per capita income compared to that of the advanced capitalist countries of the world. The agrarian conditions of these countries carry vestiges of the colonial conditions of the past, which were characterised by a predominantly feudal set of relations of production. Excepting a few pockets of plantation economy where the new relations were fostered with a view to fulfilling colonial interests, large parts of the agricultural sector remained chained to the local markets, satisfying local consumption needs. As

2/ We are using the term 'purely capitalist' to mean an economic system under which (i) production is carried out for the market, (ii) to maximise profit and where (iii) labour is a commodity like any other in a labour market. By 'feudalism' on the other hand we mean an economic system under which (i) production is carried out to meet the needs of consumption, and (ii) employment of labour is subject to various forms of restrictive contracts and do not operate in a free market. These definitions might be controversial but all we want to say is that in most of Asian, African and Latin American countries, in agriculture capitalism has not yet fully developed but land relations in agriculture have undergone some changes from the feudal stage. As a result various types of land relations are found to exist side by side.

a result, in most of these countries agricultural sector is still characterised by feudal remnants and the goal to be achieved at this stage is often described as to remove the old feudal fetters and introduce a system in its place that may ensure a socio-economic condition and an income distribution pattern which encourage and enable the majority of the farming population to take active part and initiative in increasing production and making investment for productive purposes.

In the context of underdeveloped countries development of capitalist farming system is often considered to be an indication of society's progress. But the capitalist system, motivated as it is by considerations of profit maximisation^{10/}, can not offer employment to labour beyond a certain point; this follows from the theoretical proposition that for profit maximisation the marginal productivity of any factor must equal the price paid to the factor. Agricultural capitalism can not therefore possibly provide a framework that may enable and encourage the majority of the agricultural population to take active part in production and investment.

It is, however, generally accepted that peasant farming system in medium-sized^{11/} units may help to attain this goal. The argument put forward in support of this view is that since creation of the maximum possible number

^{10/} See footnote 9.

^{11/} N. Georges et Roegen, in his 'Economic Theory and Agrarian Economics', Oxford Economic Papers XII (1960), has presented economic arguments for the policy of individual peasant farming on medium-sized units.

of owner operators with medium-sized farms requires a process of confiscation of land from the large farmers (above some ceiling level) and its redistribution to the landless peasants or owners of very small units, introduction of the system would not only encourage individual initiative for productive investment but also promote social welfare. It is for this reason that the peasant farming system is often regarded as superior to the capitalist farming system.

However, the superiority of peasant farming system over the capitalist farming system may be questioned if one accepts a different way of looking at the role of peasant farming in ensuring the progress of a society; such a way of looking at the role of peasant farming was explained by Lenin^{12/}. According to him there may be two ways in which it is possible to encourage a system characterised by ownership holdings to take shape out of a predominantly feudal framework : (1) By encouraging the big landowners to adopt new methods of production and new relations of production while allowing them to retain their holdings, and (2) Through the confiscation and distribution of the lands of the big landowners over and above a particular ceiling level. About the relative merits of these two systems Lenin wrote : '..... there may be two forms of that development. The survivals of selfdom may fall away either as a result of the transformation of the landlord farming or as a result of break up of feudal latifundia i.e., either by reform or by revolution. Bourgeois development may pursue its course headed by big landlord farming

12/ V. I. Lenin, 'Agrarian Programme of Social Democracy in the first Russian Revolution (1905-1907)', Foreign Languages Publishing House; Moscow, 1954, p.42.

which will gradually substitute bourgeois for feudal methods of exploitation. It may pursue its course headed by small peasant farming which, in a revolutionary way, will eliminate the 'emergence' of the feudal latifundia from social organism and then freely develop without them along the road of capitalist farming'.

It seems to follow from Lenin's analysis that peasant farming system may only act as a temporary and transitional phase and its effectiveness lies in the fact that ultimately it leads to capitalist farming in a 'revolutionary way'. Thus the superiority argument for peasant farming in place of capitalist farming looses its grounds.

Peasant farming has been, as has been remarked earlier, advanced as the ideal agrarian system of underdeveloped countries, though hardly ever for its role in leading the economy to capitalist stage. Not merely in idea, but in practice too, in a number of countries^{13/} the system has been introduced. Thus in Japan the land reform programme of 1946 aimed at the creation of peasant farming system; in China after the revolution the Communist Government encouraged peasant farming as a policy ensuring growth and betterment of the broadmasses of the peasantry. In India also we see in the Congress Agrarian Reforms Committee programme it was emphasised that to achieve 'maximum efficiency' peasant farming system should be encouraged. In fact, we can name a number of countries in which peasant farming system was adopted at a particular period and its immediate consequences were encouraging. But it is not enough to look at the immediate consequences only; one has to look at the

^{13/} For a detailed analysis of the land reform programmes in Japan, Egypt and China see Chapter III, and for India see Chapter IV.

long-run consequences to judge whether the peasant farming system is superior to the capitalist system. We shall see that in Japan, within a few years of the implementation of the land reform programmes, transference of land from the relatively smaller landowners to the relatively larger ones took place which ultimately led to a condition in which it was almost impossible to avoid stagnation in the sector without waiving the ceiling limits imposed on the amount of land that could be possessed by a farming household. The ceiling limit was actually waived in 1961. In China, it was always expressed by the Government that the system of peasant farming was only a temporary solution, a 'transitional phase', the ultimate objective being the adoption of the Commune system^{14/}. In Israel Dr. A. G. Black (The FAO representative to Israel) criticised the then existing small farm structure as inefficient in the production of staple industrial crops like cotton, sugar, beet, groundnuts, feed and bread grains. He suggested the creation of large scale administered farms in the production of these crops. 'The small farms, he predicted, would not be able to support their operators in keeping with Israeli standard for long'.^{15/} It appears to follow from all this that the system of peasant farming acted only as a transitional phase leading either towards further concentration or towards collectivisation. Thus superiority argument for peasant farming in comparison to capitalist farming remains questionable unless we concentrate only on the short-run consequences of the systems.

^{14/} For a detailed analysis of long-run consequences of these land reforms in Japan and China see Chapter III.

^{15/} Raan Weitz and Avshalon Rokach, 'Agricultural Development : Planning and Implementation (Israel Case Study)', Reidel Publishing Company, Dordrecht, Holland, 1968.

Now we pass on to the question of the effectiveness of the tenancy system. Regarding the economic performance of the tenancy system there are different opposing views. However, the most generally accepted idea is that tenancy system (with its various forms) leads to inefficiency.

Against this generally accepted idea, some writers hold that tenancy system under certain conditions may work just as efficiently as the peasant farming system. Thus, it is argued ^{16/} by some writers / tenancy system with fixed rent may act efficiently if there is proper security of tenure and the cultivators are compensated for the fruits of the permanent improvements (which is not realised within the period of tenure) for which they had to invest. In fact there is some empirical evidence which also supports this view and provide sufficient reason to question the inefficiency argument for tenancy.

Thus, as is revealed from Falke Dovring's ^{17/} comparative study of recent history of Europe tenancy still exists in considerable magnitude in some parts of Europe. For example, in 1951 in England and Wales the percentage of rented farms was 57.3 (there were no share-cropped farms). In Belgium this percentage was 63.6, in Spain 31.4. Moreover, Falke Dovring puts forward evidence that tenancy was associated with economic growth : ^{most advanced agriculture of France is in the} "The fact that the /North Western part of the country where tenancy predominates, has been considered in conjunction with the fact that tenancy dominated England has a prosperous agriculture. Also in Germany most of the tenancies are in the North which is likewise agriculturally the most

16/ Earl O. Heady, 'Economics of Farm Leasing Systems', Journal of Farm Economics, Vol. 29, No. 3, 1947.

17/ Folke Dovring, 'Land and Labour in Europe - a Comparative Study of Recent Agrarian History', The Hague, Martinus Nijhoff, 1956.

advanced part of the country'. Graham Hallett^{18/}, in his 'The Economics of Agricultural Land Tenure' referred to the observations made by Welsh Land Commission of 1896 and those made by E. A. Allowed for Wales. As is mentioned by Graham Hallett the Welsh Land Commissions observation showed that as a result of agricultural depression, the owner occupiers were far worse off than the tenant farmers and the study by Allowed on the Wales data for 1954-55 reveals that in most groups of farms and especially on the smaller farms, the levels of output, capital and profit were higher on the tenanted than on the owner occupied farms; the analysis of the Welsh data for 1957-58 has showed a similar pattern. Graham Hallett also refers to a comparative study of profits of tenants and owner occupiers published in the inter-war period on the basis of a survey of the Eastern Countries that shows that no definite pattern was existing. Using, the Complete Farm Management Survey results for England and Wales in 1957-58, a similar comparison was made by Hallett^{19/} himself, which showed that profit on the tenanted farms as a whole was higher than on the owner occupied farms, although average profit per hundred acres were only very slightly lower than the tenants.

On Indian agriculture A. M. Khusro^{20/} made a similar study. One of his findings is that insecurity of tenure was the most important factor hampering incentives for increasing investment by the tenants in Hyderabad before the Land Reform Legislation was passed in 1950 and amended in 1954. He

^{18/} Graham Hallett, 'Economics of Agricultural Land Tenure', Land Books, London, 1960.

^{19/} Graham Hallett, *ibid.*

^{20/} A. M. Khusro, 'Economic and Social Effects of Jagirdari Abolition in Hyderabad'. Department of Publication and University Press; Osmania University, Hyderabad.

observed that as a result of the enactment of this act, which gave the tenants proper security of tenure, they began to perform better than the owner cultivators in the sense that their investment were increasing at a much higher rate. He concluded : "Thus in whichever manner we prefer to strike a comparison between the two classes of people — absolute level of investment or investment per family — we tend to reach the same conclusion that the investment activity of tenants is forging ahead at a decidedly more satisfactory pace than that of the owner cultivators".

However, all these empirical evidence relate to tenancy with fixed rent and not the share-cropping system. In fact there is evidence to the effect that in countries of Europe the share cropping system is a much less prevalent system than the systems of tenancy with fixed rent or owner farming. The distinguishing feature of share tenancy is that under it the cropper is to pay a certain percentage of their produce as rent and not any fixed amount to the landlord. Every increase or decrease in production is associated with an increase or decrease in the amount going to the landlord as rent. This gave rise to the theorisation by economists like Marshall that the system results in inefficient allocation of resources, since the cropper may not be expected to equate the marginal product of an input to its market price but to equate only the part of the marginal product going to himself to the market price. Hence optimal intensity in the use of an input is not to be expected under the system.

However, there are some other theorists who hold the contrary view that share-cropping may work just as efficiently as owner farming under certain suitable conditions. Thus it is argued that share cropping could

work efficiently if the cost of variable inputs is borne by the two parties in proportion to their respective shares in the product and if the shares are so adjusted that the proportion going to the landlond includes the remuneration for the use of both land and the fixed capital of the landlord. This line of argument was first advanced by J. S. Mill^{21/} according to whom it was the lack of security of tenure which was the major defect of the system. After J. S. Mill, several other writers expressed similar views. Among the most recent theoreticians on the subject, S. N. S. Cheung^{22/} has tried to show that share-cropping need not necessarily lead to inefficient allocation of resources. In support of his argument he himself presented the examples of Taiwan to show that 'Under the share restriction the intensity of labour input to land was significantly higher in tenant farms than in owner farms'. Moreover, on the basis of observations related to Taiwan he tried to show that under unrestrained property rights 'no notable difference is seen in input intensities among farms with different land tenure arrangements'.

Cheung also referred to the observations made by John Loosing Buck on Chinese agriculture and James O. Bray on U. S. agriculture. Thus,

"Contrary to the prevailing opinion that tenants do not farm as well as owners a classification according to yields by different types of tenure shows no significant variation in yields for most localities, and for few in which a difference does occur, it is

^{21/} J. S. Mill, 'Principles of Political Economy with some of their applications to social philosophy' (ed.) by Ashley, Calcutta Longmans, Green, 1920.

^{22/} S. N. S. Cheung, 'Theory of Share Tenancy - with Special Application to Asian Agriculture and the First Phase of Taiwan Land Reform', Chicago University. Chicago Press, 1969.

in favour of the tenant or part owner as often as for the owners.....

In some places it is evident that the tenants farm better than the owners'. (Buck^{23/})

and

'Underdeveloped countries intent on technical progress in agriculture should recognise the fact that much of the most impressive gain in agricultural productivity occurred in areas of the United States, where a dominant form of land tenure is a share rental arrangement between landlord and tenant'. (O. Bray^{24/})

All these show that there^{are} enough theoretical reasoning and empirical evidence to raise doubts as to the validity of the generally accepted view that share-cropping system is less efficient.

In this context one may also consider the study made by C. H. Hanumantha Rao^{25/} on Indian data. Rao started by trying to prove the hypothesis that 'Under uncertainty situations where the scope of entrepreneurial function is limited, there may be an incentive for the tenants to reduce the variance of their income by shifting part of their uncertainty to suppliers of land services through share cropping arrangements'. Similarly, 'In situations where the element of uncertainty is smaller and entrepreneurial functions are relatively unimportant and where, therefore, the farm takes on the

23/ John Loosing Buck, 'Chinese Farm Economy'. Chicago University Chicago Press, 1930.

24/ James O. Bray, 'Farm Tenancy and Productivity in Agriculture : The Case of United States', Food Research Institute, Vol. IV, No. 1. (1963).

25/ C. H. Hanumantha Rao, 'Uncertainty, Entrepreneurship, and Share-cropping in India. The Journal of Political Economy, Vol. 79, No.3, 1971.

character of managerial or supervisory units the landlords may find it profitable to lease out (on share-rent basis) beyond a point the land they owned, rather than cultivate the entire holding through hired labour'. Rao thus attempted to explain the causes behind the existence and prevalence of share cropping in many cases. Moreover, Rao showed on the basis of data on West Godavari (Andhra Pradesh) that for the same holding size levels over a wide range, the marginal productivity of land among the share rented farms is higher than the owner operated farms of the corresponding size and is not lower than the larger owner operated farms. Thus Rao's study seems to imply that share rented farms are more efficient since at each level of employment of land, marginal productivity of land is higher for the share-croppers than the owner cultivators.

However, there may be different forms of share cropping and one cannot possibly come to any conclusion about relative efficiency of share cropping and other forms of tenure without considering different forms of it.

In fact, there may be varying degrees of participation in the cost and decision making by the two parties. Among the different forms of it one extreme form is that under which the landowner advances almost all the expenses and takes decisions on every aspect of production; thus under this system the landowner works like a capitalist farmer and the share cropper like a wage earner who is selling his labour power and is completely separated from the means of production. Under this form of share cropping, as described by Rainer Schickels^{26/}, the entrepreneur has full and undivided control over

^{26/} Rainer Schickels, 'Effects of Tenure Systems on Agricultural Efficiency', Journal of Farm Economics, Vol. 23, No. 1, 1941.

the system
the productive agents, so that is compatible with the optimal intensity
and combination of resources.

Nevertheless, as our discussion shows, there are enough controversial
opinions and contradictory evidence to give grounds for thinking that the
inefficiency argument for leasing system requires to be judged more
thoroughly. The generally accepted view that tenancy system is inefficient
may not be accepted as a general truth valid under all circumstances. It
is this that justifies the investigation we undertook, the results of
which are presented in the Chapters following.

Chapter II

Economic Consequences of Tenancy : Some Theories

In this chapter we shall try to give a brief summary of the development of theories on the question of relative efficiency of alternative forms of tenure. We shall restrict our review to the literature of the academic tradition of the Capitalist world, leaving out the Marxian literatures on agrarian topics.

From the very early days when old feudal system was just breaking down and capitalism was developing, the question of land tenure as a factor contributing to growth and political stability assumed considerable importance. With the growth of industrial capitalism, it became a problem to meet the increasing demand for food and raw materials for the agricultural sector. It was felt by the economists that appropriate land reform measures should be introduced which should include the introduction of new production relations that might help to break the old feudal inertia characterising agriculture. Thus we get a host of economic theories on the relative efficiency of alternative forms of tenure arising from the days of Adam Smith upto present period.

As early as 1776 Adam Smith^{1/} in his "An Inquiry into the Nature and Causes of the Wealth of Nations" presented an idea on the above question and after him economists like Arthur Young^{2/}, McCulloch^{3/}, Richard Jones^{4/}, John Stuart Mill^{5/} and Marshall^{6/} presented their ideas. However, all of these economists were of the

1/ Adam Smith, *Wealth of Nations*. New York, Modern Library, 1937.

2/ Arthur Young, *Travels during the years 1787, 1788 and 1789* (in the Kingdom of France, Dublin, 1798).

3/ J. R. McCulloch, *Principles of Political Economy*, New York, A. M. Kelley, 1964.

4/ Richard Jones, *Essay on the Distribution of Wealth and on the Sources of Taxation*. New York, Kelley and Millman, 1956.

5/ John Stuart Mill, *Principles of Political Economy*. (Ashley ed., 1920).

6/ Alfred Marshall, *Principles of Economics*. London, Macmillan Co., 1956.

opinion that the system of tenancy in general and share cropping in particular is inefficient in the sense that it does not encourage any improvements in land or methods of cultivation and that the system involves a lower productivity of both land and labour resulting in inefficient surplus of food to meet the requirements of rapidly developing industrial sector and thus hampering the overall growth of the economy. The general line of argument in these analyses is that since under the system the landlord is to get a part of the increased production, the tenant will never be willing to employ his own capital for the improvement of land they cultivate. The farmers will try to produce as much as is possible by the capital stock furnished by the landlord, it would never be in their interest to pay anything out of their own pockets for the improvement of land, particularly for those improvements for which the return is not immediate. Richard Jones, moreover considered the question of labours' productivity under different systems. According to his opinion, since under share-cropping there is little improvement of land the productivity of labour is extremely low. As a result, under the system it is not possible for the cultivators to produce any surplus over and above their subsistence minimum. Thus the system hampers growth of the economy as a whole. Although J. S. Mill recognised the arguments put forward by Adam Smith and others, he was of the opinion that most of the defects of the system originated out of imperfections of the system as practised, rather than the system. To him, it is the insecurity of tenure which is the major defect of the system as practised in most of the cases and agricultural improvements could take place provided tenants could be made secure in their rights.

It is Alfred Marshall who first tried to answer the question on the basis of a rigorous theoretical framework -- the neo-classical marginalist analytical framework. He made a comparison between the share-cropping system of tenancy and the fixed rent system and came to the conclusion that under share-cropping both capital and labour would be used less intensively than under fixed rent system. As he explained, since the share-cropper is to give his landlord half of the returns (share rent is assumed to be half of the total produce) to each dose of capital and labour he applies to land, he will not want to apply any dose the total return to which is less than twice enough to reward him. Thus as he concludes, if the share-cropper is free to adjust the input he applies, he will cultivate far less intensively than under fixed-rent system, accordingly the total return going to the landlord would also be lower in this case. Marshall's approach is represented diagrammatically in the Appendix note no. 1.

Having shown that share-cropping may result in inefficient allocation of resources Marshall did not attempt to answer why then the system of share-cropping is chosen at all. But it should be mentioned that the theoretical analysis presented by him seems to point out that resource allocation may be efficient even under share-cropping if the tenant is not free to cultivate "as he chooses". While he admits that the tenant would not be interested to allocate labour and capital to optimal intensity, he points out that in many parts of Europe where share-cropping exists the landlord can enforce efficient allocation of resources although he has to spend much time and take much trouble for that. Enforcement of efficient allocation by the landlord becomes easier if the tenant has no fixity of tenure. In Marshall's own language "And if the tent has no fixity of tenure, the landlord can deliberately

and freely arrange the amount of capital and labour supplied by the tenant and the amount of capital supplied by himself to suit the exigencies of each special case". The conditions of efficiency may be achieved, according to him, "when holdings are small, tenants poor and the landlord not averse to taking much trouble about small things". This, it should be noted, differs $\bar{\Delta}$ in emphasis from the idea held by J. S. Mill who emphasised more the fact that it is the lack of security of tenure that stands in the way of efficient functioning of the share cropping system in the long run. If tenants are secure in their rights they may be more interested to make permanent improvements in land, since they would be sure of getting a reward for the improvements they make. Again, a sense of permanent occupancy right may induce the tenant to form the land more efficiently — the tenant himself may in this case encourage his landlord to invest in land and other capital, for that may increase his share of total product. This may happen particularly when the tenants' farmsize is relatively large, accounting for a substantial share of the landowners' total income. Hence Marshall's contention that conditions of efficiency could be possibly achieved when the lease holdings are small does not appear to be a sufficient truth.

An important lacuna in Marshall's analysis is that he did not consider that there may be cost sharing by the owner, which may result in employment of inputs with optimal intensity. Marshall also did not consider any model in which a tenant distributes his labour to several farms leased in from different owners and determines the amount of labour to be applied in one particular farm in a way that enable him to maximise his total income. Similarly the situation in which landowner finds it economically more reasonable to distribute his land to several tenants and to keep a part for self cultivation is not taken into account by Marshall.

As to Marshall's argument that the owner could coerce the tenant to put in doses of labour and other inputs beyond the points that could be dictated to the tenant by a strictly marginalist analysis, he did not take into account that the scope for such interference by the owner with regard to inputs could be restricted by the nature of the production function;

Marshall's arguments were not however all based on marginalist analysis. Lot of them were based on empirical observations on the working of the fixed rent system in England and Metayage system in France and many of his reasonings in favour of the fixed rent system could appear to be sound at least with respect to English agriculture of his time.

[Thus Rainer Schickel accepted the same type of analysis to prove inefficiency of share-cropping system although he went much deeper into the problem of analysing relative efficiency of owner-farming cash-rent-tenancy and share-cropping. Following Marshall's basic approach, he starts by assuming that all prices are determined in the competitive market.]

Marshall's basic approach of dealing with the problem is still followed by modern economists, although there are extensions and improvements of the analytical procedure. Rainer Schickele^{10/} also accepted the same type of analysis to prove inefficiency of share-cropping although he went much deeper into the problem of analysing relative efficiency of owner-farming, cash rent tenancy and share-cropping. Following Marshall's basic approach, he starts by assuming that all prices are determined in the competitive market and that the aim of the entrepreneur is to maximise net return. Again, he tries to assess the relative efficiency of different systems on the basis of the two conditions of efficiency that are formulated by Marshall and other Neo-classical economists: these conditions are, first, that marginal cost for the farm, should be equal to the marginal return for it and the second, that for all factors marginal return should be the same. The first condition as is held by these economists, will guarantee the optimum intensity of factor use and the second will guarantee the optimum combination of factors. With these conditions of efficiency, Rainer Schickele described the owner-operatorship as the "Ideal System". The arguments put forward by him are similar to that generally put forward by other Neo-classical economists : since under owner-operatorship there is no separation in the decision-making power (owner-himself is the operator) and since the owner enjoys the full amount of the net product, (total product minus cost) the two conditions of efficiency would be guaranteed if he maximises his net return as he is assumed to do. Since maximisation of his net return implies the maximisation of the net return for the farm as a

10/ Rainer Schickele, Effect of Tenure Systems on Agricultural Efficiency. Journal of Farm Economics, No.XXII, 1941.

whole (no separation in decision making power and no share of the product going to the landlord), the optimum intensity of factors use for him will coincide with the optimum intensity of factors use for the farm. Again, since the owner-operator finds it profitable (due to full occupancy) to combine investment in durable inputs called for by long run production planning and investment in non-durable inputs, optimum combination of factors is achieved. Thus the second condition of optimal combination of inputs is also satisfied.

However, by way of analysing the functioning of owner-operators, Rainer Schickele emphasises that it is the separation of decision-making power which is mainly responsible for inefficiency under a system of tenure. This particular factor, namely division of decision-making power between the owner and the tenant which may be considered as one of the sources of inefficiency under tenancy, is not considered by Marshall. Thus if one strictly confines oneself to Marshallian way of analysis, fixed cash rent tenancy would appear to be as efficient as owner farming, since under cash rent tenancy the amount that goes to the land owner remains constant irrespective of the level of input use and increase or decrease in production. Rainer Schickele, however, shows that due to division of decision-making power between the two parties, even cash rent tenancy may lead to inefficient allocation of resources. Again, it is also pointed out by him, absence of security of tenure may be considered as another source of inefficiency under tenancy. His way of analysis is as follows : In the cash rent tenancy system the landlord controls the input of durable factors and the tenant that of the non-durable factors and there is no full certainty or even absence of complete uncertainty. Under this system neither of the two conditions of efficiency is fulfilled. Due to separation of

control over two classes of inputs, the land owner, while investing in durable inputs has to take the present level of non-durable inputs as given which results in rapidly diminishing marginal returns for the durable factors. This will also be the case for the non-durable factors if the analysis is considered from the point of view of the tenants. Thus the optimum intensity of input use for either tenant or landlord will not coincide with optimum intensity for the farm.^{11/} Again, due to absence of complete security of tenure the tenants usually do not find any interest to use those durable inputs return to which is not immediate and which are called for only by long run production plans. As a result, the optimum combination of factors is distorted.

Under share cropping, the above two conditions namely the separation of control over two sets of inputs and absence of complete security of tenure exist in addition to a third condition that applied only to that specific form of tenancy, namely, the marginal return to the share cropper is always less than the actual marginal return. Thus, according to Schickels the share-cropping system of tenure is more inefficient than cash rent tenancy which in its turn is more inefficient than owner farming. He, however, pointed out another form of share-cropping which may satisfy all the conditions of optimal efficiency. Under this form, the entrepreneur is the land owner or his hired delegate. The occupiers of land (share-croppers) or the hired labourers who till the land have no or very little control over the inputs. The entrepreneur has the full and undivided control over the productive agents. Under this form of tenure, he argues, the conditions of optimum efficiency are fulfilled even if the tillers are share croppers provided that the landowner has not

^{11/} Thus as Schickels holds, An increase in the intensity of durable factor inputs involves an increase in the intensity of non-durable factors if optimum combination and maximum efficiency is to be achieved. Owing to the division of control between the two parties, estimates of marginal return and the increment in rent justly claimed for additional improvements are distorted.

only the undivided control over the productive agents but also that he can adjust the share going to the share-cropper. As he points out "under this form of share-cropping then, the landowner pays the cropper's wage with share of the crop. It is not the cropper who pays the landowner's rent with the share of the crop".

Herl O Hedy^{12/}, in addition to discussing the characteristics of a leasing system which make it inefficient on the same lines also indicates the way to establish perfect leasing systems which may ensure efficiency. He starts with the assumptions regarding competition and pricing system similar to those of Rainer Schickele and points out the characteristics of "a perfect" leasing system to be : "(1) One which ensures the most efficient organisation of resources on the farm relative to consumers demand as expressed in the prices" and (2) "an equitable division of the product among the owners of the various resources employed in production". A leasing system would be an imperfect one if it contains such provision which results in either a fixed supply of specialised resources, the input of which is not related to their marginal productivity or creation of uncertainty beyond what could normally exist in the market. A fixed supply of specialised resources, as Hedy puts it, may limit the overall scale of operations in the sense that the farm can not equate marginal cost and marginal revenue as suggested by market prices. It may also cause substitution of other factors in place of the specialised factor in a manner which distorts the optimum intensity of different factors. Moreover, it may for the same reasons distort allocation of resources among different

^{12/} Herl O Hedy, Economics of Farm Leasing System, Journal of Farm Economics, No. XXIX, 1947.

commodities away from the optimal. A fixed supply of specialised resources tends to be created under tenancy, whether of the fixed cash rent or share-cropping variety. Under these systems generally the landlord furnishes the durable inputs in the form of land and buildings and the tenants furnish all or a major part of the working capital. Since the landlord does not receive the full marginal product he may be unwilling to add to investment in durable inputs such as land and building. As a result inputs of these factors may not be extended beyond a point. Again, under these forms of tenure generally there exist uncertainties beyond that which would normally exist in the market. Under this type of uncertainties future returns on investment will be discounted, and as a result, inputs would not be employed with the optimum intensity. Thus Heady's way of analysing the causes of inefficiency under tenancy is similar to that of Rainer Schickele.

Heady, however, prescribed ways through which a leasing system may get rid of the conditions causing inefficiencies. In the first place he argues that on the one hand the tenants should be allowed to furnish and realise the entire net return on otherwise fixed resources and on the other hand the landlord is not only to furnish the durable resources but also should realise the net marginal return on investment. This implies that the lease should provide for not only return on land but also return on buildings and machinery as rent payment to the landlord. Secondly, he suggests getting rid of conditions of uncertainty through long run contracts, security of tenure and compensation for unexhausted resources. According to Heady, fixed cash lease system may ensure efficient allocation if there is no uncertainties beyond what exists in normal market conditions and if it does not result in fixed supply of specialised resources. For share-cropping to be an efficient system, as it is argued by Heady, one more condition is necessary, namely, the cost of variable factors should be divided between landlord and tenant in the proportion that holds for the division of the product.

[2] D. Gale Johnson takes a different direction with the Marshallian analysis of share-cropping tenancy system by arguing that share-cropping results in inefficient allocation of resources if the share proportion going to the landlord is constant, whereas if the share proportion is variable share rent market would establish such renting conditions which would ensure a relatively efficient allocation of resources.

His approach, as he himself pointed out, was somewhat different from the earlier writers in that he considered the two important problems relating to share-cropping that were not adequately taken into account by the earlier writers. While all the previous analyses started with the notion that the problem of the share-cropper is to allocate his labour and other inputs in a given plot of land provided by the landlord, the question how tenant decides the amount of land to lease in, was systematically ignored; secondly none of the writers until Johnson examined the types of adjustments that can be made by the share-cropper and the landlord to make the system function reasonably well. Johnson tried to consider both these problems systematically.

To establish that in the absence of variability in the share proportion the system results in inefficient allocation of resources, Johnson constructs his model (see appendix note) with the assumptions :

(i) the crop share tenant like any other tenant decides how much land he will lease in, (ii) the tenant combines only two inputs land and labour, (iii) no restriction is placed by the landlord upon the tenant other than the payment of the stipulated share of the product. The conclusion that follows from his theoretical model support the idea held by Marshall with regard to the allocation of all the non-land inputs. With regard to land,

[3] DGale Johnson: Resource Allocation under share contracts.
Journal of Political Economy, No LVIII, 1950.

if follows that the tenant would go on leasing in land until its marginal product comes down to zero. Johnson recognises the apparently inconsistent result that "the tenant is willing to pay the landlord a third of the total product for the use of the land, which, at the margin, returns nothing to him". He does give some explanation but we have failed to understand what his argument is. We have also failed to appreciate the full implication of the following conclusion "under such a contract more labour and other factors would be applied to each unit of land, since labour and other factors would be used until their prices equalled the value of the respective marginal products. Consequently there would be a larger total product a greater share (residual) available for payment to land". It is not clear why the payment to landowner would be greater under fixed rent system than under share rent system as no analysis is made of the way fixed rent for land is determined.

In fact, Johnson himself was in doubt whether the landlord would accept such a leasing condition. Assuming rent to be a decreasing function of amount of labour input per unit of land he arrives at a new set of equilibrium conditions. According to this model "the tenant would under certain conditions use less labour on a given piece of land than he would if he render it for cash at the same average rent "also that" the tenant will not continue to rent land until its marginal product is zero".

However, according to Johnson, "there is no evidence that the rental share varies with the intensity of cultivation. Evidently landlords have not availed themselves of the possibility of varying the rental share (in the manner described above) as a means of increasing the rent". Moreover he himself holds that the landlord would not certainly accept the situation as is implied by these new set of equilibrium conditions and try to protect his

interest and achieve a reasonable level of rent. To enforce desired level of cultivation the landlord may adopt three techniques. First, he can contractually fix the amount of labour to be used, the method of cultivation, application of fertiliser and so on. Secondly he may share in the cost of production in the proportion in which output is shared. Thirdly, he may go in for short term lease. In the first case the landlord can enforce an efficient allocation of resources by keeping the land size small. As Johnson argues "If the unit is small and the share-cropper is restricted in outside earnings, he must apply his labour and that of his family until he has achieved certain minimum level of income". Thus Johnson, like Marshall holds the view that if the farm size is small it would be easier for the landlord to enforce an efficient allocation of resources. With regard to the second technique i.e., the sharing of expenses, he argues : "In this case the tenant and the landlord will make the decision jointly and can arrive at the best allocation of resources". Johnson however emphasises that these methods may be insufficient to ensure optimal allocation of resources and "much more powerful" factor in enforcing efficient allocation of resources is the short term lease. Thus Johnson's view was opposed to that of Mill and similar to Marshall, in that he considered absence of security of tenure as a factor enforcing efficient use of land. He holds that the major reason why crop-share system could not work well in Western Europe was that the tenant had permanent tenancy rights in land. Short term lease is considered to bring about efficient allocation of resources on the ground that : "With a short term lease renters are obviously aware that landlords have the alternative of renting their land for a cash rent independent of current output. Consequently the tenant must plan to produce an average output for acre that will provide a rental payment, if yields are average, equal to possible cash rent plus any additional payment required to compensate the landlord for the uncertainty he bears".

Johnson, however was fully aware of the possible disadvantages of short term lease system and suggested that only some of these disadvantages might partly be remedied by providing for compensation for unexhausted resources.^{14/}

Thus, it follows from Johnson's way of analysing that a share-cropping system may be made efficient if the landlord adopt either of the different ways, eg., by varying the share proportion, taking short term lease and reducing the size of the farm to be tenanted and fixing the amount of labour to be put in the tenanted land.

^{15/} It is S. N. S. Cheung who made an extensive study of share-cropping and tried to show that resource allocation remains the same irrespective of the form of tenurial relations existing in agriculture if private property rights in land and perfect competition is assumed to exist in agricultural sector. He starts by attacking the Marshallian way of analysing share-cropping on the ground that the existence of the residual earning of the tenant which is a result of Marshall's assumption of fixity of rental share (the amount he earns over and above his alternative earning that he could get by putting the same amount of labour as a wage labourer) is inconsistent with equilibrium^{16/}; as Cheung argues the landlord would not allow the tenant to enjoy the residual in the face of alternative choices such as a wage contract or a fixed rent contract.

His approach was similar to that of Johnson in that he found that by varying the rental share and by dictating the amount of labour to be put in the tenanted land, in maximising his income, the landowner can bring about an

^{14/} This idea of Johnson is similar to that of Heady that optimal intensity of labour input can be achieved if the tenancy contracts involve compensation for unexhausted resources.

^{15/} See appendix note no 3 for a brief resume of his argument.
S.N.S. Cheung, *The Theory of Share Tenancy* (Univ of Chicago Press, 1969)

efficient allocation of resources under share-cropping. However, while Johnson was reluctant to assume that landlord has the power to adjust the share proportion, Cheung did not ^{find} ~~found~~ it unreasonable to assume that the landowner has the power not only to adjust the share proportion but also to dictate the amount of labour to be put in the tenanted land. ^{16/}

However, it appears to us that Cheung's way of analysis is questionable in many respects. In the first place, the whole analysis is based on the assumption that to maximise his total rental income the landowner can adjust the rental percentage, the number of farms and the amount of tenant labour to be employed in a farm. Again, the equilibrium rate of rental percentage, the number of farms and the amount of tenant labour to be employed in a farm is to be obtained from the conditions of maximisation of total rental income to the landowners; there is no consideration of the tenant's role in deciding the amount of these variables except that the landlord while maximising his total rental income, has to bear in mind that in equilibrium the tenant's share of the output has to be equal to his alternative income and if the former is less than the latter, the tenant could have no reason to accept the contract. (See Appendix Note no. 4).

Even if one accepts that a particular type of share-cropping system may exist, in which the share-cropper is nothing but a wage-earner ^{17/} whose wage is paid by a share of the crop and the landlord is the sole decisive agent who decides everything in a way as to maximise his rental income, it is of great doubt whether the usual form of share-cropping, corresponds to that

^{16/} Cheung however was aware of the possibility that the tenant may not in practice put in the full amount of labour that is contractually fixed. He emphasises in this connexion the role of transaction cost in enforcing the stipulated amount of labour in the tenanted land.

^{17/} As Rainer Schickel hold, under such situation share-cropping may result in efficient allocation of resources. (See page 5.)

taken in Cheung's model. Usually the share-cropper possesses some important role in the decision making about the employment of a type of inputs in a farm, and, as a result, the equilibrium amount of these factors is derived also from the conditions of maximisation of the net income of tenant. For example, first as a landowner may decide the number of parcels in which he will lease out his land, a tenant may also decide, if he be free to do so, how much labour he will employ in a particular farm, or in other words, the tenant also may decide ^{the amount of land to lease in} the number of farms in which he will divide his total tenant labour so as to maximise his net return. Cheung's assumption that a landlord can adjust the rental percentage to maximise his rental income whenever he finds that the existing rental percentage does not maximise it holds true only under a situation in which the landlord is a monopolist. If we assume that the rental percentage is determined in the market with the interplay of demand and supply of land to be share-cropped and if perfect competition is assumed to exist, no individual landowner can change the rental percentage at his will, he is to accept the market rental percentage. In fact it is more usual that a particular rental percentage is accepted by every landowner for a long period.

Having shown that under private property right system resource allocation would be the same in all forms of tenure, Cheung next comes to the question: why then different tenurial systems are ^{often} found to coexist side by side. According to Cheung the coexistence of different systems of tenure at the same time and in the same region has to be explained in terms of differences in the transaction cost and degree of uncertainty and risk associated with different systems. As he points out "..... the choice of contracts is determined by weighing the gains from risk dispersion and the transaction costs associated with different contracts". For share-cropping he expects transaction cost to

be higher; since tenants would tend to use the amount of input less than what might be fixed contractually the landowner has to incur some cost (transaction cost) to enforce the stipulated amount^{18/}. But as Cheung found, share-cropping system provides much scope for sharing risk among the two parties and therefore one would expect it to be more widespread in areas characterised by high degree of uncertainty than in areas of relative certainty, if transaction costs are equal.

Cheung's analysis of the role of transaction cost has been criticised by many writers. For example C. H. H. Rao^{19/} has argued that Cheung's analysis of the role of transaction cost would be valid only if one assumes the nature of the production function to be such as to leave much scope for variations in the proportion of inputs, which according to him may not always be true.

Again, Rao criticised Cheung's theory of the choice of contracts on the ground that it "..... refers to gains from risk dispersion but omits any consideration of the scope for decision making in the face of uncertainty". According to Rao situations of uncertainty may exist with or without there being much scope for entrepreneurship. As Rao puts it "If it is possible, for instance, that the returns from any two competing crops reveal a high degree of variance in the past and yet the returns from one of them is always higher than the other". He argues that under this situation though there is uncertainty in the sense that "..... returns from the crop chosen can be identified only with a probability distribution of potential outcomes and not with a unique outcome", there is limited scope for decision making in the sense that "..... choice of product can be made simply on the basis of maximum profit criterion". Rao defines another kind of uncertainty in this way : "..... if

^{18/} Cheung's idea in this matter seems to be the same as Marshall's that by sharing "much time and trouble" landlords can force tenants to **cultivate at the stipulated intensity.**

^{19/} C.H.H. Rao : *Uncertainty Entrepreneurship and share cropping in India*
Journal of Political Economy . Vol LXXXIX No 3, 1971.

the distributions of expected returns from alternative crops overlap, then uncertainty may be said to exist for decision-making". Thus Rao distinguishes between different kinds of uncertainty and argues that in the situation of uncertainty with significant scope for decision-making both owner and tenant would prefer fixed rent system to crop-sharing arrangement. He attempts to provide evidence that in the Indian conditions share-cropping is extensive for crops for which scope for allocating decisions and for decisions regarding factor substitution is very much limited. On the other hand he provides some evidence to show that cash rent tenancy is extensive for those crops for which there is larger scope for decision-making as well as profitability.

Further from Rao's empirical work it would appear that land is not cultivated less intensively under share cropping system than under owner farming system.

Although Rao did not see share-cropping to be an inefficient system, it seems to follow from his own explanation of the conditions of existence of share-cropping that the latter is associated with retrogressive production conditions. His suggestion is that share-cropping prevails in those cases where there is little scope for entrepreneurial decision making. But entrepreneurial decision making is limited under traditional system of production whereas with the introduction of new and more sophisticated technologies farming becomes a more and more risk taking business with larger and larger scope for entrepreneurship and profitability. In the conclusion of his paper Rao himself writes : "However crop-sharing may cease to be a beneficial arrangement as profitable modern inputs assume significance". Technological backwardness is thus being regarded as a precondition for the existence of share-cropping and technological advancement as a factor inducing change

in this tenurial arrangement. This contention of Rao gets support from the observation made by R. H. Day that in the "Mississippi Delta" in 1930's share-cropping was the dominant form of tenancy and in early part of 1957 with the introduction of labour saving devices share-cropping ceased to exist as a dominant form of tenure. ^{21/}

Another attempt was made by P. K. Bardhan and T. N. Srinivasan ^{22/} to make a theoretical and empirical study of the system of share-cropping in a new direction. They recognised the lacuna in Cheung's analysis and constructed a theoretical model in which the landowner is allowed not only to lease out his land to a tenant but also to cultivate a part of the land himself. Their method is to arrive at some equilibrium amount of land to be leased in and some equilibrium value of the rental share ^{by} of equating demand for and supply of land where the demand side is determined from maximisation of utility by the tenant and the supply side is determined from maximisation of utility by the landowner. (For a brief sketch of their model see appendix note no. 5 .)

In contrast to the maximisation process carried out by Cheung, in their process the equilibrium share rental is parametrically given to all landowners. Moreover, unlike Cheung whose landowner would choose the amount of labour to be put in the tenanted land, they assumed that it is the tenant who is the sole decisive agent in determining the amount of labour. On the basis of this model they made several predictions which they tested against Indian data.

^{21/} It is however doubtful that observations in India itself would support this contention. There does not seem to be any conclusive evidence of share-cropping going into demise in such areas of India where there is technological backwardness. progress.

^{22/} P.K. Bardhan and T.N. Srinivasan: Crop Sharing Tenancy in Agriculture. A Theoretical and Empirical Analysis. American Economic Review: no LXI (1971)

The main conclusions of their analysis may be written as follows :

(1) Share-cropping results in inefficient allocation of resources.

(2) Both demand and supply of land to be tenanted are decreasing functions of the rental percentage. However, there exist an equilibrium amount of rental percentage and land to be leased out to the share-croppers and the equilibrium is unique and stable from the point of view of Walrasian stability analysis.

(3) A region with a higher wage rate will tend to have a larger incidence of crop-sharing.

(4) With land augmenting technical progress the equilibrium amount (and percentage) of land leased out under crop-sharing goes up. With neutral technical progress the equilibrium amount and percentage of land leased out under crop-sharing goes down, and the rental share goes up. With labour augmenting technical progress parameter the rental share goes up and the equilibrium amount of land leased out goes down.

(5) Given, the landlord's share in fertiliser cost, the tenant will rent less land, put in less labour and buy less fertiliser, larger the landlord's share in output and the opposite will hold true if landlord's share in the cost of fertiliser becomes larger with given the landlord's share in output.

(6) Other things remaining the same, a larger importance of production uncertainty implies a tenant will lease in less land under crop sharing.

J. E. Stiglitz^{21/} made another attempt to explain why different systems of tenure exist side by side in terms of "risk sharing and incentive properties of alternative systems" on the basis of a general equilibrium model with

^{21/} J.E. Stiglitz: Risk Sharing in share cropping. Review of Economic Studies, April 1974.

the assumption of perfect competition. On the basis of an additional assumption of elastic labour supply (defining input of labour as "effort" of an individual) he comes to the following conclusion :

(1) Assuming that landlords are less risk averse ^{than} to workers, an increase in wealth can not increase the differences in relative risk aversion between landlords and workers to an extent to lead the economy to ^{or} near to one of polar contracts i.e., either pure wage system or pure rental system.

(2) Share-cropping system — in the absence of other methods of risk sharing is not an inefficient system in the sense that incentive to work under this system is not less than any other system.

(3) "The share-cropping system is adopted because of its incentive effects (when direct supervision is costly or ineffective) and because of its risk sharing features. Although rental system provides greater incentive to work but it forces the worker to bear all the risks and although wage system allows the landlord, if he is risk neutral, to absorb all the risks, it may force heavy supervision cost on him".

Stiglitz ^{and} however of the similar opinion to that of Rao that importance of share-cropping as a risk sharing arrangement would decline with the increase in capital intensity of agriculture and improvement in technology.

Most of the theories that we have discussed so far suffer from one common defect that is these theories do not consider the realistic situation in which a tenant leased in from several owners and an owner distributes his land among several tenants. In Cheung's analysis we find that his landlord leases out land to several tenants in order to maximise his total rental income but his analysis excludes any consideration of the fact that a tenant also can lease in land from several owners and can mix different kinds of contracts in order to maximise his total income. Bardhan and Srinivasan considered many

based

owners and many tenants but their analysis is based on the implicit assumption that all the owners own a certain fixed amount of land and they leased out a certain fixed proportion of the land they own. But in practice we find there is considerable differences in the size of holdings among owners and these differences explain to a great extent the differences in the behaviour of landowners regarding choice of contracts as well as the differences in the risk bearing capacity among them. Again, the size distribution of ownership holdings differ considerably from size distribution of operational holdings and this differences is caused among many other things by transfer of land through leasing.

It is K. N. Raj^{*} who made an analysis of how the size distribution of holdings affect and is affected by the direction and extent of leasing. He made an attempt to analyse the conditions under which leasing of land takes place and its effects on the distribution of land. While Raj finds the existence of risk and uncertainty as an important factor ^{influencing} ~~infencing~~ direction and extent of leasing of land, he shows that leasing of land does take place even with complete certainty prevailing in the market. Raj showed that when the market is fully competitive (in the sense that neither the landlord nor the tenant can fix the rent) and there is complete certainty landowning households would go on leasing out and landless households would go on leasing in land until all have the operational holdings of equal size ²² ~~22~~, irrespective of the initial pattern of ownership of land. As Raj explains, with a given amount of labour the marginal productivity of land would decline and tend to zero as increments of land is

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Raj made following assumptions to prove this. (1) There are no factors of production other than land and labour. (2) All land is of equal fertility and all households have equal number of adult labour units available for work. (3) The area of land owned by different households varies considerably in size and some households own no land at all. (4) There is only one product with a given technique of production.

* K. N. Raj: "Ownership and Distribution of land" Indian Economic Review April 1970.

applied to the fixed labour input. Thus households owning considerable areas would prefer to lease out as long as the rent obtainable is higher than the marginal product of land. Similarly the landless households for whom the marginal productivity of land would be relatively high would prefer to lease in land as long as the rent payable is lower than the marginal product of land.

Thus from Raj's explanation it follows that under the situation as described by his assumptions (see footnote no 23) leasing of land would take place normally whenever there is any differences in the size of operational holdings and that it would take place to remove any differences in the size of operational holdings. Raj then puts the question how then we should explain the existence of considerable differences in the size of operational holdings that we find in practice. According to him this is ~~not~~ explained by the untenability of the assumptions he made but by the ^{fact} ~~fact~~ that the risk and uncertainty associated with production and institutional arrangements like leasing of land and hiring of labour and the difference in risk bearing capacity among households influence the extent and direction of leasing.

As Raj explains, in underdeveloped economies the landowner would prefer to lease out land to avoid the problems of management of labour and the risk associated with production and prices and the landless households would prefer to lease in land to avoid risk of unemployment. However, leasing out of land is also associated with the risk of default of rent to the landowner and to minimise the risk of default of rent the landowner would prefer to lease out land to larger parcels or to those who have already some land. Whether the landowner could prefer the alternative of leasing out in larger parcel (to smaller number of tenants) to the alternative of smaller parcels (to larger number of tenants) would depend on the rate of decline of the marginal productivity of land when increments of it is applied to the labour available in each

family. But the marginal productivity of land would tend to decline faster the greater the intensity of the labour input required for production; thus for those products that require intensive input of labour, landowner would prefer to lease out in small tenant holdings inspite of the existence of risk of default of rent.

Further regarding relative economic advantages of share cropping Raj concludes that "there would be corresponding to each marginal product of land schedule one particular size of holding at which the respective shares of land and labour would be the same whether payments to them are based on average principle or marginal principle that below this size the share of land would be lower (and of labour higher) under share-cropping, and that above this size the share of land would be higher (and of labour lower) under such sharing arrangements²⁴".

According to him effect of uncertainty associated with production and prices is to increase the risk premium attached^{and} as a result the marginal product of land schedule would shift downward. This, as he shows, would tend to reduce the size of holding at which both the two systems of tenure would yield same total rent to the landowner. Raj thus concludes "the greater the concentration in the ownership of land, and the more the aversion of the landowners to bearing risks of production, the more extensively the crop-sharing is likely to be resorted to in such situations to induce others to lease in land". Thus Raj shows that even with the existence of uncertainty and risk landlords behaviour regarding choice of contracts would be different for different size of farms.

²⁴/ It seems to us that this conclusion does not follow from the diagrammatic presentation of his argument.

Most of the theories that we had discussed so far are based on one implicit assumption that a tenant farmer tries to equate his marginal product to the market wage rate. As we have already noted, a tenant farmer may not actually try to equate his share of the marginal product to the market wage rate. In a labour-surplus economy that is characterised by the existence of a sizeable unemployment throughout the year, a tenant farmer's opportunity for alternative employment is extremely limited. Thus it seems unrealistic to think that a tenant farmer, while taking decisions about employment of his labour, would think of equating his share of the marginal product to a non-existent alternative income. It may be more realistic to assume that the tenant farmer will try to equate his share of the total product to the subsistence minimum which itself may vary (or may not vary) according to the quantity of labour put in by him.

Secondly, ^{some} of the above theories include farm size as a factor affecting relative effectiveness of tenant farming and owner farming*. It may however be realistic to think that a share cropper or a cash rent tenant will behave differently for different size of farms, just as, an owner operator with a family sized farm will work differently than an owner operator with a very large farm dependent on hired labour. In fact, while discussing allocation of labour and other inputs under tenancy, one must consider three things :

(i) whether the owner has means to invest in land, (ii) whether he is interested in improving the productivity of land and labour, and (iii) whether the tenant has means to invest. Now, it may be that the owner of a very small tenanted farm is the absentee owner whose main source of income is not agriculture, and who therefore remains satisfied with whatever he can get from his farm as rent; even if the owner is a resident landlord, it may be that the small sized tenant

* We have seen that Rao & Raj has pointed out that farmsize may affect the decision regarding choice of tenurial arrangement and made comparisons of different systems considering different size of holdings. But in Cheung's analysis or in the analysis made by Bardhan and Srinivasan farmsize does not enter ~~as~~ as a factor affecting relative efficiency of different systems.

farm under consideration forms only a very insignificant part of the total land in his possession; in this case the owner may be unwilling to bear any risk or any trouble that may arise if he enters into any contract with the tenant regarding cost-sharing. In such cases it is the owner's incentive that is lacking . Again it may also be that the owner of a small tenanted farm is himself a small owner; in this situation the land owner would be incapable of investing in land and other inputs. In all these cases the share-cropper or the tenant farmer has to bear all the costs. However, a very small tenant farmer who has to pay a part of his total product or total income as rent to the landlord would obviously be in a worse economic position than the small owner farmer. He would normally have very little surplus after meeting his subsistence requirements. Thus he is generally not in a position to purchase inputs and has to depend mainly on owned inputs (for ex. owned seed, manure etc.). This difference in economic strength would not only cause lower material inputs in the tenanted farms than in the owned farms, it would also cause the amount of labour employed under tenancy to be lower than under owner operatorship; This is because the reality in agriculture might not be too well represented by the neo-classical model of perfect substitutibility : as Rao has already pointed out certain amount of complementarity probably exists between land and other inputs. When capital and material inputs are employed in a very little amount, labour may not be employed beyond a point with any additional output.

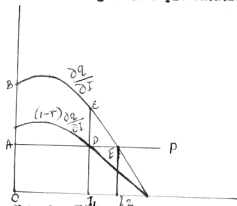
In the case of a considerably large sized tenanted farms, on the other hand, it may be reasonable to assume that the income from the farm constitute a large portion of income of the landowner. Hence the landowner would find it profitable to invest for the improvements of the conditions of production. Again since in this situation his rental income is considerably high he would be able to enter into any contract with the tenant regarding cost-sharing. The tenant in

this case may also enjoy a substantial amount of surplus after meeting all the expenses including rents to the landlord; hence, he would find it possible to invest in capital and other material inputs so as to get a still higher amount of surplus. In other words, for a large-sized tenanted farm, it seems natural to assume, both landowner and the tenant would share the total cost of production; there seems to be very little reason for lower intensity of use of material resources as well as labour (due to complementarity) under tenancy than under owner farming, if the farms under consideration are considerably large in size.

All this, however, requires to be examined empirically considering concrete conditions of a country's agriculture. This has been made in the subsequent chapters on the basis of factual survey and statistical investigation of agricultural conditions of some countries as well as of India.

Appendix

Note 1 : Diagrammatic presentation of Marshallian theory.



Under share-cropping inputs would be

employed upto OI_1 where $\frac{\delta q}{\delta I} (1 - r) = P$

rather than upto OI_2 where $\frac{\delta q}{\delta I} = P$

Note 2 : With constant wage rate (w), price of the product (p) and the share

proportion going to the landlord ($\frac{1}{3}$) we present Johnson's analysis with land and labour as the two inputs, in the following manner. One thing to be noted — here there is no discounting of future return due to uncertainty or a fixed supply of specialised resources, neither the control over inputs is segregated between the landlord and tenant.

$$x = f(n, z) \quad (\text{Production function}) \quad \dots (1)$$

where n is land and z is labour.

$$N = XP - nw - \frac{1}{3} x P \quad \dots (2)$$

This is the profit or income equation N , being net income of the share cropper.

To maximise the net income :

$$\frac{\delta N}{\delta n} = \frac{\delta x}{\delta n} P - w - \frac{1}{3} \frac{\delta x}{\delta n} P = 0 \quad \dots \quad (3)$$

$$\text{or,} \quad w = \frac{2}{3} P \frac{\delta x}{\delta n} \quad \dots \quad (4)$$

$$\frac{\delta N}{\delta z} = \frac{\delta x}{\delta z} P - \frac{1}{3} \frac{\delta x}{\delta z} P = 0 \quad \dots \quad (5)$$

$$\text{or,} \quad \frac{\delta x}{\delta z} (P - \frac{1}{3} P) = 0 \quad \dots \quad (6)$$

$$\text{or,} \quad \frac{\delta x}{\delta z} = 0 \quad \dots \quad (7)$$

The equation (4) corresponds to the marginalist idea that wage-rate will be equal to the value of the marginal product of labour to the tenant which is only two third of the actual marginal product here. Equation (7) shows that the tenant will continue to rent additional land until the marginal physical product is zero. Thus, the conditions of optimal intensity in factor use may not be achieved for land and labour, if the present assumptions hold good and if the present procedure of analysis is taken as valid.

Again, with the same assumptions (i), (ii) and (iii) taken as valid Johnson introduces another assumption that share proportion going to the landlord (r) is a variable and is a function of labour input per unit of land, i.e., $\frac{n}{z}$; but the relation between r and $\frac{n}{z}$ is assumed to be such that r decreases as the labour input per unit of land i.e., $\frac{n}{z}$ is increased. Thus a new rent equation is added to the model :

$$R = g\left(\frac{n}{z}\right) xP \quad \dots \quad (8)$$

$$\left[x = g\left(\frac{n}{z}\right) \right]$$

$$X = f(n, z) \quad \dots \quad (9)$$

$$N = XP - nw - g\left(\frac{n}{z}\right) XP \quad \dots \quad (10)$$

To maximise net income we get :

$$\frac{\partial N}{\partial n} = P \frac{\partial X}{\partial n} - w - g'\left(\frac{n}{z}\right) XP - Pg\left(\frac{n}{z}\right) \frac{\partial X}{\partial n} = 0$$

$$\begin{aligned} \text{or,} \quad P \frac{\partial X}{\partial n} &= w + Px \frac{\partial x}{\partial n} + xP \frac{\partial X}{\partial n} \\ &= w + \frac{\partial R}{\partial n} \quad \dots \quad (11) \end{aligned}$$

[From 8 it follows that

$$\begin{aligned} \frac{\partial R}{\partial n} &= g'\left(\frac{1}{z}\right) xP + g\left(\frac{n}{z}\right) P \frac{\partial X}{\partial n} \\ &= \frac{\partial R}{\partial n} Px + xP \frac{\partial X}{\partial n} \end{aligned}$$

$$\frac{\partial N}{\partial z} = P \frac{\partial X}{\partial z} - Px \cdot g'\left(\frac{-n}{z^2}\right) - g\left(\frac{-n}{z}\right) P \frac{\partial X}{\partial z} = 0$$

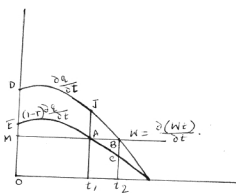
$$\text{or,} \quad P \frac{\partial X}{\partial z} = Px \frac{\partial x}{\partial z} + xP \frac{\partial X}{\partial z} = \frac{\partial R}{\partial z} \quad \dots \quad (12)$$

[Again from 8 we get :

$$\begin{aligned} \frac{\partial R}{\partial z} &= g'\left(\frac{-n}{z^2}\right) xP + g\left(\frac{n}{z}\right) \\ &\quad P \frac{\partial X}{\partial z} \\ &= \frac{\partial R}{\partial z} Px + xP \frac{\partial X}{\partial z} \end{aligned}$$

Now, as Johnson proceeds since $\frac{\delta F}{\delta n}$ is negative and $\frac{\delta x}{\delta n}$ is positive the $\frac{\delta R}{\delta n}$ in (11) may either be positive or negative. From the equation (11) it follows that if $\frac{\delta R}{\delta n}$ is positive it will result in employment of less labour on a given piece of land than that if the land was rented for cash at the same average rent $\frac{R}{x}$. If on the other hand $\frac{\delta R}{\delta n}$ is negative the tenant will use more labour. What equation (12) shows is that the land will be used by the tenant until the value of the marginal product equal the amount of change in total rent resulting from renting an additional acre of land, which is taken to reflect the marginal cost of land.

Note 3 : Cheung's argument can be represented diagrammatically in the following way : In the figure below the residual earning is MEA which is, as Cheung holds, inconsistent with equilibrium. If the



tenant employs his tenant labour only upto t_1 and gets a residual earning over and above his alternative earning. According to Cheung the landlord will either extract the residual earning from the tenant or he will stipulate in the share-contract an amount of tenant input larger than t_1 .

Note 4 : Cheung uses a two-variables production function in which one variable is land employed in one farm i.e., $h = \frac{H}{m}$, H being the total amount of land in the hands of the landowner and m being the total number of farms, and the other input is tenant labour employed in one farm i.e., t. With the assumption of identical production function for each

farm the problem of the landowner is to maximise the total rental income $R = r m q(h, t)$ subject to $wt = (1 - r) q(h, t)$, where r is the rental percentage $q(h, t)$ the production function for each farm, wt the tenant's alternative income. Now from Lagrangian expression the problem boils down to

$$\max L = r \cdot m \cdot q(h, t) - \lambda [wt - (1 - r) q(h, t)]$$

The necessary conditions are :

$$\frac{\partial L}{\partial m} = r q(h, t) + m r \frac{\partial q}{\partial h} \frac{\partial h}{\partial m} + \lambda (1 - r) \frac{\partial q}{\partial h} \frac{\partial h}{\partial m} = 0 \quad \dots (1)$$

$$\frac{\partial L}{\partial t} = m \cdot r \cdot \frac{\partial q}{\partial t} - \lambda W + \lambda (1 - r) \frac{\partial q}{\partial t} = 0 \quad \dots (2)$$

$$\frac{\partial L}{\partial r} = m \cdot q(h, t) - \lambda q(h, t) = 0 \quad \dots (3)$$

$$\frac{\partial L}{\partial \lambda} = Wt + (1 - r) q(h, t) = 0 \quad \dots (4)$$

From equation (3) above $\lambda = m$, and noting that

$$\frac{\partial h}{\partial m} = d\left(\frac{H}{m}\right)/dm = -H/m^2, \text{ equation (1) becomes}$$

$$r \cdot q + m \cdot r \cdot \frac{\partial q}{\partial h} \left(\frac{-H}{m^2}\right) + m (1 - r) \frac{\partial q}{\partial h} \left(\frac{-H}{m^2}\right) = 0$$

$$\text{that is, } r q - \frac{h}{m} \frac{\partial q}{\partial h} = 0, \quad \text{or, } \frac{r q}{h} = \frac{\partial q}{\partial h} \quad \dots (5)$$

$$\text{From (2) it follows : } \frac{\partial q}{\partial t} = W \quad \dots (6)$$

Solving equation (1) and (4) for r we get

$$r = \frac{\frac{\partial q}{\partial h} \frac{\partial h}{\partial m}}{q/h} = \frac{q - Wt}{q} \quad \dots (7)$$

(5) indicates that the rent per acre of land equals the marginal product of land in equilibrium. Equation (6) implies the marginal product of

tenant labour equals the wage rate, and the equation (7) implies that, in equilibrium, the elasticity of output with respect to land, $(\delta q/q / \delta h/h)$ equals the total yield net of tenant cost as a proportion of total product. Thus, Cheung concludes that resource allocation remains the same under any form of tenure.

Note 5 : Thus, in their approach the tenant's problem is to maximise $U^1 = V^1(C^1, 1 - l_1 - l_2)$ where $C^1 = (1 - r) F(H, l_1) + P_2 w$ where H is the amount of land hired by the tenant l_1 being the amount of labour devoted to the tenant farm by the tenant, $F(H, l_1)$ production function, P_2 the amount of tenant's labour devoted to the wage-paid occupations. Thus, assuming that the share-cropper has one unit of labour available to him $1 - l_1 - l_2$ is the amount to leisure. Similarly from the point of view of the landlord the problem is to maximise $V^2 = V^2(C^2, 1 - y)$ where $C^2 = \text{landlord's consumption} = G(1 - q, x + y) - wx + rF(1, L)$ where G is the production function in his own cultivated land being the proportion of land he leases out and $1 - q$ that the retains for self cultivation, x is the amount of hired labour y that of own labour L is the amount of labour the share-cropper puts in on the leased out land, $F(q, L)$ is the production function in the tenanted land. Moreover, they assume that L , the amount of labour employed in the tenanted land is determined by the tenant and the landlord cannot choose it. With this approach they derive some equilibrium conditions and give economic interpretation to the results thus derived.

Chapter III

Private Ownership, Peasant Farming and Tenancy : A Study Based on the Experiences of Japan, Egypt and China

As we have already discussed in chapter I, peasant farming system has been adopted in several countries with the oft-quoted aim of attaining the twin objectives of growth and welfare of the society. We have also noted that in many countries peasant farming acted only as a temporary and transitional phase and it led to either capitalist farming or collective farming system. This chapter aims at examining, in greater detail, the short-run and long-run consequences of the policy of creating owner-farming system in three selected countries other than India and thus examining the validity of the above conclusions regarding the effectiveness of peasant farming system.

We have selected the three countries, e.g., Japan, Egypt and China, on the ground that these three countries may be taken as representing the conditions of underdevelopment among the countries of the East. In respect of the conditions prevailing before their latest land reforms, the three countries did not differ much among themselves, the common features characterising these conditions being : (i) existence of a few large landownarships occupying the larger portion of the cultivable land; (ii) existence of a large number of tiny-sized farms; (iii) existence of tenancy with high rents and insecure tenancy rights; and (v) existence of a large number of landless peasants. Thus the countries started with similar problems; but they solved these problems in their own different ways. For example, the Japanese land reforms of 1946 aimed at creation of peasant farming system using the instrument of imposing a ceiling level on the amount of land that could be possessed by any farmer and confiscating and redistributing the land above the ceiling level. In the

short-run the reforms thus established the system of peasant farming but over the long-run the system gradually gave way to large-scale capitalist farming and cooperative farming, as a result of which the ceiling level was to be waived in the reform of 1962. The Egyptian land reforms of 1952 envisaged the same programme of land confiscation with compensation and redistribution; but the difference between Japanese programme of 1946 and Egyptian programme of 1952 lies in the fact that the Egyptian programme was prepared with the awareness that small farms, if allowed to work independently, might fall into instability. Thus in Egypt, ceiling level imposed on the amount of land that could be possessed by an individual was so high that it allowed efficient functioning of the large-scale farms with hired labour; and secondly, for efficient and stable functioning of the small farms, the membership to a cooperative was made obligatory for all the new land recipients. Thus, the approach followed by Egypt was not exactly the same as followed by Japan and also it led to different results : Land reforms in China, on the other hand, represent another typical case which involved a process of transition from peasant economy to the Commune system. The process was characterised by a conscious effort on the part of the Chinese authorities to develop the productive forces through peasant farming and rich peasant farming in the initial stage and gradually to educate people in socialist principles so that they might accept voluntarily the socialist transformation when brought about later on.

Thus, while the introduction of peasant farming was regarded necessary in each of these countries, the approaches followed were vastly different and the consequences that followed were also different. It is for this reason that we think it instructive to study the land reform programmes of these countries in greater detail.

Land reforms in Japan :

Before going to discuss the land reform programmes undertaken after the World War II, we shall try to give a brief account of the development of land systems in Japan upto that period^{1/} : Before the meiji restoration Japanese land system was mainly feudal in character. From the time of emergence of feudal institutions the feudal manors were unconsolidated. Attempts were sometimes made by some military factions to bring the whole system under one centralised military rule. But all attempts failed until the end of the sixteenth century when the new system characterised by a single military rule, at first Hideyoshi and then Tokugawa Shogunate, evolved.

Under the Tokugawa regime about a quarter of the total land area was under direct administration of the Tokugawa itself, and the rest was divided under the rule of 300 feudal lords who also had their respective armies. Title of landownership was established and with this tax burdens were determined on the land registered to a family. Under this system the peasants could not leave the land at their will; if they tried to do so they could be brought back by force. Moreover they had no right to select the crop for cultivation.

Emergence of tenancy system

The system described above was the typical feudal system under which the tillers were attached to the land. Thus the very nature of the system prevented the growth of tenancy. But tenancy system developed within this system itself, first with the legal recognition of land mortgaging, and then

1/ We do not of course want to discuss all the land reform programmes undertaken by this country : it would suffice to discuss the latest programmes, say, those carried out after the World War II.

with the reclamation of new land. However, even before the Tokugawa period there were some tenant cultivated land under the ownership of the Buddhist temples.

Under the Tokugawa regime because of the high rate of taxes the farmers were sometimes forced to borrow money from richer peasants, merchants or the members of the emerging capitalist class to meet the tax burden or the high cost of living. After 1720's when land mortgaging was allowed, the money lenders acquired land through their money lending activities. Those who received land in this way were the new owners of the land and the old owners became the tenants who were to meet not only their former tax burden but the rents to these money lenders. Secondly, in the newly reclaimed land the rich merchants who invested capital to undertake irrigation and clearance work became the owners and the farmers already settled on it were made their tenants.

Meiji restoration

Meiji restoration transformed the whole system of land tenure by issuing title deeds for each plot of land and removing any type of limitations on private property rights. The peasants were given the freedom to sell their land and change their jobs. But it did nothing to improve the tenancy system. On the other hand title deeds were issued even to the mortgaged land and the mortgagees were legally recognised as owners whereas the customarily recognised permanent tenancy was not recognised.

The Meiji Government reduced land taxes whereas the amount of rent was not reduced. This, coupled with a rise in price of rice, led to improve the economic condition of the landlords whereas the condition of the tenants remained as before. Moreover, difference in economic conditions between

small landowners and big landowners became wider. Indebtedness, and mortgaging of land led to transfer of ownership from the small peasants to the money lenders or other economically better-off persons who desired to invest in land^{2/}. The new owners, however, found it more profitable to lease out the land rather than to cultivate it themselves. The main factor that induced the landowners to prefer tenancy to direct cultivation was the high rate of rent. This, combined with pressure of population on land, contributed to the increase in tenancy system still further. This process continued upto 1908. Between 1908 and 1941 tenancy did not increase much; percentage of tenanted land to total land cultivated was 46% in 1941, whereas, it was 45% in 1908. The process of increase in tenancy was checked during this period due to several reasons : in the first place during this period there was an increase in rice production^{3/} due to better methods of production and better inputs the introduction of which led to improve the conditions of the small landowners and the tenant cultivators^{4/} too. Thus the cause of alienation of land through indebtedness was removed. Secondly, the Government decided to protect the owner cultivation system and began to provide credit facilities and relief measures at the time of distress. This also worked as a check against the transfer of

2/ Indebtedness, mortgaging of land and transfer of ownership occurred for different reasons : sometimes it was due to crop failures or illness or a fall in price of rice; sometimes it was due to an increase in expenses for a wedding or a funeral etc., etc. [✓] see R. P. Dore, Land Reform in Japan, Oxford University Press, 1966 [✓].

3/ It was estimated that yields per acre doubled between 1880 and 1940 [✓] see R. P. Dore, *ibid.* [✓].

4/ Increase in production led to improve the conditions of the tenants too, since rents were generally in the form of a fixed amount of rice and since there was restriction imposed by custom on the extent to which the landlord could raise the amount of rent [✓] see R. P. Dore, *ibid.* [✓].

agricultural land from the poorer to the richer peasants. Thirdly, reduction of price of rice following rice riots of 1918 reduced landlords' profits; this coupled with emergence of various tenants' organisations, rent strikes and disputes, made investment in land increasingly troublesome and insecure. All these contributed to check the process of increase in tenancy system.

The two main features of land system in Japan immediately before the reform of 1946 were (i) wide-spread tenancy; and (ii) petty farming. As it is already noted, percentage of tenanted land to total cultivated land area was as much as 46% by 1941. However, the extent of tenancy was not the same for the whole country - it varied within the limits of 33% (Nagasaki) and 59% (Kagawa)^{5/}. Secondly, distribution pattern of ownership and operation of land in Japan showed extreme fragmentation of holdings on the one hand and on the other concentration of land in the hands of a few families^{6/}. Thus, in 1947, prior to the implementation of the reform, 74.1% of the owners owned less than 1 cho* each and 31.8% of the total land area was under their ownership; on the other hand, those owning 3 or more cho comprised only 7.4% of all owners owning 43.4% of all agricultural land. If we consider the distribution of operated holdings it is seen that 63.6% of the cultivators operated less than 1 cho each and 30.7% of the land area was under their cultivation; on the other hand those who cultivated more than 3 cho comprised 9.6% of all the cultivators and controlled 33.6% of the agricultural land.

1/ R. P. Dore, *ibid.*

6/ Elias H. Tuma, *Twentysix Centuries of Agrarian Reform - A Comparative Analysis*. University of California Press, 1965.

Tables 1 and 2 give an idea about the land system in Japan before the land reform of 1946.

Table 1 : Tenure groups in Japan by household and area occupied as per cent of total

tenure status	(per cent)	
	households	area occupied
(1)	(2)	(3)
owners	32.0	54.2
part-owners — part-tenants	39.8	45.8*
tenants	28.2	

Source : Elias H. Tuma, *ibid*, p. 131.

* It includes all land under tenant cultivation whether cultivated by tenant or part-owners.

Table 2 : Estimates of land distribution in Japan by scale of ownership, 1941-1945.

size (cho)	(per cent)	
	owners	area
(1)	(2)	(3)
0.0 - 0.5	47.7	14.7
0.5 - 1.0	26.4	17.1
1.0 - 3.0	18.6	24.9
3.0 - 5.0	4.4	14.4
5.0 - 10.0	2.1	12.6
10.0 - 50.0	0.8	12.1
over 50.0	0.1	4.2

Source : Elias H. Tuma, *ibid*, p. 132.

To get an idea about the economic condition of the tenant cultivators, it is essential to consider the qualitative aspects of tenancy. As available information^{1/} suggests, most of the tenants in Japan were tenants-at-will. In some districts, however, traditional rights of permanent tenancy was recognised. Also in some cases tenants were given certain^{amount of} security. For rice lands rents were generally in the form of fixed kind rent and in upland fields rents were mostly paid in the form of fixed money terms. Share-cropping tenancy was very rare in Japan, less than 1% of the cases.

Thus, it is seen, Japanese agriculture was characterised by the existence of wide-spread tenancy on the one hand and on the other a large number of petty farmers (the average size of farms being 1 cho). The landlords played practically no role in improving the conditions of cultivation. As Dore^{8/} has pointed out majority of the landlords were either money lenders or merchants or the farmers who did nothing to improve their tenants' agricultural methods or those who wanted to make profits by putting their money into 'one abortive enterprise after another'.

The land system in Japan stood as an obstacle to her agricultural growth. The high rents and insecurity of tenure were two chief factors responsible for the worsening of the economic condition of the tenants who formed the majority of the total cultivating households^{2/}. The reluctance of the landlords to invest in agriculture to improve the conditions of land and labour and methods of cultivation was perhaps the main factor that kept agricultural investment and productivity at a low level.

1/ See R. P. Dore, *ibid.*

8/ See R. P. Dore, *ibid.*

2/ By 1941 30% of the cultivators owned their land in full while 70% were full or part tenants.

These factors, combined with the landlord-tenant disputes and tenants movements that were occurring even from the beginning of the Meiji era and were being greatly intensified from the beginning of the twentieth century, made a section of the people to feel the need for some reforms. But it was found to be impossible to reform the land system within the existing structure of the Society due to landlords' influence in the political and social affairs of the community. During the War the conflict between the landlords and the tenants was further intensified due to the fact that the absentee landlords had to come back to their villages and settle on the land through the eviction of their tenants. Thus the need for reforms was more and more realised during this period.

After Japan's surrender to American Occupation Authority the Supreme Commander of Allied Powers (SCAP) emphasised the necessity of a reform. It clearly described the objectives : "In order that the Imperial Government shall remove economic obstacles to the revival and strengthening of democratic tendencies, establish respect for the dignity of man, and destroy the economic bondage which has enslaved the farmers, Japanese Imperial Government is directed to take measures to insure that those who till the soil of Japan shall have more equal opportunity to enjoy the fruits of labour". Whatever may be the declared objectives it seems obvious that the American occupation authority must have intended to curb the economic and political influence of the landlords from the agrarian community and thus they felt the need for a comprehensive "agrarian reform".

Land reforms of 1946^{10/}

The main provisions of the land reform programme were :

of the

(a) Establishment/ system of owner-farming, the first step was taken towards making compulsory the transfer of land from landlords to tenant farmers, at the wish of the latter. All tenanted land belonging to the absentee landlords was to be transferred to the tenants. Resident landlords however were allowed to hold 5 cho of tenanted land.

(b) System of paying rent in kind was prohibited and paying rent in cash made compulsory.

The Second landreform plan

The first land reform plan failed to obtain the approval of the Supreme Commander of Allied Powers, and the Japanese Government decided to prepare a second land reform plan that would actually facilitate the establishment of an owner-farmer system. This Special Measures Bill had the following provisions:

(1) The amount of tenanted land which was permitted to be held was reduced from 5 cho to 1 cho, excluding Hokkaido where it was 4 cho. The household rather than the individual was made the unit to be used in calculating the amount of land which could be retained.

(2) Owner farmers were not excluded from the purview of compulsory land transfer; the Government was to purchase any land held by one household in excess of 3 cho excluding Hokkaido where it was 12 cho.

^{10/} Masaru Kajita, Land reform in Japan : Agricultural Policy Research Committee, Agricultural Development Series, 1962.

(3) All land leased to tenants by absentee landlords and all tenanted land in excess of 1 cho owned by resident landlords were to be purchased by the Government whether or not the tenants concerned wished to purchase the land. The land was then to be resold to the tenants.

(4) The right to select the particular tenanted holdings that could be retained was taken from the landlord and was bestowed upon the village land committee which was composed of elected members, 5 each from landlords, owner farmers and tenant farmers class.

(5) The compensation for land purchased was to be made on "farm land bonds" with an interest rate of 3.65 % per annum, but with both principal and interest to be paid off in annual instalments within 22 years.

(6) Land purchased by the Government was to be resold to the cultivators of that land.

(7) Land purchased by the tenant farmers was to be paid for in annual instalments with 3.2 per cent interest per annum, over a 24 years period. This amount exceeded one-third of the value of agricultural production for that year.

Restrictions on the Repossession of Tenanted Land

Repossession of tenanted land by a landlord was permitted in the following cases :

- (a) When a tenant does not act in good faith.
- (b) When it is deemed socially beneficial to use farm land for purposes other than agriculture.

(c) When it is objectively proper for the landowner himself to cultivate the farm land concerned. However, repossession will be permitted only if it will not put hardship on the tenant, and only if the landlord has the facilities and ability to farm so that production would not be lowered.

Regulations on the transfer of agricultural land

The purchase and sale of farm land without the permission of the prefectural governor was regarded as invalid.

The purchaser of the farm land should have possessed following qualifications :

(a) He or members of his household must cultivate land themselves.

Purchasing of farm land in order to lease it to others was not permitted.

Tenanted land, in principle, was to be sold to no other person than the tenant of the land concerned.

(b) The purchaser must at the time of purchase be farming at least three tan of land. No one who was not actually classified as a farmer was permitted to purchase farm land.^{11/}

(c) In principle, total amount of land after purchase including land both owned and rented by the purchaser, must not be more than 3 hectares. However, efficient owner farmers were permitted to own more than 3 hectares of land.^{12/}

^{11/} Thus, the landless labourers and very small cultivators were not allowed to purchase land from others.

^{12/} This provision, by implication, seems to encourage those farmers who were already in better position to invest more.

As it appears, Japanese land reform programme, aimed at creation of owner-farmers with medium-sized farms. The land reform programme, further, intended to restrict tenancy and ^{the tendency towards} concentration of agricultural land to few hands.

However, provisions in the legislation for regulations of transfer of agricultural land were not by themselves adequate to ensure complete equality regarding distribution of benefits of the reforms. On the contrary, legislations seem to have left some scope for unequal distribution of benefits among different classes of farmers^{13/}. The very small farmers (less than 3 tan of land) and the landless agricultural labourers were excluded from the land redistribution programme.

Secondly, the legislation for regulation of tenancy also left scope for unequal distribution of benefits. Thus if a tenant rented in land from 3 landlords, less than 1 cho from each of them, he was not entitled to purchase any land in the compulsory land transfer scheme; but if a tenant rented in any amount of land above 1 cho from one landlord, he was entitled to purchase the land. Thus there was evidently some scope for unequal distribution of benefits among different classes of tenants.

Thirdly, according to the law the land above the ceiling limit was to be resold to the labourers employed in this land, or to the farm families who had small holdings relative to their labour force. Resale to the farm labourers was very difficult to undertake since most of the large farms did not employ regular workers, but day-labourers only. Resale to the farm households with

^{13/} This is also observed by R. P. Dore (1966), *ibid*.

small holdings was also difficult since there were too many potential purchasers. In fact, there were many cases in which the owners were allowed to retain all of their land on the ground that they had sufficiently large labour force to cultivate it efficiently or on the ground, there were reasons to think that production would fall if the land were divided.

Immediate effects of the reforms

A. Restriction on tenancy and reduction of inequality : Regarding tenancy system, the effect of the reforms was discernable in the reduction of the magnitude of tenancy which fell from 46 per cent to 10 per cent out of total cultivated area. This is evident from the table given below :

Table 3 : Ownership and Tenancy of cultivated land,
1941, 1947 and 1950.

year	(per cent)	
	owner-cultivated land	tenant-cultivated land
(1)	(2)	(3)
	<u>rice land</u>	
1941	46.9	53.1
1947	55.9	44.1
1950	88.9	10.9
	<u>up land</u>	
1941	62.7	37.2
1947	66.5	33.5
1950	91.2	8.5

Table 3 shows that as a result of the land reforms, percentage of land cultivated under tenancy drastically decreased and percentage of land under owner-cultivation increased. However, percentage of tenant cultivated land was higher in the areas under rice cultivation than in the upland areas.

Regarding size distribution of holdings and distribution of farm income among different classes of farmers, effect of the reforms was visible in the reduction of inequality to a great extent.

Table 4 shows how size distribution of holdings changed as a result of the implementation of the land reform programme.

Table 4 : Distribution of farm land according to size of holdings : 1941-1954

	(percentages)				
size bracket	1941	1946	1949	1950	1954
(1)	(2)	(3)	(4)	(5)	(6)
under 5 tan	33.3	39.2	43.0	36.1	39.8
5 tan — 1 cho	30.0	31.3	31.1	30.4	32.5
1 cho — 2 cho	26.7	23.5	20.8	24.5	22.1
2 cho — 3 cho	6.1	3.7	3.2	-	3.4
3 cho — 5 cho	2.2	1.4	1.2	8.5	1.5
More than 5 cho	1.3	0.8	0.7	-	0.8

Source : R. P. Dore, *ibid.*

From Table 4 it is seen that percentage of cultivating farms under 1 cho increased from 63.3% in 1941 to 72.3% in 1954. On the other hand, this percentage in the case of cultivating land above 3 cho (i.e., maximum limit allowed under the law outside Hokkaido) fell from 3.5% to 2.3% during the same period. Thus

the reforms brought about a change by reducing the percentage of cultivating households within the largest size group while an increase in the percentage of cultivating households in the smallest size group was effected, thus helping to reduce the inequality in the size distribution of holdings.

As regards agricultural production and productivity, available data indicate a phenomenal increase in production and increase in the income and consumption levels of the farming population. The agricultural production index, using 1933-35 as the base, was 128 in 1955 and 146 in 1960. The gross value of agricultural production index increased from 143 in 1955 to 161 in 1960 and 1961. Since the land reforms, investment especially in farm machinery had consistently grown. The following table shows the amount of increase in agricultural investment from 1949.

Table 5 : Rise in agricultural investment from 1949 to 1955

	(unit 1000,000 Yen)						
(1)	1949 (2)	1950 (3)	1951 (4)	1952 (5)	1953 (6)	1954 (7)	1955 (8)
agricultural investment total	581	749	1014	1471	1944	2046	1912

Source : Ministry of Agriculture and Forestry, Statistics and Survey

Increase in production had played a decisive role in increasing the level of consumption in the rural districts. Table 6 indicates how rural and urban consumption levels rose steadily. From Table 6 it is also seen that rural consumption level increased to a greater extent than that of the urban. This fact may be taken as indicating that though Japan during post Second World War period embarked on an all-round development of her economy, land

reform measures undertaken during that period served as a special factor behind the improvement of the standard of living of the rural households to a greater extent than that of the urban.

Table 6: Comparative consumption levels

year	whole country	urban districts	rural districts
(1)	(2)	(3)	(4)
1934-36	100.0	100.0	100.0
1950	79.2	69.8	93.5
1951	82.7	68.9	103.4
1952	96.0	80.2	119.8
1953	108.7	94.0	130.8
1954	110.7	94.1	136.4

Source : R. P. Dore, *ibid.*

There had also been a remarkable development in the application of improved techniques, especially labour saving devices after the land reforms.

Table 7: Diffusion of agricultural machinery

('000)				
year	electric motors	powered threshers	powered sprays	motor ploughs
(1)	(2)	(3)	(4)	(5)
1935	47	92	1	0
1947	287	444	7	8
1951	620	972	20	18
1954	849	1,365	46	46

Source : R. P. Dore, *ibid.*

Table 7 shows a steady increase in the use of agricultural machinery from 1935 to 1954.

Thus, as it follows, the short-run effect of the reforms can be understood in terms of increase in production, consumption and investment in agricultural sector as a whole. Now we are faced with the basic question in the answer of which lies the keynote of Japanese land reform measures, namely, what was the main factor that led to improve agricultural productivity after the reform. The reforms, as it had been explained, helped to create peasant farming system in medium sized units, by eliminating big landowners and absentee landlords and by implementing land redistribution programme. There was also considerable reduction in the amount of tenancy, although it was not made altogether illegal. Though the tenancy system was not done away with forthrightly, certain provisions were enacted to ameliorate the condition of tenancy, e.g., there was reduction of rents, share cropping was made illegal and also security of tenure was conferred to the tenants through the restrictions stipulated in the reform laws on the sale or repossession of leased-out land by the landlords.

One may conclude that it is the working of the peasant farming system (operated through the reforms) in the place of large-scale farming (ceiling was imposed even on the amount of owner cultivated land) and tenant farming that led to increase productivity. Sometimes ^{however,} emphasis is placed on the improvement in the investment on farm machinery as being the determining factor behind increased productivity. But as it seems, improvement in the investment on farm machinery may be taken as one of the achievements of the reforms and it is also to be investigated what was the cause of this improvement. It is often held that the creation of peasant farming system might have resulted in the increase of investment on farm machinery and other agricultural investment such as investment on irrigation.

As has been discussed in the previous chapter, tenancy system is generally considered to be an inefficient system because of landlord's reluctance to invest on land improvement schemes or the tenants' incapability to use better inputs. On the other hand, owner cultivation system is generally considered to be more efficient since the owner cultivators are supposed to be more interested in land improvement and able to invest for land developments. But what actually happened in Japanese Agricultural condition after land reforms, may be best understood if we take into considerations such facts as would answer certain questions like — whether percentage of land tenanted in different regions of the country show any negative association with any of the indicators of agricultural efficiency or whether percentages of land under owner-cultivation in different regions show any positive association with any of the criterion of efficiency. Regarding this pertinent question, we get two kinds of information. In the first place, as is shown by R. P. Dore ^{14/} "the improvement in rice yields has been greatest in the northern districts where the amount of land transferred during land reforms was greatest" thus he mentioned the case of Akita prefecture. On the contrary, he mentioned that for forty-six prefectures this correlation between increase in yield in each of the prefectures and the proportion of the total land area that changed hands during the land reforms was very weak one, that "does not reach the level of statistical significance".

However, it seems to us, it is not possible to assess the effect the change in tenurial structure on agricultural productivity simply by noting positive or negative correlation between magnitude of owner-operatorship (tenancy) and magnitude of agricultural productivity in different parts of the

country. In fact, land reform measures ushered in some qualitative changes, e.g., security of tenure and ^{incentives created through} rent reduction. These changes might have generated an atmosphere which induced initiative to invest on agricultural improvement. Abolition of old type of landlord system and large landownership increased initiative of the small farmers who naturally were inclined to use more fertilizers, pesticides and irrigation, thus bringing about a total revolution on the attitude of farmers to view agriculture as a new field of profitable venture. All these factors may be considered as representing the effects of land reforms on the structure of the economy and we are to consider the impact of such qualitative changes on production, if any.

Whatever may be the real factor behind increased productivity after the reforms - the fact is that the reforms increased productivity and investment. However, one is also to look at the trends that were gradually developing in the economy after the reforms. These long run effects, as it appears, may be summarised in the following way.

Long run effects :

We have seen that the land reforms could not remove the existing inequality in the size distribution of holdings and in the distribution pattern of income altogether. After the reforms this existing inequality showed a tendency to increase further due to growing competitiveness in the agricultural sector.

From about 1950 Japanese economy under went a process of remarkable growth in her mining and manufacturing industries. This led to increasing demand for agricultural commodities either as industrial raw materials or as consumption goods which again led to increase the prices of these commodities, the prices of land and the agricultural wage rate.

While creation of owner-farming system through land reforms led to create a condition of increased initiative and enterprise among the farmers, expansion of market and increase in the prices for agricultural commodities made investment in agriculture more and more profitable. In this situation, naturally there developed competition among all classes of farmers to increase their respective share in the market. Relatively larger farmers were in a more privileged condition than the relatively smaller ones. This is seen from the fact that in the smaller-sized farms rate of profit and yield on investment was smaller than in the relatively larger sized holdings, or, in other words, rate of profit and yield on investment increased with the scale of farming. This is shown in the following table.

Table 8 : Rate of profit and yield on investment

(percentage)							
	national average excluding Hokkaido	less than 3 tan	3 - 5 tan	5 tan- 1 cho	1.0- 1.5 cho	1.5 - 2 cho	more than 2 cho
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
rate of profit ^{a/}	3.3	0.1	1.6	2.4	3.8	4.7	5.4
yield on investment ^{b/}	-	3.0	4.0	5.3	6.9	8.0	8.5

Source : Ministry of Agriculture and Forestry, Statistical Year book, 1935.

All this shows that for the large farmers there was greater possibility and potentiality of enlarging their farms still further, but for the small farmers this possibility was almost non-existent. The small farmers, in fact, found it difficult to stand in the face of competition with the larger farmers. Relatively small farmers, thus, were being compelled to leave farming and turn to side jobs.

- a/ Ret of profit = Net profit per unit of capital employed, multiplied by hundred.
- b/ Yield on investment = Gross yield per unit of Capital employed, multiplied by hundred.

Again, the condition of these relatively weaker section of the farmers further deteriorated with the rise in the general consumption level and in the prices of consumer's goods. Since the villagers were increasingly coming in contact with the living pattern as prevailed in cities, it resulted in a corresponding tendency for the general level of consumption to increase in the villages too. Cost of living was still increased with the rise in the prices of consumers goods with the increase in the demand for agricultural commodities from the industrial sector. Thus, it became increasingly difficult for those already in a weak condition to retain their existence as farmers, while relatively better-off farmers could enlarge their scale of operation thus resulting in an increase in inequality in the land distribution pattern.

The following table shows how the number of households with less than 0.5 hectares of farm size decreased and the number of households with more than this 0.5 hectares increased from 1950 to 1955. From 1955-1960 the number of households with more than 1 hectare of farm size increased and number of households with less than 1 hectare, decreased. From 1960 to 1962 the line of demarcation between increase and decrease centred on 1.5 hectare.

Table 9 : Increase or decrease in the number of households according to size of holding

land	number of households				increase or decrease		
	1950	1955	1960	1962	1950-55	1955-60	1960-62
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
total	5930	5796	5823	5655	- 134	+ 27	- 168
less than 0.5 tan	1428	1268	1266	1150	- 160	- 2	- 116
0.3 - 0.5 hectare	1032	1006	992	969	- 26	- 14	- 23
0.5 - 1.0 hectare	1952	1955	1907	1862	+ 3	- 48	- 45
1.0 - 1.5 hectare	945	982	1001	994	+ 37	+ 19	- 7
1.5 - 2.0 hectare	363	376	404	424	+ 13	+ 28	+ 20
more than 2 hectare	203	209	237	255	+ 6	+ 28	+ 18

Source : (Messrs Kojima, 1964) Ministry of Agriculture and Forestry, Statistical year books.

Above table shows how there was a decrease in number of households cultivating small farms and how gradually even the relatively larger farmers were compelled to sell their land . As Masaru Kajita finds^{15/}, the reason for selling out land upto 1960 was, in most cases, the urgency to obtain funds to afford to expenses for livelihood and from 1960 onwards it was due to scarcity of labour. There was also a gradual repossession of tenanted land by the landlords.

The whole process thus can be summarised as follows : The creation of owner operatorship unleashed initiative and enterprise in the economy but some amount of inequality still remained in the size distribution pattern. As a corollary to it, competition among the farmers to increase their respective scale of operation developed. Relatively small farmers had less possibility of increasing their scale than that of the relatively larger ones since their yield on investment was low. This, coupled with increased cost of living and increased price of land and labour , made it very difficult on the part of small farmers to maintain their existence. Large farmers, whose return on investment was larger, were restricted by law to increase their scale after the ceiling limit was arrived at. It was felt by many experts that the small farming system with the existing ceiling limit on the amount of land that could be possessed, proved to be a fetter obstructing the way of natural course of development of the economy. This seems obvious under a situation in which small farmers find it extremely difficult to retain their existence and any improvement in the form of capital formation and utilisation of improved

15/ Masaru Kajita, *ibid.*

methods in agriculture may only be made possible through large farming. In fact, there was demand from many quarters to ease the ceiling limit as it was felt to be working as an obstacle to the growth of the economy. The law of 1952 that put regulations on transfer of land was highly criticised. While the agricultural land law was appraised as being "a breakwater against the reversion of the pre-landreform parasitic landlord system" it was also criticised on the ground that in the preparation of the law "ideas were lacking as to what developments can be expected in the agricultural sector"^{16/}. All these led to the amendment of the land law in 1962. The substance of the land law in 1962 was :

(1) In order to aid in the creation of economically viable units, restrictions were eased on the ceiling on the amount of agricultural land which could be achieved.

(2) In order to provide for the smooth transfer of land agricultural cooperatives were permitted to carry out land trusts.

(3) In order to promote cooperation between the farmers agricultural producers' cooperatives with certain qualifications were permitted to acquire agricultural land.

The above discussion on land reforms in Japan makes it clear that while the reform paved the way, in the short-run for increased production and investment, in the long-run small scale owner operatorship^{17/2,3} proved to be an obstacle to further economic growth. However, the whole process developed

in a situation characterised by rapid strides in industrialisation thorough out the whole of Japan. This led to a growing demand for agricultural commodities, bringing in its trail the rising prices of these, prices of land and an increasing agricultural wage rate. It seems to follow that under such a situation there must develop competition among the farmers to increase their respective share in the market, thus helping to widen the already existing inequality. As the small farms feel insecure in the face of the competition with the larger ones, only way of improving agricultural condition lies with large farming. Thus large farming as the long term solution to the problem of ensuring growth becomes a reality.

Egypt

Our discussion on land reforms in Japan shows that in Japan the owner farming system gradually gave way to large-scale farming and cooperative farming. It will be interesting now to see what happened in Egypt where the land reforms 1952 were adopted with a similar programme of land confiscation with compensation and redistribution in a socio-economic background that was not very dissimilar to that of Japan in many respects.

Before going to discuss the reform measures, it may be helpful to discuss first the socio-economic conditions that prevailed in pre-reform Egypt^{17/}, which led to the adoption of such a programme. Before the reforms, land tenures in privately owned land in Egypt were broadly of three kinds : There were some very big estates (over 1000 feddans*) that were owned generally by absentee owners whose characters were that of a "lavish consumer". These estates were generally leased out to tenants, some times a very large number of them in small units. There were some medium sized estates (with 300 to 400 feddans) which were entirely owner operated and centrally managed by a large administrative staff and cultivated mainly by paid labourers, hired through contractors seasonally or hired as permanent labourers. Large expenditures were incurred on big machinery and other inputs, even scientific experiments were carried out with seed varieties fertilisers and irrigation in these estates. The third type was the large number of relatively small farms; on all these farms except the smallest (with less than $\frac{1}{2}$ feddan) tenancy was general and was increasing.

^{17/} The discussion is mainly based on the study by Doreen Warriner : Land Reform and Development in the Middle East, Oxford University Press, 1962.

* 1 feddan = 1.038 acres.

Share-cropping was increasing more and more in place of cash rent tenancy. The system of share-cropping was generally not of the usual type. As is described by Doreen Warriner^{18/} "share-cropping is not a contract between landowner and the tenant to divide the profits of the farm but simply a method of reducing the costs of management and labour supervision and of cutting labour costs by reducing wages". This is seen clearly in the following example presented by Doreen Warriner : in the cotton growing estates owners generally bore the entire costs of production; the share-croppers were only to provide labour and they generally could not enjoy any portion of the cotton crop — as a return to their labour they got half of the wheat crop and almost all of the maize and berseem crops for the production of which they had to provide all the necessary capital and labour. Thus the landowners got labour free for cotton crop — share-croppers were paid not by any portion of the cotton crop but by some portion of wheat, maize or berseem produced by themselves on landowner's land with the help of their own capital.

The condition of the share-croppers in the smaller estates was even worse. They did not enjoy any security of tenure and had neither any incentive nor any capacity to invest in their farms.

Thus, the conditions of ownership and cultivation that existed in Egypt before the reforms were in the most part retrogressive and detrimental to the interest of a considerable portion of the cultivators.

The second characteristic feature of the land system in Egypt before the reforms was the inequality in the distribution of landownership. 70 per cent of the proprietors in Egypt had less than $\frac{1}{2}$ an feddan each while 2,115 had over 200 feddans with an average of 550 feddans. In the size groups above 200 feddans, 188 proprietors owned holdings over 1,000 feddans with an average holdings of 2,600 feddans.

18/ Doreen Warriner, *ibid.*

Thus the two main characteristics of land system in Egypt before the reforms were (i) wide spread tenancy with insecurity of tenure and high rate of rental share; and (ii) unequal distribution of landownership with a few big landowners on the one hand and a large number of very small owners on the other.

However, from the point of view of agricultural production and its productivity Egypt's position was not worse than that of some of the highly developed countries^{19/}. But rate of population growth in Egypt was larger than the rate of growth of agricultural production, as a result it was being felt increasingly difficult to maintain the living standards of the agricultural population. Actually the higher rate of population increase in comparison with the rate of growth of production kept agricultural income to a very low level. Moreover, pressure of population on land led to increase the price of land and rental rate still further. It was felt that to maintain the living standard of the agricultural population it was essential to increase productivity. But Egyptian land system was itself an obstacle on the way to increasing investment to improve the condition of cultivation and thus to increase agricultural production. Thus, after the Coup d'etat of July 1952 the Army Group that took over power decided to reform the land system to create conditions that would encourage investment and promote production. One of the aims of the land reforms of 1952 was to remove the large land owning families from their dominating position in the economic and political life of the country on the one hand, and on the other to create incentives for the

^{19/} Charles Issawi, *Egypt in Revolution : An Economic Analysis*, Oxford University Press, 1963.

farming population to invest in productive enterprises and to break the habit of spending the whole income of their own on consumption and unproductive purposes.

Agrarian reform law of 1952^{20/}

Agrarian reform law of 1952 had three aims; redistribution of ownership; reduction of rent; raising of agricultural wages. The law in Article 1, laid down that "no person may own more than 200 feddans* of land". Landowners could retain 300 feddans if they distributed 50 feddans to each of two children. Land in excess of these maximum was to be requisitioned over a period of 5 years by the Government. Owners of the expropriated land were to receive compensation at the rate of ten times the rental value, assessed at seven times of land tax. Article 2 of the act allowed companies and private persons to own more than 200 feddans of desert land under reclamation or fallow land; industrial companies were exempted for a period of 25 years.

The requisitioned lands were to be distributed to farm labourers or small farmers in holdings not more than 5 feddans and not less than 2 feddans for each family. Owners of more than 5 feddans were not eligible to receive land. However, priorities were given to the actual cultivators or the labourers in distributing the land.

The new owners were to pay the full purchased price of the land (as newly assessed on the basis of new and lower land tax rate) in instalments over a period of thirty years plus interest at 3 per cent and 15 per cent for the cost of administration. The instalment payable annually was much less than the previous rental rate.

^{20/} The discussion is mainly based on the study made by Elias H. Tuma, "Twenty six centuries of Land Reforms", *ibid.*

* 1 feddan = 1.058 acres.

Article 33 of agricultural law decreed that the rent of agricultural land might not exceed seven times the basic land tax. In case of share cropping owners' share could not exceed one-half after deduction of all expenses, before the reform it was half of the gross produce.

With regard to restriction and regulation of tenancy it was decreed that agricultural land could be let only to a person who could farm it himself. Leasing of land must not be for less than three years and must be in writing.

As regard to the cultivation in the newly created farms, the new owners were not, however, made independent cultivators. Instead, all managerial activities including experiments with seeds, fertilisers scientific methods etc., and also marketing, were managed by the cooperatives the membership to which was obligatory for all these new owners. Further, within the period of 30 years of instalment payment, they could not sell or sublet the land. Membership of cooperatives was restricted to owners of 5 feddans or less. The land reform law of 1952 was amended in 1961. The 1961 amendment lowered the ceiling limit from 200 to 100 feddans and provided more security of tenure to the tenants.

Results

Reduction of inequality and restriction of tenancy

The land reform programme in Egypt is often claimed to have been implemented with maximum efficiency. But even if the reform measures were implemented rigorously, it could have done little to reduce the inequality in the distribution of ownership. For as we have seen, in the first place, a ceiling limit of as high as 200 feddans (later it was reduced to 100 feddans in 1961 amendment of the 1952 reform) was imposed on the ownership of farm land

and only the land above this limit was to be confiscated and distributed in small units to farmers with less than 5 feddans of farm land or to the tenants or to the actual cultivators of the land confiscated; this means that farms of size between 5 and 100 feddans were left unaffected. The following table shows (i) pattern of landownership in 1952, on the eve of the first agrarian reform; (ii) the condition of land distribution before the second reforms (of 1961) had been put into operation; and (iii) anticipated results of 1961 reforms — as estimated before the completion of it on the assumption of perfect implementation of the programme.

Table 10 : Distribution of landholdings

('000 feddans and holdings)						
	1952		1961		after the reforms of 1961	
	no. of owners	area owned	no. of owners	area owned	no. of owners	area owned
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0 - 5 f	2642	2182	2870	2660	2920	3040
5 - 10	79	526	79	530	79	530
10 - 50	69	1291	69	1300	69	1300
50 - 100	6	429	11	630	11	630
100 - 200	3	437	3	450	5	500
over 200	2	1117	2	430	-	-
total	2801	5982	3034	6000	3084	6000

Source : Charles Issawi, *Egypt in Revolution, An Economic Analysis*, Oxford University Press, 1963.

As the table shows, on the assumption of perfect implementation of the reforms, the anticipated effect of the reforms in narrowing the gap between big and small landowners was hardly important. Although after the implementation of 1961 reforms the number of farmers with more than 200 feddans of land was to be reduced to zero, still 94 per cent of the households were to own only slightly over 50 per cent of the land whereas less than 6 per cent of the households were to own slightly less than 50 per cent of the land. No doubt, as it was anticipated, the proper implementation of the reforms could cause some increase in the number of farmers with 5 feddans or less than 5 feddans of land but it could not change the land distribution pattern to a very considerable extent.

Regarding restriction of tenancy, the land reform programme was to restrict tenancy only to the cases of persons leasing in land for personal cultivation; as Charles Issawi^{21/} pointed out the reforms seem to have increased the magnitude of tenancy. According to Issawi whereas in 1950 census it was seen that 61 per cent of the land was owner operated 20 per cent leased and 19 per cent was in mixed category, these figures changed to 59 per cent, 22 percent and 19 per cent respectively in 1956. In fact, the land reform programme did not impose any restrictions on tenancy as such; it only imposed restrictions on subletting of land.

However, the land reforms reduced the rental percentage in case of share cropping and the amount of cash rent in case of cash rent tenancy, which led to some amount of redistribution of income. Reduction of rents resulted in

^{21/} Charles Issawi, Egypt in revolution : An Economic Analysis, *ibid.*

an increase in income for the tenants and a decrease ⁱⁿ income for the landlords, so that the economic conditions of the tenants were improved to some extent.

Increase in Agricultural Production and Investment

As has been generally observed hardly any improvement in productivity took place due to the landreforms in Egypt. The following Table shows land productivity before and after the reforms of 1952.

Table 11 : Land productivity before and after reform
in Egypt

harvest year	(Egyptian quintals per hectare)			
	cotton	wheat	rice	maize
(1)	(2)	(3)	(4)	(5)
1945-1949	5.7	17.3	37.3	20.9
1950	4.6	17.7	42.2	21.4
1951	4.4	19.2	30.3	20.4
1952	5.4	18.5	32.9	21.0
1953	5.7	20.6	36.7	21.9
1954	-	22.9	-	-

Source : W. Thweat, "The Egyptian Agrarian Reform", Middle East Economic Papers, American University of Beirut; Economic Research Institute, 1956.

Table 11 shows that from 1945-49 to 1954 productivity of land in respect of cotton, rice and maize remained almost stagnant. Slight increase in productivity is seen in the case of wheat. However, regarding sugarcane^{22/} (which is not shown in the table) the available data suggest that there was a steady increase from

^{22/} W. Thweat, "The Egyptian Agrarian Reform", Middle East Economic Papers(1956), American University of Beirut, Economic Research Institute.

1951-52 to 1960. It is also seen that cotton production increased from 1957 onwards. Thus while it was 4.3 quintals per hectare in 1957, 5.7 in 1958, 5.7 in 1959 it became 5.9 quintals per hectare in 1960.

However, from all this, one can hardly credit the Egyptian land reforms for having brought about considerable improvement in agricultural productivity. To have an idea about the overall improvement in the agricultural productivity, we may also consult Charles Issawi's^{23/} assessment : "On balance there seems to have been some increase but its extent does not seem to have been very considerable and its incidence has been by no means universal. Official publications show a marked increase in selected areas; thus cotton yields on eight selected districts are stated to have risen by an average of 25 per cent following the land reforms. On the other hand, reliable observers told the author that in some expropriated estates especially for fruits and orchards output had decreased drastically".

Regarding increase in income and investment, we have already seen that there was some amount of increase in income for all the existing tenants because of reduction of the rental rates. This redistribution of income in favour of the tenants might have increased investment to some extent. The gain in income, however, was most pronounced for those former tenants and other agricultural persons who got some amount of land after the land redistribution programme was implemented. These new land recipients were to pay a compensation to the former owners in instalments the amount of each instalment payment being less than the

^{23/} Charles Issawi, Egypt at Mid Century : An Economic Survey, London, New York and Toronto; Oxford Economic Press, 1954.

rental rate. This meant an increase in income for the former tenants who after the reforms became owners. The following table gives some idea about the extent of increase in income of these former tenants.

Table 12 : Instalment payment compared with pre-reform rents in selected Estates in Egypt, 1955.

estate	instalment of rent (per cent)
(1)	(2)
Mataay (El Matya Province)	41.6
Drina (Gharbia Province)	41.4
Nagah Hanady (Upper Egypt, Kena Province)	35.6
Arment (Upper Egypt, Kena Province)	47.0
El Nakas (Sharkiah Province)	26.6
Menshat Rahay (El Fayoum Province)	33.2

Source : Elias H. Tuma, *ibid.*

The table shows that the instalment payment as percentage of rent varied within 33.2 per cent to 47.0 per cent in the Estates that were selected for comparison. Considering the cost of production which was, after the reform, to be incurred by these land recipients, the increase in income was estimated^{24/} to be about 50 per cent. Moreover, in the new situation the cooperatives were to manage marketing and sale of the produce and these cooperatives took responsibility to undertake investment on fertilisers, machinery etc., by the sales proceeds; thus the surplus was now being invested rather than consumed or invested in unproductive purposes by the big landowners.

^{24/} Doreen Warriner, *ibid.*

However, as our discussion on the effect of landreforms (in reducing inequality in distribution of landownership) shows, a vast section of the proprietors within the size group of 5 to 100 feddans remained untouched by the reforms. As available information suggests, the programme of land confiscation and redistribution could not touch more than 10 per cent of the households^{25/}. Thus the effect of landreforms in Egypt was limited to a very minor section of the population except that there was some increase in income for the existing tenants also.

All these show that the Egyptian landreforms could not bring about any considerable change in the agricultural condition of Egypt. The only remarkable changes that were brought about by the reforms seem to be that it could remove the influence of the very big landowners (above 100 feddans) from the economic and political life of the country, and it led to increase the number of owner operators with 5 feddans or less than 5 feddans of land.

But these are the short run consequences of the reforms. It is also necessary to consider the long run consequences. In this context, the relevant questions for our discussion are, (1) whether in the long run the newly created peasant farms as well as those existed from the pre-reform period remained as such, i.e., if there took place any transactions of land vis-a-vis the smallest size class or ^{in other words} whether these small farms could retain their existence in the face of competition with the larger farms; (2) whether there occurred any further concentration of land within the size class of 5 to 100 feddans.

However, we are not in a position to present any statistical information that may answer the question of concentration of land and transfer of land after the reforms of 1952 and 1961. All that we can do in dealing with the question is to examine whether and how far the distribution pattern of income and wealth, that has evolved as an immediate consequence of the reforms, may act as a basis for further class differentiation in the long run.

We have already mentioned that the land distribution programme was carried out with the consciousness that if the new land recipients were to farm their land independently they might fall into instability. Thus the newly created small owners were not allowed to function independently; they were made to join the cooperative societies which were set up not only to provide loans but also to manage the marketing of product and supply of seeds fertilisers etc., with the sales proceeds. Again, sale, letting and subletting of land was legally restricted for the period within which the compensation is not fully paid up by the members of the cooperatives. Thus there was no scope, at least in law, for the transfer of agricultural land and concentration of land within these cooperative societies.

But there remained a large number of holdings of less than 5 feddans in size that were not affected by land reforms in any way, and it was realised that for their stable functioning it is necessary to extend cooperative system in these cases also.

Although the cooperative system was ^{later} extended to facilitate stable functioning of these small farms, the basis for further class differentiation through transfer and concentration of land still remained. In the first place, the cooperatives did not impose legal restriction on land transfer in any cases except for the cases of new land recipients. Since the members of the cooperatives were to be remunerated not according to the work done but according to the

size of the produce which depended on the size of the farm in each case, there was ample scope for the large farmers to enlarge their scale of operation whereas the relatively smaller ones were in less advantageous position even within the framework of cooperatives. Thus except for the cases of new land recipients for which legal restriction was imposed on the transfer of land (for 30 years), in all other cases cooperativisation did not imply removal of the basis for land transfer and concentration of land. Moreover, there remains doubt about how democratically these cooperatives were functioning. Although it had been stipulated after the reorganisation of cooperatives in 1961 that 2/3rd of the members of the supervisory councils should be the farmers with less than 5 feddans, it may be presumed that these cooperatives were more influenced by the interest of the large farmers. Although we do not have sufficient information about how far cooperatives in Egypt could actually guarantee a stable functioning of the small farms, the fact is that, there remained some basis for transfer and concentration of land and further class differentiation within the cooperatives.

From all this we came to the conclusion that, the Egyptian land reforms were different from that of the Japanese in the following ways:

(i) although Egyptian authorities intended to remove the influence of the big landowning class from the country's economic and social life, it appears that they were quite conscious that land confiscation and redistribution was not to be so extended as to create the peasant farms as the basic unit of operation, as was created in Japan after the land reform of 1946 and 1952.

(ii) Even the very small number of small farmers that were created through

the reform, were not allowed to function as independent owners. And the large number of medium large and small peasants who were not affected by land reforms were constantly being encouraged to join cooperatives of different types.

While there remains much doubt as to whether the system of cooperatives that was adopted in Egypt could ensure stable functioning of the small farms in the face of competition with the larger ones, it is however clear that the Egyptian authorities started with an objective of cooperativisation from the very beginning as was accepted by Japan only as late as in 1962, after sixteen years of its first land reform in 1946. In other words, that peasant farming system can not function independently and efficiently for long period and cannot permanently solve the problem of concentration was realised both by Japan and Egypt — but while the former realised it after a long experience, the latter was quite aware of it from the very beginning.

Land reforms in China :

So far we have discussed land reforms in two countries, e.g., Japan and Egypt. Starting from the similar problem of "abolition of feudalism" the two countries came to two different solutions, the former with the small-scale peasant farming and the latter with cooperative farming. Communist China, starting from a similar type of problem, came to a solution which may, prima facie, appear to be a mere combination of the two types in Japan and Egypt, but in reality was a qualitatively different one. Before going to discuss the land reforms in Communist China, we first of all would like to discuss the land system in pre-revolutionary China.

Land system in pre-revolutionary China

Immediately before the revolution, as available information suggest, tenancy was extensive all over the country. It is estimated^{26/} about 30 % of all farm families owned no land at all. Following table shows the extent of tenancy from 1912 to 1931-1936.

Table 13: Extent of tenancy

year	(percentage)
	tenant families to total farm families*
(1)	(2)
1912	28
1917-18	27
Early 1930's	33
1931-36	30

Source : Dwight H. Perkins, *Agricultural Development in China 1968-1969*, Aldine Publishing Company, Chicago, 1969.

* National average excluding Manchuria.

^{26/} Dwight H. Perkins, *Agricultural Development in China 1968-1969*. Aldine Publishing Company, Chicago 1969.

However, there were pronounced differences in the magnitude of tenancy and nature of tenancy-contracts among the regions. Thus, in North China magnitude of tenancy was low and tenancy contracts were generally made for very short duration; whereas in South China magnitude of tenancy was high and tenancy contracts were generally made for long and permanent duration.

From this table it is seen that the poor peasants and farm labourers constituted as high as 47.53 per cent of the village households but they controlled only slightly over 19 per cent of the total landholdings, whereas the landlords, constituting only 2.42 per cent of the households, controlled 16.43 per cent of the total landholdings.

The political and economic life of the peasants were regulated by the landed gentry who were in the rural organisational power and were supported by the Imperial Government. This gentry class was mainly consisted of absentee owners who lived either on rents or interests and who had accumulated their initial capital as merchants, bureaucrats or militarists in the past.

Thus, Chinese land system before the reform was characterised by the existence of a parasitic and functionless rentier class on the one hand, and on the other, a large number of landless and poor peasants. Wide-spread tenancy with high rents and insecurity of tenure were two features of Chinese land system at that time.

From this it becomes clear that immediately after the revolution China was faced with the same type of problems as existed in Japan immediately after the Second World War. Again, land system in China immediately after the revolution was not much dissimilar to that of Egypt before the reforms of 1952 and 1961. However, China solved its problems in its own way which was much different from either that of Japan or of Egypt.

Land reforms after the revolution^{29/}

After the revolution, the immediate aim of land reforms in China was described as : abolition of landlordism and establishment of peasant proprietorship. However, rich peasants were allowed to continue farming undisturbed at the initial stage although the ultimate objective was to turn towards cooperative and collective farming and to wipe out gradually the rich peasants. But the qualitative difference between land reforms in China and that in the other two countries lies in many factors e.g., in China's method of "democratic estimation and decision" in actual implementation of the program, in its classification of the agricultural population into landlords, rich peasants, middle peasants and poor peasants, in its principle emphasis on manual labour in determining class status, in its very process of making people accustomed to mutual help and cooperation and in its emphasis on voluntariness in place of compulsion.

The aim of land reforms in China can be made clear from the following three broad provisions :

(1) "To abolish the landownership system of feudal exploitation by the landlord class" (Article I). As a matter of fact, the aim, as it was described, was to eliminate the functionless rentier class who lived on feudal exploitation.

(2) Attention was specially paid to protect rural industry and trade. As is stated in Article 4 : " the land and other properties used by landlords directly for the operation of industrial and commercial enterprises shall not be confiscated".

^{29/} The discussion is mainly based on Chao Kue-Chun, Agrarian Policy of Mainland China - A documentary Study 1949-1957. Harvar University Press 1957.

(3) In the case of those who are on the one hand a rent receiving landlord as regard to a part of their holdings a cultivating owner for another part and a tenant or share-cropper for still another part, all at the same time, land reform laws were applicable according to their degree of exploitation'.

However, one cannot perhaps understand the full implications of Chinese land reform without going through the Chinese definitions^{30/} of different classes of farming persons : A person is categorised as landlord if the main portion of his income comes from feudal exploitation. Thus money lending and hiring of labour as well as receiving of rent are the criteria of landlordism. The rent collectors and the agents of landlords are in the same class as landlords, if they are not economically worse off than the middle peasants. The persons who obtain land from others on rent but live on the fruits of hired labour are sub-landlords. Chinese programme of land reforms, as it has already been mentioned, aimed at abolition of landlordism; criteria of landlordism include not only receiving of rent from others but also money lending and hiring of labour. It follows, the land reforms envisaged confiscation of land of those who mainly lived on the fruits of labour of the other people without contributing any amount of labour of their own. In land redistribution process the landlords were also given some amount of land but they were required to make their living by their own labour. As is stated in Article 2, 4 and 10 "Landlords are given an equal share, so that they can make their living by their own labour, thus reform themselves through labour". The

30/ Chao Kuo-Chun, Agrarian Policies of Mainland China - A Documentary Study, 1949-1957. Harvard University Press, 1957.

extreme emphasis on labour is also revealed if we consider the definition of rich peasants. A sub-landlord can be treated as a rich peasant if he is engaged in the essential form of labour (ploughing, planting, reaping etc.,) for at least some parts of the year. A rich peasant is distinguished from a middle peasant with the criterion that a person whose income from exploitation exceeds 25 per cent of his annual income is a rich peasant, otherwise he is a middle peasant. If a person is categorised as rich peasant he would be treated specially. The agrarian reform law made special provisions for the rich peasants. In Article 6 it is stated that "Land owned by rich peasants and cultivated by themselves or by hired labour and their other properties shall be protected from infringement". The rich peasants can moreover rent out small portions of their land. In certain cases where they are of the semi-landlord type, the land rented out by them may be requisitioned with Government approval. The draught animals, farm implements and buildings purchased by the rich peasants, even if they are more than sufficient, shall not be confiscated or exchanged.

The provision for concessions to the rich peasants in the Chinese Programme of land reforms appear to be contradictory to the aim of social justice; but as it was argued by the authority, they wanted to make a perfect combination of reality and justice. At the first stage of the socialist reconstruction when the problem was "to set free rural productive forces, to develop agricultural production thus to pave the way for New China's industrialisation", it was felt that any restriction on the working of the rich peasants

could stand in the way for agricultural development. Rich peasants were not restricted to continue production at the initial stage of the land reforms. But the rural "class policy" during the whole transition period was "to rely on the poor peasants, to unite with the middle peasants and to proceed gradually from restricting to finally wiping out exploitative activities by the rich peasants". Then it becomes clear that the policy of giving concessions to the rich peasants was only a temporary one, and the ultimate objective was to wipe out their exploitation.

To understand more clearly the essence of land reform in China we should moreover look at the whole programme of land confiscation and distribution.

Requisition of land

The categories of land that were confiscated were : (1) Landlord's land, (2) rural land belonging to ancestral shrines and religious institutions, (the financial loss of the religious institutions, however, was to be borne by Government revenue), (3) land of absentee landlords who followed other occupations, provided that the area so confiscated exceeded 200 per cent of the per capita availability of land in a certain locality after land distribution, (4) rural lands and peasant dwellings owned by merchants and industrialists. (However, their other properties and business connected with commercial and industrial enterprises were not to be confiscated.) (5) The land rented out by rich peasants of the semi-landlord type, under certain conditions. Moreover, in case of pure landlords confiscation extended to certain specified categories of property other than land, for example, draught animals, farm implements, and surplus grain.

Land reform programme did not confiscate land in some special situations. For example, Article 12 stated that "land owned by tillers should not be drawn upon for distribution". Secondly, status of some non-cultivating owners was recognised by law, for example, revolutionary army men, dependents of martyrs, staff members professional workers etc., who were not classified as landlords, provided that they did not own more than 200 per cent of the average per capita availability of land, after land distribution in a particular locality. The ceiling of 200 per cent might be waived in the individual cases of "Old persons living alone, orphans, invalids, helpless widows or widowers. The same rule was to be applied if the land proved to had been purchased with the earnings of the owners own labour". Rich peasants were also excluded from confiscation.

As it appears, the land reform programme in China was discriminatory in the sense that, it did not treat all classes of people equally; thus, while the invalid and incapable persons had been favoured by law the person like revolutionary army men or dependents of martyrs were given due considerations. Also a person who owned land purchased with the earnings of his own labour was excluded from the land requition programme like the person who owned land he himself tilled.

Distribution

In case of land distribution the principle to be followed was stated in Article I that "the system of peasant ownership shall be introduced".

A discriminatory policy was followed in case of distribution also :

- (1) Landlords were given an equal share, they were required to till it by themselves and live on the fruits of their own labour. The landlords who once worked for the enemy but had come back to their villages also got the same

treatment whenever it was possible. (2) The owner of a land who himself tilled it was entitled to an amount of land. The amount of land he already possessed plus the land he acquired through distribution could even be slightly larger than the average per capita availability of land after distribution. (3) Similarly, a poor peasant family could obtain more land than the average amount falling to any family of the same size. (4) Rural handicrafts men, pedlars, professional workers and their dependents were entitled to a certain amount of land, provided their earnings from the main occupation were insufficient for their regular maintenance. Dependents of persons who left rural areas and earned something elsewhere which was insufficient to maintain the dependents in village and also the certified unemployed from towns who came back to rural areas were entitled to the share of land and other means of production, if local conditions permitted it. Any person who once worked for the enemy but now had come back and also persons belonging to religious order obtained the same treatment.

As it appears, one of the objectives of land reforms in China in its first stage, was to create peasant proprietorship in place of the landlord system, so that production forces that remained so long unutilised might be released and utilised in the best possible way for the country's economic development. It is perhaps for this reason that the rich peasants also got special treatment in the land reform laws. But while the immediate aim of the land reforms was to encourage individual initiative through the creation of peasant proprietorship, the ultimate objective, as declared, was to advance towards socialisation and finally towards communisation of agriculture (and the whole economy) through different stages. It seems that Chinese leaders were fully aware of the necessity of organised farming that might enable the small farmers to achieve maximum efficiency through pooling of their individual resources. Organised^{31/} farming was considered to be more efficient economically, but to the Chinese authority economic performance was not the only consideration. The main principle on which the whole programme was based (as expressed in their ideological political campaigns) was to transform the whole economic base and political ideological and cultural superstructure of the society in a way that would remove the very sense of individualism and competition and prevent the growth of monopoly and concentration in economic and political sphere. As it is expressed in the draft programme on agricultural development submitted by the Central Committee of the Chinese Communist Party in January^{32/} 1956 : "Agriculture can be developed along

^{31/} Organised farming : The term organised farming has come to be used to mean collective farming of some form of degree or other. In this context, by collective is meant what the term means literally and not the specific connotation it has when one speaks of "Collective farm" as in Socialist Countries "Collective farm" is a particular institution of collective or joint effort and as we know there could be many other institutional forms.

^{32/} CC, CCP, Revised Draft Programme on Agricultural Development in the Nation, 1956-1967, October 25, 1957, / taken from Chao-Kuo-Chun /.

two roads. One is the Capitalist road — under which the destiny of the peasants in the hands of the landlords, rich peasants and speculative merchants, with a very few people growing richer and with the great majority of people becoming poor and bankrupt. Another is the socialist road under which the peasants, led by the working class, master their own destiny a road to common wealth and prosperity". The Chinese principle was to adopt this second road of development; accordingly the path they followed was to abolish gradually the private ownership system, replace it by "collective ownership" and to change the prevailing system of distribution of income and division of labour so that the amount of labour instead of property should be the basis for distribution of income. Thus the Chinese went through the stages of Mutual Aid System, Producer's Co-operatives of lower stage, Advanced Producer's Cooperatives (Collectives) and Commune System. The Mutual Aid Teams were meant to work as solution to the problem of the dearth of working capital in the form of food, seeds, fertilisers etc., faced by the landless labourers who had come to possess land, as well as poor peasants, who had obtained more land. The responsibility of the Mutual Aid Teams was to bring about an even allocation of scarce factors of production such as draft animals at seasons of peak demand. These temporary teams gradually became permanent and came to own collectively stock of implements and draft animals. The next stage was the Lower Stage Agricultural Producer's Co-operatives. They were not only to own some agricultural properties collectively but also to organise division of labour and crop planning, and to combine agriculture with subsidiary occupations. One feature of the lower stage cooperatives was that in these lower stage cooperatives income was distributed on the basis of both land and labour contributed. By the end of May 1956 over 91.2 per cent of the total rural households were organised in approximately ^{1 million} ~~in~~ cooperatives and by the end of 1956 about 88 per cent of all families joined Advanced Co-operatives (i.e., Collectives)

where income was determined solely on the basis of labour contributed. Thus the Advanced Cooperatives (Collectives) were characterised by two socialist principles "Collective Ownership" and "Payment According to Labour".

The next stage after collective was the commune system : These communes were not only the administrative units of the Government but they were comprehensive planning authorities with the task of promoting large-scale and divergent economic and social programmes in the countryside, such as, big irrigation projects, more intensive farming, development of subsidiary as well as industrial undertakings propagation of technical cultural activities and organising services including defence and education.

At present, commune is still the basic unit of agricultural planning and it is still the basic unit of social and political structure of the country which combines industry, agriculture, trade, education and military affairs. But communes at present are not quite the same as it was first created in 1958, in all respects. In the meantime, there has been some reorganisations, some changes in the system of payment to labour and in the working system of the communes. However, inspite of these reorganisations the two basic principles of collectivisation, namely, collective ownership as the main form of ownership and payment on the basis of labour instead of property as the main system of payment, are still being adhered to. For a detailed description on the working of the commune system and the changes that took place throughout the period from 1958 until now, see the 'Appendix Note on China's Commune' at the end of this chapter.

The guiding principle of the whole process from mutual aid team system to commune system was declared : "The principle of voluntariness should be adhered to, and commandism must be prohibited". The aim was to make the peasant realise about the utility of the cooperative system throughout the whole process, As long as they did not realise it, the policy as declared, was to make them realise and wait.

Thus, Chinese land reform as discussed above, had a much broader sphere of application than that of Japanese or Egyptian. Not only it aimed at abolition of landlordism but also it considered the problems of small farmers, landless labourers and tenants with no discrimination for any class but the

invalids and incapables. However, it also took a discriminatory policy for the development of the rich peasant economy but that was only a temporary measure, it had a long run programme of gradually "wiping out the exploitation activities by the rich peasants". Perhaps the most striking feature of land reform in China was its emphasis on manual labour. Thus in cooperatives also the cultivators got benefits according to the work done, according to the quality and magnitude of the work not according to the share of total output or capital as was the Egyptian practice. Moreover, Chinese policy of educating the peasantry in the habits of mutual aid and cooperation as a prerequisite to the wide application of the system of cooperative and commune system, also represents a special feature of its land reform programme.

Results :

Abolition of landlordism:

Following table gives an idea about the development of land confiscation and redistribution from June 1950 when the Agrarian reform law was put into effect, upto the spring of 1953.

Table 15: Estimated development of land redistribution programme in China (excluding Sinkian & Tibet)

period	(in million)	
	affected	rural population still unaffected
(1)	(2)	(3)
June 1950	178 (out of roughly 500)	322
February 1951	339	161
September 1951	400.	100
September 1952	463	37
November 1952	494	6
Spring 1953	497	3

Source : Chao Kuo-Chun, Agrarian Policy of the Chinese Communist Party, ibid.

As the table shows, by 1953 in Mainland China, more than 99 per cent of the rural population was affected by the programme of land confiscation and distribution. Also we may have an idea about the transformation of the position of the rural class forces from the following illustration taken from the village of Yungkwei Hulan Hsien of Sung Kiang province.

Table 16: Position of the rural class forces

position	population	land	houses	horses	carts
(1)	(2)	(3)	(4)	(5)	(6)
<u>before the reform</u>					
hired peasants	41.9	nil	nil	nil	nil
poor peasants	17.3	0.06	6.1	7.2	10.5
middle peasants	12.1	6.90	8.8	21.2	21.1
rich peasants	19.4	47.84	40.8	39.9	47.3
landlords	9.3	45.20	53.7	31.9	21.1
<u>after the reform</u>					
hired peasants	37.0	36.9	41.7	44.4	62.0
poor peasants	22.0	21.4	22.8	19.9	14.2
middle peasants	12.0	12.3	15.8	16.0	23.8
rich peasants	19.0	18.8	14.0	15.0	nil
landlords	10.0	10.6	5.7	4.7	nil

Source : Reports of Shri Bham Chandra Varma, in Reports of the Committee of the Panel on Land Reforms, Planning Commission, 1959.

This shows that as a result of the land reform the rich peasants and landlords lost their dominating position completely. Before the reform, as the table shows, the landlords and rich peasants owned 93.04 per cent of total land and the rest 6.96 per cent were owned by poor peasants and middle peasants, hired peasants owned nothing. After the reform rich peasants and landlords owned only 29.3 per cent of total land and the rest 70.7 per cent was distributed among hired peasants, poor peasants and middle peasants with the largest percentage (36.9) for the hired peasants. Similar changes were brought about in case of distribution of houses, horses and carts. Thus from table 15 and table 16 one may get an idea about the far-reaching effect of Chinese land reform in changing the relative socio-economic positions of different classes of farmers and in encouraging and enabling vast proportion of the rural population to take active participation in increasing production and agricultural growth. We may also have some idea about the development of organised farming in China from table 17.

From table 17 it becomes clear that from 1950 to 1958 there was steady increase in the number of organised farms of different types. From 1950 to 1954 the Mutual-Aid-Teams were predominant among all types of organised farming; from 1954 to 1958 the number of Mutual-Aid-Teams was declining and importance of Lower Stage Agricultural Producer's Cooperatives was growing upto 1956; after 1956, however, there were no Lower Stage Producer's Cooperatives and all the cooperatives were of the Collective-Farms-Type (Higher Stage Agricultural Producer's Cooperatives). In 1958 Commune system was introduced and by that year there were 26,000 People's Communes in China.

Table 17: Development of organised farming in China

	1950	1951	1952	1953	1954	1955	1956	1957	1958
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
mutual aid teams (1,000)	2700	4760	8030	7450	9930	7150	-	none	none
households in mutual aid teams (1,000)	11313	21000	45364	45637	68478	60389	-	none	none
lower stage agril. producer's cooperatives	19	300	3640	15000	114000	633000	681697	-	none
households in the agril. producer's cooperatives (1,000)	.18	1.58	57	273	2285	16881	10400	-	none
higher stage agril. producer's cooperatives (collective farms)	1	-	10	15	201	529	311935	700000	740000
households in higher stage agril. producer's cooperative (1,000)	.032	.030	1.8	2.1	12	41	107422	115000	123000
people's communes	-	-	-	-	-	-	-	-	26000
total peasant households (1,000)	105536	113683	116325	117331	119201	120000	121500	123550	

Source: State statistical bureau, Statistical Abstracts.

One may also have a more clear idea about the extent of collectivisation of agriculture in China by considering the proportion of farming households to total number of households that were brought under the sphere of organised farming. As table 17 shows, by 1950 less than 10 per cent of the farming households were drawn under the sphere of organised farming, while by 1956, organised farms of different types comprised slightly over 98 per cent of the farming households. By 1958 more than 99 per cent of the farming households were organised in the collective farms and there were 26000 People's Communes to organise the remaining 250,000 households (less than 1 per cent).

From all this it becomes clear that though the Chinese authorities intended to encourage rich-peasant farming and owner-farming in the initial stage, they, from the very beginning, initiated the process of cooperativisation and collectivisation and were successful in gradually organising nearly the entire farming households under the collectivisation programme. The underlying significance of this process of collectivisation lies in the fact that the unrestrained behaviour of the individual peasant economy was sought to be eliminated and the removal of the very basis for further class differentiation and concentration of land was considered to be the long-term goal.

We see that land reform in China brought about a change in the basic agrarian structure so that China could now enjoy the benefits of production in relatively larger scale. Through (as we have already pointed out) immediate increase of production was not the only consideration that led them to reform their agrarian system. with some amount of enlargement in the scale of production unit and with the development of the sense of team work among the peasants one could expect a considerable rise in the level of production and productivity. Again, we have also seen that during the first decade after liberation China had to go through a long process of experimentations which ^{could} ~~might~~ be expected to have stood in the way of smooth and continuous development of its agricultural production. However, to assess the short run and long run consequences of the reforms one should have to turn to statistics relating to agricultural development during the period ~~ex~~ after revolution. But unfortunately we get divergent information regarding China's agricultural development in the post revolution period and it seems difficult for us to say anything conclusively on the basis of these information. For example, according to the official production statistics^{1/} production of cereals and potatoes increased from 124.7 million metric tons in 1951 to 180.5 m. metric tons

1/ By 1958-59 it was recognised by Chinese authority that China's original official food production statistics was highly unreliable since reports submitted by the cadres in many cases were based on over estimated figures. Accordingly the original statistics were revised. Here we present the revised official figures.

in 1961 but according to a writer^{2/} on Chinese economy these figures should be 179.8 and 150.0 respectively. Thus while according to official statistics during the period^{of} 10 years food production had increased, this writer has^{tried} to show that production had actually declined instead of rising. On the basis of data provided by the State Statistical Bureau of China Pranab Kumar Bardhan derived the figures for processed food grains for the years 1952 and 1957 as being 124.9 m. tons and 149.7 m. tons respectively and he presents a figure for 1965 as being 161.8 m. tons on the basis of the official claims^{3/}. Moreover, as China's officials^{4/} claimed, the figure for food-grain production stood at 250 m. tons by 1971 which indicates a sharp increase during a period of 6 years (from 1965 to 1971):

In spite of the contrasting information we get according^{to} many of the students studying China's economy China has achieved considerable development of its agricultural sector after the revolution, though everyone believes that this development process was ~~not~~ not always smooth and continuous.

2/ Yuan-Liwu has adjusted the original official estimates on the basis of consumption statistics, data on previous year's stock of foodgrains etc., (The Economy of Communist China : An Introduction, Pall Mall Press, London, 1965.).

3/ P. K. Bardhan : Chinese and Indian Agriculture. A broad comparison of recent Policy and Performance, The Journal of Asian Studies, Vol. XXIX May 1970.

4/ Economic Times, 4-4-75, 1975.

Conclusions

Economists and policy makers, by and large, view peasant farming as conducive to growth and welfare of the society. The underlying argument is that establishment of peasant farming system on medium sized farms presupposes distribution of land to a larger section of the farming population, which increases efficiency by increasing individual initiative. Our contention is that in a private property right system peasant farming may lead to concentration of land and large-scale farming or capitalist farming in the long-run; if large-scale farming or capitalist farming is considered to be detrimental to the interest of the major section of the farming population, abolition of private property and establishment of common ownership seems to provide a logical solution to the problem of ensuring economic growth with equality. This proposition has been examined on the basis of our above analysis of the land reforms with their short-run and long-run consequences, in the three countries e.g., Japan, Egypt and China.

In Japan, with the implementation of the land reform programmes of 1946 and 1952 a large portion of the agricultural land was transferred to the tenants and landless labourers from the big land owners. This unleashed initiative and enterprise in the economy that was characterised by rapid strides in industrialisation and a growing demand for agricultural commodities; as a result there developed competition among the farmers to increase their respective share of the market. Since the smaller farmers were in weaker positions than the larger ones they found it increasingly difficult to retain

their existence in the face of competition with larger farmers. Thus to ensure growth and avoid stagnation it was felt essential to remove all obstacles to the growth of large and efficient farming and the ceiling on the amount of land-holding was finally eased in 1961. Thus Japanese land reforms, with its long run and short run consequences represent a typical example of how with the interplay of economic processes peasant farming system may give rise to large scale farming in a country that is essentially characterised by a growing industrial sector.

From a discussion of the Egyptian land reform of 1952 and 1961 it seems that the authorities there were quite aware of these probable long-run consequences of establishing owner-farming as the basic unit of operation. Although the programme of land confiscation and redistribution was taken up to reduce the extreme concentration of land-holdings, large-scale farming (upto 100 feddans) was not discouraged and the newly created small farms were not allowed to function independently. The small farmers were obliged to join cooperatives and restrictions were imposed on the sale, letting and subletting of land in these cases for a stipulated period. For all classes of farmers the policy was to extend the functioning of the cooperatives of different types, particularly to aid the stable and efficient functioning of the relatively smaller farmers. However, all these possibly could not remove the basis for further concentration of land, except for the cases of newly created farms (for whom there was restriction on sale letting and subletting of land). In so far as the members of the cooperatives were remunerated not according to the amount of work done but according to the volume of output, the possibility for further concentration still remained. Although we do not have

any factual information of the way the long-run process is working out, it is clear that the Egyptian authorities were conscious that in a private property frame work small farms, if left to themselves, might fall into instability, and also that for sustained growth of the agricultural sector large-scale farming should not be discouraged altogether.

It seems that the Chinese land reformers were guided by this consciousness that while establishment of peasant ownership may be essential for agricultural growth in a particular phase of development, abolition of private ownership should be the ultimate objective. Thus, although peasant ownership was established in China after the revolution. It was expressly meant as a transitional regime en route to socialisation of agriculture.

Thus our contention that in a private property right system peasant farming may lead to large scale farming or capitalist farming in the long-run, seems to hold true if we consider the three countries Japan, Egypt and China. The policy of establishment of owner-farming system with ceiling limit imposed on the size of holdings naturally appears to be appropriate in a stage of agricultural development in which tenancy is widely practised under condition of extreme concentration of landholdings. In such a situation transfer of land from the hands of the landlords and big farmers to the actual tillers of the soil, may indeed increase initiative and enterprise among them. This may thus help to increase agricultural production and at the same time ensure more equitable distribution of income. But the system may ^{not} be a stable one. With the growth of industries and with the enlargement of national and international market for agricultural produce ^{competition develops} among the farmers to increase their respective share

in the market. It is a truism that farmers enjoying a better economic position would be more capable of using improved techniques and better inputs than the others and thus be able to capture an increasing portion of the market. Thus the farmers who start in relative better economic conditions can make them even better, whereas, it becomes increasingly difficult for others to retain what they have. Under this condition, ceiling limits would obstruct the growth of the efficient farmers and thus become fetters to the growth of agriculture. Large-scale farming, and capitalist farming thus become an objective necessity. This process can be avoided only if common ownership of land is established in place of individual ownership.

Appendix on China's Commune

One important point to examine is the scale of production unit within the commune. The question that may arise is, if the process of transition from the stage of peasant proprietorship to the stage of commune should be understood as a progressive enlargement of the size of the production unit. The process of transition from peasant proprietorship to communes passing through different stages and forms of collectivisation, of course, meant the drawing of larger and larger number of households and greater and greater amount of resources into fewer and fewer bigger organisations, but this did not mean an amalgamation of all operational units into one single and large operational unit. Regarding the organisational aspect of the collective farms the resolution of August 1958^{1/} clearly states that "therefore in the early period of the merger (of small co-operatives into larger one) the method of changing the upper structure while keeping the lower structure unchanged may be adopted. The original smaller co-operatives may, at first, jointly elect an administrative committee for the merged co-operatives to unify planning and the arrangement of work, and transform themselves into farming zones or production brigades". Thus in the collective farms the smaller co-operatives were to remain (in the initial stage) the basic unit of operation although these smaller co-operatives are under the unified leadership of the collectives. Similarly, regarding the organisational aspect of the communes the December 1958 Resolution states^{2/}: "Under the unified leadership of the Commune Administrative Committee, necessary power

1/ Resolution on People's Commune; August 1958. See, Isaac Aschar, China's Social Policy, Anglo Chinese Educational Institute, Sept. 1972.

2/ Resolution of some question concerning People's Commune adopted by the 8th Central Committee of the Chinese Communist Party at its 8th Plenary Session, December 10, 1958. See, Chao Kuo-Chun, Agrarian Policy of the Chinese Communist Party 1921-1959, Asia Publishing House, 1960.

should be given to the administrative district (or production brigade) and the production team over such matters as the organisation of the production work and capital construction or finances etc." Thus although commune were the basic administrative, social and economic unit, smaller production brigades or smaller production teams were meant to be the Units of agricultural operation from the very beginning. Until now^{5/} the production brigades and in many places production teams remain the basic unit of agricultural operation under the commune's unified leadership.

It seems, China's agrarian policy emphasises more on collectivisation than on large-scale farming as the key to agricultural development; or in other words, as their agrarian policy reveals, they have the belief that organised farming is more efficient than small scale peasant farming system but the emphasis is not so much on enlargement of production unit as on the development of collective ownership and the system of team work — a system which, they believe may eradicate the evils associated with private ownership system.

A second point to consider is the system of payment to the individual peasants within the communes and the change that have taken place in this system. As different Resolutions on Agrarian Programme from the stage of collective farming onwards reveal the principle of "from each according to his ability to each according his work" is being adhered to as the main principle guiding the system of payment to a member^{4/}.

In this context the resolutions of December, 1958^{5/} states : "Continued development of production and continued adherence to the principle of to each according to his work" are two important questions of principle in expanding

^{3/} See George Thompson, "Capitalism and After". China Policy Study Group, London, 1973.

^{4/} See George Thimpson, *ibid*.

^{5/} Resolution on Some Question Concerning People's Commune, *ibid*.

socialist economy. The whole party should have a unified understanding of them. Some people while attempting to "enter communism" prematurely have tried to abolish too early a stage the positive roles of commodities, value, currency and prices. This line of thinking is harmful to the development of socialist construction and is therefore incorrect". Although payment according to work continues to be the main guiding principle in the matter of distribution of income, there has been some changes in the method of calculating 'work points' and determining payment to individual workers. At the beginning the calculation of wages was based on the income of the whole commune rather than the basic unit of farming i.e., production brigade or the production team. In this system of calculating wages reward to individual peasant was not directly linked up with the amount of work he performed in his own production unit^{6/}. This, according to a section of policy makers, had the effect of lowering the incentives of individual peasants and thus affecting agricultural development. After 1961 the system was replaced by a new system in which payment to individual peasants was not to be connected with the income of the whole commune but with the income of the production unit to which they were attached i.e., the production brigades or teams as the case may be which were thus the ultimate accounting unit. This system is said to have^{7/} increased worker's enthusiasm and consequently have helped to tide over the difficulty faced during 1959-61.^{8/}

6/ Dwight H. Perkins, "Market Control and Planning in Communist China". Harvard University Press, 1966; P. K. Bardhan, *Chinese and Indian Agriculture: A broad comparison of recent policy and performance*.
7/ D. H. Perkins, *ibid*. *The Journal of Asian Studies* May 1970.

8/ During the early part of 60's China faced an economic crisis to which we refer here.

Again, it is pointed out by some writers^{9/} that in the first stage of communes certain other big changes took place which affected worker's initiative and served as a cause of the agricultural crisis of 1959-61. For example, it is said that the rights of keeping private plots of land for the commune members who had been enjoying these rights while in the collective farms was done away within many places. Free markets are also said to have ceased to exist in certain places. These new policies were abandoned later on after 1959-61. These reversions of certain policies relating to Commune Organisation are explained by these writers (e.g., Dwight H. Perkins, P. K. Bardhan etc.) as carried out under economic compulsions, certain others^{10/} deny that there was any such compulsion but interpret it in terms of political struggles among policy makers.

Thus the Chinese Commune, as it function now after a long process of experimentation, is not a basic production unit (in the technological sense) — it never was — not a single accounting unit. It is an economic organisation which permits every technological and amounting aspects of economic management and development of agriculture to reach their respective optimum scales (production brigades or production teams) while these different optimal scales in many instances smaller than the maximum that could be permitted by the dimensions of particular communes, they would have been far beyond the reach of what the peasant farms immediately after the revolution could ever have aspired to reach and that is the point that is pertinent for our argument in this chapter.

^{9/} Dwight H. Perkins, *ibid.*, P. K. Bardhan, *ibid.*

^{10/} See Isaac Ascher, "China's Social Policy". Anglo Chinese Educational Institute, September 1972.

Chapter IV.

Inter-regional Variations in Tenurial Forms and Economic Conditions in India : A Factual Survey

In this chapter we want to discuss briefly the conditions of tenancy and its relative effectiveness in comparison with owner-farming in the context of India.

In the first place, our discussion would be confined to an assessment of the existing situation regarding the extent of tenancy in different states. Secondly, we shall try to discuss the relative effectiveness of owner-farming and tenant farming systems on the basis of an interstate comparison of the magnitude of ownerfarming^{and}/tenancy in conjunction with an interstate comparison of resource endowments and economic performance. Thirdly, we shall try to discuss briefly the general historical background of the tenurial conditions in different parts of the country.

Magnitude of tenancy

Regarding magnitude of tenancy and change in this magnitude overtime, there are different opposing views and contradictory evidence. The general impression is however that tenancy is declining. As is shown by Dharam Narayan and Joshi,^{1/} on the basis of 8th, 16th and 17th round reports of NSS, proportion of leased in area to total operated area has declined. This is shown in the following table :

1/ Dharam Narayan and Joshi, Magnitude of Tenancy. Economic and Political Weekly, Vol. IX, No. 39, 1969.

Table 1 : Extent of Tenancy

round	year	leased in area to total operated area (%)
(1)	(2)	(3)
8th round	1953-54	20.34
16th round	1960-61	12.53
17th round	1961-62	10.70

Source : National Sample Survey Reports.

This shows that the leased in area which constituted about a fifth of the total operated area in 1953-54 dropped to one eighth in 1960-61 and to one-tenth in 1961-62. This observation however differs from that follows from other sources. Thus, according to Agricultural Labour Enquiry conducted in 1951 the area held by tenants was 41.3 per cent (Planning Commission 1959)^{2/} and according to 1961 Census as is estimated by P. S. Sharma^{3/} per cent of area under pure and mixed tenancy together to total cultivated area was 22.41.

However, one can make only a rough comparison of these figures with that estimated on the basis of NSS reports; nevertheless, such a comparison may suggest one thing, that it is quite probable that the actual condition of tenancy is not reported properly^{4/}. Thus it remains very difficult to assess the actual magnitude of tenancy and the magnitude of its change overtime.

^{2/} Reports of the Committee of the Panel on Land Reforms, Planning Commission, 1959.

^{3/} P. S. Sharma, 'A Study of structural and tenurial aspects of rural India on the basis of 1961 Census', Indian Journal of Agricultural Economics, October-December 1965.

^{4/} P. K. Bardhan, 'Trends in Land Relations', Economic and Political Weekly, Vol. V, Annual Number, 1970.

Now we may try to have an idea about the relative condition of different states with regard to magnitude of owner-operatorship (or tenancy). The N.S.S. 16th round data on land tenure, as is represented in table 2, provides a basis for forming this idea. As the table shows percentage of operated area owned is the highest in Rajasthan and it is the lowest in Punjab. The table further indicates that with respect to owner-operatorship Rajasthan, Gujarat, Madhya Pradesh and Uttar Pradesh rank at the top — the percentage of owner operated to total operated area varying within the range of 94.50 and 90.45. The States which rank at the bottom in this respect are : Mysore, Madras, West Bengal and Punjab — the percentage of owner operated to total operated area varying within the limits of 82.41 and 66.36.

It may also be interesting to have an idea about the extent of pure tenancy in different states. (However, from table 2 we may indirectly estimate the extent of pure and mixed tenancy together in different states but it does not give any idea about the extent of pure tenancy as such.) In table 3 we have arranged the States according to the extent of pure tenancy. This shows that percentage of holdings under pure tenancy to total holdings is the lowest in Uttar Pradesh and it is the highest in Kerala. Moreover, it is seen that with regard to extent of pure tenancy Uttar Pradesh, Gujarat and Rajasthan rank at the bottom and West Bengal, Mysore, Punjab, Assam and Kerala rank at the top.

Table 2 : Extent of owner operatorship

srl. no.	states	percentage of operated area owned	srl. no.	states	percentage of operated area owned
(1)	(2)	(3)	(1)	(2)	(3)
1.	Rajasthan	94.50	8.	Bihar	86.73
2.	Gujarat	92.57	9.	Kerala	85.12
3.	Madhya Pradesh	92.41	10.	Assam	83.76
4.	Uttar Pradesh	90.45	11.	Mysore	82.41
5.	Orissa	89.69	12.	Madras	82.05
6.	Andhra Pradesh	89.26	13.	West Bengal	74.66
7.	Maharashtra	88.32	14.	Punjab	66.36

Source : National Sample Survey No. 177 (Draft), 16th round data.

Table 3 : Extent of pure tenancy

srl. no.	states	percentage of total holdings entirely leased in	srl. no.	states	percentage of total holdings entirely leased in
(1)	(2)	(3)	(1)	(2)	(3)
1.	Uttar Pradesh	1.42	8.	Madhya Pradesh	5.18
2.	Gujarat	2.51	9.	Bihar	7.08
3.	Rajasthan	2.55	10.	West Bengal	8.16
4.	Madras	3.96	11.	Mysore	8.95
5.	Orissa	4.08	12.	Punjab	9.31
6.	Maharashtra	4.49	13.	Assam	11.24
7.	Andhra Pradesh	5.16	14.	Kerala	17.69

Source : National Sample Survey No. 177 (draft) 16th round data.

Relative Effectiveness

Now, we pass on to the question of relative effectiveness of the two systems. In assessing the relative effectiveness, we find it necessary, in the first place, to compare the conditions of the farmers under the two systems with regard to resource endowments; and secondly, to compare the economic performance of the two systems.

To discuss the relative economic conditions of the farmers under the two systems with regard to their resource endowments, we would consider the following factors : (1) size distribution of holdings, (2) soil fertility, (3) rainfall, and (4) extent of irrigation.

With regard to size distribution of holdings the study made by P. S. Sharma (1965)^{6/} on the basis of 1961 Census again seems to provide a very helpful way for making a comparison of the conditions under different forms of tenure.

As is shown in the following tables, average size of holdings is always the lowest for the pure tenancy holdings, for the mixed tenancy holdings the average size of holdings is the highest — it is somewhat higher than that for the owner operated holdings.

Table 4 : Percentage of cultivating households, percentage of cultivated area and average size of holdings under different forms of tenure.

	ownership		pure tenancy		mixed tenancy	
	h*	a**	h*	a**	h*	a**
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	76.34	77.59	7.70	4.22	15.46	18.91
average size of holdings	7.78		4.28		9.07	

* h = percentage of cultivating household.

** a = percentage of cultivated area.

Source : P. S. Sharma, *ibid.*

6/ P. S. Sharma, *ibid.* A Study of Structural and Tenurial Aspects of rural India in the light of 1961 census. India Journal of Agricultural Economics October-December 1965.

Table 5 : Percentage of cultivating households and percentage of cultivating area in different states.

states	ownership		pure tenancy		mixed tenancy	
	h	a	h	a	h	a
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Jammu and Kashmir	58.21	53.06	7.90	7.05	33.89	39.89
Rajasthan	88.96	89.01	3.87	2.55	7.17	8.44
Uttar Pradesh	89.53	91.39	3.22	1.69	7.25	6.92
Madhya Pradesh	80.21	80.09	5.55	3.28	14.24	16.63
Orissa	77.83	78.09	4.89	2.87	17.28	19.04
Gujarat	86.54	86.67	4.07	2.62	9.39	10.71
Maharashtra	78.49	77.31	7.29	3.84	14.22	18.85
Andhra	78.98	76.68	6.28	3.68	14.74	19.64
Madras	76.21	78.08	10.96	6.64	12.83	13.28
Punjab	51.66	51.40	13.76	9.77	34.58	38.83
Bihar	67.82	67.82	7.35	7.35	24.83	24.83
West Bengal	65.64	65.05	13.34	10.18	21.02	24.77
Assam	62.91	65.37	15.39	9.36	21.70	25.27
Mysore	70.47	67.38	10.11	4.84	19.42	27.78
Kerala	54.90	42.7	32.53	34.72	12.57	22.49

h = percentage of cultivating households.

a = percentage of cultivated area in rural areas

Source : P. S. Sharma, *ibid.*

As the Table 4 and Table 5 show, the pattern of size distribution under the three systems remains the same for different states. All this shows that whereas pure tenants are generally small farmers the part-owner part tenants are not generally so. Part owner part tenant households may be in a better economic condition than the owner cultivators since they are generally with larger sized farms than that of the owner cultivators.

That pure tenants are in the worst condition with regard to land, may also be seen from that under pure tenancy percentage of area held is lower than the percentage of households; but under mixed tenancy and owner operatorship percentage of area held is larger than the percentage of households. This may be taken as an indication that if total farming households are classified into these three categories the distribution of farmland among the classes shows an uneven pattern with pure tenants in the worst position. However, if pure tenancy and mixed tenancy are considered together, it is seen from Table 4 that for all-India, 25.15 per cent of the total area and 25.16 per cent of the total households are within this combined category. These observations with regard to the smaller landsize of the purely tenant farms says nothing whatsoever about the relation between size and tenancy as soon as the mixed category of part owners and part tenants is considered.

However, Table 6 shows that while for some states percentage of leased in land to total operated area shows no distinct upward or downward tendency with increase in size of operational holdings, for some other states it shows a downward tendency and for still some other it declines with size of farms upto a certain point and then starts rising. In other words, no general pattern exists with regard to the relation between operational size of farms and incidence of tenancy. (This was of course noted much earlier by K. N. Raj^{6/}.)

Let us now pass on to other natural advantages and infrastructural facilities. Commonly held idea is that one tends to give out the more unfavourable pieces of land on lease and retains for self cultivation such pieces as are endowed with greater natural advantages or infrastructural facilities, e.g., fertility, rainfall, irrigation etc. If this idea be correct one would expect a positive association between tenancy and unfavourable natural conditions. To examine if tenancy system is associated with less natural endowments we have carried out an interstate comparison of amount of rainfall, soil fertility and extent of irrigation in conjunction with an interstate comparison of tenancy.

6/ K. N. Raj: Ownership and Distribution of land.
Indian Economic Review April 1970.

Table 6 : Percentage of operated area leased in for each size class of operational holdings.

sl. no.	state	0-0.49	0.50-0.99	1.00-2.49	2.50-4.99	5.00-7.49	7.50-9.99	10.00-12.49
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1.	Andhra	12.50	10.76	10.31	13.96	13.79	14.72	15.13
2.	Assam	46.15	37.78	21.42	19.88	14.40	14.29	11.90
3.	Bihar	26.24	37.25	20.36	18.97	14.91	16.64	6.36
4.	Gujarat	16.67	34.01	12.06	15.07	9.94	11.62	8.20
5.	Kerala	14.41	18.92	21.58	15.92	26.81	17.73	14.62
6.	Madhya Pradesh	12.50	35.34	10.87	10.22	11.49	8.74	6.90
7.	Madras	25.00	35.02	25.97	22.73	16.52	17.21	16.34
8.	Maharashtra	21.74	16.85	22.81	14.21	10.30	10.97	12.21
9.	Mysore	50.00	6.00	20.44	12.61	21.33	24.60	25.26
10.	Orissa	26.57	22.12	19.76	12.65	11.03	14.32	7.36
11.	Punjab	40.00	36.71	35.29	45.90	34.78	37.27	37.05
12.	Rajasthan	66.67	2.33	5.70	8.74	7.69	3.19	6.45
13.	Uttar Pradesh	29.86	20.09	14.00	10.85	10.38	8.08	6.46
14.	West Bengal	25.60	28.10	29.33	34.53	29.00	19.21	22.55

Table 6 : (contd.)

Srl. no.	State	12.50-14.99 15.00-19.99 20.00-24.99 25.00-29.99 30.00-49.99 50 and above									
		(1)	(2)	(3)	(11)	(12)	(13)	(14)	(15)		
1.	Andhra		14.56	10.91	8.63	5.28	6.86	6.75			
2.	Assam		5.63	15.37	11.76	-	11.49	-			
3.	Bihar		11.97	6.62	4.98	3.17	1.76	0.69			
4.	Gujarat		8.16	7.36	6.25	3.51	4.76	7.21			
5.	Kerala		5.88	10.48	9.21	5.00	15.45	1.57			
6.	Madhya Pradesh		5.88	5.82	6.78	7.00	6.38	7.12			
7.	Madras		13.68	10.59	15.45	8.20	6.83	2.56			
8.	Maharashtra		11.94	11.44	14.66	11.97	10.47	10.35			
9.	Mysore		13.97	13.11	22.98	14.61	16.00	13.79			
10.	Orissa		4.86	3.45	1.47	3.72	7.82	3.19			
11.	Punjab		30.48	28.06	43.23	47.95	25.60	20.97			
12.	Rajasthan		5.09	6.51	8.37	1.39	8.63	1.96			
13.	Uttar Pradesh		8.33	6.35	3.33	8.78	9.99	7.55			
14.	West Bengal		8.71	8.93	9.19	1.49	8.24	4.17.			

Source : National Sample Survey No. 177 (draft) 18th round data.

In Table 7 column 1 states are ranked according to extent of owneroperatorship and comparisons of column 1 with columns 2, 3 and 4 separately show that there is no positive association between tenancy on the one hand and unfavourable natural conditions on the other. It is seen that among the States Punjab is endowed with irrigation facilities to the largest extent although it ranks last with respect to percentage of operated area owned. Further although amount of rainfall is very low in Punjab, it is the richest among the states having a large proportion of fertile soil. On the other hand, Rajasthan and Gujarat the two states that rank at the top with respect to owner operatorship do not seem to be much endowed with natural facilities like rainfall, or soil fertility or infrastructural advantages like irrigation facilities. In fact, the rank correlation coefficient between proportion of operated area owned and rainfall, which is $-.358$ seem to indicate

that a state that is more endowed with rainfall may have a low percentage of operated area owned and vice versa. *Similar observation follows for soil fertility for which the rank correlation coefficient is $-.376$.* Again, the rank correlation coefficient between

'percentage of operated area owned' and 'gross irrigated to gross cropped area' which is negative and significant at the 5 per cent level ($-.566$) may lead us to reject the hypothesis that one would lend to lease out more land if land is less endowed with infrastructural advantages like developed irrigation system etc.

Next, we attempt to examine if there is any strong positive association between extent of ownerfarming and (i) intensity of cropping and (ii) proportion of area under cash crop (see table 7, columns 5 and 6). As is estimated, the rank correlation coefficient in the first case is $-.263$ which implies that there is some amount of negative association between extent of owner farming and intensity of cropping, but the association is not significant even at the 5 percent level. In the second case, however, the rank correlation coefficient is estimated to be $-.572$ which implies a negative and significant strong (significant at 5 per cent level) association between extent of owner operatorship and proportion of area under cash crop. This seems to contradict the generally accepted view that the practice of cash crop production which involves risk, uncertainty, as well as expectations of large profits is more prevalent in the owner farming dominated regions than in the tenancy dominated regions.

Table 7 : Natural endowments infrastructural and other facilities

sr. no.	state	soil fertility (index rating)	rainfall in actual m.m.	gross irrigated to grass cropped area (in percentage)	intensity of cropping	proportion of area under cash crop (in percentage)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Rajasthan	60.30	536.00	13.40	107.30	- 9.30
2.	Gujarat	50.50	786.00	7.50	N.A.	N.A.
3.	Madhya Pradesh	53.00	1135.00	5.60	113.40	14.80
4.	Uttar Pradesh	62.60	979.00	29.80	127.80	7.70
5.	Orissa	61.10	1369.00	13.90	N.A.	N.A.
6.	Andhra Pradesh	68.60	895.00	30.20	111.10	26.00
7.	Maharashtra	61.20	1161.00	6.80	105.50	29.90
8.	Bihar	36.50	1271.60	20.40	126.80	10.90
9.	Kerala	56.00	2986.00	N.A.	125.40	67.40
10.	Assam	56.60	2754.00	N.A.	117.50	26.20
11.	Mysore	68.40	1314.90	10.00	103.70	25.90
12.	Madras	72.30	947.60	45.50	N.A.	N.A.
13.	West Bengal	55.60	1833.00	22.70	117.40	16.30
14.	Punjab	74.10	713.00	64.30	128.50	36.50

Source : Reserve Bank of India Bulletin, October 1969.

Now, we come to the question of association between yield per acre of foodgrains and extent of owner operatorship. Table 8 gives annual per acre yield of foodgrains and different other crops. However, table 8 does not give a complete picture regarding production of different crops in the states since it does not include some of the very important crops, for example, jute. Further, although from table 7 (column 6) we see that in Kerala and Assam a considerable portion of the cultivated area is under cash crop, table 8 does not give any information regarding per acre production of any of the cash crops for these two states. However, a comparison of table 7 (column 6) and table 8 reveals some interesting feature. Thus, one may see from table 7 Kerala is with the highest percentage figure (67 per cent) for area under cash crop and as is shown in table 8, annual per acre yield for foodgrains (for 1958-59 to 1960-61) in Kerala is also the highest among the States. This shows that this tenancy dominated region (percentage of entirely leased in holdings being fairly high) is an efficient food grower although it does not specialise in foodgrain production. Rajasthan, on the other hand, with owner operatorship as the dominant form of tenure ranks last in respect of annual per acre yield of foodgrains although it seems to specialise in foodgrain production with its only 9.5 per cent area under cash crop. The rank correlation coefficient between yield per acre and extent of owner operatorship is found to be $-.608$, i.e., a negative and significantly strong association (significant at 5 per cent) is seen between these two variables, which seems to indicate that a state more dominated by tenancy as a form of tenure is a state with larger yield per acre of foodgrains and vice versa. With regard to rate of growth of crop output, however, as the table 9 shows, in general there is no significant negative or positive association between owner farming (or tenancy) and percentage increase in crop output.

Table 8 : Annual yield per acre for the period 1958-59 to 1960-61

state	food grains	sugar cane	ground nut	total oil seeds	(in lbs.)	
					cotton	tobacco
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Uttar Pradesh	669	2541	-	448	-	698
Rajasthan	392	-	-	210	-	-
Gujarat*	561	6534	579	509	86	554
Madhya Pradesh	566	-	600	318	71	-
Andhra Pradesh	641	-	702	518	57	692
Maharashtra					-	-
Orissa	594	-	1081	274	-	-
Madras	954	-	539	955	136	-
Mysore	464	-	-	484	67	499
Bihar	615	3344	-	272	-	-
West Bengal	845	-	-	292	-	-
Assam	824	-	-	-	-	-
Kerala	1137	-	-	-	-	-
Punjab	738	3295	-	-	217	-

* This row relates to Gujarat and Maharashtra taken together.

Source : V. K. R. V. Rao, 'Agricultural production and productivity during the plan periods', Indian Journal of Agricultural Economics, 1940-1964; Selected Readings, The ISFAE, Bombay.

Table 9*: Percentage increase in crop output

states	percentage increase in crop output
	1952-53 to 1964-65
(1)	(2)
Uttar Pradesh	23.9
Rajasthan	42.2
Gujarat	73.3
Madhya Pradesh	37.6
Andhra Pradesh	41.6
Maharashtra	45.6
Orissa	37.5
Madras	70.0
Mysore	57.2
Bihar	46.3
West Bengal	28.3
Assam	16.3
Kerala	33.9
Punjab	73.5

* Col. 2 is computed by S. K. Rao.

Source : Ministry of Food and Agriculture, Growth Rates in Agriculture, 1967. Compound growth rates are converted to percentages by S. K. Rao in "Regional variations in agricultural growth in India : A tentative analysis" unpublished paper presented at the seminar on Political Economy of Indian Agriculture, Calcutta, 1973.

To sum up results of our observations we note that for almost all the variables indicating either natural endowments and infrastructural facilities or performance, we get negative coefficient or rank correlation indicating that tenancy dominated regions may not be categorised as the agriculturally backward regions in comparison with the regions that are dominated by owner farming.

This type of observations by itself can not prove or disprove inefficiency of tenancy as a system of tenure. From our observations it does not follow that tenancy system is always and everywhere associated with advanced agricultural conditions. Neither our observations can prove that agricultural backwardness is always associated with a particular system of tenure. In fact our observations show that tenancy system may not be an overwhelmingly important factor causing agricultural backwardness.

For a clear understanding of the situation we have considered separately the two groups of States : One that consists of owner farming dominated States, e.g., Rajasthan, Gujarat, Madhya Pradesh and Uttar Pradesh and the other that consists of those States that rank at the top with regard to tenancy, e.g., Mysore, Madras, West Bengal and Punjab.

Rajasthan, Gujarat, Madhya Pradesh and Uttar Pradesh

It may be easily seen that this group of States may not claim to possess greater natural resources or infrastructural facilities than the others. With regard to performance while Rajasthan, Madhya Pradesh and Uttar Pradesh cannot claim to be in a better position than the others, Gujarat is placed in the 2nd position (after Punjab) with regard to percentage increase in crop output over period. In fact, a comparison among the States shows that there is wide variation

among them with regard to natural resource endowments and economic performance.

Now, we shall consider the States that are dominated by tenancy, namely :

Mysore, Madras, West Bengal and Punjab.

As may be seen from tables with regard to natural resources and irrigation facilities these states ^(except Mysore) are placed in quite advantageous positions. With regard to performance, however, there is notable differences among the States. While Madras and Punjab are placed in quite good position with regard to performance, West Bengal's position is in general bad (excepting that with regard to annual average yield per acre of foodgrains for the three years from 1958-59 to 1960-61) and Mysore is in a far better position than West Bengal with regard to rate of growth of crop output, although annual average for yield per acre of foodgrains for the three years (1958-59 to 1960-61) is considerably low. However, if we consider the rate of growth of crop output (over the 11 years from 1952-53 to 1964-65) as a better indicator of economic performance (than the annual average yield per acre for 1958-59 to 1960-61) we see that Punjab, Madras and Mysore are among the four most advanced regions in the country, while West Bengal is among the most backward ones. It seems to follow that differences in tenurial conditions cannot be fully explained by interregional differences in natural conditions nor it can by itself explain the interregional differences in economic performance. We have to recognise that there are many other factors that influence agricultural performance; the variations in agricultural enterprise and performance in different parts of the country are no more than marginally associated with variations in tenurial conditions. Among the factors causing variations natural conditions are very important. Size distribution of farms is another very important factor that may affect agricultural production and growth. We have argued in the Second Chapter that large sized tenanted farms may actually work as efficiently as large-sized owner operated farmer; effect of

variations in size among states in causing variations in agricultural performance should, however, be studied with special emphasis.

To assess the importance of farmsize we have examined how interregional variations in size distribution of farms cause interregional variations in agricultural efficiency. Table 10 gives some idea regarding differences in farmsize among different states. It may be seen from the table that four states, namely, Gujarat, Maharashtra, Punjab and Rajasthan, may be categorised as "States with big farms" (i.e., States with less than 40 per cent of holdings in the size group "0-5 acres" and more than 15 per cent of holdings in the size group "20 acres and above"). While Gujarat, Punjab and Maharashtra are among the most advanced regions; Rajasthan, being dominated by large and medium sized farms with considerably large portion of its land under owner operatorship, is agriculturally a backward a region. The agricultural backwardness of Rajasthan has, however, much to do with its extremely unfavourable natural conditions; But Kerala and Madras, the two of the most advanced States in India (both in Kerala and Madras annual average yield per acre of foodgrains is very high, Madras is moreover, a state with fairly high rate of growth of crop output) are dominated by tenancy and small farming. While Rajasthan's backwardness may be attributed to its unfavourable natural conditions — it may hardly be explained why Kerala and Madras with their enormous natural advantages are dominated with tenancy and small farming and why in spite of being dominated by tenancy and small farming they are agriculturally so advanced.

Table 10 : Percentage distribution of total number of holdings
by size class of operational holdings

U					
srl. no.	states	0-4.99	5.00-9.99	10.00-19.99	20 & above
(1)	(2)	(3)	(4)	(5)	(6)
1.	Andhra Pradesh	64.61	16.77	11.32	7.30
2.	Assam	74.01	19.42	5.89	0.68
3.	Bihar	76.18	14.98	6.39	2.45
4.	Gujarat	34.11	24.76	22.80	18.33
5.	Kerala	92.14	4.41	2.05	1.10
6.	Madhya Pradesh	43.01	24.45	20.40	12.14
7.	Madras	77.68	15.09	5.47	1.76
8.	Maharashtra	38.55	21.03	21.03	19.38
9.	Mysore	47.81	22.86	16.22	13.11
10.	Orissa	71.06	18.59	7.66	2.69
11.	Punjab	36.10	23.44	24.50	15.96
12.	Rajasthan	36.25	24.60	19.07	20.08
13.	Uttar Pradesh	71.09	18.77	7.52	2.62
14.	West Bengal	74.03	18.89	6.45	0.63

Source : National Sample Survey No. 177 (Draft) 16th round data.

It may, however, be asked whether tenant holdings in tenancy dominated advanced regions are larger in size than those in the other backward regions. From table 6 it is seen that the states for which a distinct downward tendency is seen for the "percentage of leased in area for each size class of operational holdings" are West Bengal, Bihar, Orissa, Assam, Madras and Gujarat. While the first four States are among the most backward regions in the country Madras and Gujarat are two quite advanced regions in the country. Although, size of tenanted farms in Punjab seem to be very large, this does not prove that differences in the size of tenanted farms among states is the main cause behind differences in performance. Or, in other words, one may conclude differences in present economic conditions in the states are only marginally caused by differences in existing structural and tenurial conditions. Apart from natural conditions the most important factor causing variations in economic performance among states is perhaps the general social framework as it has evolved over time, rather than the ^{tenurial relations part of it} ~~structural and tenurial set up~~ as it exists to-day.

A thoroughgoing statistical analysis of the problem is necessary and that will be attempted in the later chapters. In the meantime we have to recognise that the variations in agricultural enterprise and performance in the different parts of the country can not be explained only in terms of variations in tenurial conditions as it exists at present. Other factors are obviously of some importance. Among the factors causing variations natural conditions are very important. Also important is the general social framework as it has evolved over time. To assess the importance of these general social environmental factors, it is also necessary to discuss historical background of the states with regard to tenurial relations. This necessity stems from the fact that agricultural performance obviously does not only depend on the prevalence of ownership holdings or lease holdings but also on the various incidental aspects of the existing condition which amount to a whole organic system and which is the product of a historical process through which the tenurial system has developed to its present stage. In fact, the regions that are very similar with respect to their present tenurial conditions, may have very different historical backgrounds through which their tenurial systems have developed. We have seen that the states with similar conditions with respect to the extent of tenancy or extent of owner operatorship differ much among themselves with respect to economic performance. While this difference in economic condition is not due to the difference in the present condition of tenure, it may be explained by the difference in the historical backgrounds of the states.

We have seen that there is wide difference in economic performance among the states that are least dominated by owner operatorship (Punjab,

Kerala, West Bengal and ^{Madras} Assam). Thus, while West Bengal and Assam perform worst in comparison with almost all the states, Punjab performs the best in some very important respects and ^{also} Kerala's performance, in some respects is better than many of the states. It may now be noted that Punjab and Kerala differ from West Bengal and ^{Madras} Assam in that in the British period Ryotwari system was the prevalent form of tenure in Punjab and Kerala while Zamindari system was the prevalent form of tenure in the other two states e.g., West Bengal and Assam.

Again, if we consider the states that are dominated by owner-operatorship to the largest extent, e.g., Uttar Pradesh, Rajasthan and Gujarat, we see that while Gujarat is a considerably advanced state in some respects, Uttar Pradesh and Rajasthan perform much worse than many of the states that are not so dominated by owner-operatorship in many respects. Once again it may be seen that these states differ among themselves also in their historical backgrounds. Uttar Pradesh was a predominantly Zamindari region in the British period and Rajasthan a Jagirdari area in most parts; Gujarat on the other hand was mainly a Ryotwari state. Thus, although the differences in economic performance as at present are not found to be strongly related to the present differences in tenurial conditions, these performance differences may be explainable in terms of the different historical situations through which these states had to go in the past. In other words, it can be said that agricultural performance may depend not so much on the percentage of owner operated or tenanted holdings as on the whole historical process through which the tenure system has developed to its present condition. This may be seen more clearly if we take the most advanced states as a group and

put the least advanced ones in another group and examine their historical backgrounds. Basing ourselves in the three variables proportion of area under cash crop, annual yield per acre of foodgrains and percentage increase in crop output, it is seen that the states that may be grouped as the most advanced ones are — Punjab, Kerala, Gujarat, Maharashtra and Madras and the states that may be grouped as the least advanced ones are — West Bengal, Bihar, Orissa, Assam, Uttar Pradesh, Rajasthan and Madhya Pradesh. Now if we consider the historical backgrounds of these two groups it is seen that all the states, except Madras, in the first group, were the Ryotwari areas and all the states in the second group were the Zamindari areas. Thus, one may conclude that the existing differences among the states in respect of performance is explained, to a larger extent by the differences in historical backgrounds than by their present tenurial conditions.

It would therefore be pertinent to recapitulate very briefly the development of land systems in different parts of India from the British period upto the recent years.

Land system in the British period

After 1757 with the establishment of British Control all over India, gradually far-reaching changes were brought about in Indian agriculture. Previously rent was paid in kind as a share of the years produce which fluctuated with the amount of production. In the new system introduced by the British rent became a fixed cash rent on the amount of land and not on the amount of production. The second and more important change that was brought about by the British was the introduction of the system of permanent settlement of Lord Cornwallis introduced in 1793 for Bengal, Bihar and Orissa and

later extended to parts of North Madras. Under the system the existing Zamindars or the Officials appointed by the previous rulers to collect land revenues, were made the landlords who were to pay a fixed amount every year to the Government irrespective of year's produce. This system was much profitable for the foreign rulers and detrimental to the interest of the Indian cultivators. Since the landlords had the fear of ejectment in case of failure in paying their quota to the Government, they tried to extract even the last rupee from the peasantry so that a considerable amount might also remain for themselves.

The main objective of the British was to secure their revenue and control over the mass of the peasantry through these Zamindars. Thus, as Lord Bentinck the then Governor General of India from 1828 to 1835 put it. "If security was wanting against extensive popular turmoil or revolution I should say that the Permanent Settlement, though a failure in many respects and in most important, has this great advantage at least, of having created a vast body of rich landlord proprietors deeply interested in the continuance of the British Dominion and having control over the mass of the people". [Sir William Bentinck^{I/}, 1829].

However, within a few years this system proved to be non-profitable for the British. With the fall in the value of money Government's share in the revenue which was fixed, gradually became smaller. On the other hand with the increase in the amount^{of} rents, Zamindar's share became larger and larger. Thus the system proved to be unsuitable to fulfill the interests of the British rulers as a result of which the subsequent Zamindari settlements were made "temporary".

I/ Lord William Bentinck, Speech on November 8, 1829; reprinted in A. B. Keith, Speeches and Documents on Indian Policy 1750-1921, Vol. I.

With the aim of establishing direct relationship with the cultivators a new type of land settlement, e.g., Ryotwari settlement, was introduced by the British rulers. These settlements were temporary or subject to periodical reassessment. Under the system the whole of the land revenue was to be extracted directly by the Government from the cultivators without any share going to any intermediaries. This system was first introduced in Madras and then was spread over half of the area of British India.

Thus upto the time of independence the main forms of tenure in India were : (1) Permanent Zamindari Settlements, (2) The Temporary Zamindari Settlements, and (3) The Ryotwari Settlements. The system of either permanent or temporary settlements was the prevalent form of tenure in the present states of Assam, West Bengal, Bihar, Uttar Pradesh, Orissa and Tamil Nadu. Besides similar system also prevailed in parts of Madhya Pradesh and some of the erstwhile princely states like Hyderabad, the Central Indian states and Rajasthan. Ryotwari system was prevalent in all the remaining states e.g., Bombay, Punjab, some parts of Madras and so on.

While we have not been able to gather much information about the history of agricultural development in the Zamindari and Ryotwari areas, it is a general impression widely held that the Ryotwari areas all along have been somewhat more progressive than the Zamindari areas. Under the Zamindari system the peasants were under the control of Zamindars who were appointed by the British rulers not only to extract rents from the peasantry but also to control all the socio-economic aspects of their lives in the interest of the continuance of the British regime. The Zamindars had no interest in the improvement of the conditions of cultivation since the rents they could

collect from the peasantry were sufficient to meet their consumption needs and whenever they found it insufficient, they could raise it without any considerations for the conditions of production. Moreover there were innumerable intermediaries between the cultivators and the Zamindars who had no interest in cultivation or who were completely detached from the land and whose sole interest was to extract rents from the peasants.

One may have some idea about the actual condition under the Zamindari system from Simon Commissions report^{3/}. Thus : "In some districts the sub-infeudation has grown to astonishing proportions, as many as fifty or more intermediaries interests having been created between the Zamindars at the top and actual cultivators at the bottom".

Although the Ryotwari settlements were introduced with the original intension of establishing direct relationships with cultivators, in the process of subletting and transfer of agricultural land from the actual cultivators to the money lenders a number of intermediaries gradually sprang up and the system characterised by direct relationship between the state and the cultivators was replaced by a system characterised by the existence of a large number of intermediaries between the state and the cultivators. It was estimated^{2/} "Over a 30 per cent of the land is not cultivated by actual cultivators in Bombay and Madras". Thus the system was also extremely

3/ Simon Commission's Report, 1928. See H. D. Malaviya, 'Land reforms in India', Indian National Congress, New Delhi, 1955.

2/ R. K. Mukherjee, 'Land Problems in India', Longmans, Green, London, 1933.

detrimental to the interest of the peasantry. But the distinguishing feature of the Ryotwari system was that, unlike Zamindari system, there was no such big rent receivers like the Zamindars who were vested with all the power of controlling the peasantry and who could influence all the socio-economic aspects of their lives in their own interest and in the interest of the British rulers. It is usually presumed that, thanks to the absence of these Zamindars or similar type of rent collectors appointed by the British rulers, the conditions of farmers under the Ryotwari system was somewhat better than those under the Zamindari system.

In this context our findings about the relative performance of agriculture in the Zamindari regions and the Ryotwari regions as of now are highly interesting. We find that most of the advanced regions of India belong to the erstwhile Ryotwari regions and most of the relatively backward regions belong to the erstwhile Zamindari regions. The question then arises is, if even the areas that are most advanced were mostly under Ryotwari tenure in the past and the least advanced regions at present were the Zamindari regions of the British days, can it be said that these differences in performance are determined by the differences in the tenure conditions in the British period ? Is it not a fact that since independence a large number of legislations have been enacted in all the states for the abolition of Zamindari (in the Zamindari areas), conferment of security of tenure, regulation of rents and imposition of ceiling limits with the declared aim of establishing peasant farming system ? Have these reforms not removed the differences that were there between the Zamindari areas and the Ryotwari areas ? Presumably they have not had such an effect, ~~and the present conditions continue to be determined by the past history not only of tenurial conditions but of the entire complex of social institutions.~~

A discussion on land reforms in India^{10/} would show, the land reform legislations that were passed after the independence could not bring about any considerable change in the land system of India. No doubt Zamindars and Jagirdars of the preindependence period have been dislodged of power from their economic and social positions but regarding the actual conditions of cultivation and the conditions of the broad masses of peasantry very little changes have occurred so far. Although creation of peasant farming through land confiscation and redistribution was declared to be one of the main objectives of land reforms, no comprehensive programme was undertaken for this purpose. However, ceiling level is imposed on the amount of land in many cases, the land above the ceiling limit has not been confiscated properly and very little has been distributed so far. As we shall also see^{11/} the tenants have not achieved any real security of tenure, in most of the cases they are exposed to the danger of being evicted at the Landlord's will. Legislations on reduction of rent have also not been implemented properly. The land system that has evolved through this type of land reforms, has two characteristics. First, the existence of a few big land owners who have come to their present position either through the legal eviction of their tenants or through the evasion of the legislations that impose a limit on the amount of land that can be possessed. The second feature is the pervasive insecurity of tenure wherever tenancy system prevails. In fact, the peasant farming operating as at present have not been created through the programme of land confiscation and redistribution, — many of the existing owner cultivators

^{10/} See Appendix note on Land Reforms after Independence.

^{11/} See p , Appendix note on Land Reforms after Independence.

have never been actual tillers of the soil. It is reasonable to think that many of these owners were the tenants-in-chief of the prereform period who were holding land directly under the Zamindars at that time, and who have now come to their present position by evicting all the tenants from their land. It may also be that some of these owners were the Zamindars or Jagirdars in the prereform period who were allowed to retain their land under their personal cultivation by the land reform Legislations. All this apparently did not have any such profound effects on the comprehensive social environment and institutional framework so as to remove the differences that were there between the Ryotwari and Zamindari areas, in so far as conditions of production are concerned.

Thus it seems to follow that we cannot conclude anything regarding relative efficiency of tenancy and owner-farming systems simply on the basis of a discussion of inter regional variation in economic performance in conjunction with an interregional variation in tenancy. To get a clear idea about the relative efficiency of different forms of tenure it is essential to compare the two systems under the same socio-economic structure and with the same historical background and geographical conditions. In the next chapter we shall try to carry out such analyses on the basis of some statistical information.

AppendixNote On Agrarian Reforms After Independence

The Congress Agrarian Reform Committee^{1/} described the main purpose of the agrarian reforms as follows :

1. The agrarian economy should provide an opportunity for the development of farmer's personality.
2. There should be maximum efficiency of production.
3. There should be no scope for exploitation of one class by another.
4. The scheme of reform should be within the realm of practicability.

(Report of the Congress Agrarian Reform Committee, p.8).

To realise the purpose the Committee considered the following alternative forms of agrarian economy, namely :

- i) Capitalist farming or estate farming;
- ii) State farming;
- iii) Collective farming;
- iv) Individual peasant farming; and
- v) Co-operative farming.

With regard to Capitalist farming the Committee's opinion was that : "It would deprive the agriculturists of their rights in land, turn them into mere wage-earners and subject society to capitalist control in such a vital matter as supply of food. It would also create the problem of displaced personnel". Thus as is revealed, the agrarian reform Committee did not recommend capitalist farming as a suitable system in fulfilling the aim of the proposed reform.

^{1/} Reports of the Committees of the Panel of Land Reforms, ibid.

As regards state farming the Committee recommended that state farming of some limited degree, for example, to provide assistance through State personnel, supervision and direction at the initial stage when waste lands are reclaimed and the agricultural labourers are settled thereon, should be allowed. The Committee was of the opinion that state farming could be allowed only as a temporary device; so long the new owners on the reclaimed lands are unable to manage their work they were to be assisted by the state. But as soon as these new owners would become trained, the policy would be, as described, to develop these farms into collective farms.

With regard to individual peasant farming the Committee was in favour of the opinion that individual peasant farming on suitable units of cultivation would satisfy the purpose of land reform by creating necessary incentive to increase investment and consequently production and by reducing inequality and exploitation activities of one class by the other. Thus according to the Committee "It has been found by experience that unless the land is owned by the tiller his incentive to production does not reach the optimum point. Because of the absence of any guarantee that he would get the full benefit resulting from the improvement, he has no desire to make any improvement in the land he cultivates. The improvement, if any, made by him will only enhance the rate of rent which he has to pay even if he is allowed to enjoy security of tenure" (p.36).

Thus, the Congress Agrarian Reform Committee recommended the system of individual peasant farming as an appropriate system for the Agricultural Sector as a whole, although it also was of the opinion that "no single

uniform method of land utilisation can meet the requirements of the situation^{2/} and that "the future pattern of the agrarian economy should be flexible".^{3/}

Thus Legislations were passed with the following declared objectives:

1. Abolition of intermediary system.
2. Tenancy reform.
3. Fixation of ceiling on land holdings.
4. Improvements of the conditions of the agricultural workers.
5. Co-operative organisation of agriculture with the ultimate objective of co-operative village management.

These were declared to be the basic principles of the land reform under First Five Year Plan. Even before the inauguration of the First Plan, in fact, legislations were enacted in the permanently and temporary settled states to abolish intermediaries, but most of the work of land reform was done during the Plan period. Thus in Uttar Pradesh Zamindari abolition and Land Reform Act was passed in 1950 but it was amended more than once upto 1958. In West Bengal the West Bengal Estate Acquisition Act was passed in 1953, the West Bengal Land Reform Act in 1955. In Bihar, on the other hand, the Bihar Land Reform Act was passed in 1950, in Orissa Estate Abolition Act was passed in 1951 and the Rajasthan Land Reform and the Resumption of Jagir Act was passed in 1952. In Andhra Pradesh the Jagir Abolition Regulation was enacted in 1949.

2/ Reports of the Committee of the Panel of Land Reforms, ibid.

3/ Reports of the Committee of the Panel of Land Reforms, ibid.

To understand the changes that were actually brought about by the abolition of intermediaries in the Zamindari and Jagirdari areas, it would be better to have an idea about the various categories of lands that were owned by intermediaries^{4/}:

- i) Village common lands, abadi sites etc.;
- ii) Intermediaries' home farms, i.e., lands in which the intermediary had the right to either cultivate himself or let it to tenants who could not, however, acquire any rights in land;
- iii) Lands other than intermediaries' home farms, which was under his personal cultivation;
- iv) Lands held by tenants directly from the intermediaries;
- v) Lands held by sub-tenants.

With regard to the first category of land, the state acquired, in all cases, the waste land, forests etc., the tenants who were admitted to cultivate these lands came in indirect relation with the state.

With regard to Home farms and farms under personal cultivation of the intermediaries, various types of legislations were passed in different states. In West Bengal one of the provisions of the Estate Acquisition was to permit intermediaries to retain in possession of their Khas land upto a certain limit and to treat them as tenants holding directly under the state. The tenants in this land were not given any right, their position remained the same. However, the maximum limit which intermediaries were entitled to retain after abolition was placed at 25 acres. In Uttar Pradesh under the Zamindari Abolition and Land Reform Act it was stated : "all estates situated in Uttar Pradesh shall vest in the state and as from the beginning of the

^{4/} Reports of the Committee of Panel of Land Reforms, ibid.

date so specified all such estates shall transferred to and vest

As it was intended by the legislations in the state from all encumbrances". ^{to be} the tenants engaged in Home farms of the intermediaries i.e., Sirdars were ^{sought to be} brought into direct contact with the state.

Moreover, the Sirdars could purchase ownership right (bhumidari) on payment of ten times of their rent. The rights of the intermediaries were ^{extinguished} on payment of compensation. The same thing happened with respect to Jagirdari areas in Madhya Bharat. Also in Ajmer ownership rights accrued ^{under law,} to all tenants except the tenants on land allotted to intermediaries for personal cultivation, and in Bhopal tenants of Home farms in possession of land for more than one year, were ^{made} occupants (with heritable and transferable rights) by law.

Thus, as ^{is} seen in Uttar Pradesh, Madhya Bharat Jagirdari areas, Ajmer and Bhopal the intermediaries were ^{to be} extinguished even from their Home farms and the tenants cultivating these Home farms were given rights of occupancy and came in direct relationship with the State — without making any payment by themselves. The State, however, was to finance the compensation.

In Madhya Bharat Zamindari areas and in Rajasthan generally the position remained the same with the right of the intermediaries to retain their Home farms, but an optional right of purchase was given to the tenants. For example, in Zamindari areas of Madhya Bharat the tenants of Home farm lands could purchase ownership rights on payment of compensation within a specified period. In Rajasthan tenants could purchase ownership rights for an area yielding a net income of Rs.1200/- excluding the cost of tenant labour and the labour of his family. In Delhi the tenants of Home farms were required to pay 20 to 40 times the land revenue to purchase ownership rights. Thus we see that in some states legislations stipulated the abolition of intermediaries with

compensation from the state and confirmation of the occupancy rights and security of tenure (under some conditions) to the tenants.

Also in the other states tenants could purchase ownership rights to a limited extent. But there remained some other states where the intermediaries were allowed to retain the Home farms and land under their personal cultivation and the tenants of their Home farms were given very little or no rights. However, in some states a maximum limit was imposed on the amount of agricultural land which the intermediaries were entitled to retain. For example, the limit is 25 acres in West Bengal. On the other hand in few States the intermediaries were entitled to get some lands for their personal cultivation in addition to the lands that were already in their personal cultivation.

With regard to the land held by tenants under the intermediaries several legislations were passed in different states. In general, these Jagirdari or Zamindari type of Estates were taken over by the State and the principal tenants or the tenants-in-chief holding these estates under the intermediaries were brought under direct relationship with the State. However, there were differences in legislations in different States with regard to compensation payable to the intermediaries and with regard to the extent of rights over land to be acquired by the former tenants who now came in direct relationship with the State. Thus, while in West Bengal, Bihar, Orissa, Assam, Bhopal and Vindhya Pradesh the tenants got permanent and transferable rights over land without themselves making any compensation to the intermediaries, in Uttar Pradesh all the pre-existing varieties of tenants who had occupancy rights at the time of enactment came in direct relationship with the state without making

any compensation and they got permanent and heritable rights but no transferable rights over land (Sirdari). However, they could acquire the right of transfer on payment of 10 times the rent.

Security of tenure

With regard to security of tenure four different forms of legislations were passed^{5/}. For example, in Uttar Pradesh all the tenants (except the 'Asamis' and the 'Adibasis') got permanent rights over land. However, the law allowed the Bhumindars and Sirdars to lease out their land if they were unable to cultivate the land themselves due to physical disability or military service etc. Tenants in this land did not get any rights — neither they got any security of tenure, since these tenants or 'Asamis' were only allowed to continue in possession until the Bhumindar or the Sirdar wished to cultivate it themselves. These Asami rights were thus not permanent but heritable. Besides, all other existing tenants or sub-tenants who had no right of occupancy at the time of enactment of the act ('Adibasis') got no rights of occupancy except for the first five years of the commencement of the Act, after which they could purchase ownership rights on payment of 15 times the rents. Thus, according to the law, as it seems, all the tenants of this type who were unable to purchase the ownership rights, were not entitled to hold land after that period. Moreover, the tenants who acted like the crop sharers ('Sajhedari') were not considered as tenants and did not get any rights on land.

^{5/} Reports of the Committee of the Panel of Land Reforms, ibid.

Similarly in Delhi the Land Reforms Act of 1953 provided for conferment of ownership on all tenants and sub-tenants with the exception of those who leased in land from persons suffering from disability. Varying rates of compensation from 4 to 40 times of land revenue were imposed, which was to be paid by instalments over a period of 10 years.

In Bombay, Punjab, and Himachal Pradesh the landlords could resume and retain a maximum area (fixed by law) subject to the condition that there remained minimum areas to be retained by the tenants^{6/}. In Assam, Madhya Pradesh, Hyderabad, Orissa and Kutch upper limits were imposed on the rights of resumption by the landlords but there was no provision for minimum holdings for the tenants. However, in some states in the non-resumable areas tenants got the right of purchase of different superior rights on land.

In Andhra Pradesh, legislations were passed to ensure continuance of the leases made before and after the legislations, for specified periods, and a rental rate was fixed by law.

In West Bengal a land owner was entitled to resume for personal cultivation upto 2/3rds of his holding, although upto a specified minimum the entire holding might be resumed. Moreover, in West Bengal, Bargadars (share-croppers) got the right to hold land as long as they were able to cultivate it personally provided that there was no bonafide need by the landowners for personal cultivation.

In some other states, for example Bihar and Mysore, tenants cultivating the lands for a specified period got security of tenure, (in some cases subject to landlord's right to resume a maximum area) all tenants cultivating

6/ In Rajasthan landlords can resume any amount over and above a minimum area for the tenants.

for less than the specified period got very little or no security of tenure.

Thus, as is seen from the above discussion on the nature of legislations that were passed after independence for the abolition of intermediaries and conferment of security of tenure for the tenants, the legislations itself left much scope for eviction of tenants. In many cases the tenants were given the permanent occupancy rights but they had to incur heavy compensation to acquire such rights. In many cases landowners could resume land for personal cultivation without leaving anything for the tenants. It is only in a few cases that the tenants got permanent heritable rights over land without themselves making any compensation or that the landlords' rights to resume any land for personal cultivation was subject to the condition of leaving a minimum area for the tenants. The share-croppers, in most of the cases, were not considered as tenants and they, in these cases, got no rights of tenants. However, some legislations were passed in many states to regulate the rental percentages, but in most of the cases these legislations were not implemented properly.

Implementation

As is observed by Planning Commission, the tenancy regulation laws suffered from many defects which made it actually impossible to bring about considerable qualitative change in the tenurial conditions of the country. According to the Commission "in spite of a new legislations on the statute book in the field the old practice still obtains. Tenancies continued to be

governed by custom or agreement. Old rents still continue to be paid and accepted though law has sealed them down in many areas and the receipt of higher rent is illegal". Secondly, it is moreover, observed that "gaps are left in the laws which render them largely ineffective. For instance, a landlord is permitted to eject a tenant to resume land for personal cultivation Thus though landlord's right of resumption is limited in extent, he was able to exercise an undue influence over all tenants which added to his bargaining power and rendered the law ineffective". The third defect as pointed out by the Commission is that "In an attempt to balance meticulously the interests of owners and tenants the provisions of the law, in a number of states, have been so complex that the bulk of the peasantry find it difficult to understand them. After the enactment of a law it was generally left to the tenants and the landlords to take advantage of the provisions of the new legislation and no organised effort was made to make the the tenants understand the law and ensure that they take advantage of it". Lastly, it is stated that "even where the tenants are aware of their rights they generally ^{are} in too weak a position both economically and socially to insist on their rights". Thus as is revealed from the Report the tenancy reform legislations could not do much in bringing about considerable improvement in the conditions of tenants and cultivation by tenants. The same impression about the effectiveness of the tenancy reform laws is expressed by Wolf Ledejinsky^{3/} (1966). In assessing the effectiveness of tenancy reform legislations in Madras he comments "The gaps between the theory of a well-intentioned measure and the practice of non-enforcement can be summed up as follows : (a) an invitation to evict tenants

^{3/} Wolf Ledejinsky, 'A Study of Tenurial Conditions in Pakage Districts', New Delhi, Planning Commission, 1965.

at the landlord's pleasure, and (b) a constant threat to the tenants that they can be evicted. With no alternative occupations in sight and a vast army of agricultural labourers ready to take their place, the tenants are in no better position to protect their rights under the Security of Tenure Act than they are in a position to protect the rent provision under the Fair Rent Act". Similarly about Andhra Pradesh he comments : "That the present law failed to give relief to the tenants, became apparent to us as we moved from village to village. It is the consensus of opinion that tenants are being changed or ejected, and that some of the tenancy land had gone under landlord's personal cultivation. The more important point to note is that even the tenants who have continued as tenants do not feel secure in their holdings at all The law itself is defective. It introduces no path for enforcement". About Bihar he holds "The law regarding security of tenure is obviously defective". Also according to his opinion in Punjab the tenancy reform legislation have failed, whatever may be the reason for it.

Not only that the tenancy reform legislations have been implemented properly but also that the policy of establishing peasant proprietorship through confiscation and redistribution of land has failed, become clear from the report of the Task Force on Agrarian Relations set up by the Planning Commission in February 1972. Thus according to the report^{9/} "The programmes which could have led to a radical change in agrarian structure and the elimination of some of the elements of exploitation in the agrarian system and usher in a measure of distributive justice were those of tenancy reform, ceiling on agricultural holdings of land and distribution of land to the landless and small holders These programmes can not be said to have succeeded".

9/ Planning Commission Task Force Report, New Age, 1973.

Chapter V

Economic Differences under Different Forms of Tenure in India — A Statistical Profile

In Chapter IV we made an attempt to arrive at some conclusions regarding relative conditions of tenants and owners on the basis of an inter-state comparison of natural endowments, economic performance and extent of tenancy. A conclusion that we arrived at was that interregional variations in economic conditions do not much influence and are not much influenced by the interregional variations in tenancy; differences in climatic and geographic conditions along with differences in the present socio-economic structure and the history through which the present structure has evolved -- all these may play important roles in determining interregional variations in economic performance. In this chapter and in subsequent chapters, therefore, we should like to compare the two systems (owner farming and tenancy) under the same socio-economic structure and with the same historical background and geographic and climatic conditions; instead of carrying out inter-state comparisons, henceforth we shall try to find the relative conditions of tenancy and owner farming within different regions of the country.

This Chapter, however, represents an effort to bring out some performance characteristics of tenancy system as against owner farming system in particular regions of the country, from a first hand examination of the Farm Management Survey reports. We will study the relative economic conditions of tenants from two standpoints; namely, their economic status and their performance as producers. To assess the economic status we would consider six

variables e.g., (1) size of farm; (2) stock of animals and expenditure per animal; (3) current expenditure structure; (4) percentage area under irrigation; (5) employment pattern of labour; and (6) capacity of retaining the produce of different commodities to take advantage of the increased prices in the market. Economic performance would be assessed, in the first place, by the choice of crops, the choice of combination of inputs to be used and intensity of cropping and secondly, from the stand point of the results obtained in terms of yield per acre and output per unit of input.

The Farm Management Survey Reports^{1/} that we would use to compare the relative conditions of tenancy and owner farming with regard to the above mentioned variables, relate to West Bengal (1969-70), Andhra Pradesh (1959-60) Uttar Pradesh (1954-57), Madhya Pradesh (1955-56), Punjab (1955-56) and Madras (1955-56). Since the conditions under different forms of tenure are not reported in similar ways and to the same extents in all the Reports relating to different states and different years, it would not be possible to consider all the variables for each of the states covered in our analysis. For example, while it would be possible to consider all the variables for West Bengal (1969-70) it would not be possible to consider some of the variables for any of states other than West Bengal. As a result, it would be unreasonable to make any

^{1/} The Farm Management Survey Reports of the Government of India, West Bengal (1969-70), Andhra Pradesh (1959-60), Uttar Pradesh (1954-57), Madhya Pradesh (1955-56), Punjab (1955-56) and Madras (1955-56).

- Do in Andhra Pradesh (1959-60).
- Do in Uttar Pradesh (1954-57).
- Do in Madhya Pradesh (1955-57).
- Do in Madras (1955-56).

general statement regarding the behaviour pattern of tenants and owners simply on the basis of such information. However, on the basis of such information, it would be possible to try to form some hypotheses regarding the questions concerned, which of course would require more rigorous statistical tests on the basis of more comprehensive statistical information.

1. Relative economic conditions with regard to economic status and capital stock

(a) Farm size

Farm size may be taken as an indicator of economic status since a large farmer may be found in a better economic position with a larger marketable surplus, a larger investable fund and a larger volume of consumption. It may also be reasonable to expect that a tenant farmer would generally be a small farmer. In the first place, a tenant generally may have no land which is the primary capital in agriculture and secondly, he may be in a worse economic position since a large portion of the total income goes to the landlord as rent resulting in lowering his capacity to accumulate^{2/}. Thus a tenant farmer with less capital than the owner farmer may not generally be in a position to form a large farm. Now we shall see how far it is possible to form any hypothesis regarding this question, which may be done by means of statistical testing, on the basis of the following facts.

2/ There are also some facts in support of this idea : as we have seen in Chapter IV, according to 1961 Census pure tenants are always (in all states) with lower average size of farms than the pure owners.

Table 1 : Farm size

(a)

size class (in acres)	Andhra Pradesh Paddy Zone (1959-60)	
	percentage of area under owner cultivation	percentage of area under tenancy
(1)	(2)	(3)
0.01- 1.25	82.72	17.28
1.26- 2.50	78.12	21.88
2.51- 5.00	67.47	32.53
5.01- 7.50	40.06	59.94
7.51-10.00	63.93	36.07
10.01-15.00	56.99	43.01
15.01-20.00	68.16	31.84
above 20.00	97.51	2.49

(b)

size class (in acres)	West Bengal (1959-70)	
	percentage of area under pure ownership	percentage of area under pure tenancy
(1)	(2)	(3)
0.01- 1.25	75.9	11.1
1.26- 2.50	54.8	7.1
2.51- 3.75	20.0	6.7
3.76- 5.00	27.3	0.0
5.01- 7.50	47.1	0.0
7.51-10.00	83.3	0.0
10.01-15.00	66.7	0.0
15.01 & above	0.0	0.0

(c)

size class (in acres)	Madhya Pradesh (1956-57)		
	percentage of area under own cultivation	percentage of area leased in for cash rent	percentage of area under share cropping
(1)	(2)	(3)	(4)
0 - 5	97.51	2.49	7.51
5 - 10	76.72	15.77	7.51
10 - 15	61.93	36.76	11.31
15 - 20	52.57	30.34	17.09
20 - 30	60.77	12.73	26.49
30 - 40	64.15	24.83	14.02
40 - 50	89.56	5.63	4.81
50 & above	71.88	16.66	11.46

(d)

size class (in acres)	Madras (1954-55)		
	mean size of farms		
owner cultivated	purely rented		partially rented
	(1)	(2)	(3)
0.01- 1.25	6.61	11.23	9.32

As is seen from the above tables, no unique size distribution pattern is seen for all the states considered. Thus, whereas size distribution pattern in West Bengal (1969-70) shows that tenants are generally cultivators of small sized farms (within the size group 0-3.75 acres) in Madhya Pradesh (1955-56), there is no share-rented farms within this size class of 0-5 acres, and proportion of area cultivated on cash rent tenancy is only 2.43 per cent of the total area in this size group. It is seen that for Madhya Pradesh (1955-56) as one goes away from lower to higher size classes, percentage of area cultivated under share-tenancy to total cultivated area in each size class increases up to the size class of 20-30 acres. Again, whereas in Andhra Pradesh (1959-60) (paddy zone) most of the cultivated land is under tenancy in the size class 5.01 to 7.50 acres there is no tenanted farm in West Bengal (1969-70) within this size class and in Madhya Pradesh proportion of area under tenancy to total cultivated area is lower in the size-group 5-10 acres in comparison with that in any other groups. In Andhra Pradesh (paddy zone) moreover, one can not say that proportion of area under tenancy to total area, decreases as one goes away from lower to higher size classes. In Madras (1955-56) it is seen that mean size of farm is the highest for fully rented farms and it is the lowest for fully owner cultivated farms. From all this we may conclude :

- (1) no unique pattern seems to exist with regard to size distribution of holdings under tenancy in comparison with that under owner operatorship among different regions of the country; (2) one can not say that tenancy is generally associated with small-scale-farming.

↓ We reached the same conclusion in chap IV on the basis of the data. It has also been mentioned that the size of the farm is not a good indicator of the type of tenancy. This is also supported by the data in the table. The size of the farm is not a good indicator of the type of tenancy. This is also supported by the data in the table.

Thus, it becomes doubtful that a particular tenurial system is associated with a particular size distribution of holdings all over the country. The pattern that was discerned in the census data in the last chapter is not discerned here in this fragmentary data.

(b) Percentage area under irrigation

One may also get some idea about relative conditions of tenants with regard to economic status by examining how much of tenanted land is under irrigation and how much remain unirrigated in comparison with that under owner operatorship. An economically better off farmer may avail of facilities of irrigation to a larger extent and thus may be placed in an even more advantageous condition than an economically worse off farmer. One may therefore consider the proportion of irrigated area under different forms of tenure as indicating relative economic advantages of farms under different systems. Following table gives an idea about the extents of irrigation facilities under different form of tenure.

Table 2 : Irrigation facilities

class	percentage area under irrigation	
	West Bengal (1969-70)	Uttar Pradesh (1954-57)
(1)	(2)	(3)
pure owners ^{a/}	38.6	76.0
pure tenants ^{b/}	27.9	58.0
cash and kind rent tenant ^{c/}		83.0

a/ Pure owners are those who do not lease any land.

b/ Pure tenants are those who do not own any land and lease in land on share rent basis.

c/ Cash and kind rent tenants lease in land on fixed cash or kind rent basis.

Table 2 shows, of the total area under share-cropping (purely rented in) only 27.9 per cent and 68.0 per cent are under irrigation for West Bengal, and Uttar Pradesh respectively. For owner farming system these percentages are 38.6 and 76.0. Again, of the total area under cash and kind rent tenancy as much as 83.0 percent is under irrigation in Uttar Pradesh. All this may be taken as indicating that share-croppers are generally in the worst condition with regard to extent of irrigation, while the cash rent tenants may be in a better position.

(c) Stock of animals and expenditure on animals

Stock of animals may be taken as an indicator of economic status. In agriculture, in the absence of sufficient mechanisation, bullock labour is used as one of the important factors of production; moreover, milch animals and others may be used as important sources of profit. Thus possession of a larger number of animals may indicate a better economic status. However, due to indivisibility a small and poor farmer may also be compelled to keep as many animals as are kept by a relatively larger and richer farmer — in that case, per animal expenditure better indicates the relative economic conditions of two groups of farms. Thus in the following table we consider not only number of animals per acre but also per animal expenditure, under the two different forms of tenure.

Table 3: Stock of animals and expenditure on animals

class	West Bengal (1969-70)				maintenance cost per animal (Rs.)
	animals per acre (Nos)				
	draught	milch	other	total	
(1)	(2)	(3)	(4)	(5)	(6)
pure owners	.36	.23	.18	.78	162.47
pure tenants	.73	.14	.14	1.03	63.40

Table 3, which refers to West Bengal (1969-70) shows that the tenants' average number of draught animal per acre is larger than the owners although their (tenants') per acre stock of milch and other animals is lower. However, considering average number of all animals per acre it is seen tenants are with a larger figure than the owners. One possible explanation for the larger per acre figure for number of cattle for the tenants in West Bengal may be that due to indivisibility for the input of cattle tenants can not reduce the number of cattle in proportion to their farm size which is smaller than that of the owners in the sample. Another interesting thing is that although average number of animals per acre is larger for the tenants, the maintenance cost per animal incurred by the tenants is significantly low. This reflects that there may be difference in resources between the classes and that cattle held by the tenants may have a very much lower performance rate.

(d) Employment pattern of labour

In this context of assessing the relative economic status of tenants and owner farmers, another related question is the question of differences in economic condition as is revealed from the differences in employment pattern

of labour. In a richer farming family the number of family members to work on agriculture may be expected to be less and its capacity of hiring in of labour from outside to be more than that in a poorer farming family. Thus, one of the ways of assessing the relative economic conditions of two groups of farms may be to consider the relative conditions with regard to the pattern of employment of family labourers on own or rented in farm, its employment outside the farm and employment of non-family and hired in labourers on own or rented in farms.

Table 4: Employment pattern of labour

class	(in hours)		
	West Bengal (1969-70)		
	employment of family labour		employment of non-family labour
	work on farm	hired out	hired in
(1)	(2)	(3)	(4)
pure owners	550.3	263.0	851.4
pure tenants	768.1	919.5	98.3

From table 4 it is seen, in the first place, that in a owner operator's family, the average number of family labour hours employed in his farm or outside his farm, is much lower than that in a tenant farmer's family. Moreover, it is interesting to note that owners' per farm hired out labour hours is much less than their family labour hours employed in own farm, whereas labour hours hired in from outside is much larger. On the other hand, the tenants, whose per farm employment of family labour hours in their tenanted farms is higher than that of the owners, are to hire out more labour hours than that employed in their tenanted farms and that hired out per farm by the owner operators; they can hire in labour from outside to a much less extent than the owner operators.

Thus the relative conditions of employment pattern of labour under the two different forms, as is shown in the table that refers to West Bengal (1969-70), may be described in the following way :

- (1) Number of labour hours supplied by a tenant family is much larger than that in the owner-operator family.
- (2) Whereas a tenant farmer is to depend more on family labour than on hired labour for the cultivation of his tenanted land, an owner operator depends more on hired labour than on family labour.
- (3) A tenant farmer hires out a larger portion of the available labour hours in comparison with an owner farmer.

(e) Current expenditure structure

Relative economic conditions of tenants and owners may also be examined from the point of view of the differences in the pattern of cash disbursement between the two groups of farmers. In the first place, a lower amount of cash expenditure by a tenant with a particular size of farm than an owner operator with the same size of farm may indicate that the tenant farmer is in a worse economic condition than the owner farmer; and secondly, the differences in the percentage expenditure on different items of production between the tenants and the owners may indicate the differences in relative importance given to different items of inputs between the two groups of farms. Following table shows the current expenditure structure of the two groups of farms.

Table 5: Cash disbursement per farm

class	(in rupees)				
	West Bengal (1969-70)				total expen- diture
	percentage expenditure on labour	irrigation	input purchases	others	
(1)	(2)	(3)	(4)	(5)	(6)
Pure owners	37.77	4.16	50.41	7.66	775.69
pure tenants	14.07	1.50	60.30	23.62	230.19

As is seen from table 5, per farm total expenditure incurred by the share croppers is much less than one-third of that incurred by the owners. Again, it is seen that the share-croppers' percentage expenditure on labour and irrigation per farm is much lower than the owners. For input purchases and others, however, the share-croppers incur a larger proportion of their total expenditure than that of owners, although in terms of absolute amounts expenditure on input purchases is lower for the share croppers. The lower amount of expenditure incurred by the share-croppers may be due to the fact that, in the sample they are with a lower average size of the farms than the owners.

(f) Capacity of retaining the produce of different commodities to take advantage of the increased prices in the market

Another aspect of the difference in economic conditions of owners and tenants is their relative capacity for retaining the produce to take advantage of the increased prices in the market. It seems to be obvious that an economically well off farmer may find it possible and profitable to retain the produce to take advantage of the increased prices in the market, whereas a relatively poor farmer's capacity to retain the produce may be less than the economically better off farmers. Following table gives an idea about the relative conditions of tenants and owners with regard to the capacity of retaining the produce of different commodities.

Table 6: Monthly sale of different commodities per farm and average price fetched (West Bengal, 1969-70).

(price in rupees)

(a) paddy

class	June to Nov. 1969		Nov. - Dec. 1969		January 1970		February 1970	
	quantity sold (p.o.)	price fetched (Rs.)	quantity sold (p.o.)	price fetched (Rs.)	quantity sold (p.o.)	price fetched (Rs.)	quantity sold (p.o.)	price fetched (Rs.)
(1)	(2)	(3)	(3)	(4)	(5)	(6)	(7)	(8)
pure owners	4.26	62.77	18.63	69.11	11.50	74.15	22.67	71.80
pure tenants	0.00	-	100.00	70.00	0.00	-	0.00	-

(a) paddy (contd.)

class	March 1970		April 1970		May 1970	
	quantity sold (p.o.)	price fetched (Rs.)	quantity sold (p.o.)	price fetched (Rs.)	quantity sold (p.o.)	price fetched (Rs.)
(1)	(9)	(10)	(11)	(12)	(13)	(14)
pure owners	15.41	76.03	14.05	66.45	13.48	73.29
pure tenants	0.00	-	0.00	-	0.00	-

(b) jute

class	sales price	
	June - Nov. 1969	December 1969
(1)	(2)	(3)
pure owners	122.57	133.00
pure tenants	99.30	0.00
		123.02
		99.30

As is seen in table 6, for West Bengal (1969-70) tenants get lower price for jute and paddy than the owners. For potato the paddy sell almost all at the harvest period whereas the owners retain it throughout the year and get a much higher price than the tenants.

2. Choice regarding cropping pattern, combination of inputs and intensity of cropping

(a) Cropping pattern

In so far as production of different types of commodities involves different degrees of uncertainty and scope for entrepreneurial decision making, choice of cropping pattern indicates how far the farmer is motivated by the consideration of earning profit and wants to bear risk for that. Production of cash crops involves risks because of market fluctuations. Again, increase in the production of cash crops is often taken as an indication of progress of a country since demand for most of the cash crops depends on the degree of industrialisation in the national economy as well as growth of international trade.

It is sometimes argued^{3/} that the share-cropping system is associated with the production of a particular crop for which there is relative certainty and less scope for entrepreneurial decision making. While this argument may seem to be plausible the statistical information as is demonstrated in table 7 does not fully bear it out.

3/ C. K. Hanumantha Rao, Uncertainty, Entrepreneurship and Share-Cropping in India. Journal of Political Economy, Vol. LXXIX, No. 3, 1971.

Table 7 : Cropping pattern*

state	(percentages)							
	area under food crops		area under fibre crops		area under oil seeds		rent	tenants
	owners	tenants	cash	rent	owners	tenants	cash	rent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
West Bengal (1969-70)	74.79	75.43	-	14.39	16.77	-	3.27	1.59
Uttar Pradesh (1954-57)	58.4	58.4	-	15.40	18.10	-	2.50	1.90
Madhya Pradesh (1955-56)	47.3	54.2	54.50	42.80	36.80	40.20	5.00	7.90
Madhya Pradesh (1956-57)	49.43	51.54	65.90	42.34	37.91	29.71	6.32	10.19
Punjab (1955-56)	60.00	63.00	-	16.00	16.00	3.00	2.00	-
Madras (1955-56)	75.2	89.4	-	13.20	3.30	-	-	-

* For Uttar Pradesh and Punjab "owners" include pure owners and cash rent tenants; and "tenants" means share-croppers. For West Bengal and Madhya Pradesh "owners" are only pure owners and "tenants" are share-croppers, - almost all the "tenants" in West Bengal, particularly in Hooghly are share-croppers, in Madhya Pradesh there are also cash rent tenants.

As is seen from table 7 except for Madhya Pradesh (1955-56 and 1956-57) and Madras (1955-56) percentage area under fibre crops is not lower for the tenants than the owners. However, tenants do not seem to give less importance to the production of food crops than the owners in any of the states.

The generally accepted idea that tenants are not interested in the production of cash crops, is not however borne out by the available information. All this indicates that it may not be accepted as a general truth that tenants are not motivated by the consideration of earning profit or they do not want to bear risk for that.

(b) Choice of input combinations

Since choice of input combinations reflects the nature of technology adopted by a farmer, differences in the choice of inputs between owners and share-croppers reflect the difference in technology adopted by the two groups of farmers. From tables 3(a) and 3(b) it is seen that the share croppers' per acre labour input is larger than the owners their per acre expenditure on

material inputs is lower. Again, since we shall see later in table 9 that there is only negligible difference in yield per acre (for West Bengal) between owners and tenants, it may be reasonable to think that the share-croppers substitute labour for material inputs or that relation of material inputs per acre with class is inverse of that of labour input per acre.

Table 8: Choice of inputs
(West Bengal, 1969-70)

(a)

class	per acre labour input (in hours)			
	family labour	hired labour	total human labour	bullock labour
(1)	(2)	(3)	(4)	(5)
pure owners	223.83	346.36	570.19	135.54
pure tenants	566.06	72.44	638.50	135.22

(b)

class	per acre expenditure on material inputs (Rs.)					
	seeds	chemical fertiliser	oil cakes	manures	insecticides	all input items
(1)	(2)	(3)	(4)	(5)	(6)	(7)
pure owners	83.56	46.57	13.18	11.30	3.54	158.20
pure tenants	54.52	32.35	18.46	12.66	1.66	119.56

As regard to input of family labour and hired labour it is seen from table 8(a) that for West Bengal while per acre family labour input is larger for the share-croppers than the owners, per acre hired labour input is lower for them. As regard to different types of material inputs it is seen from

We have carried out experiments in six stages; in the first stage of our experiment we have considered only three cases, West Bengal (Hooghly) 1955; Andhra Pradesh (West Godavari) 1957 and Punjab (Amritsar) 1955 and choice of our variables is as follows.

- X_1 : land (area)
- X_2 : family labour days
- X_3 : hired labour days
- X_4 : bullock labour days
- X_5 : seed value (owned and purchased) + value of fertilizer + value of manures (owned and purchased).
- X_6 : irrigation charges
- X_7 : implements (major and minor) (value in rupees)
- Y : total value of crop output.

In the second stage bullock labour is excluded; X_5 and X_6 are added together and considered as one variable. Also X_7 is modified by adding to it depreciation charges. Thus the variables in the second stage stand as follows.

- X_1 : land
- X_2 : family labour days
- X_3 : hired labour days
- X'_5 : $(= X_5 + X_6)$: seed value + fertilizer + irrigation charges
- X'_7 : implements + depreciation
- Y : total value of crop output.

The third stage of experiment is carried out with hired labour and family labour added together and considered as one variable i.e., X'_2 .

In the light of the results of the 3rd stage we have excluded variable X'_7 (X_7 + depreciation) in the 4th stage and in the 5th stage we have included

variable X_7' but excluded X_5' ($X_5 + X_6$). In the last stage we have excluded both X_5' and X_7' and undertaken production function analysis only with two independent variables, e.g., land and total labour.

All these experiments as are done in the stages 2, 3, 4, 5 and 6 are repeated three times with three different choices of the functional forms : Linear with intercept, linear without intercept and the Cobb-Douglas. Again, the whole set of experiments is repeated (from stage 2 to stage 6) with the same sets of independent variables and the same functional forms with Farm Business Income as the dependent variable in place of Total Value of Crop Output.

In Table A we have arranged the coefficients of the production function fits with 8 variables (i.e., results of the experiment in stage 1). In each table (from table 2A₁ to table 12C₂) the production function fits throughout different stages, for a particular year, district, functional form and dependent variable are arranged.

Following observations seem to follow with regard to the coefficients of the variables

In the case of the first stage of our experiment with 8 variables (table A₁) it is seen that the coefficient of land is significant in five cases out of six; coefficient of family labour is significant in four cases and that of hired labour in three cases out of six. But with regard to other variables, in most of the cases the coefficients are not significant — sometimes coefficients of some variables are negative and non-significant, sometimes they are even negative and significant. Thus, it is seen that coefficient of bullock labour

1/ These tables are presented in the appendix to this chapter.

is significant only in three cases and in each of these cases the value of the coefficient is negative; coefficient of value of seeds, fertilizers and manures is not significant in any of the cases, coefficient of irrigation charges is significant in only one case in which it is positive and coefficient of implements is significant and negative in one case. This shows that values of the coefficients as representing the marginal productivities of inputs concerned cannot in many cases be explained in terms of accepted economic theories. Another interesting observation follows on the basis of tests of equality carried out for the coefficients of hired labour and family labour. It is observed (see table 1A₂) that the value of t is significant only in one case out of six. It follows that in many situations marginal productivity of hired labour and family labour would be the same. This result, if correct, is obviously of great importance. However, all these lead us to carry out other experiments with different choices of the variables.

Thus in the 2nd stage of our experiments we exclude bullock labour, ^{to avoid multicollinearity}

since bullock labour may be used only as a complementary to human labour.

Secondly, irrigation charges is added to the value of seeds and fertilizers and manures, since the combined input may be regarded as indicating the investment on variable inputs other than human labour and implements. Thirdly, depreciation charges is considered as an item of current expenditure on fixed capital and is added to the value of implements.

It is seen that coefficients of land, family labour and hired labour are non-significant in a considerably large number of cases. In the case of value of seeds, fertilizers, manures and irrigation charges and in the case of

implements the number of cases in which the coefficients are non-significant is even larger. This suggests that most of the variation in production may be accounted for by variations in land and human labour and the variable denoting the combined inputs of value of seeds etc., and the variable denoting implements may be excluded from the set of independent variables.

This, coupled with the results of the tests of equality of the coefficients of hired labour and family labour, made on the basis of the experiments in stage 1 leads us to carry out other experiments with (i) hired labour and family labour added together and considered as one variable, and (ii) exclusion of either value of seeds etc., or value of implements or both from the set of independent variables. Thus, in the third stage hired labour and family labour are added together and considered as one variable. Again, it is seen that coefficients of land and labour are non-significant in many cases and it is only a few cases in which coefficients of the variables denoting the combined inputs of value of seeds etc., and implements are significant.

Again to avoid multicollinearity problem

In the fourth stage of experiment we eliminate implements and carry out production function fits with only the three independent variables : land (acres), total labour and the variable denoting the combined inputs of value of seeds, fertilizers, manures and irrigation charges. It is seen that still in a large number of cases the coefficients of the variables are non-significant and the number of cases in which the coefficient of the combined inputs of value of seeds etc., is insignificant, is very small. Thus in the fifth stage of our experiment we start with land, total labour and implements as independent variables and exclude the variable denoting the combined inputs of seeds etc. However, it is found that with regard to significance of the variables the results

obtained in this stage are not better than that obtained in the earlier stages. Thus in the final stage of our experiment we carry out production function fits only with two independent variables, e.g., land and total labour. It is seen that except a few cases, coefficients of land and total labour are significant.

Now, if we compare the results obtained in different stages of the experiment, it is seen that judged by the values of R^2 there are no discernable differences. It seems to suggest that a production function fit with two variables viz., land and labour, may be taken as a sufficiently good representation of the technological relations between inputs and output in our sample of farms. Again, if we compare the set of results obtained with ^{Total Value of Crop} Output as the dependent variable with that obtained with Farm Business Income as the dependent variable, it is seen that the production function fits are in general better in the first case than in the second one. Thus, we may take a production function fit with output as the dependent variable and land and labour as the two independent variables as a good representation of technological reality.

As we have already noted at the outset, the extent to which economically meaningful conclusions can be drawn from the above results could depend on the validity of the cross section production function as a representation of the relations between inputs and output. In trying to arrive at some general conclusions regarding the relative economic performance of tenants and owners from our results, we have come to have some very serious doubts regarding the use of the cross section production functions. In the first place, as we have already noted, in our series of experiments, coefficients of some variables are often found to be non-significant or significant with negative values. In the case of non-significant values of the coefficients, the economic interpretation has to be that a change in the amount of use of that particular input does not produce any significant change in output. A significant and negative value of the coefficient of the variable implies that with an increase in the amount of use of that particular input there is a decrease in output. Thus on the basis of the experiments that we have made one may conclude that an increase in the amount of the combined inputs of seeds, fertilizers, manures and irrigation, sometimes results in either no change at all in production or sometimes a decrease in production. Similar conclusions may be drawn with respect to implements. However, it is of

doubtful economic meaning that an increase in the use of inputs like seeds, fertilizer etc., would result in no change in production or decrease in production — or that any variation in production is explainable only by the variation in the two variables, land and labour, all other inputs being of no consequence.

Another negative conclusion is based on the finding that the results of production function fits are most highly sensitive to variations in time and space. The results are so different as one passes from one fit to another that it is to be doubted whether they can be made the basis of any generalisation. That the results of the production function fits are highly sensitive to variations in time and space can be easily seen if we observe the variations with respect to different years with same district and variations with respect to different districts with same year. The sensitivity of the coefficients to variations in time and space is also seen in the cases when production function fits are carried out with total number of observations in each case i.e., with the "tenants" and "owners" taken in a single class. To show this we have presented some of the results of the production function fits with total number of observations in each case, in the tables from table 4 to table 9. Thus consider the coefficient of land. In the case of the log-linear fit with land and labour as the independent variable and total value of output as dependent variable ^(table 9) the sensitivity to place change is so much that the variation from one district of West Bengal to another is of the order of 0.41 to -0.07. The sensitivity to time change is indicated by the change from -0.07 to 0.27 as one goes from year 1955 to year 1956 for the same district of West Bengal. Again coefficient for labour doubles itself when one passes from one district of West Bengal to another (0.56 to 1.17) for the same year and it dwindles to a fifth (0.56 to 0.11) when one passes from ^{one} year to

Table 4 : Sensitivity of the coefficients to variations in time space. (Linear with intercept with total value of crop output as dependent variable and land, total labour, seeds etc., and implements as independent variables.)

["Owners" and "Tenants" combined.]

	coefficient of				R ²
	land	total labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)
West Bengal District 1, 1955	98.10 *** (12.28)	0.78 (0.62)	2.67 (2.08)	-0.23 (0.37)	0.79
West Bengal District 1, 1956	99.09 ** (30.24)	1.62 * (0.36)	-0.01 (0.27)	1.31 ** (0.28)	0.84
West Bengal District 2, 1955	27.33 * (9.85)	2.67 *** (0.21)	-0.28 (0.31)	-0.10 (0.37)	0.88
West Bengal District 2, 1956	127.52 *** (16.86)	0.95 * (0.39)	1.14 ** (0.27)	1.60 (1.19)	0.78
Andhra Pradesh District 1, 1957	73.88 ** (23.79)	3.43 *** (0.55)	0.79 (0.53)	-0.08 (0.36)	0.85
Andhra Pradesh District 1, 1959	-17.82 (33.90)	9.50 *** (1.00)	-0.96 (0.78)	-0.48 (0.38)	0.88
Punjab District 1, 1955	74.55 ** (16.92)	1.25 * (0.56)	2.21 * (0.77)	0.08 (0.18)	0.73
Punjab District 1, 1956	57.91 (21.89)	2.53 * (0.75)	2.55 * (0.96)	-0.21 (0.19)	0.74
Punjab District 2, 1955	94.15 ** (15.23)	1.78 * (0.62)	0.0.03 (0.34)	0.44 (0.29)	0.72
Punjab District 2, 1956	104.97 *** (15.48)	1.54 (0.86)	0.27 (0.20)	1.22 * (0.47)	0.72

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 5 : Sensitivity of the coefficients to variations in time space. (Linear with intercept with total value of crop output as dependent variable and land and total labour as independent variables.)

["Owners" and "Tenants" combined.]

(1)	coefficient of		R ²
	land	total labour	
(1)	(2)	(3)	(4)
West Bengal District 1, 1955	92.02 ^{***} (11.55)	1.47 ^{***} (0.29)	0.73
West Bengal, District 1, 1956	129.66 ^{***} (13.38)	1.57 ^{**} (0.39)	0.79
West Bengal District 2, 1955	26.97 [*] (9.77)	2.52 ^{***} (0.16)	0.77
West Bengal District 2, 1956	140.77 ^{***} (17.36)	1.89 ^{***} (0.32)	0.73
Andhra Pradesh District 1, 1957	70.36 [*] (23.63)	4.07 ^{***} (0.51)	0.45
Andhra Pradesh District 1, 1959	-32.39 (32.37)	8.45 ^{***} (0.60)	0.45
Punjab District 1, 1955	94.86 ^{***} (16.51)	2.24 ^{**} (0.50)	0.73
Punjab District 1, 1956	78.95 ^{**} (20.68)	3.44 ^{***} (0.65)	0.71
Punjab District 2, 1955	93.91 ^{***} (13.38)	1.97 [*] (0.59)	0.71
Punjab District 2, 1956	100.55 ^{***} (15.92)	2.67 ^{***} (0.80)	0.79

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 6 : Sensitivity of the coefficients to variations in time and space. (Linear without intercept with output as dependent variable and land, total labour, seeds etc., and implements as the independent variables.)

["Owners" and "Tenants" combined.]

	coefficient of				R ²
	land	total labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)
West Bengal District 1, 1955	97.70*** (12.15)	0.76 (0.60)	2.68 (2.08)	-0.23 (0.37)	0.72
West Bengal District 1, 1956	98.49*** (17.14)	1.62** (0.35)	-0.01 (0.27)	1.31** (0.27)	0.81
West Bengal District 2, 1955	27.66* (9.54)	2.67*** (0.20)	-0.29 (0.31)	0.08 (0.36)	0.33
West Bengal District 2, 1956	101.03*** (17.53)	0.31* (0.37)	1.11** (0.27)	1.51 (1.12)	0.77
Andhra Pradesh District 1, 1957	67.95* (23.50)	3.30*** (0.55)	0.83 (0.54)	-0.12 (0.36)	0.73
Andhra Pradesh District 1, 1959	-29.89 (35.00)	9.09*** (1.03)	-0.93 (0.81)	-0.51 (0.40)	0.77
Punjab District 1, 1955	70.25** (16.66)	1.11 (0.55)	2.15* (0.78)	0.10 (0.18)	0.71
Punjab District 1, 1956	56.94* (21.63)	2.51** (0.75)	2.49* (0.93)	-0.21 (0.19)	0.74
Punjab District 2, 1955	88.14*** (15.06)	1.48* (0.61)	0.05 (0.35)	0.28 (0.23)	0.74
Punjab District 2, 1956	103.14*** (15.22)	1.37 (0.82)	0.29 (0.20)	-1.16 (0.46)	0.72

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 7: Sensitivity of the coefficients to variations in time and space. (Linear without intercept with output as dependent variable and land and total labour as independent variable.)

["Owners" and "Tenants" combined.]

(1)	coefficient of		R ²
	land	total labour	
(1)	(2)	(3)	(4)
West Bengal District 1, 1955	91.50 *** (11.16)	1.44 ** (0.26)	0.71
West Bengal District 1, 1956	126.04 *** (17.93)	1.51 ** (0.39)	0.72
West Bengal District 2, 1955	27.50 * (9.33)	2.96 ** (0.58)	0.70
West Bengal District 2, 1956	140.82 *** (16.94)	1.39 ** (0.29)	0.72
Andhra Pradesh District 1, 1957	63.20 * (23.29)	3.96 *** (0.30)	0.70
Andhra Pradesh District 1, 1959	-45.38 (33.31)	3.07 (0.60)	0.37
Punjab District 1, 1955	90.61 *** (16.12)	2.10 ** (0.45)	0.75
Punjab District 1, 1956	80.84 ** (19.94)	3.49 *** (0.63)	0.71
Punjab District 2, 1955	90.45 *** (13.23)	1.69 * (0.56)	0.72
Punjab District 2, 1956	108.85 *** (15.60)	2.59 * (0.73)	0.70

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 3 : Sensitivity of the coefficients to variations in time and space. Log-linear with output as dependent variable and land, total labour and seeds etc., as independent variable.

["Owners" and "Tenants" combined.]

(1)	coefficient of			R ²
	land	total labour	seeds, manures, fertilizer and irrigation	
(1)	(2)	(3)	(4)	(5)
West Bengal District 1, 1955	0.41 *** (0.07)	0.55 ** (0.13)	0.03 (0.09)	0.10
West Bengal District 1, 1956	0.91 *** (0.17)	0.07 (0.15)	0.05 (0.08)	0.70
West Bengal District 2, 1955	-0.06 (0.10)	1.26 *** (0.11)	-0.10 (0.9)	0.17
West Bengal District 2, 1956	0.25 (0.27)	0.24 (0.37)	0.41 (0.20)	0.21
Andhra Pradesh District 1, 1957	0.17 * (0.07)	0.48 ** (0.12)	0.37 *** (0.09)	0.20
Andhra Pradesh District 1, 1959	-0.42 ** (0.10)	1.21 *** (0.19)	0.36 * (0.15)	0.7
Punjab District 1, 1955	0.48 ** (0.12)	0.36 * (0.13)	0.20 (0.12)	0.20
Punjab District 1, 1956	0.55 ** (0.11)	0.38 * (0.13)	0.15 (0.13)	0.20
Punjab District 2, 1955	0.44 ** (0.10)	0.35 ** (0.11)	0.20 (0.12)	0.71
Punjab District 2, 1956	0.39 ** (0.08)	0.47 *** (0.08)	0.13 (0.07)	0.70

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 9 : Sensitivity of the coefficients to variations in time and space. (Log-linear with output as dependent variable and land total labour as independent variables.)

["Owners" and "Tenants" combined.]

(1)	coefficient of		R ²
	land	total labour	
(1)	(2)	(3)	(4)
West Bengal District 1, 1955	0.41 *** (0.07)	0.56 *** (0.07)	0.82
West Bengal District 1, 1956	0.92 *** (0.17)	0.11 (0.14)	0.70
West Bengal District 2, 1955	-0.07 (0.10)	1.17 *** (0.08)	0.87
West Bengal District 2, 1956	0.27 (0.22)	0.82 ** (0.22)	0.52
Andhra Pradesh District 1, 1957	0.15 (0.08)	0.88 *** (0.08)	0.89
Andhra Pradesh District 1, 1959	-0.44 ** (0.10)	1.59 *** (0.10)	0.36
Punjab District 1, 1955	0.56 ** (0.11)	0.49 ** (0.11)	0.62
Punjab District 1, 1956	0.60 *** (0.10)	0.46 ** (0.10)	0.72
Punjab District 2, 1955	0.54 *** (0.09)	0.46 ** (0.09)	0.71
Punjab District 2, 1956	0.45 *** (0.07)	0.55 *** (0.07)	0.78

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

another for the same district. It may be checked with the results presented in the tables that the same instability is also present in the coefficients of land and labour for the same states when one passes from the fit with land and labour alone to other fit involving more variables. (By comparison much less instability is shown by the estimated coefficient values for Punjab).

The coefficients for the linear fits are no more stable. In West Bengal the marginal productivity of land increased in a single year with same district from 27.33 to 127.52 (in the case of 4 independent variables e.g., land, total labour, seed value etc., and implements with total value of $\frac{\text{crop output}}{\text{land}}$ as the dependent variable (see table 4), whereas that of labour during the same period from 2.67 to 0.95.

The same type of variation is seen in the case of linear production fit without intercept. Thus, it is seen, marginal productivity of land in West Bengal again increased in a single year with the same district from 27.66 to 127.28 (table 6).

We have seen that the production function fits are not poor if judged by conventional statistical considerations : the R^2 in most cases is pretty high. Hence, it is not that the fitted function fails to account for a large enough portion of the observed variation. The instability we are speaking of arises from what may be called very large year effects and area effects^{2/}, or what it implies

^{2/} The instability that we have noted is not peculiar to the fits carried out by us alone. As a matter of fact the data used by us are the same as have been used by various other research workers and the functional forms used by us are also the most commonly used ones; hence the results obtained by us should not be basically any different from those obtained by others. Nor are they. Thus Raj Krishna (Some production functions for the Punjab ; Indian Journal of Agricultural Economics, Vol. 19, 1964) obtained a coefficient of 0.20 for human labour for Perozepur and Amritsar for the year 1954-55 and one of 0.57 for the same districts for the year 1955-56. Srivastava and Nagadevara's (On the allocation efficiency under risk in Transforming Traditional Agriculture ; Economic and Political Weekly, Vol. 7, 1972) estimates of coefficients of land changed from around 0.50 to -0.55 just by changing over from 1967-68 to 1968-69, crops produced remaining the same (local wheat), area remaining

is that if we are to make estimates on the basis of pooled data, the R^2 of such fits would be very very low — much lower than the ones associated with the fits that have already been carried out. Now, if one wants to make any generalisations they have to be made precisely on the basis of such pooled estimates. The very idea of generalisation is that conclusions drawn should not be valid for particular districts and particular years, but hold irrespective of time and area as long as certain basic conditions remain common.

However, one explanation for this instability in the values of the coefficients may be that we have not considered the possible size effects, while carrying our production function fits. In fact, there may be differences in technological relations between inputs and outputs among the farms under different size classes and the observed instability might reflect heterogeneity in the population which is assumed to be homogenous. Thus in the next chapter (Chapter VII) we shall try to judge the relative effectiveness of the two systems considering relative performance of the two groups of farms under different size classes.

2/ (contd.) the same (Ferozepur) and functional form remaining the same (Cobb-Douglas). The coefficients for human labour marks a rise during the same year from around 0.20 to 1.25 ! It is not necessary to multiply examples. It is quite clear that production function fits that have been carried out by other research workers to cross section data obtained by the Farm Management Surveys also reveal such instability of the numerical values of the coefficients.

Table 1A: Results of production function fits in stage 1

Linear with intercept

(Dependent variable : Total value of crop output)

region and year	coefficient of										r^2
	inter- cept	land	family labour	hired labour	bullock labour	value of seeds, ferti- lizer and manure	(3)	(7)	(9)	(13)	(11)
West Bengal 1, 1955	owners	34.20	61.54 ^{**}	2.01*	1.70*	0.76	-4.73	(1.74)	(3.72)	0.76	0.66
	standard errors	(37.81)	(19.48)	(0.93)	(0.82)	(1.74)	(3.72)			(0.49)	
	tenants	-52.92	94.17	0.10	4.27	0.60	5.49	(2.35)	(2.35)	-1.15	0.96
	standard errors	(96.33)	(59.37)	(1.19)	(2.35)	(2.35)	(6.87)			(1.37)	
Andhra Pradesh 1, 1957	owners	97.22	159.89 ^{***}	1.69 ^{***}	4.25	-3.17*	-1.13	(3.25)	(2.69)	1.30	0.75
	standard errors	(174.89)	(29.58)	(1.29)	(0.59)	(3.25)	(1.53)			(0.37)	
	tenants	-309.58	-309.58	0.99 ^{***}	5.63	-15.27*	-3.54	(6.50)	(2.35)	-10.83	0.95
	standard errors	(325.14)	(145.75)	(1.97)	(0.36)	(6.50)	(3.21)			(1.33)	
Punjab 1, 1955	owners	7.90	90.70	1.10	2.14*	- 3.13	1.54	(3.13)	(2.09)	7.79 ^{***}	0.76
	standard errors	(162.40)	(26.63)	(0.59)	(0.87)	(3.25)	(1.26)			(0.35)	
	tenants	-217.09	251.23 ^{***}	6.74 ^{***}	4.20 ^{**}	-13.52 ^{**}	0.52	(2.29)	(2.54)	-5.11	0.95
	standard errors	(143.15)	(42.98)	(1.65)	(1.52)	(2.29)	(2.54)			(0.39)	

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 1A₂: Test for equality for the coefficients of family labour and hired labour

region	t-value	
(1)	owners	(5)
West Bengal 1, 1955	owners	0.2515
	tenants	-1.8876
Punjab 1, 1955	owners	-1.2309
	tenants	1.5205
Andhra Pradesh 1, 1957	owners	-1.3053
	tenants	-5.3229*

function
Table 2A: Results of production/fits in different stages
West Bengal District 1, 1955

Linear with intercept
(Dependent variable : Total value of crop output)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	16.90	91.07 ***		1.13	1.22	-0.12	0.36	0.31
standard errors	(27.30)	(12.10)		(0.69)	(0.64)	(2.16)	(0.37)	
tenants	-16.75	86.17		0.15	4.29 *	4.24	-1.23	0.96
standard errors	(79.87)	(50.94)		(0.94)	(1.83)	(4.48)	(1.71)	
<u>equation 2 :</u>								
owners	14.25	91.05 ***	1.21			-0.22	0.33	0.31
standard errors	(25.45)	(12.03)	(0.63)			(2.12)	(0.36)	
tenants	-123.62	150.04	-0.37			10.91 *	-3.15	0.93
standard errors	(95.47)	(62.65)	(1.25)			(5.25)	(2.16)	
<u>equation 3 :</u>								
owners	13.99	93.30 ***	1.11			00.41		0.31
standard errors	(25.43)	(11.77)	(0.62)			(2.01)		
tenants	-125.42	79.71	0.10			14.17 *		0.91
standard errors	(100.67)	(42.12)	(1.20)			(5.01)		
<u>equation 4 :</u>								
owners	14.07	92.36 ***	1.22 **				0.01	0.31
standard errors	(26.90)	(10.87)	(0.52)				(0.32)	
tenants	-5.70	60.01	1.01				5.37 **	0.96
standard errors	(76.98)	(29.42)	(0.64)				(1.00)	
<u>equation 5 :</u>								
owners	13.92	92.37 ***	1.23 **					0.31
standard errors	(25.27)	(10.80)	(0.27)					
tenants	-236.59	116.80 *	2.98 *					0.84
standard errors	(118.52)	(51.80)	(0.99)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Equation
Table 2A₂: Results of production/fits in different stages
West Bengal District 1, 1955
Linear with intercept
(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of					R ²	
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation		imple- ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	25.94	71.16 **		1.62	0.16	-1.66	0.28	0.60
standard errors	(33.18)	(14.71)		(0.84)	(0.71)	(2.63)	(0.46)	
tenants	-62.85	41.47		-0.58	1.01	8.99 *	-0.53	0.95
standard errors	(63.86)	(40.73)		(0.75)	(1.47)	(3.58)	(1.37)	
<u>equation 2 :</u>								
owners	65.83	71.52 **	0.43			-0.22	0.63	0.54
standard errors	(33.17)	(15.68)	(0.82)			(2.77)	(0.48)	
tenants	-106.11	66.17	-0.79			11.57 **	-1.27	0.94
standard errors	(59.27)	(38.87)	(0.78)			(3.26)	(1.34)	
<u>equation 3 :</u>								
owners	65.35	75.76 **	0.25			0.96		0.55
standard errors	(33.32)	(15.42)	(0.81)			(2.63)		
tenants	-104.81	37.70	-0.59			12.89 **		0.93
standard errors	(58.94)	(24.66)	(0.75)			(2.93)		
<u>equation 4 :</u>								
owners	25.67	75.61 **	1.23				-1.47	0.60
standard errors	(32.62)	(13.18)	(0.39)				(0.39)	
tenants	-58.66	35.21	0.76				3.42 **	0.91
standard errors	(76.35)	(29.22)	(0.64)				(1.00)	
<u>equation 5 :</u>								
owners	65.16	73.58 **	0.52					0.55
standard errors	(33.14)	(14.16)	(0.36)					
tenants	-205.89	71.42	2.02					0.90
standard errors	(88.52)	(38.23)	(0.74)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 28₁ : Results of production fits in different stages

West Bengal District 1, 1955

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	91.65 ***		1.23	1.23 *	-0.13	0.34	0.31
standard errors	(12.06)		(0.66)	(0.63)	(2.16)	(0.37)	
tenants	80.85		0.13	4.38 *	4.27	1.17	0.96
standard errors	(42.95)		(0.93)	(1.77)	(4.49)	(1.69)	
<u>equation 2 :</u>							
owners	91.59 ***	1.26 **			-0.23	0.33	0.31
standard errors	(11.93)	(0.62)			(2.12)	(0.36)	
tenants	116.95	-0.73			12.99 *	-3.09	0.91
standard errors	(60.82)	(1.31)			(5.35)	(2.53)	
<u>equation 3 :</u>							
owners	93.82 ***	1.17			0.40		0.30
standard errors	(11.72)	(0.61)			(2.01)		
tenants	48.60	-0.25			16.15 **		0.99
standard errors	(33.62)	(1.31)			(4.98)		
<u>equation 4 :</u>							
owners	92.92 ***	1.29 **				-0.02	0.30
standard errors	(10.81)	(0.28)				(0.31)	
tenants	58.65	0.99				5.40 ***	0.96
standard errors	(21.57)	(0.62)				(3.86)	
<u>equation 5 :</u>							
owners	92.91 ***	1.28 **					0.30
standard errors	(10.75)	(0.25)					
tenants	60.99	3.06 *					0.73
standard errors	(45.62)	(1.12)					

* significant at 5%

** significant at 1%

*** significant at 0.1%

Function

Table 2B : Results of production/fits in different stages
West Bengal District 1, 1955

Linear without intercept

(Dependent variable : Net Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple-ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	72.04 **		1.77	0.24	-1.75	0.25	0.60
standard errors	(14.69)		(0.31)	(0.77)	(2.63)	(0.46)	
tenants	21.52		-0.66	1.37	9.09	-0.30	0.94
standard errors	(35.96)		(0.73)	(1.43)	(3.76)	(1.41)	
<u>equation 2 :</u>							
owners	74.01 **	0.63			-0.26	0.62	0.52
standard errors	(15.83)	(0.32)			(2.81)	(0.48)	
tenants	33.07	-1.08			13.23	-1.23	0.32
standard errors	(39.72)	(0.86)			(3.50)	(1.52)	
<u>equation 3 :</u>							
owners	73.19 **	0.50			0.92		0.31
standard errors	(15.56)	(0.81)			(2.67)		
tenants	11.70	-0.39			14.54		0.31
standard errors	(20.30)	(0.31)			(3.03)		
<u>equation 4 :</u>							
owners							0.52
standard errors							
Tenants	21.21	0.64				3.79	0.30
standard errors	(21.95)	(0.63)				(0.87)	
<u>equation 5 :</u>							
owners	76.11 **	0.76 *					0.31
standard errors	(14.26)	(0.33)					
tenants	22.35	2.09 *					0.70
standard errors	(35.40)	(0.37)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function

Table 2C, : Results of production fits in different stages

West Bengal District 1, 1955

Log Linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	3.34 ***	0.49 ***	0.47 **			-0.03		0.32
standard errors	(0.42)	(0.09)	(0.14)			(0.09)		
tenants	2.34 **	0.52 *	0.26			0.45		0.90
standard errors	(0.93)	(0.22)	(0.40)			(0.35)		
<u>equation 5 :</u>								
owners	3.43 ***	0.50 ***	0.43 ***					0.87
standard errors	(0.34)	(0.09)	(0.08)					
tenants	1.79 **	0.58 *	0.76 ***					0.83
standard errors	(0.47)	(0.22)	(0.12)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function
Table 20₂ : Results of production/fits in different stages

West Bengal District 1, 1955

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	4.06 **	0.73 **	0.31			-0.20		0.4
standard errors	(0.88)	(0.19)	(0.31)			(0.20)		
tenants	1.76	0.45 *	0.21			0.69		0.3
standard errors	(0.94)	(0.22)	(0.41)			(0.35)		
<u>equation 5 :</u>								
owners	4.57 ***	0.76 **	0.06					0.4
standard errors	(0.71)	(0.19)	(0.13)					
tenants	0.17	0.54 *	0.97					0.3
standard errors	(0.51)	(0.24)	(0.13)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 3A₁: Results of production fits in different stages

West Bengal District 2, 1955

Linear with intercept

(Dependent variable : Total value of crop output)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owner	-3.44	27.32 *		2.85 *	2.23 *	-0.17	-7.23 ***	0.90
standard errors	(22.55)	(9.83)		(0.25)	(0.30)	(0.34)	(0.33)	
tenants	-77.29	114.29 *		1.40 *	0.44	1.53	1.64	0.90
standard errors	(62.13)	(39.29)		(0.57)	(0.80)	(1.28)	(2.03)	
<u>equation 2 :</u>								
owners	1.19	18.79 *	2.63 **	-0.0		-0.07	-0.23	0.90
standard errors	(23.08)	(9.25)	(0.24)			(0.34)	(0.34)	
tenants	-53.07	112.66 *	1.28 *			1.48	0.27	0.90
standard errors	(61.56)	(40.37)	(0.58)			(1.31)	(1.85)	
<u>equation 3 :</u>								
owners	-4.50	18.42 *	2.64 ***			-0.15		0.90
standard errors	(21.32)	(9.19)	(0.24)			(0.31)		
tenants	-55.04	115.92 **	1.25 *			1.59		0.90
standard errors	(58.74)	(33.24)	(0.55)			(1.02)		
<u>equation 4 :</u>								
owners	-4.83	26.23 *	2.70 ***				-0.57	0.91
standard errors	(20.12)	(9.72)	(0.17)				(0.28)	
tenants	-41.08	112.16 *	1.75 *				-0.34	0.89
standard errors	(61.45)	(35.36)	(0.48)				(0.57)	
<u>equation 5 :</u>								
owners	-1.92	18.33 *	2.55 ***					0.90
standard errors	(20.56)	(9.14)	(0.16)					
tenants	-32.06	107.05 *	1.69 *					0.89
standard errors	(58.67)	(33.08)	(0.47)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 3A₂ : Results of production/fits in different stages

West Bengal District 2, 1955

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	land	coefficient of				seeds, manures, fertilizer and irrigation	imple- ments	R ²
(1)	(2)	(3)	total labour	family labour	hired labour	(6)	(7)	(8)	(9)
<u>equation 1 :</u>									
owners	23.71	21.43		1.77 ***	0.38		-0.74	-0.74	0.55
standard errors	(26.40)	(11.51)		(0.30)	(0.35)		(0.40)	(0.39)	
tenants	-19.95	47.37		1.26	-1.06		-2.15	4.33	0.57
standard errors	(35.94)	(53.07)		(0.77)	(1.08)		(1.72)	(2.74)	
<u>equation 2 :</u>									
owners	39.19	2.11	1.29 **				-0.50	-0.20	0.43
standard errors	(29.47)	(11.8)	(0.31)				(0.44)	(0.44)	
tenants	40.10	43.33	0.96				-2.20	0.94	0.41
standard errors	(92.60)	(60.72)	(0.87)				(1.97)	(2.78)	
<u>equation 3 :</u>									
owners	33.93	1.78	1.30 **				-0.59		0.42
standard errors	(27.18)	(11.72)	(0.31)				(0.40)		
tenants	33.39	54.44	0.87				-1.80		0.41
standard errors	(38.55)	(50.12)	(0.81)				(1.54)		
<u>equation 4 :</u>									
owners	25.67	75.61 **	1.23 **				-1.47		0.51
standard errors	(32.62)	(13.18)	(0.39)				(0.39)		
tenants	-53.66	35.20	0.76				3.42		0.51
standard errors	(76.35)	(29.22)	(0.64)				(1.00)		
<u>equation 5 :</u>									
owners	43.57	1.42	0.97 **						0.41
standard errors	(26.59)	(11.82)	(0.21)						
tenants	7.51	64.42	0.37						0.37
standard errors	(86.41)	(49.78)	(0.69)						

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 3B₁ : Results of production fits in different stages

West Bengal District 2, 1955

Linear without intercept

(dependent variable : total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	27.07 *		2.34 ***	2.22 ***	-0.16	-0.24	0.31
standard errors	(9.59)		(0.24)	(0.29)	(0.32)	(0.32)	
tenants	92.77 *		1.52 *	0.72	1.13	1.75	0.30
standard errors	(34.63)		(0.57)	(0.78)	(1.26)	(2.08)	
<u>equation 2 :</u>							
owners	13.36 *	2.64 **			-0.07	-0.22	0.30
standard errors	(9.03)	(0.23)			(0.33)	(0.33)	
tenants	97.27 *	1.38 *			1.21	0.52	0.30
standard errors	(34.85)	(0.57)			(1.29)	(1.84)	
<u>equation 3 :</u>							
owners	13.08 *	2.63 **			-0.14		0.30
standard errors	(8.92)	(0.23)			(0.31)		
tenants	102.47 **	1.33 *			1.42		0.30
standard errors	(23.92)	(0.53)			(1.01)		
<u>equation 4 :</u>							
owners	25.83 *	2.69 *				-0.57	0.31
standard errors	(9.44)	(0.16)				(0.28)	
tenants	101.82 **	1.76 *				-0.27	0.39
standard errors	(30.39)	(0.49)				(0.56)	
<u>equation 5 :</u>							
owners	13.13 *	2.55 **					0.30
standard errors	(8.87)	(0.15)					
tenants	99.43 **	1.71 *					0.39
standard errors	(29.47)	(0.47)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 3B₂ : Results of production/fits in different stages

West Bengal District 2, 1955

Linear without intercept

(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
equation 1 :							
owners	25.54 *		1.85	0.44	-0.83	-0.14	0.55
standard errors	(11.23)		(0.23)	(0.35)	(0.33)	(0.38)	
tenants	41.82		1.29	-1.03	-2.24	4.36	0.57
standard errors	(45.81)		(0.75)	(1.02)	(1.66)	(2.74)	
equation 2 :							
owners	4.63	1.40 **			-0.62	-0.08	0.42
standard errors	(11.63)	(0.29)			(0.43)	(0.42)	
tenants	54.95	0.89			-2.00	0.76	0.41
standard errors	(51.91)	(0.85)			(1.90)	(2.75)	
equation 3 :							
owners	4.34	1.39 **			-0.65		0.42
standard errors	(11.45)	(0.29)			(0.40)		
tenants	62.60	0.82			-1.69		0.41
standard errors	(43.07)	(0.80)			(1.51)		
equation 4 :							
owners	21.98	1.35 ***				-1.29	0.50
standard errors	(11.52)	(0.20)				(0.34)	
tenants	81.75	0.69				-1.78 *	0.51
standard errors	(39.61)	(0.64)				(0.73)	
equation 5 :							
owners	4.76	1.04 ***					0.39
standard errors	(1.04)	(0.20)					
tenants	66.21	0.37					0.37
standard errors	(43.20)	(0.69)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function

Table 3C₁ : Results of production fits in different stages
West Bengal District 2, 1955

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	0.37	-0.02	1.22 ***			-0.12		0.64
standard errors	(0.43)	(0.12)	(0.14)			(0.11)		
tenants	-0.18	-0.30	1.25 ***			0.14		0.94
standard errors	(0.54)	(0.23)	(0.22)			(0.19)		

equation 5 :

owners	0.47	-0.04	1.11 ***					0.64
standard errors	(0.41)	(0.12)	(0.10)					
tenants	-0.30	-0.31	1.36 ***					
standard errors	(0.51)	(0.23)	(0.15)					0.94

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 3C₂ : Results of production/fits in different stages

West Bengal District 2, 1955

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irriga- tion	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	0.64	0.04	0.99			-0.26		0.1
standard errors	(1.32)	(0.38)	(0.46)			(0.36)		
tenants	0.05	-0.54	1.34			-0.28		0.44
standard errors	(1.64)	(0.71)	(0.63)			(0.58)		
<u>equation 5 :</u>								
owners	0.84	-0.00	0.75					0.
standard errors	(1.28)	(0.37)	(0.32)					
tenants	0.27	-0.52	1.09					0.
standard errors	(1.55)	(0.72)	(0.45)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function

Table 4A, : Results of production/fits in different stages

West Bengal District 1, 1956

Linear with intercept

(Dependent variable : Total value of crop output)

equation	inter- cept	land	total labour	coefficient of family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	66.30	74.80 ***		1.26	1.25 ^{xy}	-0.15	1.87 ^{xxx}	0.90
standard errors	(24.51)	(12.85)		(0.33)	(0.28)	(0.19)	(0.21)	
tenants	-41.90	-39.80		-1.53	1.99	19.29 ^{xy}	11.6	0.95
standard errors	(176.73)	(182.60)		(2.21)	(3.81)	(5.06)	(8.03)	
<u>equation 2 :</u>								
owners	66.72	74.88 ^{xxx}	1.25 ^{xxx}			-0.15	1.88 ^{xxx}	0.90
standard errors	(21.87)	(12.60)	(0.25)			(0.19)	(0.20)	
tenants	-252.41	215.25	-3.08			17.85 ^{xy}	2.74	0.94
standard errors	(118.43)	(78.87)	(1.99)			(5.32)	(5.94)	
<u>equation 3 :</u>								
owners	-2.15	121.08 ^{xxx}	1.32 *			0.20		0.79
standard errors	(29.66)	(16.69)	(0.37)			(0.26)		
tenants	-252.50	227.88 *	-3.33			18.50 ^{xy}		0.95
standard errors	(105.83)	(70.98)	(1.05)			(4.92)		
<u>equation 4 :</u>								
owners	-21.83	110.96 ^{xxx}	2.15 *				-1.11	0.80
standard errors	(30.60)	(17.03)	(0.52)				(0.53)	
tenants	-318.52	281.05	0.56				-0.86	0.84
standard errors	(246.26)	(182.18)	(2.49)				(2.40)	
<u>equation 5 :</u>								
owners	2.36	121.38 ^{xxx}	1.35 ^{xy}					0.79
standard errors	(23.95)	(16.64)	(0.37)					
tenants	-252.47	228.92 [*]	0.95					0.84
standard errors	(156.51)	(105.04)	(2.15)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function
Table 4A, : Results of production fits in different stages
West Bengal District 1, 1956
Linear with intercept
 (Dependent variable : Total value of crop output)

equation	inter- cept	land	total labour	coefficient of family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
equation 1 :								
owners	66.30	74.80 ***		1.26	1.25**	-0.15	1.87***	0.90
standard errors	(24.51)	(12.85)		(0.33)	(0.28)	(0.19)	(0.21)	
tenants	-41.90	-39.80		-1.53	1.99	19.29**	11.6	0.95
standard errors	(176.73)	(182.60)		(2.21)	(3.81)	(5.06)	(8.03)	
equation 2 :								
owners	66.72	74.83***	1.25***			-0.15	1.88***	0.90
standard errors	(21.87)	(12.60)	(0.25)			(0.19)	(0.20)	
tenants	-252.41	215.25	-3.03			17.85**	2.74	0.94
standard errors	(118.48)	(78.87)	(1.99)			(5.32)	(5.94)	
equation 3 :								
owners	-2.15	121.08***	1.32 *			0.20		0.79
standard errors	(29.66)	(16.69)	(0.37)			(0.26)		
tenants	-232.50	227.88*	-3.33			18.50**		0.93
standard errors	(105.83)	(70.98)	(1.85)			(4.92)		
equation 4 :								
owners	-21.83	110.96***	2.15 *				-1.11	0.80
standard errors	(30.60)	(17.03)	(0.52)				(0.53)	
tenants	-318.52	291.05	0.56				-0.86	0.84
standard errors	(246.26)	(182.18)	(2.49)				(2.40)	
equation 5 :								
owners	2.36	121.38***	1.35**					0.79
standard errors	(23.95)	(16.64)	(0.37)					
tenants	-252.47	228.92*	0.95					0.84
standard errors	(156.51)	(105.04)	(2.15)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 4A₂ : Results of production/fits in different stages

West Bengal District 1, 1956

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irriga- tion	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	31.95	87.37***		1.38	-0.08	-0.10	1.63***	0.25
standard errors	(27.75)	(14.55)		(0.44)	(0.32)	(0.21)	(0.24)	
tenants	-139.58	-83.65	-	-0.76	0.61	15.00**	13.95*	0.33
standard errors	(167.92)	(178.44)		(2.01)	(3.62)	(4.80)	(7.63)	
<u>equation 2 :</u>								
owners	71.73	91.14***	0.31			-0.10	1.87***	0.34
standard errors	(26.40)	(15.21)	(0.31)			(0.22)	(0.24)	
tenants	-221.84	16.01	-1.37			14.43**	10.48*	0.33
standard errors	(101.45)	(67.53)	(1.71)			(4.56)	(5.09)	
<u>equation 3 :</u>								
owners	3.11	137.15***	0.37			0.52		0.71
standard errors	(32.67)	(18.38)	(0.41)			(0.29)		
tenants	-145.65	64.34	-2.28			16.93**		0.32
standard errors	(108.68)	(72.85)	(1.90)			(5.05)		
<u>equation 4 :</u>								
owners	-43.97	114.79***	2.15**				-2.42**	0.77
standard errors	(30.90)	(17.20)	(0.52)				(0.53)	
tenants	-399.92	251.55	0.24				-3.07	0.69
standard errors	(216.87)	(160.44)	(2.20)				(2.12)	
<u>equation 4 :</u>								
owners	8.84	137.54***	0.42					0.71
standard errors	(31.93)	(18.35)	(0.40)					
tenants	-163.93	65.29	1.63					0.61
standard errors	(150.71)	(101.15)	(2.07)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 4B, : Results of production/fits in different stages
 West Bengal District 1, 1956
 Linear without intercept
 (Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
equation 1 :							
owners	81.20 ***		1.58 **	1.27 **	-0.08	1.72 ***	0.90
standard errors	(12.86)		(0.37)	(0.29)	(0.19)	(0.20)	
tenants	-66.46		1.44	2.46	19.53 **	12.28	0.95
standard errors	(137.41)		(2.08)	(3.18)	(4.95)	(17.46)	
equation 2 :							
owners	84.00 ***	1.37 **			-0.07	1.75 ***	0.90
standard errors	(12.37)	(0.26)			(0.19)	(0.20)	
tenants	217.36 *	-3.95			19.00 *	-0.59	0.91
standard errors	(92.08)	(2.26)			(6.17)	(6.60)	
equation 3 :							
owners	120.86 ***	1.31 **			0.19		0.79
standard errors	(16.20)	(0.36)			(0.26)		
tenants	214.39 *	-3.89			18.87 **		0.91
standard errors	(81.50)	(2.10)			(5.68)		
equation 4 :							
owners	109.65 ***	2.05 **				-1.02	0.30
standard errors	(16.39)	(0.49)				(0.50)	
tenants	153.32	1.09				1.08	0.32
standard errors	(156.61)	(2.62)				(1.87)	
equation 5 :							
owners	121.63 ***	1.35 **					0.79
standard errors	(16.13)	(0.36)					
tenants	214.26	0.43					0.32
standard errors	(112.68)	(2.28)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
 Table 4B₂ : Results of production/fits in different stages
 West Bengal District 1, 1956

Linear without intercept

(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	86.45 ^{***}		1.53 ^{**}	-0.07	-0.07	1.55 ^{***}	0.35
standard errors	(14.23)		(0.41)	(0.32)	(0.21)	(0.22)	
tenants	-172.47		-0.44	2.17	15.81 ^{**}	16.19 [*]	0.37
standard errors	(134.92)		(2.04)	(3.12)	(4.86)	(7.32)	
<u>equation 2 :</u>							
owners	100.94 ^{***}	0.43			-0.01	1.74 ^{***}	0.35
standard errors	(14.83)	(0.31)			(0.23)	(0.24)	
tenants	17.86	-2.11			15.45 ^{**}	7.56	0.35
standard errors	(79.40)	(1.95)			(5.32)	(5.69)	
<u>equation 3 :</u>							
owners	137.46 ^{***}	0.38			0.25		0.71
standard errors	(17.85)	(0.40)			(0.28)		
tenants	55.89	-2.64			17.16 ^{**}		0.79
standard errors	(76.82)	(1.98)			(5.35)		
<u>equation 4 :</u>							
owners	112.15 ^{***}	1.96 ^{**}				-2.25	0.77
standard errors	(17.15)	(0.50)				(0.51)	
tenants	91.18	0.90				-0.63	0.59
standard errors	(146.39)	(2.45)				(1.75)	
<u>equation 5 :</u>							
owners	138.45 ^{***}	0.43					0.71
standard errors	(17.79)	(0.40)					
tenants	55.78	1.29					0.53
standard errors	(104.27)	(2.11)					

* significant at 5%

** significant at 1%

*** significant at 0.1%

Table 40₁ : Results of production ^{function} fits in different stages

West Bengal District 1, 1956

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	4.63 ^{***}	0.89 ^{**}	0.10			0.04		0.68
standard errors	(0.59)	(0.18)	(0.17)			(0.08)		
tenants	6.55 ^{**}	1.15 [*]	-0.97			0.95		0.86
standard errors	(1.45)	(0.47)	(0.50)			(0.39)		

equation 5 :

owners	4.62 ^{***}	0.89 ^{**}	0.13					0.68
standard errors	(0.59)	(0.18)	(0.15)					
tenants	5.71 ^{**}	1.29 [*]	-0.17					0.78
standard errors	(1.60)	(0.56)	(0.45)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 4C₂ : Results of production fits in different stages

West Bengal District 1, 1956

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertiliser and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	4.91***	1.01**	0.00			0.00		0.30
standard errors	(0.64)	(0.19)	(0.18)			(0.09)		
tenants	5.37	1.17	-0.59			0.50		0.76
standard errors	(2.30)	(0.92)	(0.98)			(0.76)		

equation 5 :

owners	4.91***	1.01*	0.01					0.60
standard errors	(0.63)	(0.19)	(0.17)					
tenants	4.93*	1.24	-0.17					0.50
standard errors	(2.64)	(0.89)	(0.72)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 5A, : Results of production/fits in different stages
West Bengal District 2, 1956

Linear with intercept

(Dependent variable : Total value of crop output)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	1.91	121.91 ***		1.30 *	-0.95	1.15 **	3.19 *	0.82
standard errors	(46.63)	(16.18)		(0.52)	(0.50)	(0.30)	(1.26)	
tenants	-174.58	165.30 *		1.98 *	2.50 *	0.52	6.27 *	0.96
standard errors	(55.44)	(52.76)		(0.70)	(1.09)	(0.36)	(2.26)	
<u>equation 2 :</u>								
owners	9.23	113.19 ***	0.08			1.36 **	3.60 *	0.77
standard errors	(51.68)	(17.73)	(0.47)			(0.33)	(1.39)	
tenants	-143.75	140.30 *	2.31 **			0.33	4.12	0.96
standard errors	(58.12)	(55.87)	(0.74)			(0.38)	(2.18)	
<u>equation 3 :</u>								
owners	13.37	128.57 ***	0.83 *			1.35 **		0.75
standard errors	(53.79)	(17.44)	(0.38)			(0.34)		
tenants	-146.79	209.03 **	1.72 *			0.77 *		0.95
standard errors	(61.68)	(44.89)	(0.72)			(0.32)		
<u>equation 4 :</u>								
owners	16.26	146.91 ***	2.74 **				-2.71	0.76
standard errors	(52.48)	(16.82)	(0.43)				(0.62)	
tenants	-124.48	145.51 **	2.96 ***				0.37	0.93
standard errors	(70.05)	(45.76)	(0.56)				(0.68)	
<u>equation 5 :</u>								
owners	28.37	140.74 ***	1.50 **					0.69
standard errors	(58.98)	(18.86)	(0.37)					
tenants	-130.36	153.20 **	2.97 **					0.93
standard errors	(68.01)	(40.72)	(0.55)					

* significant at 5%

** significant at 1 %

*** significant at 0.1 %

function

Table 5A₂ : Results of production/fits in different stages
West Bengal District 2, 1956

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	-79.74	52.52 **		1.46 **	1.89 **	-0.61	3.29 **	0.82
standard errors	(33.56)	(11.64)		(0.37)	(0.35)	(0.22)	(0.90)	
tenants	-123.59	61.81		1.93 **	1.35	-1.13 **	3.13 *	0.90
standard errors	(45.98)	(43.75)		(0.58)	(0.91)	(0.29)	(1.37)	
<u>equation 2 :</u>								
owners	-31.10	54.14 **	1.69 ***			-0.65 *	3.21 **	0.82
standard errors	(33.55)	(11.54)	(0.30)			(0.21)	(0.90)	
tenants	-111.41	51.93	2.06 **			-1.21 **	2.27	0.90
standard errors	(44.36)	(42.64)	(0.56)			(0.29)	(1.67)	
<u>equation 3 :</u>								
owners	-77.37	67.83 **	2.37 ***			-0.65 *		0.73
standard errors	(56.32)	(11.77)	(0.25)			(0.23)		
tenants	-113.09	39.32 *	1.74 **			-0.97 **		0.36
standard errors	(45.28)	(32.96)	(0.52)			(0.23)		
<u>equation 4 :</u>								
owners	-32.49	60.81 **	1.82 ***				0.49	0.79
standard errors	(38.03)	(12.19)	(0.31)				(0.45)	
tenants	-151.20	132.92 **	0.20				-1.09	0.33
standard errors	(56.82)	(37.15)	(0.46)				(0.55)	
<u>equation 5 :</u>								
owners	-84.70	61.94 ***	2.05 ***					0.76
standard errors	(38.03)	(12.16)	(0.24)					
tenants	-133.74	160.07 **	0.17					0.72
standard errors	(59.85)	(37.60)	(0.49)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
 Table 5B₁ : Results of production fits in different stages

West Bengal District 2, 1956

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	121.99 ^{***}		1.30 [*]	-0.95	1.15 ^{**}	3.19 [*]	0.0
standard errors	(15.92)		(0.50)	(0.48)	(0.30)	(1.26)	
tenants	116.65 [*]		2.17 [*]	1.03	0.40	5.82	0.0
standard errors	(57.95)		(0.81)	(1.25)	(0.41)	(2.63)	
<u>equation 2 :</u>							
owners	113.58 ^{***}	0.09			1.36 ^{**}	3.36 [*]	0.7
standard errors	(17.51)	(0.45)			(0.33)	(1.39)	
tenants	105.70	2.40 [*]			0.27		0.0
standard errors	(58.42)	(0.81)			(0.41)		
<u>equation 3 :</u>							
owners	147.68 ^{***}	2.73 ^{**}			-2.72 ^{**}		0.7
standard errors	(16.46)	(0.40)			(0.62)		
tenants	134.57 ^{***}	1.22 [*]			1.15 ^{**}		0.9
standard errors	(15.67)	(0.31)			(0.27)		
<u>equation 4 :</u>							
owners	147.68 ^{***}	2.73 ^{***}				-2.72	0.7
standard errors	(16.46)	(0.40)				(0.62)	
tenants	117.91 [*]	2.95 ^{**}				0.49	0.3
standard errors	(43.62)	(0.59)				(0.71)	
<u>equation 5 :</u>							
owners	142.05 ^{***}	1.55 ^{**}					0.6
standard errors	(18.48)	(0.33)					
tenants	126.59 ^{**}	2.96 ^{**}					0.3
standard errors	(41.25)	(0.58)					

* significant at 5%

** significant at 1%

*** significant at 0.1%

function
Table 5B₂ : Results of production fits in different stages

West Bengal District 2, 1956

Linear without intercept

(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
equation 1 :							
owners	49.07 **		1.31 **	1.75 **	-0.63 *	3.26 *	0.31
standard errors	(11.71)		(0.37)	(0.35)	(0.22)	(0.92)	
tenants	23.73		2.07 **	1.76	-1.22 **	2.80	0.33
standard errors	(46.27)		(0.65)	(1.00)	(0.33)	(2.10)	
equation 2 :							
owners	50.71 **	1.55 **			-0.67 *	3.18 *	0.31
standard errors	(11.62)	(0.30)			(0.22)	(0.92)	
tenants	25.11	2.14 **			-1.26 **	2.35	0.33
standard errors	(44.71)	(0.62)			(0.31)	(1.84)	
equation 3 :							
owners	64.46 **	2.22 **			-0.68 **		0.73
standard errors	(11.75)	(0.24)			(0.23)		
tenants	63.93	1.81 **			-1.01 **		0.37
standard errors	(33.23)	(0.57)			(0.25)		
equation 4 :							
owners	56.92 **	1.64 **				0.52	0.75
standard errors	(12.13)	(0.30)				(0.45)	
tenants	149.39 **	0.19				-0.94	0.79
standard errors	(37.39)	(0.51)				(0.61)	
equation 5 :							
owners	58.01 **	1.37 *					0.75
standard errors	(12.12)	(0.22)					
tenants	132.76 **	0.17					0.76
standard errors	(36.96)	(0.52)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 5C, : Results of production fits in different stages

West Bengal District 2, 1956

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of						R ²
		land	total	family	hired	seeds,	imple-	
		labour	labour	labour	labour	manures, fertilizer and irri- gation	ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	2.84*	0.25	0.24			0.41*		0.43
standard errors	(1.22)	(0.27)	(0.37)			(0.20)		
tenants	1.20	0.19	0.93*			0.08		0.97
standard errors	(0.73)	(0.19)	(0.22)			(0.10)		

equation 5 :

owners	1.93	0.27	0.77*					0.45
standard errors	(1.16)	(0.27)	(0.27)					
tenants	0.92	0.17	0.06					0.93
standard errors	(0.70)	(0.19)	(0.17)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 5C₂ : Results of production/fits in different stages

West Bengal District 2, 1956

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	0.97	0.55	0.91 **			-0.10		0.56
standard errors	(1.27)	(0.29)	(0.39)			(0.21)		
tenants	-2.17	0.76	2.48 *			-1.46 **		0.56
standard errors	(5.54)	(0.90)	(1.04)			(0.46)		
<u>equation 5 :</u>								
owners	1.19	0.55	0.78 *					0.55
standard errors	(1.18)	(0.28)	(0.28)					
tenants	2.44	1.06	0.33					0.34
standard errors	(3.84)	(1.07)	(0.94)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 6A, : Results of production/fit in different stages

Andhra Pradesh District 1, 1957

Linear with intercept

(Dependent variable : Total value of crop output)

equation	intercept	coefficient of					R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	-15.78	107.30 ^{**}		0.23	3.24 ^{**}	0.09	0.39
standard errors	(107.30)	(22.48)		(1.00)	(0.71)	(0.62)	(0.33)
tenants	-231.25	15.80		2.91	5.27 ^{***}	1.16	0.97
standard errors	(287.86)	(78.94)		(1.47)	(0.75)	(0.67)	(1.50)
<u>equation 2 :</u>							
owners	-210.94	113.86 ^{**}	2.26 ^{* *}			0.77	0.36
standard errors	(136.82)	(23.16)	(0.61)			(0.58)	(0.34)
tenants	311.72	-22.62	5.41 ^{***}			1.31	0.96
standard errors	(296.43)	(79.64)	(0.78)			(0.69)	(1.54)
<u>equation 3 :</u>							
owners	-187.38	113.78 ^{**}	2.50 ^{**}			0.69	0.36
standard errors	(136.38)	(23.18)	(0.59)			(0.58)	
tenants	-353.61	-32.71	5.18 ^{***}			1.24	0.96
standard errors	(269.80)	(72.99)	(0.74)			(0.63)	
<u>equation 4 :</u>							
owners	11.02	107.04 ^{**}	0.35			3.11 [*]	0.37
standard errors	(147.94)	(22.13)	(0.98)			(1.06)	
tenants	-368.99	29.93	3.56 [*]			2.61	0.96
standard errors	(267.36)	(76.98)	(1.46)			(1.38)	
<u>equation 5 :</u>							
owners	-194.32	110.63 ^{**}	3.08 ^{***}				0.35
standard errors	(136.63)	(23.19)	(0.33)				
tenants	-503.61	-18.69	6.14 ^{***}				0.96
standard errors	(271.39)	(76.61)	(0.57)				

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 6A₂ : Results of production fits in different stages

Andhra Pradesh District 1, 1957

Linear with intercept

Source: *Journal of Agricultural Economics*, 1958, 11, 1, 1-10.

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irriga- tion	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	72.05	95.50 **		-1.56	2.16 *	-1.67 *	0.62 *	
standard errors	(132.58)	(19.50)		(0.86)	(0.61)	(0.54)	(0.29)	
tenants	-348.34	149.07 *		1.29	-0.89	0.82	-0.08	
standard errors	(246.83)	(67.69)		(1.26)	(0.64)	(0.57)	(1.28)	
<u>equation 2 :</u>								
owners	-170.15	103.65 **	0.95			-0.82	0.70 *	
standard errors	(123.70)	(20.94)	(0.56)			(0.52)	(0.31)	
tenants	-273.62	184.75 *	-0.74			0.68	0.27	
standard errors	(256.92)	(68.49)	(0.67)			(0.60)	(1.34)	
<u>equation 3 :</u>								
owners	-134.18	103.52 **	1.32 *			-0.95		
standard errors	(126.01)	(21.51)	(0.55)			(0.53)		
tenants	-254.16	189.44 *	-0.78			0.71		
standard errors	(233.27)	(63.11)	(0.64)			(0.56)		
<u>equation 4 :</u>								
owners	34.05	105.09 **	-1.58				2.40	
standard errors	(140.79)	(21.06)	(0.94)				(1.01)	
tenants	-443.58	160.07 *	1.75				-2.01	
standard errors	(224.78)	(64.72)	(1.23)				(1.15)	
<u>equation 5 :</u>								
owners	-124.63	107.86 **	0.52					
standard errors	(127.69)	(21.67)	(0.31)					
tenants	-340.15	197.49 *	-0.23					
standard errors	(225.65)	(63.53)	(0.47)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Tablr 63, : Results of production fits in different stages

Andhra Pradesh District 1, 1957

Linear without intercept

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	106.97**		0.20	3.24**	0.08	0.39	
standard errors	(22.04)		(0.92)	(0.70)	(0.61)	(0.33)	
tenants	-5.12		2.77	5.26**	1.29	-0.49	
standard errors	(73.63)		(1.45)	(0.76)	(0.65)	(1.45)	
<u>equation 2 :</u>							
owners	109.86**	2.17**			0.73	0.43	
standard errors	(22.99)	(0.61)			(0.58)	(0.34)	
tenants	-54.31	5.08**			1.50	-1.02	
standard errors	(71.53)	(0.79)			(0.67)	(1.49)	
<u>equation 3 :</u>							
owners	110.21**	2.40**			0.70		
standard errors	(23.08)	(0.58)			(0.58)		
tenants	-32.52	5.22**			1.42		
standard errors	(58.60)	(0.76)			(0.65)		
<u>equation 4 :</u>							
owners						2.96	
standard errors						(1.38)	
tenants	-13.89	3.39*					
standard errors	(68.72)	(1.50)					
<u>equation 5 :</u>							
owners	106.85**	3.00***					
standard errors	(22.98)	(0.32)					
tenants	60.99	3.06**					
standard errors	(45.62)	(1.12)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 6B₂ : Results of production/fits in different stages
Andhra Pradesh District 1, 1957
Linear without intercept
(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures fertiliser and irrigation	implement	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	97.01 **		-1.44	2.14 *	-1.64 **	0.63 *	0.60
standard errors	(19.14)		(0.80)	(0.61)	(0.53)	(0.29)	
tenants	117.54 ***		1.08	-0.91	1.02	-0.53	0.54
standard errors	(1.29)		(1.29)	(0.67)	(0.57)	(1.27)	
<u>equation 2 :</u>							
owners	100.42 **	0.88			-0.81	0.67 *	0.61
standard errors	(20.76)	(0.55)			(0.53)	(0.31)	
tenants	156.94 *	-0.77			0.85	-0.11	0.60
standard errors	(62.38)	(0.69)			(0.58)	(1.29)	
<u>equation 3 :</u>							
owners	100.97 **	1.25			-0.94		0.59
standard errors	(21.27)	(0.54)			(0.54)		
tenants	153.78 **	-0.75			0.84		0.60
standard errors	(50.28)	(0.65)			(0.56)		
<u>equation 4 :</u>							
owners	105.74 **	-1.52				2.34 *	0.60
standard errors	(20.71)	(0.86)				(0.95)	
tenants	107.39 *	1.56				1.59	0.59
standard errors	(59.39)	(1.29)				(1.19)	
<u>equation 5 :</u>							
owners	105.44 **	0.46					-
standard errors	(21.41)	(0.30)					
tenants	148.74 *	-0.05					0.56
standard errors	(51.45)	(0.46)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 60₁ : Results of production/fits in different stages

Andhra Pradesh District 1, 1957

Log linear

(Dependent variable : Total value ^{of} crop output)

equations	intercept	coefficient of						R ²
		land	total	family	hired	seeds,	imple-	
		labour	labour	labour	labour	manures, fertilizer and irri- gation	ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	2.15 **	0.15	0.29			0.55 **		0.91
standard errors	(0.41)	(0.08)	(0.14)			(0.11)		
tenants	2.35 *	0.25	0.59 *			0.22		0.90
standard errors	(0.77)	(0.17)	(0.25)			(0.15)		
<u>equation 5 :</u>								
owners	1.87 *	0.15	0.87 ***					0.89
standard errors	(0.47)	(0.09)	(0.10)					
tenants	1.85 *	0.24	0.87 ***					0.90
standard errors	(0.70)	(0.17)	(0.15)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 6C₂ : Results of production/fits in different stages

Andhra Pradesh District 1, 1957

Log linear

Jointly significant at 5% level

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	2.61	0.29	-0.02			0.53		
standard errors	(1.79)	(0.35)	(0.63)			(0.43)		
tenants	1.91	1.07	0.25			0.07		
standard errors	(3.85)	(0.85)	(1.34)			(0.73)		

equation 5 :

owners	2.34	0.29	0.52					
standard errors	(1.73)	(0.35)	(0.38)					
tenants	1.75	1.07	0.34					
standard errors	(3.35)	(0.83)	(0.74)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 7A₁ : Results of production/fits in different stages

Andhra Pradesh District 1, 1959

Linear with intercept

(Dependent variable : Total value of crop output)

equation	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
equation 1 :								
owners	-6.52	55.22		1.73	8.84 ^{***}	-1.71	-0.70	0.39
standard errors	(252.09)	(39.32)		(2.62)	(1.07)	(0.88)	(0.39)	
tenants	-855.51	-26.72		6.67	7.96 ^{**}	0.60	2.02	0.97
standard errors	(289.24)	(59.60)		(2.01)	(1.68)	(1.11)	(1.00)	
equation 2 :								
owners	-521.70	48.96	9.18 ^{***}			-2.11	-0.73	0.37
standard errors	(204.81)	(42.31)	(1.15)			(0.94)	(0.42)	
tenants	-924.92	-39.22	7.58 ^{**}			0.84	2.28	0.97
standard errors	(270.62)	(56.33)	(1.58)			(1.05)	(0.92)	
equation 3 :								
owners	569.04	25.22	9.22 ^{**}			-2.15		0.37
standard errors	(206.70)	(40.78)	(1.17)			(0.96)		
tenants	-1006.27	-33.51	8.56 ^{**}			0.86		0.96
standard errors	(299.29)	(62.94)	(1.70)			(1.17)		
equation 4 :								
owners	-2.07	19.37	-0.50				7.85	0.33
standard errors	(261.66)	(38.32)	(2.48)				(2.36)	
tenants	-836.83	-16.01	6.93 ^{**}				2.66	0.96
standard errors	(300.36)	(60.15)	(1.84)				(1.64)	
equation 5 :								
owners	-574.35	7.90	7.35 ^{***}					0.35
standard errors	(213.94)	(41.45)	(0.84)					
tenants	-990.38	-49.91	9.70 ^{***}					0.96
standard errors	(295.38)	(58.44)	(0.70)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 7A₂ : Results of production/fits in different stages

Andhra Pradesh District 1, 1959

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of					seeds, manures, fertilizer and irrigation	imple- ments	R ²
		land	total labour	family labour	hired labour				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
<u>equation 1 :</u>									
owners	-293.26	-377.08 **		4.78	20.33 ***	-7.29 *	2.62 *		0.54
standard errors	(679.56)	(106.01)		(7.06)	(2.89)	(2.39)	(1.06)		
tenants	-527.33	-54.94		2.43	3.45	-0.03	1.72		0.36
standard errors	(267.75)	(55.17)		(1.86)	(1.55)	(1.03)	(0.92)		
<u>equation 2 :</u>									
owners	-1419.89	-390.78 ***	21.08 ***			-3.15 **	2.56 *		0.50
standard errors	(537.33)	(111.01)	(3.01)			(2.43)	(1.11)		
tenants	-532.51	-64.37	3.15 *			0.13	1.93 *		0.35
standard errors	(249.59)	(52.13)	(1.46)			(0.97)	(0.85)		
<u>equation 3 :</u>									
owners	-1255.28	-308.25 *	20.92 ***			-3.00 *			0.56
standard errors	(553.06)	(109.12)	(3.13)			(2.57)			
tenants	-651.43	-60.38	3.98 *			0.20			0.32
standard errors	(270.96)	(56.98)	(1.54)			(1.06)			
<u>equation 4 :</u>									
owners	25.43	-346.51 *	-3.89				17.84 *		0.54
standard errors	(750.34)	(109.89)	(7.13)				(6.77)		
tenants	-532.78	-38.91	2.19				1.99		0.33
standard errors	(273.77)	(54.82)	(1.67)				(1.50)		
<u>equation 5 :</u>									
owners	-1274.98	-372.57 **	13.94 ***						0.48
standard errors	(594.12)	(115.10)	(2.34)						
tenants	-647.58	-64.25	4.26 **						0.32
standard errors	(264.29)	(52.29)	(0.62)						

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 7B, : Results of production/fits in different stages

Andhra Pradesh District 1, 1959

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple-ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	55.21		1.70	8.83 ^{***}	-1.71	-0.70	0.39
standard errors	(39.22)		(2.23)	(1.05)	(0.88)	(0.39)	
tenants	-31.44		6.00 [*]	8.42	0.24	2.01	0.96
standard errors	(63.36)		(2.29)	(1.91)	(1.26)	(1.14)	
<u>equation 2 :</u>							
owners	45.27	8.84 ^{***}			-2.11 [*]	-0.80	0.37
standard errors	(43.42)	(1.16)			(0.97)	(0.43)	
tenants	-115.76	7.73 ^{**}			0.66	2.53	0.96
standard errors	(58.10)	(1.86)			(1.24)	(1.08)	
<u>equation 3 :</u>							
owners	18.81	8.85 ^{***}			-2.16 [*]		0.86
standard errors	(41.80)	(1.19)			(0.99)		
tenants	-177.36	8.85 ^{**}			0.67		0.94
standard errors	(63.98)	(1.98)			(1.36)		
<u>equation 4 :</u>							
owners	19.36	-0.50				7.85 ^{**}	0.33
standard errors	(38.30)	(2.07)				(2.03)	
tenants	-65.77	5.94 [*]				3.65	0.95
standard errors	(62.76)	(2.00)				(1.77)	
<u>equation 5 :</u>							
owners	1.31	6.96 ^{**}					0.85
standard errors	(42.49)	(0.84)					
tenants	-128.90	9.74 ^{**}					0.94
standard errors	(58.57)	(0.81)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 73₂ : Results of production/fit in different stages

Andhra Pradesh District 1, 1959

Linear without intercept

(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	-377.69*		3.54	20.15***	-7.25*	2.60*	0.64
standard errors	(106.11)		(6.02)	(2.84)	(2.39)	(1.05)	
tenants	-83.67		2.02	3.74	-0.22	1.72	0.84
standard errors	(54.60)		(1.97)	(1.65)	(1.09)	(0.98)	
<u>equation 2 :</u>							
owners	-400.85**	20.15**			-3.18*	2.38	0.57
standard errors	(114.14)	(3.36)			(2.55)	(1.13)	
tenants	-113.08*	3.25*			0.07	2.09	0.83
standard errors	(49.44)	(1.58)			(1.05)	(0.92)	
<u>equation 3 :</u>							
owners	-322.40*	20.11**			-3.05*		0.54
standard errors	(111.05)	(3.15)			(2.63)		
tenants	-114.40*	4.17*			0.08		0.78
standard errors	(54.10)	(1.67)			(1.15)		
<u>equation 4 :</u>							
owners	-346.43*	-3.78				17.75*	0.54
standard errors	(109.85)	(5.94)				(5.83)	
tenants	-70.59	1.56				2.62	0.81
standard errors	(54.13)	(1.72)				(1.53)	
<u>equation 5 :</u>							
owners	-337.19*	13.09**					0.46
standard errors	(116.80)	(2.31)					
tenants	-115.90*	4.29**					0.78
standard errors	(49.25)	(0.68)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 70, : Results of production ^{function} fits in different stages

Andhra Pradesh District 1, 1959

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of					imple- ments	R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	-1.31	-0.51**	1.26*			0.40		0.86
standard errors	(0.59)	(0.12)	(0.23)			(0.18)		
tenants	0.22	-0.06	0.91*			0.36		0.94
standard errors	(0.54)	(0.12)	(0.29)			(0.22)		

equation 5 :

owners	-1.34	-0.52	1.66***					0.85
standard errors	(0.61)	(0.12)	(0.13)					
tenants	-0.03	-0.13	1.33***					0.94
standard errors	(0.55)	(0.11)	(0.11)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
 Table 7C₂ : Results of production/fit in different stages

Andhra Pradesh District 1, 1959

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	-0.58	-0.04	0.47			0.62		0.23
standard errors	(2.29)	(0.49)	(0.90)			(0.73)		
tenants	-11.45	-0.36	1.30			1.54		0.63
standard errors	(3.61)	(0.81)	(1.95)			(1.52)		

equation 5 :

owners	-0.62	-0.05	1.10					0.22
standard errors	(2.29)	(0.49)	(0.52)					
tenants								0.61
standard errors								

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 3A, : Results of production/fits in different stages

Punjab District 1, 1955

Linear with intercept

(Dependent variable : Total value of crop output)

equations	inter- cept	land	total labour	coefficient of family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1:</u>								
owners	-95.25	0.83 **		0.35	1.79	3.06 *	-0.57	0.72
standard errors	(220.14)	(0.24)		(0.34)	(1.04)	(1.03)	(0.33)	
tenants	-64.90	99.31 **		1.23	2.06	0.29	0.54	0.85
standard errors	(155.81)	(31.63)		(0.96)	(1.00)	(1.41)	(0.24)	
<u>equation 2:</u>								
owners	-134.25	87.78 **	0.83			3.00	-0.47	0.71
standard errors	(212.57)	(24.32)	(0.77)			(1.04)	(0.32)	
tenants	-137.52	97.31 **	1.60			0.38	0.54	0.85
standard errors	(134.83)	(31.52)	(0.87)			(.41)	(0.24)	
<u>equation 3:</u>								
owners	-134.35	79.18 **	0.93			2.38 *		0.69
standard errors	(212.61)	(23.68)	(0.81)			(1.10)		
tenants	-193.93	64.00	1.65			2.28		0.84
standard errors	(137.65)		(0.91)			(1.16)		
<u>equation 4:</u>								
owners	29.30	90.80 **	1.52				1.14	0.66
standard errors	(233.40)	(24.68)	(0.81)				(1.10)	
tenants	-124.74	91.42 **	2.08 *				1.00	0.83
standard errors	(163.93)	(26.25)	(0.92)				(0.93)	
<u>equation 5:</u>								
owners	-48.31	96.11 **	1.89 *					0.65
standard errors	(221.36)	(24.17)	(0.72)					
tenants	-213.99	90.10 **	2.58 **					0.82
standard errors	(141.09)	(26.26)	(0.79)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 8A₂ : Results of production fits in different stages

Punjab District 1, 1955

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of					R ²	
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation		imple- ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	107.68	67.35*		0.28	-0.53	-0.77	0.15	0.26
standard errors	(224.34)	(24.74)		(0.86)	(1.06)	(1.05)	(0.33)	
tenants	32.40	-10.67		1.05	0.61	0.53	0.49	0.34
standard errors	(169.03)	(34.31)		(1.04)	(1.08)	(1.53)	(0.26)	
<u>equation 2 :</u>								
owners	158.45	64.82 *	0.01			-0.73	0.09	
standard errors	(213.34)	(24.41)	(0.78)			(1.05)	(0.32)	
tenants	70.50	-9.62	0.85			0.49	0.49	0.33
standard errors	(145.24)	(33.95)	(0.94)			(1.52)	(0.26)	
<u>equation 3 :</u>								
owners	143.03	66.62 *	-0.01			-0.60		0.25
standard errors	(203.35)	(23.43)	(0.76)			(0.95)		
tenants	13.54	-39.71	0.89			2.21		0.23
standard errors	(146.21)	(30.61)	(0.96)			(1.24)		
<u>equation 4 :</u>								
owners	76.32	65.75 *	-0.00				-0.73	0.25
standard errors	(216.58)	(22.90)	(0.75)				(1.02)	
tenants	-22.74	-14.81	1.92				-0.25	0.24
standard errors	(174.92)	(28.01)	(0.98)				(1.00)	
<u>equation 5 :</u>								
owners	126.28	62.34 *	-0.24					0.24
standard errors	(204.10)	(22.29)	(0.67)					
tenants	0.15	-14.47	1.79*					0.24
standard errors	(143.94)	(27.72)	(0.84)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 3B. Results of production/fit in different stages

Punjab District 1, 1955

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	79.52**		0.28	1.83	2.99*	-0.56	0.72
standard errors	(22.29)		(0.83)	(1.03)	(1.02)	(0.32)	
tenants	100.22**		1.07	2.04*	0.26	0.55*	0.35
standard errors	(31.53)		(0.85)	(1.00)	(1.41)	(0.24)	
<u>equation 2 :</u>							
owners	30.51**	0.76			2.34*	-0.43	0.70
standard errors	(22.63)	(0.73)			(1.03)	(0.32)	
tenants	93.73**	1.34			0.32	0.58*	0.35
standard errors	(31.72)	(0.82)			(1.42)	(0.24)	
<u>equation 3 :</u>							
owners	74.26**	0.92			2.30*		0.69
standard errors	(22.33)	(0.77)			(0.96)		
tenants	63.05*	1.27			2.37		0.35
standard errors	(29.23)	(0.86)			(1.13)		
<u>equation 4 :</u>							
owners	92.10**	1.55				1.10	0.66
standard errors	(21.92)	(0.76)				(1.05)	
tenants	91.34**	1.77				1.28	0.33
standard errors	(26.37)	(0.79)				(0.84)	
<u>equation 5 :</u>							
owners	94.08**	1.36					0.69
standard errors	(21.86)	(0.70)					
tenants	90.19*	2.20					0.32
standard errors	(26.70)	(0.75)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 88₂ : Results of production fits in different stages

Punjab District 1, 1955

Linear without intercept

(Dependent Variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	71.68 **		0.36	-0.57	-0.69	0.14	0.26
standard errors	(22.72)		(0.84)	(1.05)	(1.04)	(0.33)	
tenants	-22.13		1.13	0.62	0.55	0.43	0.34
standard errors	(34.22)		(0.92)	(1.08)	(1.53)	(0.26)	
<u>equation 2 :</u>							
owners	71.09 **	0.07			-0.59	0.06	0.24
standard errors	(22.67)	(0.78)			(1.03)	(0.32)	
tenants	-10.33	0.99			0.52	0.47	0.33
standard errors	(33.96)	(0.88)			(1.52)	(0.26)	
<u>equation 3 :</u>							
owners	72.04 **	0.04			-0.51		0.24
standard errors	(21.95)	(0.76)			(0.94)		
tenants	-39.62	0.93			2.20		0.23
standard errors	(33.61)	(0.90)			(1.23)		
<u>equation 4 :</u>							
owners	69.12 **	0.07				-0.83	0.25
standard errors	(23.63)	(0.71)				(0.97)	
tenants	-14.73	1.86				-0.20	0.24
standard errors	(23.01)	(0.84)				(0.89)	
<u>equation 5 :</u>							
owners	67.63 **	-0.16					0.24
standard errors	(23.22)	(0.65)					
tenants	-14.47	1.79 *					0.24
standard errors	(27.72)	(0.78)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 8C₁ : Results of production fits in different stages

Punjab District 1, 1955

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of					R ²	
		land	total labour	family labour	hired labour	seeds, manures, fertiliser and irri- gation		imple- ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	2.41**	0.48**	0.36 *			0.29		0.77
standard errors	(0.60)	(0.14)	(0.16)			(0.15)		
tenants	3.48**	0.54*	0.31			0.13		0.65
standard errors	(0.95)	(0.24)	(0.24)			(0.19)		
<u>equation 5 :</u>								
owners	2.79**	0.57**	0.54**					0.75
standard errors	(0.58)	(0.14)	(0.14)					
tenants	3.69**	0.61*	0.38					0.65
standard errors	(0.90)	(0.22)	(0.22)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
 Table 8C₂ : Results of production/fit in different stages

Punjab District 1, 1955

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	6.05	1.62	0.17			-0.90		0.13
standard errors	(3.12)	(0.76)	(0.85)			(0.93)		
tenants	3.08	-0.56	0.25			0.34		0.01
standard errors	(5.75)	(1.40)	(1.47)			(1.16)		
<u>equation 5 :</u>								
owners	4.89	1.36	-0.37					0.11
standard errors	(2.96)	(0.73)	(0.70)					
tenants	3.61	-0.38	0.42					0.01
standard errors	(5.43)	(1.33)	(1.35)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 9A : Results of production fits in different stages
Punjab District 2, 1955

Linear with intercept

(Dependent variable : Total value of crop output)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	-819.18	117.39 **		2.26	1.97	-1.55	0.75	0.69
standard errors	(549.21)	(24.97)		(1.16)	(1.25)	(0.97)	(0.43)	
tenants	189.00	33.64		2.54	3.62	0.60	-0.41	0.37
standard errors	(225.63)	(21.66)		(0.77)	(1.14)	(0.34)	(0.55)	
<u>equation 2 :</u>								
owners	-757.17	115.07 ***	2.13 *			-1.52	0.75	0.69
standard errors	(426.05)	(21.25)	(0.89)			(0.96)	(0.43)	
tenants	129.33	39.87	2.74 **			0.73	0.54	0.37
standard errors	(218.07)	(21.03)	(0.74)			(0.31)	(0.53)	
<u>equation 3 :</u>								
owners	-321.46	115.59 ***	2.35 *			-1.51		0.67
standard errors	(355.29)	(21.66)	(0.90)			(0.98)		
tenants	121.92	39.09	2.34 **			0.20		0.37
standard errors	(213.03)	(21.04)	(0.63)			(0.30)		
<u>equation 4 :</u>								
owners	-457.02	102.02 **	1.79				-0.36	0.66
standard errors	(517.85)	(23.02)	(1.12)				(1.64)	
tenants	-6.59	54.75 *	2.22 **				2.05	0.36
standard errors	(202.79)	(18.54)	(0.65)				(0.95)	
<u>equation 5 :</u>								
owners	-361.31	84.63 **	3.20 **					0.65
standard errors	(362.78)	(20.09)	(0.64)					
tenants	-44.65	47.49	5.56 *					0.67
standard errors	(419.99)	(61.75)	(1.80)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 9A₂ : Results of production fits in different stages

Punjab District 2, 1955

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	-39.08	30.08		1.08	-0.83	1.22	0.37	0.23
standard errors	(483.00)	(21.95)		(1.02)	(1.10)	(0.85)	(0.37)	
tenants	481.15	30.18		-0.40	-0.53	-0.01	0.17	0.17
standard errors	(213.33)	(20.96)		(0.74)	(1.10)	(0.33)	(0.53)	
<u>equation 2 :</u>								
owners	321.54	14.70	0.21			1.23	0.41	0.25
standard errors	(381.12)	(19.01)	(0.80)			(0.86)	(0.38)	
tenants	488.24	29.54	-0.42			-0.02	0.19	0.17
standard errors	(208.06)	(20.07)	(0.71)			(0.30)	(0.51)	
<u>equation 3 :</u>								
owners	560.51	14.98	0.33			1.23		0.23
standard errors	(312.30)	(19.04)	(0.79)			(0.86)		
tenants	490.84	29.47	-0.20			-0.05		0.17
standard errors	(205.52)	(19.83)	(0.59)			(0.29)		
<u>equation 4 :</u>								
owners	125.27	45.11	1.69				-2.12	0.24
standard errors	(445.67)	(19.81)	(0.96)				(1.41)	
tenants	486.48	29.68	-0.27				-0.24	0.17
standard errors	(186.33)	(17.04)	(0.60)				(0.83)	
<u>equation 5 :</u>								
owners	605.03	28.85	0.76					0.23
standard errors	(314.20)	(16.78)	(0.74)					
tenants	516.05	26.81	-0.29					0.17
standard errors	(150.79)	(13.36)	(0.58)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 93₁ : Results of production fits in different stages

Punjab District 2, 1955

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	103.52 **		1.48	2.48	-1.56	0.52	0.63
standard errors	(23.30)		(1.03)	(1.22)	(0.99)	(0.40)	
tenants	42.21 *		2.72 **	3.61 *	0.49	-0.42	0.37
standard errors	(18.46)		(0.73)	(1.15)	(0.31)	(0.56)	
<u>equation 2 :</u>							
owners	110.11 **	1.36 *			-1.62	0.40	0.67
standard errors	(21.51)	(0.90)			(0.98)	(0.37)	
tenants	44.45 *	2.84 **			0.63 *	-0.54	0.37
standard errors	(18.21)	(0.72)			(0.26)	(0.54)	
<u>equation 3 :</u>							
owners	112.58 *	2.15 *			-1.58		0.67
standard errors	(21.42)	(0.96)			(0.90)		
tenants	44.35 *	2.44 **			0.71 *		0.37
standard errors	(18.21)	(0.60)			(0.25)		
<u>equation 4 :</u>							
owners	92.30 **	1.42				0.51	0.65
standard errors	(19.79)	(0.37)				(1.24)	
tenants	54.54 **	2.22 **				2.06 *	0.36
standard errors	(17.04)	(0.60)				(0.83)	
<u>equation 5 :</u>							
owners	94.90 **	1.56					0.65
standard errors	(18.62)	(0.79)					
tenants	76.43 *	2.14 **					0.34
standard errors	(15.54)	(0.64)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 9B₂ : Results of production fits in different stages
Punjab District 2, 1955
Linear without intercept
(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	23.56		1.00	-0.78	1.21	0.35	0.28
standard errors	(20.13)		(0.89)	(1.05)	(0.85)	(0.35)	
tenants	52.12*		0.03	-0.55	-0.29	0.14	0.08
standard errors	(18.68)		(0.74)	(1.16)	(0.31)	(0.56)	
<u>equation 2 :</u>							
owners	16.80	0.32			1.32	0.56	0.25
standard errors	(18.90)	(0.79)			(0.86)	(0.32)	
tenants	50.63*	-0.04			-0.38	0.22	0.07
standard errors	(18.31)	(0.72)			(0.26)	(0.54)	
<u>equation 3 :</u>							
owners	20.22	0.70			1.39		0.20
standard errors	(19.13)	(0.77)			(0.87)		
tenants	50.67*	0.12			-0.41		0.07
standard errors	(18.11)	(0.59)			(0.24)		
<u>equation 4 :</u>							
owners	47.78*	1.85*				-2.36	0.24
standard errors	(16.94)	(0.74)				(1.06)	
tenants	44.81*	0.25				-1.22	0.06
standard errors	(16.70)	(0.59)				(0.81)	
<u>equation 5 :</u>							
owners	35.82*	1.21					0.17
standard errors	(16.62)	(0.71)					
tenants	31.80*	0.29					
standard errors	(14.53)	(0.60)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table C₁ : Results of production fits in different stages

Punjab District 2, 1955

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	3.33**	0.51**	0.41*			0.05		0.67
standard errors	(0.62)	(0.14)	(0.16)			(0.16)		
tenants	2.69**	0.23	0.19			0.52		0.75
standard errors	(0.61)	(0.17)	(0.17)			(0.20)		

equation 2 :

owners	3.42**	0.53**	0.44**					0.67
standard errors	(0.57)	(0.12)	(0.13)					
tenants	3.16**	0.34	0.48**					0.70
standard errors	(0.62)	(0.14)	(0.14)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 9C₂ : Results of production/ite in different stages

Punjab District 2, 1955

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired bour	seeds, manures, fertilizer and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	5.54	1.62	-0.91			0.32		0.16
standard errors	(2.85)	(0.65)	(0.72)			(0.73)		
tenants	1.36	-0.62	-0.81			1.96		0.10
standard errors	(3.77)	(1.08)	(1.06)			(1.25)		
<u>equation 5 :</u>								
owners	6.01	1.74*	-0.72					0.16
standard errors	(2.62)	(0.59)	(0.59)					
tenants	2.82	0.53	0.26					0.04
standard errors	(3.67)	(0.81)	(0.82)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function

Table 10A₁: Results of production/fits in different stages

Punjab District 1, 1956

Linear with intercept

(Dependent variable : Total value of crop output)

equations	inter- cept	land	total labour	coefficient of family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	79.06	2.75**		1.51	1.80	-0.09	-76.66	0.31
standard errors	(22.02)	(0.77)		(0.92)	(0.97)	(0.18)	(154.93)	
tenants	5.53	3.73		4.30	3.70	-1.07	-11.43	0.59
standard errors	(68.39)	(2.60)		(4.38)	(2.72)	(1.11)	(528.99)	
<u>equation 2 :</u>								
owners	72.80	2.55**	1.87			-0.13	12.03	0.31
standard errors	(21.77)	(0.72)	(0.93)			(0.18)	(143.48)	
tenants	6.86	3.84	3.66			-1.06	-32.18	0.58
standard errors	(64.80)	(2.49)	(2.65)			(1.09)	(507.31)	
<u>equation 3 :</u>								
owners	71.59	2.27**	1.85			21.70		0.30
standard errors	(21.59)	(0.71)	(0.97)			(142.45)		
tenants	17.72	3.26	3.86			-259.90		0.57
standard errors	(65.80)	(2.42)	(2.64)			(450.74)		
<u>equation 4 :</u>								
owners	95.86	3.40**	-1.56				-10.28	0.30
standard errors	(20.06)	(0.67)	(0.85)				(152.54)	
tenants	46.59	5.50*	0.17				-250.68	0.53
standard errors	(64.90)	(1.96)	(2.99)				(401.32)	
<u>equation 5 :</u>								
owners	84.63	3.20*	47.49					0.30
standard errors	(20.09)	(0.64)	(61.75)					
tenants	47.49	5.55*	-256.76					0.53
standard errors	(61.75)	(1.83)	(460.42)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 10A₂ : Results of production fits in different stages

Punjab District 1, 1956

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	-71.44	61.71*		2.07*	-2.95*	0.91	-0.04	0.43
standard errors	(176.84)	(25.13)		(0.87)	(1.05)	(1.11)	(0.20)	
tenants	-3.70	64.19*		-3.28*	-5.64**	3.78*	0.26	0.61
standard errors	(188.58)	(24.3)		(0.93)	(1.24)	(0.97)	(0.39)	
<u>equation 2 :</u>								
owners	290.55	36.16	0.43			1.21	-0.20	0.26
standard errors	(191.54)	(29.06)	(0.96)			(1.31)	(0.23)	
tenants	78.00	50.26	-3.73			3.95	0.24	0.52
standard errors	(199.57)	(25.49)	(0.98)			(1.04)	(0.42)	
<u>equation 3 :</u>								
owners	304.82	34.33	0.32			1.14		0.25
standard errors	(190.37)	(28.92)	(0.95)			(1.30)		
tenants	130.64	47.75	-3.60			3.90*		0.52
standard errors	(175.07)	(24.78)	(0.94)			(1.02)		
<u>equation 4 :</u>								
owners	-37.30	70.30**	2.40				-5.09**	0.47
standard errors	(170.39)	(22.41)	(0.75)				(0.95)	
tenants	38.96	91.95**	-0.87				-2.68	0.35
standard errors	(208.32)	(28.09)	(0.85)				(1.29)	
<u>equation 5 :</u>								
owners	349.98	45.41	0.75					0.25
standard errors	(183.00)	(26.01)	(0.82)					
tenants	133.83	77.87*	-1.27					0.24
standard errors	(215.63)	(28.92)	(0.88)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 10B, : Results of production/fits in different stages

Punjab District 1, 1956

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficients of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	77.35**		2.63**	1.53	1.71	-0.09	0.31
standard errors	(21.70)		(0.75)	(0.91)	(0.95)	(0.18)	
tenants	2.93		3.73	4.30	3.70	-1.08	0.59
standard errors	(61.97)		(2.59)	(3.47)	(2.72)	(1.03)	
<u>equation 2 :</u>							
owners	72.99**	2.35**			1.89	-0.13	-
standard errors	(21.62)	(0.72)			(0.95)	(0.17)	
tenants	5.34	3.83			3.65	-1.09	0.58
standard errors	(59.56)	(2.48)			(2.65)	(0.98)	
<u>equation 3 :</u>							
owners	71.91**	2.29*			1.86		0.80
standard errors	(21.51)	(0.71)			(0.94)		
tenants	5.46	3.00			3.85		0.56
standard errors	(59.84)	(2.38)			(2.66)		
<u>equation 4 :</u>							
owners	95.51**	3.38 *				-1.34	0.80
standard errors	(19.51)	(0.63)				(0.78)	
tenants	33.66	5.24 *				0.46	0.53
standard errors	(59.40)	(1.88)				(2.94)	
<u>equation 5 :</u>							
owners	91.99**	3.05**					0.79
standard errors	(19.30)	(0.60)					
tenants	35.33	5.30 *					0.53
standard errors	(57.35)	(1.82)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function

Table 10B₂ : Results of production fits in different stages

Punjab District 1, 1956

Linear without intercept

(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	60.12**		2.00	-2.90	0.83	-0.04	0.40
standard errors	(24.76)		(0.86)	(1.04)	(1.09)	(0.20)	
tenants	63.75		-3.28	-5.64	3.78	0.25	0.61
standard errors	(22.10)		(0.92)	(1.23)	(0.96)	(0.36)	
<u>equation 2 :</u>							
owners	40.63*	0.56			1.62	-0.22	0.24
standard errors	(29.24)	(0.97)			(1.29)	(0.24)	
tenants	53.95*	-3.71			3.96	0.31	0.52
standard errors	(23.49)	(0.98)			(1.04)	(0.38)	
<u>equation 3 :</u>							
owners	38.87	0.44			1.57		0.23
standard errors	(29.15)	(0.96)			(1.28)		
tenants	53.91*	-3.47			3.91		0.51
standard errors	(23.33)	(0.93)			(1.03)		
<u>equation 4 :</u>							
owners	68.99*	2.35				-5.02	0.47
standard errors	(21.40)	(0.70)				(0.83)	
tenants	93.96*	-0.83				-2.72	0.35
standard errors	(25.61)	(0.81)				(1.27)	
<u>equation 5 :</u>							
owners	55.87*	1.08					0.22
standard errors	(25.73)	(0.81)					
tenants	84.20**	-1.14					0.23
standard errors	(26.39)	(0.85)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 10C₁ : Results of production fits in different stages

Punjab District 1, 1956

Log linear

(Dependent variable: Total value of crop output)

equations	intercept	coefficient of					imple- ments	R ²
		land	total	family	hired	seeds, manures, fertilizer and irri- gation		
		labour	labour	labour	labour			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	3.44 ^{**}	0.60 ^{**}	0.43 [*]			0.03		0.75
standard errors	(0.59)	(0.13)	(0.16)			(0.16)		
tenants	2.47 ^{**}	0.36	0.21			0.53 [*]		0.72
standard errors	(0.61)	(0.21)	(0.22)			(0.23)		
<u>equation 5 :</u>								
owners	3.48 ^{***}	0.61 ^{**}	0.45 ^{**}					0.74
standard errors	(0.53)	(0.12)	(0.12)					
tenants	3.23 ^{**}	0.55 [*]	0.52 [*]					0.66
standard errors	(0.79)	(0.21)	(0.19)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 10C₂ : Results of production fits in different stages

Punjab District 1, 1956

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of				seeds, manures, fertilizer and irri- gation	imple- ments	R ²
		land	total labour	family labour	hired labour			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	6.84 *	2.34 *	0.12			-1.19		0.24
standard errors	(2.91)	(0.65)	(0.81)			(0.83)		
tenants	10.18	0.46	-2.84			1.90		0.13
standard errors	(5.50)	(1.48)	(1.50)			(1.60)		
<u>equation 5 :</u>								
owners	5.20	1.95 *	-0.60					0.22
standard errors	(2.70)	(0.61)	(0.64)					
tenants	12.91 *	1.13	-1.74					0.08
standard errors	(5.04)	(1.38)	(1.19)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Table 11A, : Results of production fits in different stages
Punjab District 2, 1956

Linear with intercept

equations	inter- cept	land	total labour	family labour	hired labour	seeds, manures, fertilizer and irriga- tion	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	-736.33	137.92 ^{***}		2.26	2.79	0.10	0.42	
standard errors	(479.67)	(22.22)		(1.57)	(1.51)	(0.22)	(0.59)	
tenants	744.33	-11.39		2.45	2.59	0.92	2.23	
standard errors	(336.42)	(22.16)		(0.78)	(1.64)	(0.65)	(0.60)	
<u>equation 2 :</u>								
owners	-377.54	141.69 ^{***}	2.55			0.10	0.54	
standard errors	(336.54)	(18.34)	(1.23)			(0.21)	(0.54)	
tenants	722.25	-10.71	2.45 ^{**}			0.95	2.23	
standard errors	(231.97)	(17.96)	(0.77)			(0.58)	(0.59)	
<u>equation 3 :</u>								
owners	-323.41	141.71 ^{***}	2.84 [*]			0.09		
standard errors	(376.95)	(18.73)	(1.21)			(0.21)		
tenants	1020.71	-11.94	3.75 ^{**}			0.79		
standard errors	(252.32)	(20.33)	(0.83)			(0.67)		
<u>equation 4 :</u>								
owners	-367.92	141.03 ^{***}	3.39				0.01	
standard errors	(457.94)	(21.49)	(1.21)				(1.49)	
tenants	1155.35	-7.32	4.01 ^{***}				0.55	
standard errors	(343.35)	(25.69)	(0.78)				(1.57)	
<u>equation 5 :</u>								
owners	-370.76	141.18 ^{***}	3.10 [*]					
standard errors	(363.01)	(18.56)	(1.06)					
tenants	1070.49	-1.20	4.07 ^{***}					
standard errors	(250.50)	(18.82)	(0.76)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 11A₂ : Results of production/fits in different stages

Punjab District 2, 1956

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of					R ²	
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation		imple- ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	-676.21	111.63**		1.19	-1.19	-0.11	0.45	0.53
standard errors	(435.59)	(22.49)		(1.59)	(1.53)	(0.22)	(0.59)	
tenants	419.96	10.43		0.80	-0.64	-0.01	0.81	0.36
standard errors	(210.03)	(13.83)		(0.49)	(1.02)	(0.40)	(0.37)	
<u>equation 2 :</u>								
owners	-269.23	94.84**	-0.08			-0.08	0.78	0.56
standard errors	(393.61)	(19.42)	(1.33)			(0.22)	(0.55)	
tenants	650.66	-1.67	0.74			-0.28	0.86	0.31
standard errors	(149.47)	(11.57)	(0.49)			(0.37)	(0.38)	
<u>equation 3 :</u>								
owners	-153.45	94.90**	0.57			-0.09		0.54
standard errors	(394.43)	(19.60)	(1.26)			(0.22)		
tenants	765.77	-2.15	1.24			-0.34		0.22
standard errors	(147.75)	(12.17)	(0.47)			(0.39)		
<u>equation 4 :</u>								
owners	-637.60	115.22**	1.41				-2.81	0.55
standard errors	(464.33)	(21.79)	(1.23)				(1.51)	
tenants	494.64	11.20	1.27				-1.64	0.27
standard errors	(193.51)	(14.27)	(0.43)				(0.87)	
<u>equation 5 :</u>								
owners	-119.93	95.38	0.33					0.54
standard errors	(379.67)	(19.42)	(1.11)					
tenants	744.22	-6.30	1.10					0.21
standard errors	(145.23)	(10.91)	(0.44)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 11B : Results of production/fits in different stages

Punjab District 2, 1956

Linear without intercept

(Dependent variable : Total value of crop output)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	126.61 ***		0.87	2.73	0.18	0.48	0.31
standard errors	(21.36)		(1.30)	(1.54)	(0.21)	(0.60)	
tenants	10.79		2.57 *	0.73	1.43 *	2.44 **	0.71
standard errors	(20.13)		(0.82)	(1.43)	(0.63)	(0.62)	
<u>equation 2 :</u>							
owners	138.50 ***	1.48			0.19	0.16	0.31
standard errors	(19.47)	(1.22)			(0.21)	(0.55)	
tenants	-0.39	2.52			1.18	2.67 **	0.81
standard errors	(19.06)	(0.84)			(0.62)	(0.61)	
<u>equation 3 :</u>							
owners	138.60 ***	1.64			0.18		0.31
standard errors	(19.30)	(1.07)			(0.21)		
tenants	3.55	4.25			1.09		0.54
standard errors	(23.55)	(0.89)			(0.75)		
<u>equation 4 :</u>							
owners	128.34 ***	1.81				1.42	0.81
standard errors	(20.75)	(0.99)				(1.28)	
tenants	37.97	4.75				-2.28	0.54
standard errors	(22.84)	(0.82)				(1.38)	
<u>equation 5 :</u>							
owners	137.24 ***	2.64					0.30
standard errors	(19.19)	(0.97)					
Tenants	19.83	4.73					0.51
standard errors	(20.44)	(0.84)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 11B : Results of production/fit in different stages
 Punjab District 2, 1956
 Linear without intercept
 (Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds, manures, fertiliser and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	101.90**		0.00	-1.25	-0.05	0.50	0.56
standard errors	(21.50)		(1.31)	(1.55)	(0.21)	(0.60)	
tenants	25.23		0.37	-1.63	0.27	0.93	0.50
standard errors	(12.45)		(0.51)	(0.33)	(0.39)	(0.38)	
<u>equation 2 :</u>							
owners	93.86**	-0.41			-0.06	0.72	0.56
standard errors	(19.42)	(1.22)			(0.21)	(0.54)	
tenants	7.61	0.33			-0.07	1.26	0.60
standard errors	(13.16)	(0.58)			(0.43)	(0.42)	
<u>equation 3 :</u>							
owners	94.30**	0.34			-0.07		0.54
standard errors	(19.55)	(1.09)			(0.21)		
tenants	9.47	1.62			-0.11		-
standard errors	(14.41)	(0.56)			(0.47)		
<u>equation 4 :</u>							
owners	105.87**	0.47				-1.77	0.56
standard errors	(20.77)	(0.99)				(1.23)	
tenants	30.59*	1.58				-2.86	0.17
standard errors	(12.19)	(0.44)				(0.73)	
<u>equation 5 :</u>							
owners	94.03**	0.18					0.54
standard errors	(19.33)	(0.98)					
tenants	7.80	1.57					-
standard errors	(12.45)	(0.51)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 110, : Results of production fits in different stages

Punjab District 2, 1956

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of					R ²	
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irri- gation		imple- ments
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

equation 3 :

owners	3.32 ^{***}	0.55 ^{***}	0.39 ^{**}			0.10		0.84
standard errors	(0.44)	(0.09)	(0.11)			(0.08)		
tenants	3.19 ^{***}	0.10	0.62 ^{***}			0.10		0.73
standard errors	(0.55)	(0.13)	(0.12)			(0.12)		

equation 5 :

owners	3.39 ^{***}	0.59 ^{***}	0.47 ^{**}					0.84
standard errors	(0.44)	(0.08)	(0.10)					
tenants	3.44 ^{**}	0.14 ^{**}	0.67 ^{***}					0.72
standard errors	(0.46)	(0.12)	(0.11)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 11C₂ : Results of production fits in different stages

Punjab District 2, 1956

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of					imple- ments	R ²
		land	total labour	family labour	hired labour	seeds, manures, fertiliser and irri- gation		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	5.00	0.57	-0.17			0.26		0.13
standard errors	(1.93)	(0.40)	(0.51)			(0.36)		
tenants	3.83	0.19	0.41			-0.01		0.26
standard errors	(1.07)	(0.26)	(0.24)			(0.24)		
<u>equation 5 :</u>								
owners	5.16	0.66	0.02					0.12
standard errors	(1.91)	(0.37)	(0.43)					
tenants	3.84	0.19	0.40					0.26
standard errors	(0.89)	(0.24)	(0.21)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 12A, : Results of production/fits in different stages

Punjab District 2, 1970

Linear with intercept

(Dependent variable : Total value of crop output)

equations	inter- cept	coefficient of					imple- ments	R ²
		land	total labour	family labour	hired labour	seeds, manures, fertiliser and irriga- tion		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 1 :</u>								
owners	250.38	884.25***		0.43	0.67*	1.99***	-0.04	
standard errors	(1293.55)	(117.42)		(0.32)	(0.29)	(0.33)	(0.09)	
tenants	5730.88	-574.71		1.78*	3.74*	-0.07	0.04	
standard errors	(4009.56)	(605.50)		(0.65)	(1.05)	(1.06)	(0.07)	
<u>equation 2 :</u>								
owners	-118.33	910.02***	0.57*			2.02***	-0.04	0.87
standard errors	(1198.75)	(112.32)	(0.26)			(0.33)	(0.09)	
tenants	7818.53	-1036.17	2.24**			1.01	0.12	0.82
standard errors	(4220.96)	(599.80)	(0.65)			(0.94)	(0.07)	
<u>equation 3 :</u>								
owners	-95.37	919.77***	0.57*			1.91***		0.87
standard errors	(1194.17)	(110.09)	(0.26)			(0.25)		
tenants	7731.95	-764.18	2.00*			1.18		0.76
standard errors	(4611.82)	(632.04)	(0.69)			(1.03)		
<u>equation 4 :</u>								
owners	-3597.21	1095.41***	1.41**				0.47	0.81
standard errors	(1414.73)	(134.40)	(0.34)				(0.38)	
tenants	5698.01	-464.51	1.59*				2.20**	0.86
standard errors	(3286.18)	(470.05)	(0.51)				(0.70)	
<u>equation 5 :</u>								
owners	-4387.76	1150.26***	1.70***					0.81
standard errors	(1267.73)	(127.28)	(0.26)					
tenants	5934.39	-609.79	2.44**					0.73
standard errors	(4399.62)	(626.39)	(0.59)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 12A₂ : Results of production/fits in different stages

Punjab District 2, 1970

Linear with intercept

(Dependent variable : Farm Business Income)

equations	inter- cept	coefficient of					R ²
		land	total labour	family labour	hired labour	seeds, imple- manures, ments fertilizer and irrigation	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	-580.10	918.27 ***		0.10	-0.57	1.45 **	0.72
standard errors	(1296.21)	(117.66)		(0.32)	(0.29)	(0.33)	(0.09)
tenants	2647.93	-145.53		1.08	2.82 **	-1.48	0.74
standard errors	(2357.76)	(431.56)		(0.46)	(0.74)	(0.76)	(0.05)
<u>equation 2 :</u>							
owners	433.77	847.41 ***	-0.28			1.39	0.71
standard errors	(1219.12)	(114.23)	(0.26)			(0.33)	(0.09)
tenants	4500.72	-555.08	1.49			-0.51	0.60
standard errors	(3225.07)	(458.28)	(0.49)			(0.72)	(0.05)
<u>equation 3 :</u>							
owners	496.38	874.02 ***	-0.28			1.11 *	0.70
standard errors	(1221.04)	(112.56)	(0.26)			(0.25)	
tenants	4494.81	-536.52	1.47			-0.50	0.60
standard errors	(3063.33)	(419.83)	(0.46)			(0.68)	
<u>equation 4 :</u>							
owners	-2873.46	1068.69 ***	0.69			-0.52	0.27
standard errors	(1280.42)	(121.64)	(0.31)			(0.34)	
tenants	5202.11	-563.33	1.06			0.59	0.61
standard errors	(2826.22)	(404.26)	(0.44)			(0.60)	
<u>equation 5 :</u>							
owners	-1998.38	1007.98 ***	0.37				0.66
standard errors	(1150.76)	(115.54)	(0.23)				
tenants	5266.30	-602.78	1.28				0.57
standard errors	(2821.61)	(401.72)	(0.37)				

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

Function
Table 12B₁: Results of production fits in different stages

Punjab District 2, 1970

Linear without intercept

(Dependent variable : Total value of crop output)

equations	land	total labour	coefficient of family labour	hired labour	seeds, manures, fertilizer and irri- gation	imple- ments	R ²
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	888.10 ***		0.47 *	0.69 *	1.98 **	-0.04	0.87
standard errors	(115.39)		(0.22)	(0.27)	(0.32)	(0.09)	
tenants	7.09		1.71 *	4.10 **	-0.65	0.02	0.84
standard errors	(465.71)		(0.71)	(1.12)	(1.07)	(0.08)	
<u>equation 2 :</u>							
owners	909.04 ***	0.55 *			2.03 ***	-0.04	0.87
standard errors	(111.78)	(0.19)			(0.31)	(0.09)	
tenants	-323.42	2.29 *			0.50	0.11	0.76
standard errors	(500.51)	(0.75)			(1.04)	(0.08)	
<u>equation 3 :</u>							
owners	918.93 ***	0.55 *			1.92 ***		0.87
standard errors	(109.46)	(0.19)			(0.22)		
tenants	-62.24	2.05 **			0.67		0.70
standard errors	(494.37)	(0.77)			(1.09)		
<u>equation 4 :</u>							
owners	1057.67 ***	0.89 **				0.82	0.80
standard errors	(136.04)	(0.27)				(0.35)	
tenants	57.21	1.47				2.22	0.83
standard errors	(378.85)	(0.57)				(0.79)	
<u>equation 5 :</u>							
owners	1153.95 ***	1.26 **					0.79
standard errors	(131.70)	(0.22)					
tenants	-67.82	2.32 **					0.69
standard errors	(400.25)	(0.62)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 12B₂ : Results of production/fits in different stages

Punjab District 2, 1970

Linear without intercept

(Dependent variable : Farm Business Income)

equations	coefficient of						R ²
	land	total labour	family labour	hired labour	seeds manures, fertilizer and irrigation	implements	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>equation 1 :</u>							
owners	909.35***		0.01	-0.62*	1.43**	-0.12	0.72
standard errors	(115.69)		(0.22)	(0.27)	(0.32)	(0.09)	
tenants	123.23		1.05	2.93**	-1.75*		0.72
standard errors	(313.86)		(0.48)	(0.75)	(0.72)		
<u>equation 2 :</u>							
owners	851.01***	-0.22			1.36**	-0.12	0.34
standard errors	(113.72)	(0.20)			(0.32)	(0.09)	
tenants	-144.78	1.52*			-0.81	0.01	0.72
standard errors	(361.35)	(0.54)			(0.75)	(0.05)	
<u>equation 3 :</u>							
owners	878.41***	-0.22			1.07**		0.70
standard errors	(111.98)	(0.20)			(0.23)		
tenants	-128.46	1.50*			-0.80		0.52
standard errors	(320.78)	(0.50)			(0.70)		
<u>equation 4 :</u>							
owners	1038.54***	0.28				-0.24	0.65
standard errors	(122.59)	(0.24)				(0.32)	
tenants	-87.01	0.94				0.62	0.50
standard errors	(330.01)	(0.50)				(0.69)	
<u>equation 5 :</u>							
owners	1009.66***	0.17					0.65
standard errors	(116.56)	(0.19)					
tenants	-121.83	1.18*					0.46
standard errors	(324.88)	(0.42)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function

Table 12C₁ : Results of production/fits in different stages

Punjab District 2, 1970

Log linear

(Dependent variable : Total value of crop output)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertilizer and irrigation	imple-ment	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	4.22	0.49 ^{***}	0.19 [*]			0.34 ^{***}		0.85
standard errors	(0.60)	(0.06)	(0.09)			(0.05)		
tenants	0.53	-0.17	0.95 [*]			0.13		0.80
standard errors	(2.43)	(0.54)	(0.43)			(0.17)		
<u>equation 5 :</u>								
owners	3.37	0.61 ^{***}	0.56 ^{***}					0.79
standard errors	(0.69)	(0.07)	(0.09)					
tenants	0.20	-0.12	1.10 ^{**}					0.78
standard errors	(2.34)	(0.53)	(0.38)					

* significant at 5 %

** significant at 1 %

*** significant at 0.1 %

function
Table 120₂ : Results of production/fit in different stages

Punjab District 2, 1970

Log linear

(Dependent variable : Farm Business Income)

equations	intercept	coefficient of						R ²
		land	total labour	family labour	hired labour	seeds, manures, fertiliser and irri- gation	imple- ments	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<u>equation 3 :</u>								
owners	1.97	0.78**	0.30			0.32		0.43
standard errors	(2.14)	(0.24)	(0.34)			(0.18)		
tenants	-3.04	-0.40	1.44*			0.00		0.72
standard errors	(3.47)	(0.77)	(0.62)			(0.24)		
<u>equation 5 :</u>								
owners	1.16	0.69**	0.65*					0.41
standard errors	(2.12)	(0.24)	(0.28)					
tenants	-3.05	-0.39	1.45†					0.72
standard errors	(3.24)	(0.73)	(0.53)					

* significant at 5 %

** significant at 1 %

*** significant at 0.5 %

Chapter VII

Economic Differences under Different Forms of
Tenure — Results of Some Statistical Tests

In this chapter we shall carry out tests separately for different size groups. We shall, however, not proceed to compare production function fits as we did in the last chapter. This would not be possible given the small number of observations that would correspond to the different classes that would be defined by the intersection of size classification and tenurial classification. We have therefore taken recourse to comparing the average variable values for the two tenurial classes (as defined in the previous chapter) for the same size group. The individual farms in each social class are grouped into three size classes : 0-5 acres, 5-10 acres and 10 acres and above, to take care of any possible size effects. The data used are the same as in the previous chapter.

Now to assess the relative effectiveness of tenancy system we have considered 15 variables relating to different aspects of farm economics. They are -

- | | | |
|---|---|---|
| A. variables relating to costs and benefits | : | (1) value of yield per acre
(2) intensity of cropping
(3) total cost of production (actual plus imputed) per acre
(4) ratio of imputed cost to actual cost
(5) farm business income |
| B. variables referring to material inputs | : | (6) value of manure and fertilizer inputs per acre
(7) value of seed inputs per acre |

C. variables referring to
land and capital

- : (8) input of bullock labour days per acre
- (9) ratio of hired bullock labour days to owned bullock labour days
- (10) expenditure on maintenance of implements
- (11) irrigation charges per acre
- (12) proportion of net irrigated area to net sown area
- (13) number of fragments per acre

D. variables relating to
labour input

- : (14) input of human labour in man days per acre
- (15) ratio of hired labour to family labour.

To judge the relative effectiveness of tenancy system the F-test we carry out is the test for the equality of two population means with respect to each of the 15 variables, for the two classes of farmers, separately for each of the three size classes. The method we follow is to carry out One-Way Analysis of Variance (or equivalently, Fisher's F-test) for the equality of the sample means. If we consider the results of F-tests alone we see that only one variable appears to differ systematically between owners and tenants and that is the 'Ratio of Imputed Cost to Actual Cost'. Another variable that shows a somewhat systematic pattern in the matter of significance of test results is 'Farm Business Income per Acre'. Also in the cases of 'Irrigation Charges per Acre' and 'Expenditure on the Maintenance of Implements' we see a somewhat systematic pattern in this respect. Excepting these variables none other variable significantly differs among the classes in any uniform fashion. Thus, in the case

the expected variable values are the same for owners and tenants. The answer to this question is given by the sequential binomial formula

$$\sum_{r=m}^n nC_r \left(\frac{1}{2}\right)^r$$

The results of this tests are presented in the same tables from 1 to 15. It is seen that, in the size class 0-5 acres the number of cases in which tenants are with a lower value of particular variable is significantly high in the cases of the variables, although for higher size classes, in most of these cases, we do not find that the tenants are with larger (or smaller) average value for a particular variable in a predominantly large number of cases. Now we find it also useful to see how these results vary among the different classes of variables.

Variables referring to costs and benefits
(tables 1 to 5)

If we consider the variables referring to costs and benefits we see that in the size class 0-5 acres for two variables, e.g., yield per acre and intensity of cropping the average values are lower for the tenants than the owners in significantly large number of cases. For two other variables e.g., 'Total cost of production per acre' and 'Farm business income per acre' the number of cases in which the tenants are with higher (or lower) average value is not significant even in the size class 0-5 acres. In the case of 'Ratio of imputed cost to actual cost' in all size classes, the number of cases in which the average value is higher for the tenants is significantly high. From all this we see that one can not say the tenants always incur a less amount of cost and get a lower return

in comparison with the owners. However, we see in the smallest size class yield per acre is generally lower for the tenants; again Farm business income, which is gross value of production less of all types of imputed and actual expenditures, is not lower in significantly large number of cases, but in most of the cases in which it is lower, the difference is significantly large not only in the size class 0-5 acres but also in the largest size class. Thus with regard to productivity and income the tenants may be in a worse position in some cases, particularly in the case of smallest size class, than the owners.

Variables referring to material inputs

That tenants in the smallest size class may be in a worse position than the owners and in the larger size classes the effects of tenure on economic performance becomes less important is seen also in the cases of two variables, e.g., value of manures and fertilizers per acre and value of seeds per acre. It is seen that in the size class 0-5 acres the tenants generally use less of these two inputs than the owners, while in the larger size classes tenancy does not seem to affect the use of these inputs.

Variables referring to land and capital

It is seen that none of these variable except 'Irrigation charges per acre' and 'Number of fragments per acre' seems to be affected by the existing tenurial arrangements, in any of the size classes. Thus, we see that the average value of the variables, namely, 'Input of bullock labour days per acre', 'Ratio of hired bullock labour to owned bullock labour', 'Expenditure on maintenance of implements'

and 'Proportion of net irrigated area to net sown area' are neither larger for the tenants nor lower for them in significantly large number of cases. Thus tenancy does not seem to affect these variables. However, with respect to 'Irrigation charges per acre' and 'Number of fragments per acre' in the size class 0-5 acres the average values are lower for the tenants in significantly large number of cases whereas in the size class 5-10 acres average values are neither larger nor smaller for the tenants in significantly large number of cases. In the size class '10 acres and above' in all the cases the tenants have a large average value for number of fragments per acre whereas in this size class with respect to 'Irrigation charges per acre' they have neither a larger nor a smaller average value in significantly large number of cases. Thus we may say that whereas in smallest size groups tenants may be in a worse position so that they can pay for irrigation facilities a less amount than the owners, in larger size classes tenancy does not seem to worsen the economic conditions of the farmers to such extent as to make them incur less expenditure on irrigation. With respect to number of fragments per acre, however, it is seen that smallest sized owner operated farms are generally more fragmented than the tenanted farms of the same size — whereas with the increase in farm size tenanted farms become more and more fragmented in relation to owner operated farms. One possible explanation for this may be that fragmentation of holdings is generally caused through the process of inheritance and the tenanted holdings are not inherited and there thus for a poor tenant cultivator who can not lease in more than very small amount of land there is no reason for him to chose very small fragmented pieces whereas an owner cultivator in many cases, is to remain satisfied with the different fragments of land that he may acquire through inheritance. On the contrary, an

economically well off tenant farmer who can lease in a big amount of land may find it more advantageous to lease in land from more than one landowner. A big sized owner farmer may have the means of consolidating small fragmented pieces; in any case, given the same force of disintegration the average size of fragments would be higher in bigger sized owned farms. Thus with farm size becoming larger the tenant may be found to cultivate more fragmented land than the owners although in the small size group this may not be the case.

Variables relating to labour input

It is seen that although the average value for the 'Ratio of hired labour to family labour' is neither larger nor smaller for the tenants in significantly large number of cases in any of the size classes, average value for 'Total human labour days per acre' is lower for the tenants in significantly large number of cases in the size class 0-5 acres. This shows that while we can not say that employment of hired labour in relation to family labour depends much on tenurial arrangements, it can be said that in a small sized tenanted farm less amount of total labour per acre is employed, although in larger sized farms effects of tenancy on employment of human labour is reduced.

Conclusion

From the above findings we may conclude that effect of tenancy on the use of different inputs and on farm productivity and income may be visible only in the cases of small sized farms (0-5 acres). It may be that within a very small size the tenanted farms are less efficient than the owner operated farms in the sense that they use less of labour and material inputs per acre, they cultivate

land with less intensity and get lower yield per acre and in many cases significantly lower farm business income per acre. In larger size classes, however, this effect of tenancy is not so visible. Another interesting conclusion that seems to emerge from the discussion is that tenants generally depend more on owned inputs than on purchased or hired inputs in comparison with the owners.

The significant difference observed between the two tenurial classes for the smallest size group bears out our anticipation expressed in the concluding portion of the last chapter that the tenurial classes may not be regarded as homogeneous statistical populations, that there are significant differences between the technological features of different size groups for the same tenurial class. As such the reservations expressed by us about the fitting of common production functions to all farms belonging to the same tenurial class seem to be justified. Again, the results derived in this chapter correspond to our expectation regarding the relative economic conditions of tenants and owners in different size groups, as expressed in Chapter II.

Table 1 : Yield per acre

		(in rupees)		
size classes		6 to 5	5 to 10	10 acres and
references		acres	acres	above
state	year	F-value	F-value	F-value
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	1.89	.01	-
West Bengal 2	1955	.47	2.02	-
West Bengal 1	1956	.55	15.34**	.30
West Bengal 2	1956	.00	6.34**	-
Andhra	1957	.34	.00	14.72**
Andhra	1958	.35	.54	.35
Andhra	1959	.15	.57	1.87
Punjab 1	1955		.19	1.03
Punjab 2	1955		0.02	0.08
Punjab 1	1956	0.04	2.68	1.12
Punjab 2	1956	.10	1.10	.90
Punjab 2	1970	3.01*	.28	2.61
total number of cases, n		10	12	9
number of cases, m				
in which tenants have				
lower mean value than				
others		10	1	3
result of binomial test		significantly lower	significantly higher	not significant
		(.001) ^{a/}	(.003) ^{b/}	

Table 1. (contd.)

- a/ The figure in the bracket is the probability of getting 11 or more cases of tenant mean lower than owner mean when actually there is no difference between them in the population, given by

$$\left({}^{12}C_{11} + {}^{12}C_{12} \right) \left(\frac{1}{2} \right)^{12}$$

- b/ The figure in the bracket is the probability of getting 2 or fewer cases of tenant mean being lower than owner mean ^{though} actually there is no difference between them in the population, given by

$$\left({}^{12}C_2 + {}^{12}C_1 + {}^{12}C_0 \right) \left(\frac{1}{2} \right)^{12}$$

- c/ West Bengal 1 and West Bengal 2 indicates the two districts Hooghly and 24 Parganas of West Bengal. Similarly Punjab 1 and Punjab 2 indicate the districts of Ferozepur and Amritsar of Punjab.

- d/ Not significant at the 5 % level (one sided test)

* Significant at 5 % level

** Significant at 1 % level

Table 2: Intensity of Cropping

		(in rupees)		
size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
state	year			
(1)	(2)	(3)	(4)	(5)
West Bengal	1 1955	.25	.06	-
West Bengal	2 1955	1.23	.30	-
West Bengal	1 1956	.92		.37
West Bengal	2 1956	1.52	.24	-
Andhra	1957	2.73	.20	.04
Andhra	1958	3.64*	.25	.34
Andhra	1959	.07	.92	-
Punjab	1 1955			
Punjab	2 1955			
Punjab	1 1956 a/			
Punjab	2 1956			
Punjab	2 1970	.38	.30	.03
total number of cases, n		8	8	5
number of cases, m in which tenants have lower mean value than owners		7	5	4
result of binomial test		significantly lower (.039)	not significant	not significant

a/ Data for this particular variable were not available for these four Punjab cases.

Table 3 : Total cost of production per acre

size classes		(in rupees)		
references		0 to 5 acres	5 to 10 acres	10 acres and above
state	year	F-value	F-value	F-value
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	.96	.20	-
West Bengal 2	1955	1.04	2.10	-
West Bengal 1	1956	7.46**	.50	.06
West Bengal 2	1956	.48	.91	-
Andhra	1957	2.37	1.15	.33
Andhra	1958	.22	.32	1.93
Andhra	1959	.24	.27	.90
Punjab 1	1955		.35	.24
Punjab 2	1955		.08	.85
Punjab 1	1956	.16	6.36**	.46
Punjab 2	1956	.53	.00	1.19
Punjab 2	1970	1.01	0.01	.14
total number of cases, n		10	12	9
number of cases, m in which tenants have lower mean value than others		8	7	6
result of binomial test		not significant	not significant	not significant

Table 4 : Ratio of imputed cost of total cost of production

		(in rupees)		
size classes		0 to 5	5 to 10	10 acres and
references		acres	acres	above
state	year	F-value	F-value	F-value
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	9.71**	.72	-
West Bengal 2	1955	5.93**	.41	-
West Bengal 1	1956	14.66**	.28	19.86*
West Bengal 2	1956	4.17*	9.78**	-
Andhra	1957	65.76**	11.66**	3.01*
Andhra	1958	29.53**	6.47*	3.93*
Andhra	1959	61.07**	7.42**	2.79
Punjab 1	1955	-	41.09**	52.90**
Punjab 2	1955	-	17.75**	68.62**
Punjab 1	1956	.25	20.44**	17.15**
Punjab 2	1956	.46	.28	16.51**
Punjab 2	1970	8.07**	7.38**	.98
total number of cases, n		10	12	9
number of cases, m in which				
tenants have lower mean		1	2	1
value than others				
results of binomial test		significantly	significantly	significantly
		higher	higher	higher
		(.012)	(.022)	(.022)

Table 5 : Farm business income

(in rupees)

size classes		0 to 5	5 to 10	10 acres and
references		acres	acres	above
state	year	F-value	F-value	F-value
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	10.35**	1.31	-
West Bengal 2	1955	.13	.28	-
West Bengal 1	1956	14.49**	.00	.15
West Bengal 2	1956	3.69*	.04	-
Andhra	1957	5.62*	2.13	1.56
Andhra	1958	3.09*	3.37*	.04
Andhra	1959	.001	.07	.69
Punjab 1	1955	-	.40	2.06
Punjab 2	1955	-	.12	5.10*
Punjab 1	1956	.09	3.21*	8.18**
Punjab 2	1956	.12	2.23	7.69**
Punjab 2	1970	1.04	.04	4.97*
total number of cases, n		10	12	10
number of cases, m in which				
tenants have lower mean		8	8	7
value than others				
result of binomial test		not	not	not
		significant	significant	significant

Table 6 : Manure and fertilizer input per acre

		(in rupees)		
size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
state	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	-	-	-
West Bengal 2	1955	-	-	-
West Bengal 1	1956	-	-	-
West Bengal 2	1956	-	-	-
Andhra	1957	2.27	.38	3.81*
Andhra	1958	0.02	0.02	.12
Andhra	1959	.25	.09	.05
Punjab 1	1955	-	2.23	.66
Punjab 2	1955	-	3.05*	.03
Punjab 1	1956	.02	.03	.00
Punjab 2	1956	.05	1.27	1.35
Punjab 2	1970 ^{a/}	-	-	-
total number of cases, n		9	11	8
number of cases, m in which tenants have lower mean value than others		8	4	1
result of binomial test		significantly lower (.020)	not significant	significantly higher (0.039)

^{a/} Not available.

Table 7 : Seed input per acre in value

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
state	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	1.68	.58	-
West Bengal 2	1955	1.29	.33	-
West Bengal 1	1956	1.16	10.56**	-
West Bengal 2	1956	.13	.19	-
Andhra	1957	1.71	.17	.00
Andhra	1958	.52	.47	.16
Andhra	1959	.08	1.17	.26
Punjab 1	1955	-	.80	.00
Punjab 2	1955	-	1.44	.05
Punjab 1	1956	.13	3.09*	1.00
Punjab 2	1956	.00	.17	.01
Punjab 2	1970 ^{a/}	-	-	-
total number of cases, n		9	10	8
number of cases, m in which				
tenants have lower mean		9	3	3
value than others				
result of binomial test		significantly lower (.002)	not significant	not significant

a/ Data for this variable is not available for this Punjab case.

Table 8 : Input of bullock labour days per acre

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
state	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	1.02	.24	-
West Bengal 2	1955	.21	.43	-
West Bengal 1	1956	1.29	6.72*	.63
West Bengal 2	1956	.17	.14	-
Andhra	1957	.05	1.46	.03
Andhra	1958	.04	.03	2.42
Andhra	1959	.22	2.84	1.43
Punjab 1	1955	-	2.60	.51
Punjab 2	1955	-	.47	.24
Punjab 1	1956	.88	1.08	0.50
Punjab 2	1956	.00	0.14	0.60
Punjab 2	1970	1.25	.11	.05
total number of cases, n		10	12	9
number of cases, m in which tenants have ^{lower} mean value than others		8	1	5
result of binomial test		not significant	significantly lower (.003)	not significant

Table 9 : Ratio of hired bullock labour days to owned bullock labour days

size classes			0 to 5 acres	5 to 10 acres	10 acres and above
references			F-value	F-value	F-value
state	year				
(1)	(2)		(3)	(4)	(5)
West Bengal	1	1955	.20	2.46	-
West Bengal	2	1955	1.62	1.67	-
West Bengal	1	1956	7.13**	7.40*	-
West Bengal	2	1956	1.57	2.33	-
Andhra		1957	.01	.36	.37
Andhra		1958	.00	.41	.83
Andhra		1959	2.17	.83	1.30
Punjab	1	1955	-	-	-
Punjab	2	1955	-	-	-
Punjab	1	1956	-	-	-
Punjab	2	1956	-	-	-
Punjab	2	1970	.07	.11	.22
total number of cases, n			8	8	5
number of cases, m in which					
tenants have lower mean			5	4	3
value than others					
result of binomial test			not significant	not significant	not significant

Table 10 : Expenditure on the maintenance of implements

(in rupees)

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
state	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	2.23	1.00	-
West Bengal 2	1955	3.34*	.02	-
West Bengal 1	1956	1.74	6.24*	.26
West Bengal 2	1956	2.68*	.28	-
Andhra	1957	1.38	2.44	1.34
Andhra	1958	.46	1.02	2.76
Andhra	1959	.00	.00	2.94*
Punjab 1	1955	-	.63	2.04
Punjab 2	1955	-	4.06*	.08
Punjab 1	1956	.24	.57	2.07
Punjab 2	1956	1.52	4.80*	.32
Punjab 2	1970	.92	.75	.01
total number of cases, n		10	12	9
number of cases, m in which tenants have lower mean value than others		7	8	3
result of binomial test		not significant	not significant	not significant

Table 11 : Irrigation charges per acre

(in rupees)

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
states	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	a/		
West Bengal 2	1955			
West Bengal 1	1956			
West Bengal 2	1956			
Andhra	1957	23.52**	9.12**	1.51
Andhra	1958	3.52*	6.56*	.60
Andhra	1959	13.01**	2.07	8.19**
Punjab 1	1955	-	.01	.31
Punjab 2	1955	-	.01	.17
Punjab 1	1956	.15	2.49	.04
Punjab 2	1956	.12	.83	.90
Punjab 2	1970	.27	.17	1.92
total number of cases, n		6	8	8
number of cases, m in which				
tenants have lower mean		6	8	4
value than others				
result of binomial test		significantly lower (.008)	significantly lower (.004)	not significant

a/ Data for the particular variable were not available for these 4 West Bengal cases.

Table 12 : Proportion of net irrigated area to net sown area

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references				
states	year	F-value	F-value	F-value
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	.12	2.36	-
West Bengal 2	1955	1.24	2.22	-
West Bengal 1	1956	.03	1.56	-
West Bengal 2	1956	8.26**	.04	-
Andhra	1957	1.28	.63	3.22*
Andhra	1958	.42	.58	.45
Andhra	1959	2.14	3.60*	.61
Punjab 1	1955	a/		
Punjab 2	1955			
Punjab 1	1956			
Punjab 2	1956			
Punjab 2	1970	14.29**	.05	.07
total number of cases, n		8	6	5
number of cases, m in which tenants have lower mean value than others		2	6	4
result of binomial test		not significant	not significant	not significant

a/ Data for this particular variable were not available.

Table 13 : Number of fragments per acre

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
states	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	1.31	.47	-
West Bengal 2	1955	.12	.00	-
West Bengal 1	1956	.45	.08	2.32
West Bengal 2	1956	1.28	.51	-
Andhra	1957	2.44	1.46	.70
Andhra	1958	1.40	.16	.43
Andhra	1959	2.04	.18	2.25
Punjab 1	1955	-	.20	.00
Punjab 2	1955	-	.35	.43
Punjab 1	1956	1.21	2.84	.19
Punjab 2	1956	.60	1.05	.29
Punjab 2				
total number of cases, n		9	11	8
number of cases, m in which tenants have lower mean value than others		9	3	0
results of binomial test		significantly lower (.002)	not significant	significantly higher (.004)

Table 14 : Human labour input per acre in may days

size classes		0 to 5 acres	5 to 10 acres	10 acres and above
references		F-value	F-value	F-value
states	year			
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	2.41	0.26	-
West Bengal 2	1955	3.11*	1.20	-
West Bengal 1	1956	0.08	6.42*	0.06
West Bengal 2	1956	1.43	1.35	-
Andhra	1957	0.87	1.09	3.95*
Andhra	1958	0.20	0.24	0.98
Andhra	1959	0.06	0.23	1.37
Punjab 1	1955	-	3.47*	7.66**
Punjab 2	1955	-	0.05	0.02
Punjab 1	1956	0.15	1.41	0.06
Punjab 2	1956	1.15	0.30	0.30
Punjab 2	1970 ^{a/}	1.88	0.15	0.72
total number of cases, n		10	12	12
number of cases, m in which				
tenants have lower mean		9	5	6
value than owners				
result of binomial test		significantly lower (.012)	not significant	not significant

^{a/} Entries for Punjab 2 1970 are in hours. For all other states and year entries are in days.

Table 15 : Ratio of hired labour to family labour

size classes		0 to 5	5 to 10	10 acres and
references		acres	acres	above
state	year	F-value	F-value	F-value
(1)	(2)	(3)	(4)	(5)
West Bengal 1	1955	0.42	.52	-
West Bengal 2	1955	.93	1.94	-
West Bengal 1	1956	.41	6.68*	-
West Bengal 2	1956	.35	.00	-
Andhra	1957	1.74	4.63*	.45
Andhra	1958	.18	3.20*	.13
Andhra	1959	3.03*	2.01	2.12
Punjab 1	1955	2.14	3.82*	.99
Punjab 2	1955	-	2.41	1.29
Punjab 1	1956	.41	.55	2.33
Punjab 2	1956	.66	.13	.97
Punjab 2	1970	.31	.43	.34
total number of cases, n		10	12	9
number of cases, m in which				
tenants have lower mean		7	8	6
value than owners				
result of binomial test		not	not	not
		significant	significant	significant

Table 16 : Number of observations in each size and ownership class for all the cases

size classes		0 to 5 acres		5 to 10 acres		10 acres and above	
references							
states	year	owners	tenants	owners	tenants	owners	tenants
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
West Bengal 1	1955	74	11	8	3	3	0
West Bengal 2	1955	62	18	10	7	2	0
West Bengal 1	1956	72	11	5	3	3	1
West Bengal 2	1956	60	19	9	6	3	0
Andhra W	1957	45	11	6	9	26	7
Andhra W	1958	43	8	6	10	22	8
Andhra W	1959	30	10	10	4	19	11
Punjab 1	1955	12	0	20	18	38	12
Punjab 2	1955	1	0	8	12	50	29
Punjab 1	1956	9	1	23	15	40	13
Punjab 2	1956	4	2	3	8	2	32
Punjab 2	1970	22	1	48	6	66	7

CONCLUSION

It is a general impression that tenancy system is an inefficient form of tenure. The argument put forward in favour of this view is that, since under tenancy a part of the total product or a fixed amount of money always goes to the landowner, the tenants are left with less capacity and less incentive to invest for the improvement of land. Share-cropping is especially considered to be an inefficient system on the ground that under the system conditions for optimal intensity of input-use and optimal allocation of resources are not supposed to be achieved.

Peasant farming is often viewed by the economists and policy makers as conducive to both growth and social welfare. The underlying argument is that establishment of peasant farming presupposes distribution of land among a larger section of the population, which increases social welfare directly and increases economic efficiency by providing preconditions for individual initiative. However, there are empirical findings as well as theoretical reasonings which tend to show that under certain circumstances, tenancy system may work just as well as owner farming.

In this study, we have carried out various statistical tests of hypothesis regarding the relative performance of the two systems. By and large, our test results ^{supports} ~~confirm~~ the hypothesis *that tenant farms are not more inefficient than owner farms* ^{only} ~~under certain circumstances~~. The data that we have examined suggest that in the very small size group of farms tenants generally perform less efficiently than owners but among medium and large farms, tenants do not generally perform any worse than owners.

As to the idea of making owner farms the basis for a viable agriculture our investigation of experience of various countries suggest that this ~~has been~~ ^{is} ~~treated as~~ the most ~~as~~ a temporary and unstable solution. It is seen that in the long run owner farming in a social framework of private property tends to give rise to concentration of land and large scale capitalist farming. It ^{seems to} ~~suggests~~ that an arrangement that can be viable in the short as well as long run, has necessarily to be some form of co-operativisation or collectivisation.

X [Footnote]

It may be remarked by some reader that this is not a very important conclusion, that very few ~~any~~ have seriously advanced the hypothesis that, when farmers with substantial resources lease in more land the use of resources is more inefficient than when they do not. But neither in the literature of the theory of tenant farming nor in political programmes in this country does one encounter an important distinction made between large tenant farms and small tenant farms. Our conclusion may appear to be no more than a matter of common sense; however, in our opinion confirmation of a matter of common sense with rigorous analysis of empirical fact does constitute a scientific contribution.

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