Causes behind Tenancy Contract among the Marginal Farmers of West Bengal, India and Its' Impact on their Livelihood

Kundu, Amit and Goswami, Pubali

Department of Economics, Jadavpur University, Kolkata-700032, West Bengal, India

3 March 2021

Causes behind Tenancy Contract among the Marginal Farmers of West Bengal, India and Its' Impact on their Livelihood

Amit Kundu and Pubali Goswamy

The basic objective of this paper is to identify the possible factors which influence the marginal farmer households of West Bengal to go for tenancy contracts. In our study area, the target group is marginal farmer households where the only fixed-rent contract is observed, and all the contracts are verbal. Comparatively big landowners among the marginal farmer households where lack of motivation is observed among the younger generations to pursue agricultural activities for their livelihood and have higher earnings from different non-farm activities influence them to lease out the land. On the contrary, landless or the marginal farmer households owned very small size of land are more eager to take land in a lease for cultivation. The availability of family labour force among these types of households and earnings from alternative sources play an important role during the time of taking such a decision. After applying Heckman's two-step treatment effect models, it is observed that marginal farmer households who lease out land are economically better off than the marginal farmer households who are not interested in any such tenancy contract. Besides that, it is also observed that farm households even after taking land in the lease are economically worse-off than the farm households who are not interested in any tenancy contract. But most of the marginal farmer households whichever type are living below the poverty line.

Introduction

Agriculture still occupies an important role in the Indian economy where a large section of the population lives in the rural areas and their prime occupation is agriculture. Small agricultural landholdings constitute a vast majority of farmers in developing countries including India (FAO, 2010). Hence, for sustainability in agricultural production and for food security purposes it is required to maintain the livelihood of those small as well as marginal farmers. This can be done if it is observed that those small farmers can generate profit from agricultural activities

_____
Amit Kundu, Professor, Department of Economics, Jadavpur University, Kolkata 700032, West Bengal, Email: akundu29@gmail.com, akundu1970@gmail.com
Pubali Goswamy, Research Scholar, Department of Economics, Jadavpur University, Kolkata 700032, West Bengal, Email: goswamipubali@gmail.com

and can have the opportunity to get employment in different non-farm sectors. In India, the number of marginal farmers is continuously rising because there is a gradual decline in per-capita landholdings among agricultural households (Kundu and Das 2019). According to different rounds of NSSO data (mainly the 70th round), it is observed that the average size of land holdings of the marginal farmers of India was 0.40 hector in 2000-2001 which decreased to 0.39 hector in 2010-2011. Agricultural Census 2010-2011 indicated that 82.16 per cent of the agricultural households of West Bengal are marginal farmers[1] and according to the 2015-2016 Agricultural Census that figure increased to 82.81 per cent. In West Bengal, we observe huge dominance of marginal farmers among the agricultural households. This is basically the continuation of the observations of Lieten (1994). He had shown that the land distribution programme initiated by the State government of West Bengal, became successful in the sense that it provided land to many landless families. He had also shown that the average size of plots allocated to the beneficiaries fell drastically to hardly 1 bigha (one-third of an acre) from 3 bighas observed in 1967. The basic objective to give ownership rights to more rural households was to improve their economic conditions. So, it is also observed in the Agricultural Census 2010-2011 that the average size of operational holdings of the marginal farmer households in West Bengal was 0.49 hector which remains unchanged even in the 2015-2016 Agricultural Census. According to the report of The Centre for Studies of Developing Societies (2018), most of the farmers are mainly marginal in nature of this country and would prefer to take up any other work except agriculture. Poor income and bleak futures are the main reasons, why they want to give up farming. But we must identify the actual causes behind it in West Bengal, a state dominated by marginal farmer households. Actually, a marginal farmer can adopt three strategies before the agricultural season: (i) he/she may operate only their owned land without giving or taking any land on lease or (ii) lease out their entire land to a tenant, either under fixed rent or under share tenancy system, or (iii) leased in the land to enhance their operational holding for cultivation. In West Bengal, there is no restriction on land leasing although only share cropping leases are legally permitted. But in this state, the fixed rent tenancy is the most common term of land leasing (52 per cent, Mani 2016). On the basis of a micro-level field survey, it will be investigated, in which situation a marginal farmer household is not willing or willing to take agriculture as their livelihood and whether their strategy helps them to improve their economic condition?

Survey of Literature

G. Parthasarathy and D.S. Prasad (1974) in their study in the Andhra Delta found that the lease market facilitates a shift of control of the land to the small-holders and tenants. Big owners are found to lease out and the resultant distribution of operational area is less uneven than the ownership pattern. Thus, the lease market enabled the landless to gain access to land.

Bliss and Stern (1982) tried to identify the major determining factors of the farm households to participate in the lease market. According to them, total land size, family labour force, and non-firm income were the important factors which influenced the farmers" participation in the lease market. They also showed that lease in or lease out decision more or less depends on the household head's socioeconomic characteristics. Age had a positive effect on the leasing out decision, i.e., the old farmers were not able to cultivate their own land and would prefer to lease out the land. Non-firm income opportunities had a negative impact on lease in the land. Higher non-firm income influenced the farmer to lease out their land. But their observations were not only among the marginal farmers.

Srivastava (1989) found out the fact that with the increasing penetration of capitalism in agriculture, the form of tenancy has been subject to change. The emergency of the small lessor-large lessee relationship described as the 'phenomenon' of reverse tenancy is clearly an important aspect of this change. Yet in the country, as well as in several large regions, the typical lessee continued to be the marginal/landless cultivator and a large number of landless and poor peasants continued to lease in land under conditions of severe under-employment and pressure on land. According to the NSS 26th Round Survey, 27 million households or 27.02 per cent of the rural households leased some land. 22 million of these households were marginal cultivators, owning less than 2.5 acres of land, comprising 32 per cent of such cultivators. Again, in the case of small cultivators, 30 per cent of such cultivators lease the land. These cultivators together formed 91 per cent of the total cultivators leasing in the land.

According to Goyal and Pandey (2000) in Haryana, land-lease activity increased over time. The percentage of leased-in area to total owned had increased to 19 to 44 from 1982 to 1992. His work was on to study the structural changes in the ownership holdings and the operational holdings over time and to analyze the temporal changes in the land-lease activity in Haryana state. In Haryana, fixed monetary rent was found to be the main term of the lease, however at the national level; crop-sharing was the most important kind of lease contract. The highest percentage of households who reported leasing out of the land was the medium households (32 per cent), whereas leasing-in of land was reported to be the highest (72 per cent) among the marginal farmers.

Sharma (2000) based on NSS Report found that, despite some increase in the portion of the leased-in area between 1981-1982 and 1991-1992, in most of the states, the incidence of tenancy in 1991-1992 was lower in most of the states compared to that of 1971-1972. According to him, the importance of share tenancy, both in terms of holding and area has declined significantly. He also concluded that while lower category (small and marginal farmers) households continued to dominate the lease market as lessees. The evidence from NSS data shows that a significant increase in the proportion of leased-out areas was accounted for by lower category households.

Hanumantha Rao and Gulati (1994) found out that after the introduction of new technology which is capital intensive, wages and the rate of mechanization

became high, and the farmers (mainly small and marginal) who are leasing-in areas would be able to make fuller use of their fixed equipment. However, the area involved in reverse tenancy is rather insignificant, as the advantage of the cheap family labour force the small and marginal farmers to lease-in land. In such cases, the pure tenants, as well as the small and marginal farmers, would be able to augment their operational holdings by leasing-in area. This may also contribute to the more efficient use of land, labour and other resources. Socially it is a desirable trend, as smaller holdings maximize output per unit of capital.

Chattopadhyay and Sengupta (2001) had shown that the medium-sized farms belonging to both owner and tenant (sharecropper) categories are efficient and irrigation facility is the most important factor which can influence the efficiency of the production process.

According to Akter, *et. al.* (2006), participation in the lease market helps the farmers in different ways such as to transfers land to the farmers who have less land for cultivation, more capability to use land, and a higher labour force.

Sanzidur Rahman (2010) explained the socio-economic factors which influenced the farmer's participation in the lease market. The farm households with insufficient cultivated land but a higher level of livestock and other farm capital asset, generally lease in land for cultivation. The opposite is exact for the farmers who lease out their land. The farm households with a high level of education wanted to lease out the land and the non-educated farm households leased in the land. Actually, the opportunity to get employment in non-firm activity increased with education. Kung (2002) explained that education reduced the demand for leased in land for cultivation.

Kaur and Singh (2011) had shown in Punjab that the small farmers have leased in the land to enhance their income. Actually, these farmers were not earning adequate income from their owned land to maintain their livelihood so they wanted to enhance their operational holding by leasing-in land. The main reason behind the farmers who leased out their land was to join services. Few farmers also leased out their land because of the lack of irrigation facilities. The authors suggested that cooperative farming can improve the livelihood of the small and marginal farmers.

Research Objective

After the effective implementation of land reform and due to laws of inheritance most of the farm households OF West Bengal are marginal in nature. In this background, it is observed that some marginal farmers prefer to lease out their owned land and some of them prefer to take more land in lease. In this background we want to investigate the following questions:

1. In which situation do the marginal farming households lease out their own land and whether this strategy helps them to be economically better-off or not?

2. Who is leasing in land from those marginal farming households and whether after leasing in land those farming households can improve their livelihood?
3. Is there any incidence of Reverse Tenancy among the marginal farmers?
4. The incidence of poverty among all types of marginal farmer households in our study area.

Study Area

South 24 Parganas district of West Bengal is selected for our study area. According to the Director of Agriculture, Government of West Bengal, South 24 Parganas district is dominated by marginal farmer households. Its cropping intensity is 143 per cent, the Net irrigated area is 115.73 thousand hectors whereas the Gross irrigated area in 415.53 thousand hectares. In major parts of this district, we observe the presence of multiple cropping with a combination of cultivation of both food and cash crop. In 2018, 89 per cent of the farmers are marginal in nature. It is also reported that approximately 32500 numbers of tenants are present in that district. In that district, out of 18 blocks, we have chosen Sonarpur Block randomly. In Sonarpur block, we have 65 villages. In our micro-level study, we have randomly chosen two Mouzas (villages) Dihi and Gangajora for our micro-level study. Incidentally, in those two sample villages most of the farmers are marginal in nature. In the low-lying alluvial soil in our study area, farmers are producing mainly paddy, wheat and vegetables like brinjal, ladies finger, spinach, pumpkins, etc. So, we observe the presence of multiple cropping in those villages and that also happens because most of the agricultural lands are properly irrigated. Initially, we have identified the marginal farmers in our selected villages with the help of the local government or Panchayat. Then we have randomly chosen 351 sample farm households and after that, those farm households are divided into three groups: (i) the farm households who only operate their own land; (ii) the farm households who totally lease out their land for the entire reference period[2], (iii) the farm households who took land in a lease for one year for cultivation. Among the third group of farm households, we observe two types of tenants, the tenants who do not have any land and operate only on lease-in land[3] and the tenants who own some land and take some additional land in a lease for agricultural production to enjoy few positive externalities during the time of production. In our sample farm households, 61 farm households are of the first type, 173 farm households of the second type and 117 farm households belong to the third type. It should be mentioned that in our study area all the tenancy contracts are informal in nature and no lease agreement has been recorded.

In the existing literature, we observe two types of tenancy contracts in land market: fixed rent system or share tenancy system. The farmer who leases out land is suffering from a moral hazard problem because he cannot properly monitor or verify the tenant's effort level during the time of agricultural production. Besides that, there are always possibilities of crop loss due to many unobservable factors like flood, drought, pest infection etc. Hence, only one type of tenancy agreement

is observed here and that is a fixed rent system where payment is made mainly in cash and is paid after the end of agricultural production. Costs of all inputs related to farming are entirely borne by the tenant and in return, he shall get all the harvests produced in that land. In our study area under the Fixed rent system, the rent in 98.12 per cent of situations are paid in cash and remaining very few cases it is paid in terms of crop. The rental value of land in our study area is ₹1500/bigha for paddy, ₹1000/bigha for wheat and ₹600/bigha for vegetables. In-kind payment as rent, it is 40 kg paddy per bigha.

Here, a tenancy contract is found to be predominantly an annual contract. Congruently some of the tenants were also found carrying cultivation practices in leased out land for several years at a stretch but almost all of them have a grievance that the duration of leasing, the operation was not affixed by the lesser. The agreements were mostly verbal in nature and we observed a total absence of any legal papers related to the tenancy contract. The probable reason for the reluctance of landlords to issue any formal written leased agreements to tenants may be due to their apprehensions generated from burgeoning national debate on land reforms, especially tenancy reform and resonating slogans like "Land to the tiller." However, the majority of tenants confessed that the tenancy duration must be fixed in order to eradicate any trepidation of eviction in the ensuing years.

Initially, a questionnaire on the basis of our research problems is designed on the basis of a pilot survey and focal group discussions in our study area. Then identify the target group, primary data is collected through a field survey. Information is collected about the social and demographic characteristics of the farm household, types of cultivation, amount of crop produced, different types of costs of cultivation, income earned from other sources including income earned through participating in the National Rural Employment Guarantee Programme, etc. The survey was done mainly in the month of February, and March 2019. So here the reference period is from April 2018 to March 2019. The following table shows the distribution of the sample farm households in terms of participation in tenancy contracts or not.

Table 1: Distribution of the Sample Marginal Farmer Households in Terms of Participation in Tenancy Contract or Not

Land/Tenancy status	Farming Households who took land in lease	Farming households who gave away land in lease	Cultivate their own land
Less than 1 acre	42+106 = 148[4]	48	53
1-2.5 acre	25	89	8
Total	173	117	61

Source: Field survey.

To Identify the Possible Reasons behind Leasing Out of Owned Cultivatable Land

Initially, we want to identify the possible causes why a marginal farming household wants to lease out its land for the entire agricultural season. To investigate that we consider two types of farm households: (i) who entirely lease out their land and (ii) the farm households who cultivate their own land without taking any land in the lease in the entire reference period.

For this investigation, we have to identify the possible factors which may influence the marginal farmer households to lease-out their land.

i. Total land owned by the ith household (TLandowned$_i$): Land is here measured in the acre. It is required to be checked whether comparatively big landowners among the marginal farmer households are not willing to continue agricultural activities, rather they prefer to lease out their owned land for one year. The above Table 1 justifies the reason behind choosing this factor where it is observed that a good number of marginal farming households, who own a larger size of land in our sample, gave away land in a lease for cultivation. From our field investigation, it is observed that all the tenancy contracts are under a Fixed rent system where the entire cost of cultivation is born by the farmer who took land in lease (the tenant)[5]. The expected sign of the variable should be positive.

ii. Education level of the respondent (Education$_i$): The education level of the respondent is measured in the number of year he/she spent on education. It is expected that if the main earning member of the farm household is educated enough, he/she may look for alternative employment opportunities after leasing out-owned land for the entire period. So, the expected sign should be negative.

iii. Female-headed household: (Fhead$_i$): It is here treated as a dummy variable and has taken the value 1 if the sample household is a female-headed household; otherwise we have to consider it '0'. If the household is female-headed, then the guardian of the household may not take the risk of cultivation because it is quite difficult for her to visit land during the time of cultivation and monitor hired labourers. Rather she prefers to lease out land under a Fixed rent system, where there is no risk but certain earnings after the end of each agricultural season. So, the expected sign should be positive.

iv. Total Number of Family Labour force available for agricultural production: (Flabforce$_i$): Total family labour force is here calculated as the total number of family members including children between ages 10 to 14 who can participate in the agricultural production process when requires. Due to the high daily agricultural wager rate and high other costs of inputs required for agricultural production; marginal farmer households prefer to use the family labour force during the time of cultivation. It is observed that female members of the household are not working as farm labour in other's fields but work in their own field as a labourer to minimize the wage bill during the time of

entire production process. The same thing also happens for the child. This can also reduce the moral hazard problem which may crop up if the cultivation process is done by 'hired labour'. In this background, it is expected that a farm household may be willing to go for production if he/she realizes that they have a family labour force that can help him during the time of different agricultural production activity otherwise he/she may lease out their land[6]. So, the expected sign should be negative.

v.   Total Non-farm income of the ith household (TNonfincome$_i$): This accommodates the total non-farm income of the ith household including earnings from MGNREGP (if any of the household members participate). It is here represented as average monthly non-farm income of ith farm household. Total earnings of the representative household except agriculture is here calculated as the sum total of earnings of all the earning members of the representative households from different sources including earnings from MGNREGA. It is expected that if the farm household has alternative employment as well as income opportunities, he or she may lease out their land for a certain time period.

vi.   The willingness of the next generation to take agricultural activities for their livelihood or not (Nextgen$_i$)[7]: It came out from our field survey that, younger generations of the certain farm households (son or daughter above 14 years) are not willing to take agricultural profession for their livelihood in future. Rather they prefer to do any white collared job; even as part-time salesman in a departmental store. It is reported several times that the father becomes aged and his health does not permit them to visit the field regularly to act as a permanent worker. Then it is the responsibility of his son or daughter to share the burden of cultivation but in many situations, they are not interested to supervise that. If this situation arises, then the head of the farm household may not be willing to take the risk of cultivation, rather leasing out the owned land under a fixed rent system. The variable is here explained as a dummy variable and takes the value 1 if the younger member(s) of the household is not willing to take agriculture for his/her future livelihood. Otherwise, it will take the value 0 and the expected sign should be positive.

So, to identify the possible factors which may influence a farm household during the time of taking the decision about leasing out their land, we have to depend on the following Logit model[8]:

$$\text{Leaseout}_i = f(\text{TLandowned}_i, \text{Education}_i, \text{Fhead}_i, \text{Flabforce}_i, \text{TNonfincome}_i, \text{Nextgen}_i) \quad \ldots(1)$$

Here dependent variable 'Leaseout' is a dummy in nature. It takes the value 1 for those farm households who leased out their owned land and takes the value 0 for those households who cultivate their own land and do not take any land in the lease or give land to other farm households in lease[9]. Before moving towards regression, a multi-collinearity test among the explanatory variables has been done through

VIF method and we observe total absence of multicollinearity problem in Eq. (1). The result of Eq. (1) is given below:

Table 2: Possible Reasons behind Leasing-out of Owned Land (Dummy Dependent Variable: Lease-out)

Explanatory variable	Value of the Marginal Co-efficient including standard error	
Tlandowned	2.577 ***	(.5879)
Education	.08202	(.0695)
Fhead	-.2585	(.666)
Flabforce	0.751	(.2434)
TNonfincome	.00918 ***	(.0039)
Nextgen	2.3719 ***	(.441)
Pseudo R^2	0.444	

Notes: *** => significant at one per cent level, Standard errors are given in parenthesis

Discussions: The result of the Logit regression mentioned in Eq. (1) shows that marginal farmer households[10] who own comparatively larger size of land in acre are more interested to discontinue cultivation and prefer to lease out their agricultural land under a fixed rent system[11]. The other important factors which influence the decision are better non-farm income of the sample household and the lack of motivation of the younger generation members of the farm households to take agricultural activity as a profession for their livelihood in the future[12].

Impact on the Livelihood of the Marginal Farmer Households after Leasing out of Land

Now we have to check whether quitting cultivation helps the farm households improve their livelihood? In this investigation, the livelihood of a farm household is here reflected through the Monthly Per Capita Income of a farm household on an adult equivalent scale.

To do that initially we have to calculate the aggregate net farm income of each farm household in the entire reference period[13]. Net farm income in a particular product is the difference between total farm income and total farm expenses. The difference is the net income generated from the ordinary production and marketing activities of the farmer. Initially, it is required to know whether the produced crop is entirely marketed or part of it is used for self-consumption. In both situations, total produced output (including the amount of crop used for self-consumption) is converted into monetary value by multiplying the produced crop and the market price or government declared procurement price of that crop. On the expenditure side, we have to know the variable inputs used in the production process. This variable input varies with the quantities produced and are entirely

used during the production period. Cost of inputs such as seeds, fertilizers, pesticides, energy used for running machinery, cost of water for irrigation and total wage bill spent for hired labourers are generally accommodated in the cost of variable inputs. The Sum of all the costs of the variable inputs used during the time of the entire production process is considered here as the total cost of the variable inputs in the agricultural production (TCVI). Net farm income of the agricultural households who operate only their own land for agricultural production becomes the difference between their monetary values of the produced crop[14] and the total variable cost of production[15]. If that particular household cultivates more than once in our reference period, then it is required to calculate net earnings from each production and the aggregate net earnings of those farm households become the sum total of those net earnings in total reference period. For the agricultural households who gave away land in the lease for one year under a fixed rent system, the earnings from fixed rent are considered here as their income from agricultural activity.

The information about income earned by the earning members of the household from the different non-farm sectors in the entire reference period is also collected. During the time of calculation of non-farm income, the income earned by that sample household from MGNREGS is also considered. The aggregate income of that sample farming household in the entire reference period is divided by 12 to get the aggregate average monthly income of that household

To address our first research problem, for impact evaluation, we consider two types of farm households: (i) the farm households who lease out their owned land for the entire reference period and (ii) the farm households who cultivate only their owned land without leasing out or leasing in any land. The former households are considered the treatment group and the second group of households is considered as the control group. To identify the livelihood of the marginal farming households we here consider its Monthly Per-capita Income calculated on the basis of the adult equivalent scale[16] as the outcome variable.

This outcome variable is observed in both the farm households, either the treatment group or of the control group. Hence, for this investigation, we must take the help of the Two-step treatment effect model developed by Heckman (1976)[17]. For this evaluation, we consider the following two equations:
The original equation is

$$\text{MPCI}_i = \alpha_0 + \alpha_1 \text{Leaseout}_i + \alpha_2 \text{TEarnmem}_i + \alpha_3 \text{Education}_i + \alpha_4 \text{Fhead}_i + u_i$$
…(2)

The Selection Equation will be

$$\text{Leaseout}_i = \beta_0 + \beta_1 \text{TLandowned}_i + \beta_2 \text{TNfincome}_i + \beta_3 \text{Nextgen}_i + \varepsilon_i \quad …(3)$$

This Treatment-Effect method estimates the above two methods simultaneously. Eq (2) is the prime equation whose parameter estimates mainly of 'Leaseout' is necessary to identify whether after leasing out entirely owned land,

the farm households are economically better-off or not. It is called the Treatment variable which is a dummy in nature. Eq (3) is the selection equation which will try to identify the possible reasons which influence the marginal farming households to lease-out their land. Initially, we have to estimate Eq. (3) through the Probit model, which predicts the probability of being in the 'treatment group' from a set of strictly exogenous variables. We have to reconstruct Eq. (2) where we have the original explanatory variables and an additional explanatory variable called the inverse Mill's ratio, i.e., $\hat{\lambda}$ which is constructed from the estimated co-efficient of the selection equation mentioned in Eq. (3).

We have to consider that both u_i and ε_i are normally distributed with mean zero and the covariance matrix is expressed as $\begin{bmatrix} \sigma_u & \rho \\ \rho & 1 \end{bmatrix}$. Here '$\rho$' indicates the correlation between the two error terms mentioned in modified Eq. (2) and Eq. (3). The parameter estimates of $\hat{\lambda}$, i.e., $\hat{\theta}$ of renewed Eq (2) which includes estimated Inverse Mill's ratio becomes equal to $\rho\sigma_u$. If it is proved that $\hat{\theta} \neq 0$ (that will happen when ρ is not equal to 0), we can take the help of Two-step Treatment effect model for this investigation because there are some household-related factors due to which, the farm household has to lease-out their entire owned land. The result of the Two-Step Treatment Effect model is given below in Table 3:

Table 3: The outcome variable is $MPCI_i$

Name of the variable of original Equation	Value of the Co-efficient and Standard Error	
Leaseout	2566.04 ***	(504.56)
TEarnmem	46.655	(214.74)
Education	13.624	(47.1912)
Fhead	-935.499 **	(432.2811)
Constant	973.1038	(514.633)
$\hat{\lambda}$	1925.275 ***	(346.6166)
Wald $\chi^2(4)$	31.23 ***	

Notes: ***=> significant at one per cent level.

As the parameter estimate of $\hat{\lambda}$ is statistically significant, two-step Treatment Effect model developed by Heckman is here appropriate to address this research problem

Discussion: If monthly adult equivalent per capita income is considered as an indicator of the livelihood of a particular farm household, then from the above evaluation result, after correcting selectivity bias it is proved that the livelihood of the farm households who lease out their entire owned land and move for alternative sources of income is better than the farm households who cultivate their owned land. It is also observed that the MPCI of the farm households is less among the female-headed households. It came out from our field survey that female-headed households generally have single or two earning members who cannot generate sufficient income from non-farm activities. Due to this, this result emerges.

Causes of Taking Land in Lease for Cultivation

Now the question arises which type of marginal farm households are willing or more probable to take land in the lease for cultivation? For this investigation we consider the following Logit regression equation:

$$\text{Leasedin}_i = f\big(\text{TLandowned}_i, \text{Flab}_i, \text{Age}_i, \text{TNfincome}_i, \text{Nextgen}_i\big) \qquad \dots(4)$$

Here the dependent variable 'Leasedin' is Dummy in nature and takes the value 1 if the sample farm household has taken land in lease. Otherwise, it takes the value 0. It is expected that the farm household having a better family labour force is more probable to take land in lease and households with better income from different non-farm sources may be less probable to take land in the lease for more intensive cultivation. It is also expected that if the next generation is not interested in cultivation, then that may reduce the motivation of the parents of the representative farm household to move to more intensive cultivation. The result of the Logit regression is given below, i.e., in Table 4:

Table 4: Possible Causes behind Leasing in land: (Dummy Dependent variable 'Leasedin')

Name of the Explanatory variable	Value of the Marginal Coefficient with Standard Error	
TLandowned	-0.1547 ***	(.02165)
Flab	.7891 **	(.4623)
TNfincome	-.000179 **	(.000103)
Age	.0026	(.1080)
NextNextgen	-0.340	(.562)
Constant	4.096 ***	(.94)
Pseudo R^2	0.6521	

Notes: ***=> significant at 1per cent level and **=> significant at 5 per cent level.

Discussion: The above result shows that comparatively small landholders or landless farm households are more probable to take land on lease. But the most important aspect is the availability of the family labour force. If the sample marginal or landless farm household has a better family labour force then it is highly probable that that farm household is willing to take land in lease[18]. Besides that, better non-farm income reduces the possibility of the farm household taking land on lease for cultivation. But here the age of the respondent or vision of the next generation of the farm household to think about agriculture as a profession does not have any influence on the decision of the farm households to take or not to take land in lease. It came out from our field investigation that the farm households who are inclined to take land in lease want to stick in agricultural production mainly to maintain their subsistence level of living. It is observed that

the majority of these types of farm households have no such skill based on which they can find any suitable alternative earning opportunity for survival purposes.

Is there any Reverse Tenancy?

A reverse tenancy situation arises when a small or marginal farmer leases out his/her land mainly to the large landowners or agricultural entrepreneurs. This system emerged in the 1970s when it is observed that small farmers have started giving up their land to middle or large farmers because they found it easier to work as landless labourers rather than cultivating their own land from which the earnings are not satisfactory. The phenomenon was described as reverse tenancy and in northern and western states of India, up to one third or two-fifth of the lands farmed by middle farmers was leased from small farmers. Actually, in the reverse tenancy system, the land is leased out for a stipulated time period either under the share tenancy system or under the fixed rent system but the ownership of land holdings remains undisturbed

The above two results in this paper indicate that comparatively big landowners among the marginal farmer households are now leasing out land and moving to other occupations for their livelihood. But the land is taken in the lease for cultivation by the landless or the marginal farmer households own very small amount of land. Incidentally, both types of farm households are marginal in nature. This type of tenancy cannot be called reverse tenancy because land is leased out by comparatively big landowners among marginal farming households to comparatively very small landowners even the landless farm household.

Are the Farm Households Who Took Land in Lease Economically Better-Off?

Now the question is whether after taking land on lease, the living condition of the lessee is better than the marginal farm households who do not lease in or lease out the land? For this impact evaluation technique, the farm households who took land in the lease for cultivation are called as Treatment group and the farm households who are neither leasing out land or leasing in land and cultivate only their own land are clubbed as 'The Control group'. Here the outcome variable is just like the previous situation is Monthly Per-capita income on an adult equivalent scale which is observable for both types of households. To calculate this initially total yearly profit of the farm household from his total operational holding is considered. Here, it is required to be mentioned that both the farm households either belong to the treatment group or the control group are marginal farm households. The farm households who took land in the lease for cultivation is taken land for one year and the rent he paid under the fixed rent system is deducted from

his annual farm income during the time of calculation of the Monthly Per-capita income of that farm household.

Heckman type Two-step treatment effect model[19] is here again applied. To do that we consider the following two equations:

The original outcome Equation is

$$MPCI_i = \alpha_0 + \alpha_1 TEarnmem_i + \alpha_2 Fhead_i + \alpha_3 Education_i + \alpha_4 Leasedin_i + u_i$$
$$\ldots(5)$$

And the Selection Equation is

$$Leasein_i = \beta_0 + \beta_1 Tlandowned_i + \beta_2 TNincome_i + \beta_3 Flab_i + \varepsilon_i \qquad \ldots(5A)$$

Like the previous situation here also observe the presence of selectivity bias. So, the Heckman Two-step Treatment Effect model gives the following result[20]:

Table 5: The Outcome Variable is MPCI

Name of the Variable	Parameter Estimate and SE	
TEarnmem	153.357	(55.2700) ***
Fhead	-195.165	(234.0980)
Education	-6.7376	(37.4373)
Leasedin	-875.165	(227.1368) ***
Constant	375.998	(32.5304) ***
$\hat{\lambda}$	801.023	(196.397) ***
Wald $\chi^2(4)$	28.19 ***	

Note: ***=> significant at one per cent level.

Here also $\hat{\lambda}$ is statistically significant which establishes that Two-step treatment effect model is here appropriate for impact evaluation after correcting treatment biasness.

Discussions: The above result shows that the livelihood of the farm households who took land in the lease is inferior to the farm households who cultivate only their own land. So, taking land on lease does not help the farm households to improve their ultimate livelihood. Actually, in our study area, the farm households who took land in the lease are either landless or own very small amount of land. It is also observed that cultivation is their main occupation and doing that they can just maintain their subsistence level of livelihood.

The livelihood of the Farming Households

The rural poverty line in West Bengal in terms of Monthly Per-capita consumption expenditure was ₹783 after considering 2011-2012 as the base year[21]. The adjusted rural poverty line of West Bengal in March 2019 becomes ₹1127.52[22]. So initially,

we had to calculate the Monthly Per-capita consumption expenditure of each farm household based on a mixed reference period[23] and adult equivalent scale[24]. If that is below the adjusted poverty line, then that farm household whichever its category will be identified as a farm household lying below the poverty line or poor. We have divided the poverty among the farm households into two parts. If MPCE of the farm household (measured in current price) is below ₹800 then that farm household is identified as a household that is acutely poor. If MPCE is between ₹801 and ₹1128 then a farm household is identified as moderately poor. But if the value of MPCE of a farm household is above ₹1128 then it can be said that the farm household is not poor. If we look at Table 6 then it is observed that all the sample farm households who operate their own land only are acutely poor. The same situation is observed among the farm households who are involved in agricultural production in their own land if it has and after taking some land in lease. Here it is observed that only 3 out of total 173 such sample households are laying above the adjusted rural poverty line. If we look at the farm households who leased out their land, it is observed that 101 farm households out of 137 sample households are acutely poor and 32 sample farm households are poor. Only 4 sample farm households are lying above the poverty line. So, it comes out from our fiend investigation that, in West Bengal, poverty is observed among the marginal farming households. Some have given their own land in lease and look for alternative employment opportunities but that does not help them to remove their poverty. It is also observed that in spite of the presence of multiple cropping and production of the cash crop in our study region, the majority of the marginal farmer households are poor but the intensity of poverty is less among the marginal farmer households who comparatively owned larger size of land and after leasing out their land depend on the alternative non-farm income for their livelihood.

Table 6: Poverty Analysis among the Farm Households: (in terms of Adult Equivalent Monthly per Capita Consumption Expenditure)

Poverty range/type of farmers	Farm households operate only owned land	Farm households who took land in lease	Farm households who leases-out their owned land
0-800 (acute poverty)	60	170	101
801-1128 (below poverty line)	1	0	32
1129-2500 (above poverty line)	0	3	3
2500 and above	0	0	1
Total	61	173	137

Source: Calculated by authors on the basis of the information collected from field survey.

Conclusions

Tenancy contract under the Fixed rent system is observed among the marginal farmer households. This paper has identified the causes for lease-in and lease-out of owned land among the marginal farmer households. It is established that

comparatively big landholders among the marginal farmer households are more interested in leases out land to landless households or the marginal farmer households who own extremely small size of land. Lack of interest among the younger generations of the households to pursue cultivation for their livelihood is also a major reason for leasing out the land. The landless households or marginal farmer households who own a small plot of land and whose family labour force is available during the time of agricultural production generally prefer to take some land in the lease for cultivation. But there is no incidence of Reverse Tenancy. It is observed that the livelihood of the marginal farm households who are looking for alternative earning opportunities after leasing out-owned land can maintain the best livelihood among the above mentioned three types of farm households. They are followed by the marginal farm households who cultivate their own land without taking or giving any owned land in lease. The marginal farm households who take land in the lease are in the worst condition in terms of livelihood because almost all such sample respondents are acutely poor even after taking land in the lease for cultivation. It is also observed that despite the presence of multiple cropping in our study region, most of the farm households of all considered types are laying below the poverty line

Endnotes

1. Marginal farmers are those farmers who own agricultural land up to 2.5 acres.
2. The farmers who reported that they leased out their land, are engaged in non-agricultural activities like non-agricultural labour, fishery, trade, service, construction etc.
3. The farmer can be called pure tenant.
4. Here 42 farm households are landless and the remaining farm households own very small size of land.
5. According to the West Bengal Land Reform Act, 1955, as amended in 1970, 1971 and 1981, land lease on sharecropping is only allowed. No fixed-rent tenancy system is allowed even by a person under disability of any kind. But in our study area, we observe the presence of only a fixed rent system.
6. It is assumed that the opportunity cost of family labour is zero.
7. The present situation, this variable may take an important role in the tenancy contract which was not addressed before. Incidentally, we have found 115 such households that have a household member in the above-mentioned age cohort. Among both types of farm households, these members are not willing to pursue agricultural activities for their livelihood.
8. Previous kinds of the literature identified 'Education', 'Flabforce', 'TNonfincome' are determining factors during the time of leasing out land. But in the present paper, apart from those variables, we add 'Nextgen' and 'Fhead' as two additional explanatory variables which may influence the marginal farm households during the time f taking decision about leasing out his/her owned land.
9. Here we drop those marginal farmers who took land in lease.
10. It is already mentioned that in our sample all the farm households are marginal farmers.
11. This happens because the value of the marginal co-efficient of 'Tlandowned' is positive
12. On the basis of the positive value of the marginal coefficient, the variable is very strong enough for a marginal farmer household during the time of taking the decision on leasing out his/her

land prior to the beginning of the agricultural season. This factor was not addressed previously in the existing literature.

13. Here, this is necessary for our farm households who operate only their owned land.

14. Which is treated as earnings.

15. The important average variable costs incurred by the farmers during the time of Kharif paddy cultivation are; ₹1800/bigha for hired labour, ₹600/bigha as labour cost for tractors and other machines, ₹200/bigha for fertilizers and ₹800/bigha for other expenses respectively. The average variable cost of cultivation for rabi paddy is ₹2200/bigha for hired labour, ₹125/bigha for manures, ₹600/bigha for tractors and other machine labour costs, ₹300/bigha for fertilizers, ₹1250/bigha for irrigation and ₹1200/bigha for other expenses respectively. Different types of average variable costs for wheat cultivation are ₹300/bigha for hired labour, ₹100/bigha for fertilizers and ₹350/bigha for other expenses respectively. Different average variable costs for vegetables cultivation are ₹600 /bigha for hired labour, ₹300/bigha for manures, ₹150/bigha for fertilizers, and ₹350/bigha for plan protection of chemicals and ₹400/bigha for irrigation respectively. It is observed that the productivity, i.e., yields of khariff paddy, rabi paddy wheat and vegetables are 9.6 quintals/bigha, 12 quintals/bigha, 1.2 quintals/bigha and 0.18 quintals/bigha respectively. The farmers have reported that all production of kharif paddy is utilized for their self-consumption and they are now able to sell their rabi paddy directly to the government at the rate ₹1450/ quintals[1]. Other crops such as wheat, and vegetables are sold in the market which fetches them ₹800/ quintals and ₹6000/ quintals respectively.

16. But the age composition of the members of the sample farming household is not same. So, we must calculate the adult equivalent family member of each household. In this calculation adult male and female members are given weight 1, the child below age group 14 but above 6 years are given weight ½ and the child below 6 years of that sample household is given weight ¼. Based on that weight, we can calculate adult equivalent family members of each sample farming household. Dividing the average monthly income of a household by adult equivalent family members of that household we get the Monthly Per-capita Income of that household in the adult equivalent scale which is here treated as an outcome variable.

17. Here 'Leaseout' is considered as an intervention which takes only two values 1 or 0. It is already proved that there exist some factors which are influencing 'Lease out'. Hence the problem of treatment endogeneity is arising during the time of evaluation of whether 'Leaseout' can help the marginal farmer households to improve their livelihood through better MPCE. The outcome variable of the present impact evaluation is here MPCE which is observed both for the treatment group as well as for the control group. So, to tackle the sample selection bias or treatment endogeneity problem, two-step Treatment Effect model developed by Heckman is here applied.

18. But the availability of the family labour force is not a decision-making factor during the time of leasing out of the land.

19. The cause for using this method has already been explained previously.

20. Summary Statistics of some variables are given in the Appendix.

21. Press Note on Poverty Estimate, Government of India, Planning Commission, July 2013. Here the poverty line is calculated as per the Tendulkar method on Mixed Reference Period

22. According to Press Information Bureau, Government of India, Ministry of Statistics and Programme Implementation in May 2019 the value of the Consumer Price Index of rural labourers in West Bengal in March 2019 was 143.4 after considering 2012 as the base year. So, the rural poverty line is adjusted in March 2019 accordingly.

23. The concept of a mixed reference period is borrowed from NSSO. Here the reference period of food consumption expenditure including fuel, expenditure on education and entertainment is the previous one month. During the time of collecting information about health and clothing, the considered reference period was the previous year.

24. The method has already been discussed.

Reference

Bliss, C.J. and Nicholas Stern (1982), *Palanpur: The Economy of an Indian Village*, Oxford University Press, Oxford, UK.

Chattopadhyay, M. and A. Sengupta (2001), Tenancy Inefficiency: A Study based on West Bengal Agriculture, *Economic and Political Weekly*, 36(5): 497-502, February 3-16.

Government of India (2010-11, 1015-16), *Agricultural Census (2010-11, 1015-16)*, Published by Agricultural Cooperation and Famer's Welfare, Ministry of Agriculture, Government of India

Goyal S.K. and R.N. Pandey (2000), Temporal Changes in Land-lease Market in Haryana, *Indian Journal of Agricultural Economics,* 55(3): July-September.

James, J. Heckman (1976), The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple estimator of Such Models, *Annals of Economic and Social Measurement*, 5/4 475-492.

James, Kai-sing Kung (2002), Off-farm Labour Markets and the Emergence of Land Rental Markets in Rural China, *Journal of Comparative Economics*, 30(2): 395-414.

Kaur, M. and S. Singh (2011), Agricultural Land Lease Market in Gurdaspur District of Punjab, *Journal of Agricultural Development Policy*; 21(2): 51-60.

Kundu, A. and S. Das (2019), Push and (or) Pull? Drivers of Labour Force Participation in Indian Agriculture, *Indian Journal of Labour Economics*, 62(3): 413-430, September.

Liesbet, Vranken, Johan Swinnen (2006), Land Rental Markets in Transition: Theory and Evidence from Hungary, *World Development*, 34(3): 481-500.

Lieten, G.K. (1994), For a New Debate on West Bengal, *Economic and Political Weekly*, 29(29): 1835-1838.

Mani, G. (2016), Model Agriculture Land Leasing Act, 2016: Some Observations, *Economic and Political Weekly*, 51(42): page no, 15th October.

Parthasarathy, G. and D.S. Prasad (1974), Response to an Impact of HYV Rice According to Land Size and Tenure in a Delta Village A.P. India, *Developing Economics*June.

Rao, Hanumantha and A. Gulati (1994), Indian Agriculture: Emerging Perspective and Policy Issues, *Economic and Political Weekly*, December 31,. pp. A158 – A169.

Sanzidur, Rahman (2010), Determinants of Agricultural Land Rental Market Transactions in Bngladesh, *Land Use Policy,* 27(3): 957-964.

Shaheen Akter, *et. al.* (2006), *Land Rental Market in India: Efficiency and Equity Considerations*, Annual Meeting of Agricultural Economists Queensland Australia August

Sharma, H.R. (2000), Tenancy Relations in Rural India; A Temporal and Cross-Sectional Analysis, *Indian Journal of Agricultural. Economics*, 55(3): 295-307.

Srivastava. R. (1989), Tenancy Contracts during Transition. A Study Based on Field Workers in Uttar Pradesh (a), *Journal of Peasant Studies*, 16(3): 339-349.

Taslim, Mohammad A. and Farid U. Ahmed (1992), An Analysis of Land Leasing in Bangladesh Agriculture, *Economic Development and Cultural Change,* 40(3): 615–628.

Appendix

Summary Statistics

Indicator/ Tenancy status	Farmers who leased in land				Farmers who leased out their land			
	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max
Size of the land in acre	0.77	0.27	0.165	1.65	1.5	0.99	0.33	6.6
Education	1.10	1.73	0	10	3.05	3.18	0	12
Unemployed family members	1.40	0.65	0	3	1.67	0.70	0	3
Total non-farm income (₹)	30884	22642	0	178000	114306	16774	9000	69000
Monthly per capita income (₹)	1528	573	572	4314	2957	2178	535	18989

Indicator/ Tenancy status	Owned land cultivator			
	Mean	Std dev	Min	Max
Size of the land in acre	0.74	0.31	0.33	1.65
Education	2.18	2.61	0	12
Unemployed family members	1.47	0.67	0	4
Total non-farm income (₹)	47262	77001	11000	57000
Monthly per capita income (₹)	2051	2188	661	17944

Source: Calculated by authors.