DETERMINANTS OF LAND LEASING DECISIONS FOR SHRIMP FARMING: A CASE STUDY OF SMALLHOLDERS' SHRIMP FARMING IN INDIA

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ABSTRACT

Using primary data collected from 208 shrimp farming households and 69 households leasing-out land for shrimp farming, this paper explores the demographic and economic factors influencing the land leasing decisions for traditional and scientific shrimp farming in West Bengal, India, applying Tobit Model. The results indicate that size of households' land holding is positively related with the extent of land leased-in for traditional shrimp farming whereas for scientific shrimp farming the association was found to be negative. This signifies that land leasing market does not facilitate the households having lesser landholding to lease-in land for shrimp culture in the case of traditional shrimp farming whereas in the case of scientific shrimp farming it does facilitate such households. In the case of traditional shrimp farming households' association with other fisheries related activities was also found to have positive influence on their leasing-in decisions . On the supply side, variables like number of adult male members, households' association with fisheries related activities and non-farm assets were found to have positive, negative and positive association respectively with the extent of land leased-out for traditional shrimp farming. The analysis also exhibits that the age of the household head has negative relationship with the extent of land leased-out by them both in the case of traditional and scientific shrimp farming. This signifies that existing institutional arrangements in shrimp farming of West Bengal are not considerably successful to motivate young rural people to undertake shrimp farming on their own   instead of leasing-out land for shrimp culture and aquaculture policies should address this aspect.

Keywords: Shrimp Farming,Leasing-in,Leasing-out, leasing market

INTRODUCTION

Shrimp is one of the most important aquaculture products in India in terms of export earning capacity. Shrimp constitutes 44% of total marine product exports from India in terms of value and 21% in terms of volume. The economic issues pertaining to shrimp aquaculture have attracted the attention of many researchers and the issues mainly revolves around the profitability of various shrimp farming systems, ,the environmental costs of shrimp farming and the institutional aspects of shrimp farming. In the Indian context though many studies have dealt with the first two aspects, the institutional aspects are relatively less explored. Studies dealing with the leasing institution of shrimp culture in India like [1]and [2] mainly address two important issues, (1) land leasing policies and practices and (2) regulations of shrimp culture [3]. An overview of the state policies towards land leasing in shrimp culture unfolds that various state governments made conscious effort of fixing a certain ceiling of land to be leased for aquaculture to the poorer section of the society. So, the leasing policies in many states were directed by government expect Goa and West Bengal. Though leasing policies have largely been used as a means to promote shrimp farming and direct the available suitable land to the poorer section of the society, in many cases the emergence of shrimp farming as a commercial activity itself led to changes in the institutions of land leasing. Such changes include the increasing land rent in the area to changes in the land tenure systems [2,4]. But despite all the regulations and policy initiatives, the development of shrimp culture is still facing a number of challenges. Delay in the allotment of land by state governments, non-acceptance of leased-in land for mortgage and delay in sanction of loans act as a disincentive to the beneficiaries. Thus, despite the government's effort to re-distribute coastal lands suitable for shrimp culture in order to ensure access of such lands to all the sections of society, private leasing markets for shrimp farming exists . So

far none of the studies have examined the nature and pattern of land leasing market for shrimp farming in Indian context. The studies mentioned above mainly describe the institutions involved in land leasing for shrimp culture and do not analyse the land leasing market of aquaculture in-depth. There has not been any systematic analysis on the leasing market of shrimp culture judged from both the demand and supply sides. The present paper intends to address this lacuna in the existing literature and attempts to analyze the determinants of leasing-in or leasing–out decisions in the context of shrimp farming. This would help to identify whether the private lease-market in shrimp culture functions efficiently by providing more land towards the households with lesser land for shrimp farming or not. Such an investigation will also facilitate the policy makers to undertake policies which will facilitate the resource poor shrimp farmers to lease-in land and expand their farm size. The paper is divided into five sections. The following section provides some insights from the literature about determinants of leasing decision. The third section outlines the model specification and the variables used in order to examine the determinants of land leasing-in and leasing-out for shrimp farming. The fourth section describes the data source used for the paper. Fifth section presents the estimation results and discussions of the results and the final section delineates the concluding remarks.

FARM HOUSEHOLDS' CHARECTERISTICS AND LEASING DECISIONS: INSIGHTS FROM THE LITERATURE

The studies pertaining to the determinants of farm households' participation in the leasing market [5,6,7] are based on a few theoretical models which have two basic assumptions - there exists imperfect land, labour and credit market in the agricultural context and individuals differ in terms of their initial wealth, specific human capital and off-farm employment opportunities [8]. These studies broadly suggest that family labour, total land endowment of the farm households, factors which determine the managerial capacity of the family labourers and off-farm employment opportunities are the main factors affecting the participation of farm households in the leasing market. Following discussion depicts the interaction of these variables with the leasing decisions of the farm households.

The labour input needed for cultivation can be either supplied by the members of the farm family or hired labour. Even for appointing hired labour, a farm family needs to have sufficient supervisory family labour to make those hired labourers work. There is an upper limit to which any given number of family workers can supervise the hired workers [9]. Once this limit is exceeded proper supervision becomes difficult and thus production suffers. Thus, the family which has sufficient number of workers is supposed to lease-in more land. On the other hand, the farm families who have more family workers face problems of gainfully employing the family labour on their land holding. In many cases, hiring out family labour as daily wage laboureres is not socially desirable [10]. Moreover, the management capability of a family labour can be employed gainfully if the farm family lease-in land instead of hiring out family labour as a daily wage labourers [11]. In case, market for family labour is imperfect, higher the number of male workers higher will be the amount of leased-in land.

The total land endowment of the farm family is also an important factor in determining their leasing-in and leasing-out decisions. Leasing-in land itself is a result of an adjustment of the household towards its optimal operational scale [7][a] .Households lease-in or lease-out land to close the gap between the desired amount of land and actual amount of land owned by them. Thus, households owning lesser land are expected to lease-in land and households having more land *ceteris paribus* will lease-out land[12,6,13]

The variables which affect the management capability of a particular farm family also affect their leasing decisions. The important decisions regarding the use of the land a household possesses, is taken by the head of the household. Thus, the socio-economic characteristics of the head of the household affect the leasing decisions. Age of the household head is supposed to have positive influence on the leasing-out decisions. This implies, the aged household heads would not be able to cultivate on their own and would like to lease-out their land. The education level of the household head is expected to have a positive influence on leasing-in decisions. Off-farm labour opportunities are expected to affect leasing-in

decisions negatively. Higher off-farm labour opportunities will lead to leasing-out of land and households would go for other non-farm activities. The economic status of the farm households may also affect the leasing decision.

DATA SOURCE

In order to analyse the land leasing-in and leasing-out decision in the context of shrimp farming the present paper uses primary data collected from the households in two shrimp farming districts of West Bengal, India. The existing leasing practices in West Bengal are dominated by private leasing markets, providing suitable ground for analyzing the factors determining leasing decisions of the households in the case of shrimp farming. Our analysis is based on the data on 108 traditional and 101 scientific shrimp farming households collected by multistage stratified random sampling technique from two shrimp farming districts of West Bengal, India. In order to analyse the supply side of the leasing market, data on 40 and 29 sample households who have leased-out land for shrimp farming have been collected from the study villages of traditional and scientific shrimp farming using random sampling . The study shrimp farming villages are engaged in small scale shrimp culture where the average shrimp farm size is less than two acres. The data has been collected during the culture year 2004-05.

VARIABLES AND MODEL SPECIFICATION

In order to analyze the factors influencing the leasing-in and leasing-out decisions for shrimp farming using censored regression or Tobit model has been used. The leasing-decision involve three sets of households, those who leased-in land for shrimp culture, those who leased-out land for shrimp culture and the shrimp farming households who did not participate in the leasing market (owner operators). An Ordinary Least Squares (OLS) estimate taking the extent of leased-in and lease-out land as a dependent and the possible factors affecting the leasing-decision as independent variables would not involve the observations pertaining to the sample shrimp farming households who did not participate in the leasing market (owner operators). Non inclusion of the owner operators in the analysis may generate biased estimates for the factors affecting leasing decisions in shrimp farming. Thus we have used the groups of lessees, lessors and owner-operators as our sample in the estimation of Tobit regression for the factors influencing households' decision to lease-in or lease-out land for shrimp culture. We have estimated separate models for the leasing-in and leasing-out decisions in the case of traditional and scientific shrimp farming. In the case of traditional shrimp farming our sample for Tobit model consists of 58 lessees, 50 owner-operators and 40 lessors adding up to 148 households. In the case of scientific shrimp farming, our sample consists of 33 lessees, 67 owner-operators and 29 lessors adding up to 129 households. The Tobit model for leasing-in and leasing-out are left censored at zero. This implies that for the model on leasing-in decision, the dependent variable assumes positive values if the household had leased-in land for shrimp culture and zero if the household is an owner-operator or had leased-out land for shrimp culture. In the case of the Tobit model on leasing-out decision, the dependent variable assumes positive values if the household had leased-out land for shrimp culture and zero if the household is an owner-operator or had leased-in land for shrimp culture. The Tobit model to identify the factors affecting leasing-in (out) decision of the households for shrimp farming is specified as follows:

$$Y^* = b'X + e$$
$$Y = 0, if Y^* \leq 0$$
$$Y = Y^*, if Y^* > 0$$

Where Y is a vector of the extent of land leased-in (out) for shrimp culture which is censored at zero; X is a matrix of explanatory variables which are hypothesised to influence the amount of land leased-in (out) for shrimp culture by the households; b represents vector of unknown parameters to be estimated corresponding to the explanatory variables and e is the disturbance term assumed to be normally distributed.

The explanatory variables in this case reflect the heterogeneities among the households in terms of demographic composition of the family and other socio-economic variables. The explanatory variables include number of adult male members in the family (ADMALE); number of children in the family (CHILD); total land owned by the household (TOLAND) in acres; age of the household head (AGEHH) in years; whether the household is associated with fisheries related occupation or not (OFISH)[OFISH takes the value one if household is associated with fisheries related occupation and zero otherwise] ; gram panchayat the household belongs to (GP) and value of non-farm assets possessed by the households (NASSET) ('00000 Rs.). It should be mentioned that in the case of traditional shrimp farming GP=1, if the household belongs to Bermajur-I gram panchayat and GP=0, if the household belongs to Sandeshkhali gram panchayat. In the case of scientific shrimp farming GP=1, if the household belongs to Heria gram panchayat and GP=0, if the household belongs to Tikasi gram panchayat.

In the Tobit regression the number of adult male members and number of children are included as separate variables in order to capture the influence of different types of family labour in the leasing-in (out) decision of the households for shrimp culture. As discussed earlier if the market for family labour is imperfect, ADMALE is expected to have a positive impact on the leasing-in decisions of the household. This implies that households with higher number of adult male members are expected to gainfully employ their family labour into shrimp culture instead of hiring-out their labour for other occupations. The variable CHILD is expected to have a positive influence on the leasing-in decisions of the households. As the number of children (dependents) is more, households may lease-in more land for supporting their family by expanding their shrimp farming activity. On the other hand, the households having higher number of children are expected to offer lesser land in the lease market for shrimp culture.

As discussed earlier, variable TOLAND is expected to have negative impact on the leasing-in decisions and a positive influence on the leasing-out decisions for shrimp culture. If the households who are interested to undertake shrimp farming possess less land, they are supposed to lease-in more land in order to expand their shrimp farming activities. Such negative influence of total landholdings on leasing-in decisions would imply that the land lease market in shrimp farming is operating efficiently and facilitating the distribution of land towards households interested to culture shrimp with lesser land in their possession. The age of the household head AGEHH is expected to have negative influence on the leasing-in decisions because the younger farmers might be enthusiastic to expand the shrimp farming activity by leasing-in land. The variable representing households' association with fisheries related business (OFISH) is expected to have a positive impact on the leasing-in decision for shrimp farming. The association of the households with fisheries related occupations might expose them to better information and hence inspire them to lease-in land for shrimp culture. The impact of the non-farm asset (NASSET) of the households would depend on many exogenous factors prevalent in the study area. The asset of the lessees may act as an added incentive for the lessors to lease-out their land to wealthy people so that timely payment of the rent would be assured. Thus, the wealthy households are more likely to access the lands offered in the leasing market for shrimp culture if they wish. Moreover, the wealthy households generally have higher political influence in the rural settings. So, the process of leasing-out land for shrimp culture also might be easier for them. In that sense NASSET might have a positive influence on the supply side of the leasing market also. The leasing decisions of the households for shrimp farming may also be influenced by the gram panchayat they belong to. The institutional and locational factors specific to the gram panchayats may affect the leasing decisions of the households. For example, in the study area for traditional shrimp farming the Sandeshkhali gram panchayat had undergone several changes as far as the development of shrimp farming is concerned. Though the household level shrimp farming is a recent phenomenon in the gram panchayat, earlier a few large shrimp farms existed in the area, owned by outsider entrepreneurs. The households who had small pieces of land in the river side used to lease-out their land to those entrepreneurs. So, the practice of leasing already existed in the area

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before. Thus, in Sandeshkhali, the practice of leasing-in and leasing-out land for shrimp culture might be more prominent. Moreover, location specific factors like existence of more land worth leasing-in (out) for shrimp culture in a particular gram panchayat may also influence the leasing decisions of the households. In order to capture such influences on leasing decisions for shrimp farming we have incorporated the variable GP.

RESULTS AND DISCUSSIONS

Before going into the details of the estimation results let us have a glance on the descriptive statistics of the variables which are presented in table I. Our sample of 108 traditional shrimp farming households consists of 50 households who have used their own land and hence are the owner operators in shrimp culture. The average landholding of the households leasing-in land for shrimp farming is slightly lower than that of the owner operators in the case of traditional shrimp farming. However the average landholding of the lessors was more than that of the owner operators in the case of traditional shrimp farming. The average number of male members in the family was higher for lessors in the case of both traditional and scientific shrimp farming. The table also reveals that the percentage of households associated with fisheries related activities were more for lessees than that of the owneroperators in case of both the shrimp farming systems. In the case of both traditional and scientific shrimp farming the average household head for owner operators were higher than that of the lessors . It can also be observed from the table that households who leased-in higher amount of land possessed higher value of non-farm assets. The average value of non-farm asset possessed by owner-operators was Rs. 31826 which was lesser than the value of non-farm assets owned by the lessees irrespective of the groups. The above observations indicate that the amount of assets have a favourable impact on leasing-in land for shrimp culture.

Table I: Descriptive Statistics of the Variables

Variables	Traditional Shrimp Farming			Scientific Shrimp Farming		
	Owner operators	**Leesses**	**Lessors**	**Owner operators**	**Leesses**	**Lessors**
Sample	50	58	40	67	32	29
Leased-in (out) land(acres)	-	6.24 (15.96)	1.2 (0.91)	-	0.99 (0.69)	1.50 (0.66)
Total land owned (acres)	1.86 (2.04)	1.81 (2.37)	2.15 (0.58)	2.03 (1.44)	1.93 (1.34)	4.8 (2.2)
No of male members	2.57 (1.19)	2.8 (1.73)	3.0 (0.82)	2.39 (1.2)	2.04 (1.00)	2.9 (1.1)
No. of Children	1.88 (1.58)	1.69 (1.27)	1.38 (1.40)	2.17 (1.99)	1.76 (1.28)	1.48 (0.98)
Association with fisheries related Business (%)	28.6	56.9	26.2	19.40	27.27	31.03
Age of the household Head	49.24 (11.02)	41.52 (12.4)	48.6 (16.4)	51.75 (19.6)	52.72 15.9)	51.0 (18.6)
Value of non-farm assets(Rs.)	31826 (12096)	41970 (25946)	42445 (28229)	104968 (46513)	112340 (63121)	12356 (10365)

Note: Figures in the parentheses indicate the t-values
Source: Primary survey

The estimation results of the Tobit models for leasing-in and leasing-out decisions in the case of traditional shrimp farming are presented in Table II. The maximum likelihood estimates of the coefficients are presented in the Table. It can be observed from Table II that the variable TOLAND has a statistically significant influence on the amount of land leased-in for shrimp culture. The positive sign of the coefficient implies that holding everything else constant the households with higher amount of landholdings will lease-in more land for shrimp culture. The shrimp farmers who had higher land in possession might have received preference from the lessors because possession of higher land is an assurance for them for timely payment of the lease-rent. On the other hand, the households who had higher land holdings could afford to keep a portion of their own land for agricultural purposes. So, possession of agricultural land might have acted as a risk covering measure for the households, and inspire them to undertake shrimp culture on leased-in land. Thus leasing market in the case of traditional shrimp farming does not facilitate the small landowners to lease-in land and undertake shrimp farming. The estimation results also show that OFISH has a positive and statistically significant influence on the households' leasing-in decisions for shrimp culture. This implies that households associated with fisheries related activities will lease-in more land for shrimp farming. This could be due to the fact that the households related to fisheries related occupations have higher access to information related to leasing market for shrimp culture in the locality.

Table II: Maximum Likelihood Estimates of Tobit Model for Factors Influencing Leasing-in and Leasing-out Decision for Traditional Shrimp Farming

	Leasing-in		Leasing-out	
Variables	Coefficients	P-values	Coefficients	P-values
Constant	-20.06 (-2.54)	0.01	0.99 (0.87)	0.38
ADMALE(number)	-0.29 (-0.25)	0.80	0.41 (2.25)	0.02
CHILD(number)	0.29 (0.25)	0.76	-0.34 (-2.24)	0.02
TOLAND(acres)	3.12 (4.30)	0.00	0.06 (0.57)	0.56
OFISH (Dummy)	9.76 (3.54)	0.00	-0.71 (-1.71)	0.08
AGEHH(years)	0.15 (1.19)	0.23	-0.05 (-2.68)	0.00
GP(Dummy)	-8.74 (-3.07)	0.00	-0.67 (-1.71)	0.08
NASSET ('00000 Rs.)	0.06 (1.31)	0.18	0.02 (2.69)	0.00
Sigma	12.88 (10.24)	0.00	1.67 (7.95)	0.00
LR chi2(7)	50.74		31.79	
Prob>chi2	0.000		0.000	
Log-likelihood	-271.49		-119.09	
Number of observations	148		148	

Note: Figures in the parentheses indicate the t-values
Source: Primary survey

Interestingly, the locational and institutional factors captured by the variable GP are also found to have significant influence on the leasing-in decisions of the traditional shrimp farming households. In this case the negative coefficient of the variable GP signifies that the households belonging to Bermajur-I gram panchayat leased-in lesser land than that of the households in the Sandeshkhali gram panchayat. As mentioned earlier, this could be a result of the prior existence of leasing practices and existence of more land suitable for shrimp culture in the riverside areas of the Sandeshkhali gram panchayat. Table II also presents the estimation results for factors influencing the households' decision to lease-out land for traditional shrimp culture. It can be observed from the table that the variables related to the demographic characteristics of the household namely number of adult male members in the family, number of children and age of the household head played significant role on the supply side of the leasing market for traditional shrimp farming. The positive and statistically significant coefficient of the variable ADMALE indicates that the households having more number of adult male members leased-out more land for shrimp farming. This result is in contrast to the expectation that the households having more adult male members offer less land to the leasing market and self-cultivate their land. One of the reasons for this could be the risky nature of shrimp farming. The households with higher number of male members rather prefer to diversify their economic activities by engaging themselves into agriculture and other businesses instead of shrimp farming and lease-out their land suitable for shrimp culture. But, the results show that the households who had higher number of children in their family offered lesser land in the leasing market for shrimp culture. One of the reasons for this could be that the households with higher number of children preferred to retain their land for future use rather than leasing-out for shrimp culture. The negative coefficient of the variable AGEHH signifies that in the case of traditional shrimp farming the younger the household heads were, the more the land they leased-out for shrimp farming. This signifies that the young rural people did not have enough motivation to culture shrimp on their own, rather they leased-out their land for shrimp culture. They preferred to enjoy a certain annual fixed income and engaged themselves in other occupations. The positive coefficient of the NASSET implies that *ceteris paribus* households possessing higher non-farm assets leased-out more land for shrimp farming. This implies that comparatively wealthy households leased-out higher extent of land for traditional shrimp farming instead of culturing shrimp themselves. It can be observed that the total land owned (TOLAND) did not have significant impact on leasing-out decisions of the households in the case of traditional shrimp farming.

The estimated coefficient of the variable OFISH is negative and statistically significant. This implies that among the households who leased-out land for shrimp farming, those who were associated with fisheries related business leased-out lesser land. The households association with fisheries related activities exposes them to more information about the shrimp farming practices which might have inspired them to offer less land in the lease market for shrimp culture and culture shrimp on their own. As in the case of demand side of the leasing market for shrimp farming, in the supply side also variable GP was found to be statistically significant and negatively influencing households' decision to lease-out land. In this case the households belonging to Sandeshkhali gram panchayat leased-out higher extent of land than those belonging to Bermajur-I gram panchayat. This implies the participation of the households in leasing activities for shrimp culture; both from the supply and demand side was more prominent in Sandeshkhali Gram panchayat. The significant value of sigma which is the inverse Mill's ratio reveals that exclusion of the observations with zero value of the variable Y would bias the results in case of both sides of the leasing market for shrimp farming.

In the case of scientific shrimp farming also, we have tried to explore the factors influencing households' decision to lease-out and lease-in land for shrimp farming following the Tobit models specified earlier. The results of the estimated coefficients for the leasing-out and leasing-in decision for scientific shrimp farming are presented in Table III. But in the case of scientific shrimp farming our estimation results do not indicate significant influences of the household specific demographic and socio-economic characteristics on their leasing-in and leasing-out decisions. A possible reason for such results could be that in the study area for scientific shrimp farming the leasing practice for shrimp farming itself was very

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limited. In our sample scientific shrimp farmers only 33% had leased-in land for shrimp culture. Moreover, in our four study villages only 29 households were found to lease-out land for shrimp culture. The limited practice of leasing land for shrimp farming in the study area itself might have restricted the scope to identify the specific household characteristics which may significantly influence their leasing decisions. However, in order to get some idea about the household specific characteristics influencing their decision to lease-in and lease-out land for shrimp culture, let us look into the results presented in Table III. It can be noted that in the case of leasing-in land for scientific shrimp farming, the only variable found to have statistically significant influence on leasing-in decisions for shrimp culture is TOLAND. The sign of the estimated coefficient reveals that in case of scientific shrimp farming *ceteris paribus* the households having lesser land endowment leased-in more land for shrimp culture. This is the opposite case of traditional shrimp farming where the impact of the total landholding of the household on leasing-in decision was positive. One of the possible reasons for this difference could be the very high returns of scientific shrimp farming. The households having lesser land also undertake the risk of leasing-in because two or three years of successful crops can turn their fortune. Another reason could be, the households possessing lesser lands did not want to culture shrimp on their own land because if they convert their entire land into shrimp ponds and incur loss in shrimp culture, the land would not be suitable for agriculture at least in the near future. Our result indicates that in the case of scientific shrimp farming the existing leasing arrangements facilitate the households who had lesser landholdings to lease-in land for culturing shrimp.

Table III: Maximum Likelihood Estimates of Tobit Model for Factors Influencing Leasing-in and Leasing-out Decision for Scientific Shrimp Farming

	Leasing-in		Leasing-out	
Variables	Coefficients	P-values	Coefficients	P-values
Constant	-1.27 (-1.30)	0.19	-1.27 (-1.17)	0.24
ADMALE(number)	-0.24 (-1.36)	0.17	0.22 (1.39)	0.16
CHILD(number)	-0.09 (-0.71)	0.47	-0.09 (-0.67)	0.49
TOLAND(acres)	-0.21 (-2.45)	0.01	0.48 (4.89)	0.00
OFISH (Dummy)	0.11 (0.27)	0.66	0.55 (1.35)	0.18
AGEHH(years)	0.02 (1.13)	0.25	-0.04 (-2.21)	0.00
GP(Dummy)	-0.05 (-0.12)	0.90	0.17 (0.43)	0.18
NASSET('00000 Rs.)	0.005 (1.46)	0.15	.018 (0.42)	0.66
Sigma	1.54 (6.42)	0.00	1.41 (6.56)	0.00
LR chi2(7)	20.00		51.81	
Prob>chi2	0.01		0.000	
Log-likelihood	-100.76		-80.38	
Number of observations	129		129	

Note: Figures in the parentheses indicate the t-values;   Source: Primary survey

It can also be observed from table 3 that the variable TOLAND has positive and significant influence on the households' decision to lease-out land for shrimp culture. Thus, *ceteris paribus* the household who owned higher amount of total land leased-out more land for shrimp culture. This is consistent with the expected sign that households with higher landholding lease-out more land. Thus it can be said that the land market in the case of scientific shrimp farmers facilitates the transfer of land from the big landowners to small landowners. In case of scientific shrimp farming also it can be observed that, lesser the age of the head of the household, higher was the land leased-out for shrimp culture. This implies that the younger farmers leased-out their land and engaged their family labour in business related activities, instead of taking the risk of shrimp farming.

CONCLUSION

This paper examines the nature of leasing market in shrimp farming from the demand and supply side. The analysis of factor influencing the leasing-in and leasing-out decisions of the shrimp farming households reveals that in the case of traditional shrimp farming the households with higher amount of landholdings leased-in more land for shrimp culture. This suggests that private lease-market in shrimp farming does not facilitate the households with less landholdings to lease-in land, in the case of traditional shrimp farming. Thus, the government should encourage the redistribution of coastal lands for shrimp culture, especially, to the households having less landholding. Households' association with fisheries related occupations was found to have favourable impact on their leasing-in decisions in the case of traditional shrimp farming. In the supply side it was found that the households with higher number of male members, preferred to lease-out more land rather than employing their male workforce into shrimp culture. It was observed that in the case of traditional shrimp farming system the young household heads leased-out more land for shrimp culture. In the case of scientific shrimp farming, it was found that the households with lesser landholdings leased-in more land for shrimp farming. This indicates that in the case of scientific shrimp farming the existing lease market facilitates the households with lesser landholdings to lease-in land for scientific shrimp farming. As in the case of traditional shrimp farming, in the case of scientific shrimp farming also younger household heads lease-out higher amount of land for shrimp culture. Thus, it can be said that the present prospects and institutional arrangements in shrimp farming are not considerably successful to catch the imagination of the young rural people and motivate them to undertake shrimp farming instead of leasing-out their land for shrimp farming.

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ENDNOTES
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