Original Research

Socio- Economic Status of the Sheep & Goat Farmers in Sundarban, West Bengal

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Abstract

A study on socio-economic status of the 5998 goat and sheep farmers of Sundarban, West Bengal was made to assess their financial condition for making a suitable plan to uplift the livelihood on the basis of the survey. It had been observed that women were mostly (69.77%) engaged in sheep and goat farming and their financial condition was poor. The education status of these farmers mostly was below 10th standard and they were mainly engaged in household work. Majority of these farmers (84.02%) had not received any training related to Animal husbandry practices and thus provision of suitable training in this area could be helpful for their livelihood security. As the land holding capacity of these farmer were low, sheep and goat farming can be an alternative tool to enrich their economic status. Analysis of individual earning of these farmers was indicated that caste, family size, education status and knowledge about Animal husbandry had a significant effect on family income of these farmers either from agriculture, Animal husbandry particularly sheep and goat. Education status and land holding capacity had a positive impact on economic condition of these farmers. As a whole promotion of sheep and goat husbandry could be an ideal intervention to improve the socio-economic condition of these islanders whose livelihood was in stake.

Key words: Socio-Economic Status, Sheep Husbandry, Sundarban

Introduction

The Sunderban is the largest delta formed by the rivers namely Ganga, Bramhaputra and the Meghna. It is famous for its uniqueness in flora and fauna strength, ecosystem and intricate coastline. But in the island

blocks of Sundarban, very limited alternative earning opportunities must have prompted a large percentage of households to retain their non-viable marginal land. Thus, livestock can be an alternative because Livestock sector alone contributes nearly 25.6% of value of output at current prices of total value of output in Agriculture, Fishing and Forestry sector. The overall contribution of Livestock Sector in total GDP is nearly 4.11% at current prices during 2012-13 (19th livestock census reference). The state of West Bengal possesses a valuable genetic resource of sheep and goat known as "Black Bengal Goat" and "Garole Sheep" which contribute a vital role in the economy of rural, small and marginal landholders by their contribution towards marketable commodities such as meat, milk, fibre and skin (Dhara *et al.*, 2016). Due to abrupt changes in climatic condition, the livelihood of these islanders is in stake which can be maneuvered through scientific sheep and goat husbandry practices as their higher fecundity (kidding interval 3 times in 2 years and Borula gene, (Fec B) and better productivity contribute a considerable income to the rural compared to other livestock farming. As sheep and goat are smaller in size, maintenance by the women can be done very easily. Thus, the role of women in goat and sheep rearing is very significant and through which women are able to contribute meaningfully to the cash needs for family members (Tudu and Roy, 2015). In view of the above, efforts is being taken to safe-guard the interest of these islanders by understanding their problems and to provide a suitable alternative solution for their better livelihood. The assessment of the socio-economic status of the goat and sheep farmers of Sunderban area of West Bengal is made towards formulation of a sustainable programme for their better livelihood which is at stake. The present study was carried out to study the socio-economic condition of 5998 sheep and goat farmers of the village Bali1, Bali2, Choto Mollakhali, Jharkhali, Tridibnagar, Laskapur, Sahebkhali, Ramapur, Charalkhali, Moukhali, Deuli of Surdarban area mainly in Gosaba, Basanti (South 24 Pgs), Hingalgunj (North 24 Pgs) Block of West Bengal under the project entitled "Biotech Kisan Hub" at WBUAFS during the period of May 2018 to April 2019 for formulation of a sustainable programme for their better livelihood.

Materials and Methods

The present research work was done in Sunderban of the state of West Bengal during (May 2018 to April 2019). The area of study was selected purposively which is under coastal zone of India. Bali 1, Bali 2, Choto Mollakhali, Jharkhali, Tridibnagar, Laskapur, Sahebkhali, Ramapur, Charalkhali, Moukhali, Deuli of Surdarban area mainly in Gosaba, Basanti (South 24 pgs), Hingalgunj (North 24 pgs) Block of West Bengal. From the selected villages total number of 5998 farmers were selected randomly, which constituted the sample of the present study. A pretested interview schedule has been used for survey work. The data has been collected through face to face interview and by direct observation for procuring various information related to their socio-economic status like (caste, religion, educational status, animal husbandry knowledge, family size, occupation, annual income from goat rearing) and other sources etc.

Statistical Methods Used

The data were analyzed by few statistical methods i.e. percentage analysis, chi-square test, Spearman correlation test and one-way analysis of variance (Snedecor and Cochran 1994).

Results and Discussion

The data under the present study have been analyzed to find out the socio-economic condition of the farmers. It is a composite measurement of an individual's economic and sociological standing. In the present study, it is measured on the basis of gender, age, caste, land holding, marital status, religion, family type, house type, training, occupation, annual income, educational qualification- as presented in (Table 1) and the correlation of some important factors had been made and depicted in (Table 3).

Socio-Demographic Status

Gender

The perusal of the result depicted that the majority of the farmers were women (69.77%) in either sheep or goat rearing followed by men (30.23%) (Table 1). The present findings are in close agreement with the findings of Dhara *et al.* (2016) as the goat or sheep are smaller in size which can be handled by the women farmer easily. The chi-square test (Table 2) revealed that the difference in gender is highly significant(p<0.01). The gender is positively correlated with age, land holding, occupation, educational status, training received. Caste is not correlated with gender (Table 3). It has been observed that the women farmers were mostly landless or marginal and their annual income was mostly less than rupees thirty thousand. They have not received any sort of training related to annual husbandry and their educational status was below 10th standard or even illiterate. The women farmer had no occupation other than household work which is quite obvious in the rural area. Animal husbandry particularly sheep and goat can be an important tool in this regard which was also focused by Dhara *et al.* (2016) and Tudu *et al.* (2015).

Age

The chart explored that the most of the farmers were within 30-60 yrs (52.8%) and they are most interested in goat and sheep rearing. Analysis of survey revealed that above 60 yrs age group farmers (16.6%) and up to 30 yrs age group *i.e.* young age group farmers were 30.6% (1835 out of 5998) were least interested in goat farming (Table 1). This finding was in accordance to the observation of Tudu *et al.* (2015) and Dhara *et al.* (2016) but varied from Sultana *et al.* (2014) which may be due to different location. The difference in observation of different age group was statistically significant (p<0.01) as per chi-square test (Table 2). Spearman correlation indicate that the age group was only positively correlated with land holding, educational status, house type but it is negatively correlated with occupation, family type, training on Animal husbandry and family income (Table 2). Since the older were the head of the family they have more

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land holding and thus they have more family income while the younger farmers were engaged in younger were mainly unmarried while older farmers were either married or widow which considered to be a natural finding. Due to keen interest, these young farmers may be allowed to take training on animal husbandry which can be beneficial for their alternative livelihood as service is scanty.

Table 1: Demographic and socio personal characteristics of sheep and goat farmers (N = 5998)

Characters	Category	No.	Percentage
Gender	Male	1813	30.23
	Female	4185	69.77
Age	Young group (up to 30 years)	1835	30.6
	Most active group (30-60years.)	3167	52.8
	Elder group (above 60 years.)	996	16.6
Land holding categories	Landless	470	7.84
	Marginal	4105	68.44
	Small	1294	21.57
	Medium-Large	353	5.88
Occupation	Labour	2470	41.18
	Business	470	7.84
	Independent profession	1411	23.53
	Cultivation	1411	23.53
	Service	235	3.92
Caste	General	1140	19
	Schedule caste	2429	40.5
	Schedule tribe	870	14.5
	Other backward caste	1559	26
Education of the respondent	Illiterate	2639	44
	Primary	1835	30.6
	Middle school	1158	19.3
	High school	360	6
	Graduate	6	0.1
Marital status	Unmarried	470	7.84
	Married	4184	69.76
	Widow/ Widower	1344	22.4
Religion	Hindu	4240	70.69
	Muslim	1740	29.01
	Christian	18	0.3
Family type	Nuclear family	252	4.2
	Joint family	5746	95.8
Training	Not received	5040	84.02
	Received	958	15.98
House	Kancha house	3293	54.9
	Mixed house	1925	32.1
	Pucca house	780	13
Annual Family Income	Up to Rs 30,000/-	720	12
	Above Rs 30000/-	5278	88

Occupation

Most of the farmers income (88%) was above Rs.30,000/- but they mostly worked as labour (41.18%), engaged in business (8%) where as independent profession (23.53%) and cultivation (23.53%) and service sector were (3.92%), whereas only (12%) farmers income was up to Rs.30,000/- (Table 1) respectively. This observation disagrees from Samanta *et al.* (2009) and Nandi *et al.* (2011) which may accrue smaller

sample size. Since the livelihood of the islander is in stake as they earn less Rs.30,000/- per year, an alternative arrangement for better livelihood is the need of the hours. The difference in percentage of observation in occupation among the surveyed farmers was highly significant as per chi-square test (p<0.01) (Table 2). Occupation had positive correlation with education training received and family income while it is negatively correlated with family type. Among the surveyed population who have service had chosen nuclear family instead of staying jointly which is considered to be as social stigma. Other findings were obvious as person having higher education are mainly engaged in service or business and they are keen to incur-training. The family income of the farmers who were mainly engaged in business or service was more than Rs.30,000/- while most of the agriculture labour had less than Rs.30,000/- earning per year.

Caste

The detail observation in the chart revealed that mostly SC (40.5%) farmers were popular in goat rearing followed by OBC (26%) and general caste (19%), whereas (15%) farmers belongs to ST (Table 1).The present findings are corroborated with findings of Samanta *et al.* (2009) and Roy *et al.* (2018) as they also reported that the general trend of sheep and goat farming is preferred by the SC. The chi-square test indicates that the difference in percentage of caste was highly significant (p<0.01) (Table 2).

Educational Qualification

The analysis of the data revealed that their educational status was not good i.e. most of the farmers were illiterate (44%) and primary (30.6%) and middle school (19.3%), where only (6%) farmers were graduate (Table 1). The present findings were corroborated with findings of Samanta *et al.* (2009) and Nandi *et al*. (2011) but altered from Roy *et al.* (2018) as the sample size was less and different location. The variation of percentage of the farmers having different educational status was statistically significant (p<0.01) as indicated in chi-square test. The Spearman correlation coefficient of educational status with other factors had been calculated and depicted in (Table 2). The education status of the farmers has been positively correlated with family type, training received as annual income. Members of Joint family were more interested to lake education which indicates natural social behavior (Table 1) where the head of the family insists the younger generation to stay themselves in the arena of education. Person having higher education are mostly involved in scientific cultivation, business or service which was reflected in their annual family income. Farmers with higher education were keen to receive the knowledge of Animal Husbandry though their interest to participate in training had seen visible in the present survey.

Marital Status

In the present study, married farmers were more interested in sheep and goat rearing (69.76%), followed by widow (22.04%) and unmarried (7.84%) were less interested in sheep and goat (Table 1).This finding is

diverge from Dhara *et al.* (2016) because the area where they studied is different and the sample size is lesser that of present study. Chi-square test revealed that the variation in percentage was highly significant (p<0.01) (Table 2).

Religion

The result revealed that most of the Hindu farmers (70.69%) were predominant in sheep and goat farming rather than Muslim (29.01%) and least were Christian (0.3%) (Table 1).This observation is different from the result of Dhara *et al.* (2016) as the study made by Dhara *et al.* is in different location where Muslim community is predominant. The difference in observation was highly significant as revealed in chi-square test (p<0.01) (Table 2).

Family Type

The perusal of the chart revealed that majority of joint family (95.08%) was engaged in goat & sheep farming while only (4.2%) nuclear family was involved in sheep and goat rearing (Table 1).The present finding is in close agreement with the findings of Dhara *et al.* (2016) .In the village, mostly of the families are staying jointly along with all the family members which considered to be the normal picture of society of rural Bengal which is an observation finding. Chi-square test indicate that the variation was highly significant (p<0.01) (Table 2). It had been found that the correlation between family type with the training received, annual family income was positively correlated. Hence, the finding indicate that the members of joint family were interested in receiving training on Animal Husbandry as this can contribute a considerable portion to their livelihood as alternative source of income. On the whole, the family income per year of the farmers in the joint family was higher than that of nuclear family as because the land holding and alternative occupation of the farmers was observed higher under the present study.

Training

In the present study, it was observed that the majority of the farmers (84.02%) did not receive any sort of training on animal husbandry and only (15.98%) received training on animal husbandry (Table 1). The present observation is found similar to Dhara *et al.* (2016) which is the main scenario of West Bengal where need of propagation of knowledge about animal husbandry practices need to the promoted. The variations were found statistically significant (p<0.01), (Table 2) as per the result observed in chi-square test. Imparting training is an important tool to get alternative livelihood of the farming community as indicated in the present survey where by training received was positively correlated with annual family income (Table 3). Livestock can contribute to the bread and butter of farmers which is reflected in the present study.

House Types

The detailed observation of the chart revealed that most of the farmers' house were kancha house (54.09%) and mixed house were (32.01%) and only (13%) were Pucca house (Table 1). These findings are like chalk and cheese from Dhara *et al*. (2016) which considered to be the normal scenario of rural Bengal. In the villages of West Bengal particularly in the Sundarban area which lies in the remote part where Kancha or mixed house are predominant. Chi-square test indicates that the difference is highly significant (p<0.01) (Table 2).

Table 2: Chi -Square test of socio personal characteristics of sheep and goat farmers (N = 5998)

Test Statistics												
	Gender	**Age group**	**Land holding**	**Occupation**	**caste**	**Education Status**	**Marital status**	**Religion**	**Family type**	**Training received**	**House Type**	**Annual income**
Chi-Square	938.043[a]	1198.964[b]	6514.839[c]	2639.621[d]	928.990[c]	3840.401[d]	3771.803[b]	4508.264[b]	5032.350[a]	2780.770[a]	1583.464[b]	3540.124[a]
df	1	2	3	4	3	4	2	2	1	1	2	1
Asymp. Sig.	0	0	0	0	0	0	0	0	0	0	0	0

Table 3: Correlation coefficient of socio personal characteristics of sheep and goat farmers (N = 5998)

	Gender	**Age group**	**Land holding**	**Occupation**	**Education Status**	**Family type**	**Training received**	**Annual income**
Gender	1	.075**	.276**	-.287**	-.428**	.150**	-.288**	.128**
Age group		1	.169**	-.404**	-.346**	.053**	-.257**	-.222**
Land holding			1	-.492**	-.475**	.188**	-.112**	.515**
Occupation				1	.690**	-.081**	.181**	.136**
Education Status					1	-.211**	.167**	.131**
Family type						1	-.106**	.199**
Training received							1	-0.002
Annual income								1

Socio-Economic Status

The study on the economic status of the 5998 sheep and goat farmers in the Sundarban area had been assessed and being depicted in (Fig. 1 - 4). The analysis of variance regarding effect of caste, family size, educational status and knowledge about animal husbandry practices on individual family income was also made (Table 4, Fig.1 to 4). It has been found from the survey that the family income from agriculture, from animal except (sheep and goat), from sheep and goat, others source (service/business) and total income of general caste was significantly (p<0.01) higher than other caste (SC, ST & OBC). The total income of general caste is (Rs.31,000/-) while the same had been (Rs.18,421/-) in case of other caste. Not only that

income from sheep and goat was also higher for general caste (Table 4) but the enhanced economic profit of general caste might be due to involvement either in service or business than compared to others.
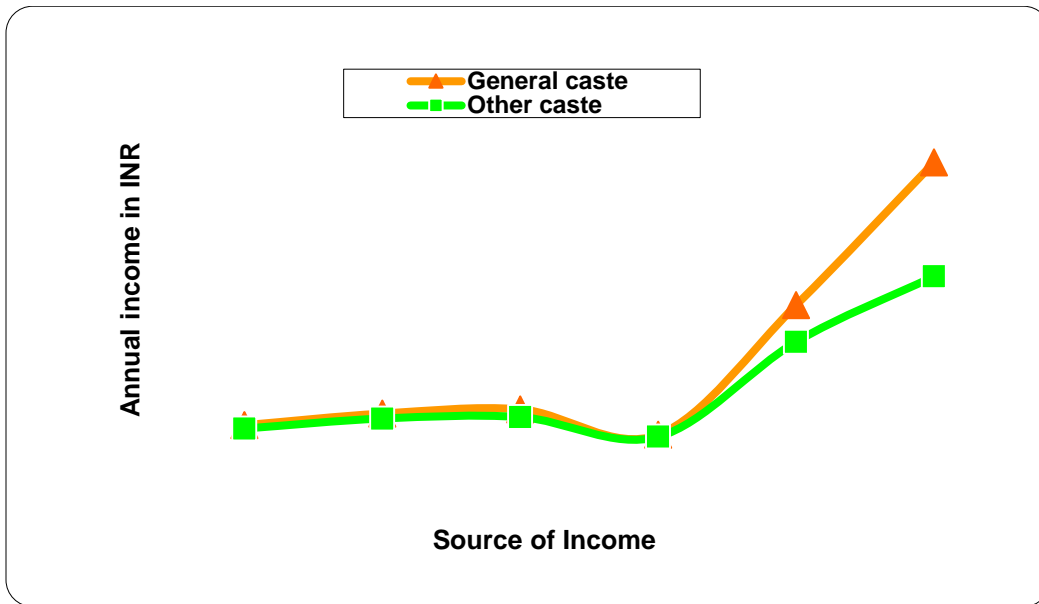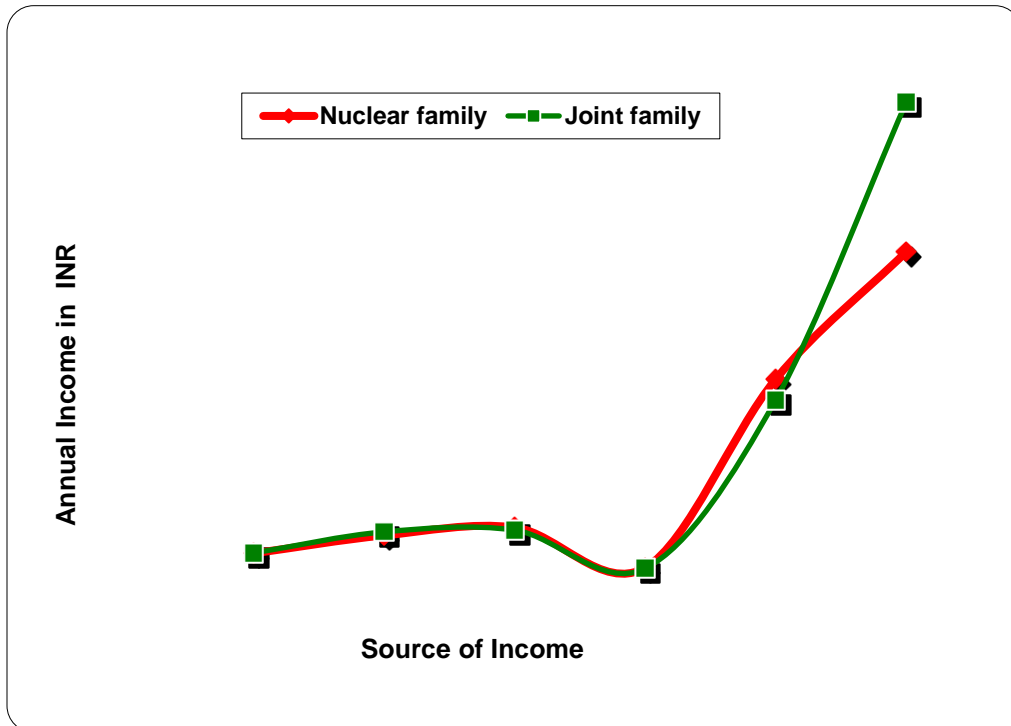

Fig. 1: Source of income from different caste

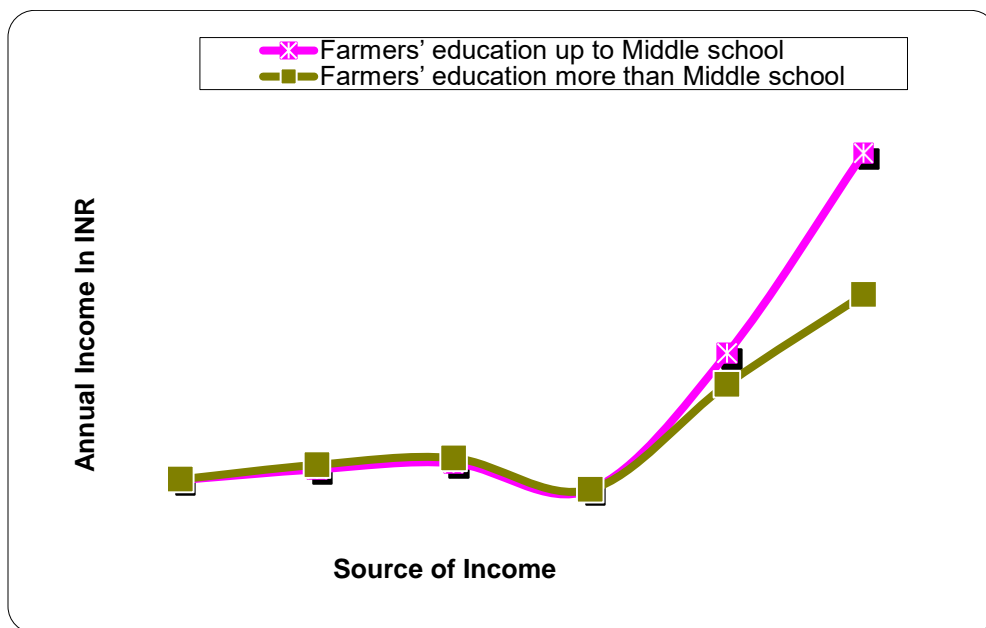**Fig. 2:** Source of income from different family sizes

Fig. 3: Source of income depended on the farmer's education

Fig. 4: Source of income depended on training of animal husbandry

The observation made by Dhara *et al*. (2016) is in agreement with the present result although they have not found any significance which might be due to less number of observation in their studies. The difference in economic return either for nuclear family or joint family was no significant except in case of sheep and goat where nuclear family had gain slightly higher (p>0.05) income (Table 4 and Table 5). It has been found from the present study that in case of joint family, the total income was comparatively higher than nuclear family as the number of family member was higher in case of joint family. Farmers' education was an

important component which influences the economic profitability of the farmers' family. The economic returns of the farming community having educational status more than middle school (10th) had significantly higher total income arising from other sources like service and business (Table 4, Table 5).

Table 4: Monthly economic return (in rupees) (Mean ± SEM) of the sheep and goat farmers (N = 5998)

Different factors	From agriculture (Rs)	From animal (except sheep and goat) (Rs)	From Goat and Sheep (Rs)	Per Sheep and Goat income	From other (service/ businesses) (Rs)	Total income (Rs)
General caste	1991.88± 4.17	3271.20± 4.37	3740.88± 6.42	935.22± 1.24	15256.11± 9.48	31000.00± 10.20
Other caste	1617.00± 3.47	2724.12± 2.66	2882.88± 5.89	720.72± 2.42	11197.35± 8.20	18421.35± 9.88
Nuclear family	1644.72± 4.12	2705.32± 3.27	3177.24± 5.22	794.31± 1.65	11937.88± 7.25	19465.16± 10.02
Joint family	1668.48± 4.42	2914.00± 4.19	3017.52± 6.05	754.38± 4.12	10705.65± 8.14	28305.65± 8.55
Farmers' education up to middle school (class ten)	1594.56± 3.11	2513.56± 5.22	3043.92± 5.15	760.98± 2.55	12428.09± 8.08	29580.13± 8.45
Farmers' education more than middle school (class ten)	1655.28± 4.35	2904.60± 3.77	3480.00± 4.88	780.78± 3.01	9792.28± 8.16	17475.28± 7.60
Training received	1619.64± 3.68	2524.84± 3.84	2938.32± 4.70	734.58± 2.83	13336.99± 8.29	30654.00± 7.82
Training not received	1271.16± 3.55	1855.00± 3.52	2319.24± 3.22	579.81± 1.88	7883.59± 6.24	19630.35± 8.07

Table 5: ANOVA monthly economic return of different category of the sheep and goat farmers

SOV	DF	From agriculture	From animal (Except Sheep and goat)	From Sheep and goat	From other (servi / buiss)	Total income	From agriculture	From animal (Except Sheep and goat)	From Sheep and goat	From other (servi / buiss)	Total income
		Mean Square					F value				
Caste	1	235.46**	276.76**	112.67**	392.86**	682.62**	9.37	9.2	7.31	5.74	9.82
Family member	1	88.62*	118.3*	93.12**	246.29*	279.13*	3.53	3.93	6.04	3.6	4.01
Farmer Edu	1	46.66	66.52	58.99*	219.64*	214.51	1.86	2.21	3.83	3.21	3.08
AH know	1	145.42**	116.45*	182.49**	64.64	184.38	5.79	3.87	11.84	0.94	2.65
Error	5993	235.46	276.76	112.67	392.86	682.62					

*** P<0.01 *p<0.05*

The considerable higher income of these farmers might be due to influence of education towards their occupation. Interestingly it has been observed that the income from sheep and goat of the farmers' having education up to middle school (10th standard) was higher because the sheep and goat has been handled by the women or marginal farmers those who unable to reach the arena of higher education. The present finding is not in accordance with the observation of Dhara *et al.* (2016) which may be due to different location and lesser sample size. The higher education of the goat farmers had a negative impact on goat rearing and is in agreement with the findings of Dhara *et al.* (2016) as there is presence of social stigma. Knowledge about

animal husbandry had significant effect (p<0.01) on income generation from animal except sheep and goat or sheep and that reflects in total income also (Table 5). It has been observed that the income from animal (except sheep and goat) or from sheep and goat or other animals contributes towards the deficiency in income generation of the farmers present study which is ratified with the finding of Dhara *et al.* (2016). The total income of the farmers having knowledge of animal husbandry practices was found higher than other groups (Rs.19,630/-) though knowledge related to animal husbandry practices was not pertinent for agriculture, business or service thus the income from these areas is not affected.

Conclusion

The socio-economic status explored that the majority of goat and sheep farmers in the coastal zone of Sunderban area found cultivation to be the main occupation to maintain livelihood security. The analysis revealed that the majority of women were engaged in sheep and goat farming who were mostly married. Finally, it is also depicted that various constraints like lack of training facilities, education etc. were the major drawbacks for the upliftment of the socio-economic status of the farmers in selected coastal zone of West Bengal. From the present study, it could be concluded that the women employ their labour in goat and sheep rearing as a subsidiary occupation. Therefore, small ruminants are considered to play a pivotal role in generating employment, income, capital, and storage. The production potential of Black Bengal Goat and Garole sheep could be enhanced with the introduction of superior technologies as well as improved practices which would help the women to contribute meaningfully to meet the needs of the family members.

Acknowledgement

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