Women and Livestock Management: An Empirical Study of Assam

Nandita Goswami
Assistant Professor,
Deptt.of Economics,
Barbhag College
Kalag

Abstract

Agriculture is one of the most important sectors of the economy of Assam. Participation of women in this sector is significant. Livestock is the backbone of the agriculture sector of Assam and livestock keeping is mostly done by women. Besides farming women play an important role in livestock and household activities. They spend a considerable time in livestock and poultry management activities which are unaccounted and are considered as domestic work. The present study tries to analyse the participation of women in livestock management activities especially in Assam. The study has been carried out by using both secondary as well as primary data. The primary data has been collected by carrying out the field study. The field study covers the Brahmaputra valley of Assam. It has been revealed from the study that women have actively participated in all activities related to livestock management in Assam.

Keywords: Livestock Management, Participation, Women

Introduction

Agriculture is one of the most important sectors of the economy of Assam. Participation of women in this sector is significant. Livestock is the backbone of the agriculture sector of Assam and livestock keeping is mostly done by women. Besides farming women play an important role in livestock and household activities. They spend a considerable time in livestock and poultry management activities which are unaccounted and are considered as domestic work. The present study tries to analyse the participation of women in livestock management activities especially in Assam.

Objective of the Study

The main objective of the paper is to analyse the nature and extent of participation of women in livestock management activities and also identify the factors that significantly influence their extent of participation.

Methodology

The present study has been carried out by using both secondary as well as primary data. The secondary data has been used to create the background of the analysis and core of the study depends on primary data

The primary data has been collected by carrying out the field study. The field study covers the Brahmaputra valley of Assam. Four districts has been selected randomly from four agro- climatic zones of Brahmaputra valley, one from each- Jorhat from upper Brahmaputra valley, Morigaon from central Brahmaputra valley, Darrang from North Bank valley and Nalbari from lower Brahmaputra valley. From each district one Agricultural Development Officers (ADO) circle has been selected. From each of the selected ADO circle three villages has been selected keeping in view that represents various socio economic conditions. In the selected villages, the universe for the sampling consisted of total number of Farm household. From this universe 9 to 12 percent of the household has been selected at random. In this way a sample of 228 Farm household has interviewed. Appropriate statistical and econometric tools have been used to analyse the data.

Livestock and Poultry Population and Trend in Assam

The estimated livestock and poultry population as per sample survey of different category for 2013-14, reveal that population of indigenous cattle has decreased by 3.7 percent during 2013-14 compared to the previous year. This decrease was also recorded for buffaloes during the same period. On the other hand, population of cross breed cattle and goats has recorded increase of 3.0 and 3.2 percent respectively during 2013-14 over 2012-13, (Economic survey of Assam 2014-15). Compound Annual Growth Rates (CAGR) has been estimated for livestock and poultry

population of different category by fitting a semi log trend equation. This is shown in Table-1.

Table 1 Estimated CAGR of different Categories of livestock Population during 2008-09 to 2013-14

Indigenous Cattle	3.3***
Crossbreed Cattles	2.3***
Buffalos	-2.4**
Goats	3.1
Fowls	6.1*
Ducks	6.5*

Source: Authors own calculation base on the data taken from Economic Survey of Assam 2014-15 (*, **and*** indicates significant at 10, 5 percent and 1 percent level)
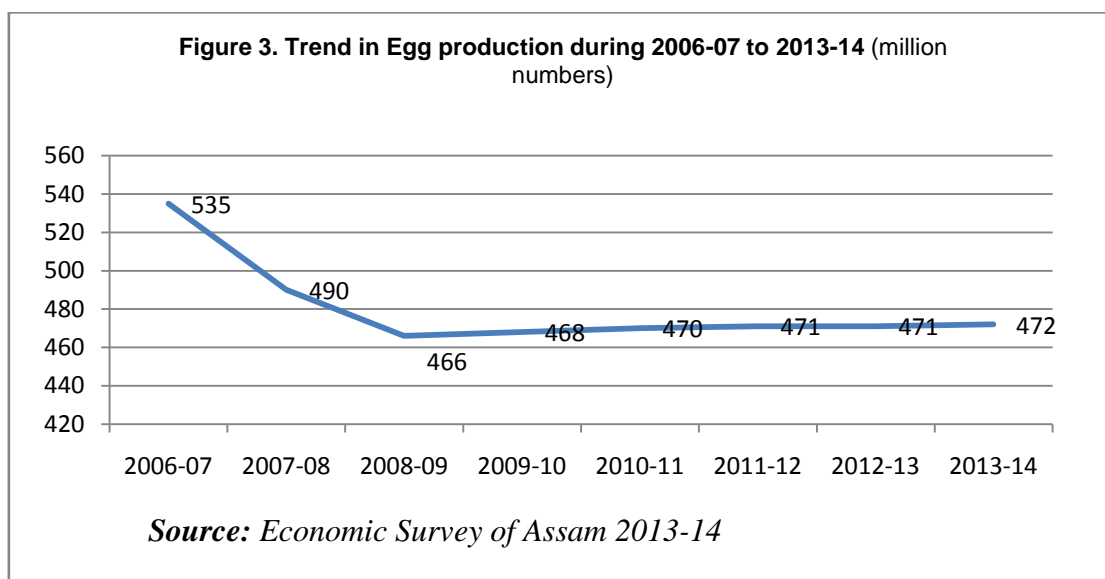
It has been observed that except for buffalo, CAGR is positive for population of all categories of livestock and poultry. The trend in production of live stock product i.e Milk, Meat and Eggs from 2006-07 to 2013-14 has been shown in following figures.

Figure 1 Trend in Milk Production During 2006-07 to 2013-14 (Million Litres)

Source: Economic Survev of Assam 2013-14
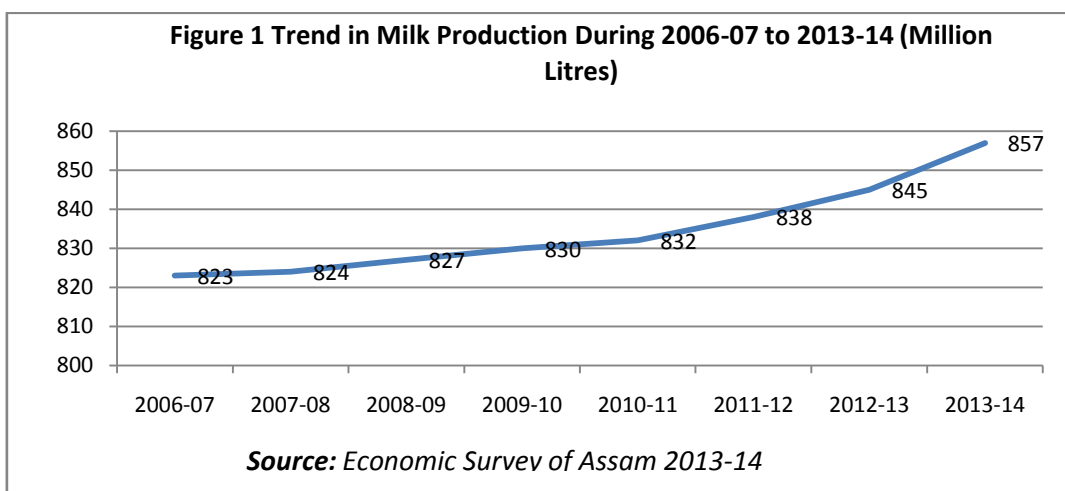
An increasing trend has been observed in case of milk production. In 2006-07, total production of milk in the state was 823 million litters and a very smooth rising trend has been found up to 2010-12. After 2010-12, production has increased in an increasing rate..

Figure 2 Trend in Production of Meat during 2006-07 to 2013-14 ('000 tonnes)

Source : Economic Survey of Assam 2013-14

In case of Meat production also an increasing trend has been observed. In 2006-07 production of meat was 28.8 thousand million tones. It has increased to 38.64 thousand million tones in 2013-14.

Remarking An Analisation

Figure 3. Trend in Egg production during 2006-07 to 2013-14 (million numbers)

Source: Economic Survey of Assam 2013-14

In case of egg production an opposite picture has been observed. A sharp decline in the production of egg has been observed from 535 million in 2006-07 to 466 million in 2008-09. After 2008-09 a gradual increase in the production of egg has been observed.

Extent of Participation of Women in Livestock Management Activities

For the analysis of extents of women's participation data has been collected from both adult male and female family members of the sample household. Here, 10 types of activities have been identified and respondents are asked whether the activity has been performed mostly by men or women. To measure the extent of participation of male and female family members, scores have been assigned for each activity according to their level of participation as follows.

Level of Participation	Scores
Mostly	1
Occasionally	0.5
Not at all	0

The table -2 shows the number and percentage of women involved in different activities related to livestock management. Ten activities related to livestock management namely bringing fodder, preparing food, grazing animals, health care, offering water, cleaning animal, cleaning shed, cleaning utensil, milking and selling product, have been identified in course of field study. From the study it has been found that women of sample household actively participated in most of the activities related to livestock management.

Table 2 Participation of women in livestock management

Activities	Number of women (percentage)		
	Score '0'	Score '.5'	Score '1'
1	2	3	4
Bringing fodder	177 (76.0)	23 (10.0)	32 (14.0)
Preparing food	9 (3.9)	6 (2.6)	214 (93.4)
Grazing animal	170 (74.2)	21 (9.2)	38 (16.6)
Health care	43 (18.8)	42 (18.3)	144 (62.9)
Offering water	16 (7.0)	21(9.2)	192 (83.8)
Cleaning animal	115 (50.2)	39 (17.0)	75 (32.8)
Cleaning shed	5 (2.2)	11 (4.8)	213 (93.0)
Cleaning utensil	2 (0.9)	5 (2.2)	220 (96.1)
Milking	105 (45.9)	41 (17.9)	83 (36.2)
Selling product	71 (31.0)	36 (15.7)	122 (53.3)

Source: *Field Survey*

Figure in the parenthesis indicates percentage of the respondent

It has been observed that more than 90 percent of the women of sample household have participated mostly in the activities such as preparing food, cleaning shed and utensil. Their participation has also found to be significant in activities like offering water, health care and selling of the product as more than 60 percent of the respondent participate actively (Score'1'). But they rarely participate in other activities like fodder collection, grazing animals, cleaning animals and milking. This result has corroborated to the study of Zahoor et al. (2013) who found that rural women participated in all livestock management activities but their strength of participation was low for some

10

activities. They also found that Cleaning shed and animal, watering, care of sick animals and milking are the main activities where the participation of women was high. But in this study it has been found that in case of milking less than 50 percent of the respondents participate actively.

The average of the score i.e. mean score (MS) of each activity has been calculated to measure the extent of participation as-

MS=ΣS/TR

Where,

ΣS= total score of the activity

TR= total number of respondent

Again to measure the overall extent of participation of women in decision making process of farm Grand Mean Score has been calculated.

GMS=ΣMS/ TA

Where,

ΣMS= Summation of mean scores of each activity

TA= Total number of activities

If the mean score of any activity has been found to be greater than or equal to 0.5, considered as active participation of women.

The figure 4 shows the mean score of men and women for different activities related to livestock management.

Figure 4 Involvement of Men and Women in different Activities Related to Livestock Management

Source: Calculated from field survey
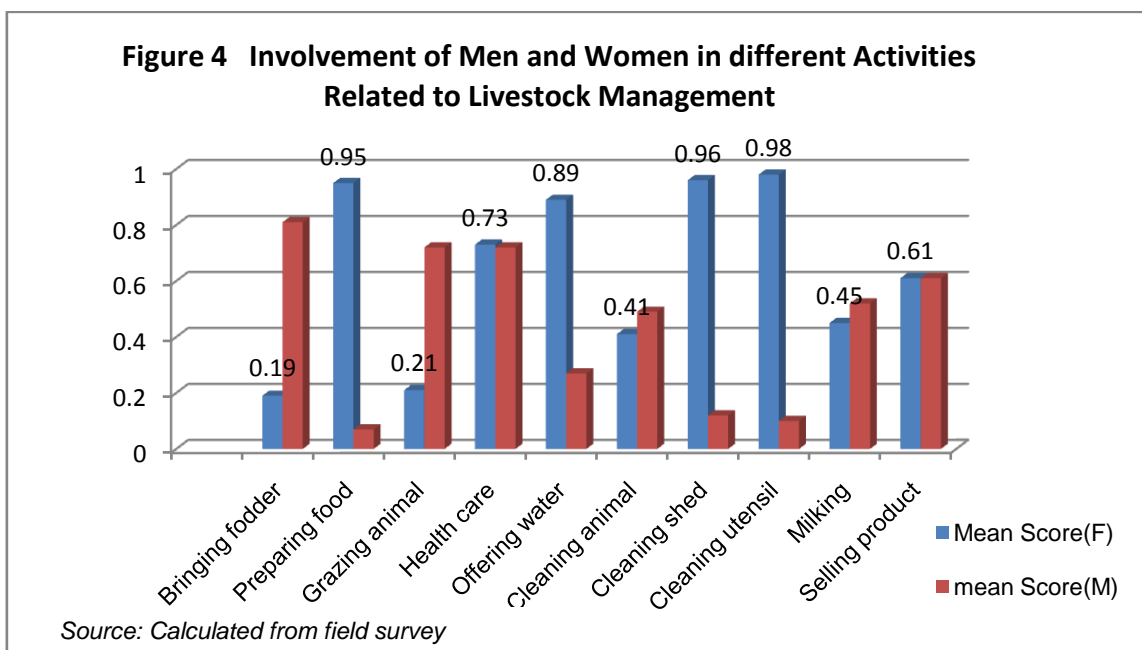
The mean score of women participation in the activities related to livestock management is more than 0.5 in most of the activities except bringing fodder, grazing animal, cleaning animal and milking. The value of grand mean score (0.63) indicates that women actively participate in livestock activities. It is also found that grand mean score of male family members of the sample household is 0.43, which is less than 0.5 indicating lower participation.

There are four activities which have been dominated by women and only two that have been dominated by men. Activities namely preparing food, offering water, cleaning shed and cleaning utensil are dominated by women and bringing fodder and grazing animal are the two activities which are predominantly performed by men. Remaining activities are jointly performed by both men and women. Thus, In case of livestock management, activities are pre dominantly performed by women.

Determinants of Women's Involvement in Livestock Activities

Women in the rural area are highly involved in the activities related to livestock management. The extent of their involvement depends on various socio economic factors. It has been mentioned in the above section that different scores have been assigned for all the activities of each respondent according to their

extent of participation. To measure the extent women participation, participation index (PI) for livestock management activities have been constructed as-

PI=ΣS / MPS

Where,

ΣS= total score of the respondent

MPS= Maximum Possible Score

Some selected socio economic variables are used to run the regression

Determinant of involvement of women in different activities related to livestock management has been measured with the help of logistic function as the dependent variable i.e participation Index takes value between 0 and 1.

$Y= 1/ (1+e^{-z})$

Here Y= value of DMI

Z = Linear combination of explanatory variable

$Z= \alpha + \Sigma \beta i X_i + U$

It may be noted that as Z goes from -∞ to +∞, Y goes from 0 to 1. In spite of basic model which is non linear in nature, its parameters can be estimated by linear regression technique by using Z as repressor. The value of Z can be constructed by using the formula

$$ln \{Y/ (1-Y)\} = Z$$

Functional form of the model that has been constructed to determine the factors significantly

Remarking An Analisation

affecting extent of participation on women in decision making process of farm is as follows-

$\ln\{ Y/ (1-Y)\}_i = \alpha + \beta_1(G)_i + \beta_2(YS)_i + \beta_3(FS)_i + \beta_4(R)_I + \beta_5(JC)_I + \beta_6(MM)_I + \beta_7(INC)_i + \beta_8 (LH)_i + \beta_{10}(C_1)_i + \beta_{11}(C_2)_i + \beta_{12}(C_3)_i + \beta_{13}(LD_1)_i + \beta_{14}(LD_2)_i + \beta_{15}(LD_3)_i + u_i$

Where, G= Age of the respondent

YS= year of schooling

FS= Family Size

R= Religion (Dummy R_i=1 for Hindu and '0' other wise)

JC= Availability of job card (Dummy)

MM= Male migration (Dummy)

INC= household income (in thousand Rs)

MPI= Male Participation Index

LH = landholding of the household

C_i = Caste of the respondent (dummy)(i=1,2,3). [C_1= 1 for OBC   and MOBC; 0 otherwise, C_2 =1 for SC and 0 otherwise and C_3 = 1 for ST and 0 otherwise.]

LD_i = Locational Dummy (i=1,2,3) [LD_1= 1 for Darrang, 0= otherwise, LD_2=1 for Nalbari,   0= otherwise and LD_3=1 for Jorhat, 0= otherwise.]

Where u_i is the random disturbance term (u_i=1,2,3,……..,245) and β_j 's are the unknown parameters to be estimated where j=(0,1,2,….15). Finally, estimation of the parameters has been done by using stata 11.0. The estimated result of regression analysis is summarised in table 3.

The results of logistic regression run for female participation in livestock management activities has been shown in the following table. Since the data used in the present study comes from cross section sample, it may be possible that disturbance term may not be homoskedastic. Therefore, Breusch-Pagan test for heteroskedasticity has been done and found that disturbance term is heteroskedastic. It has been corrected through the estimation of White robust standard error. The average value of Variance Inflation Factor has been calculated to verify the problem of multi colinearity and it has been found to be less than 10 indicating no linear relationship among the explanatory variables.

Table 3 Result of Logistic Regression For Livestock Activity
Dependent Variable: Participation Index (Livestock)

Breusch-Pagan test for heteroskedasticity has been done. Result=presence of heteroskedasticity Corrected by using robust standard error Average VIF=1.45 Average tolerance=0.78		
Variable/constant	coefficient	Standard Error
G	-0.005	0.004
YS	-.019 **	0.008
FS	0.016	0.020
R	0.38***	0.12
JC	0.061	0.088
MM	0.15	0.13
LH	-.0.092***	0.026
MPI	-0.79 ***	0.22
INC	-0.026	0.04
C_1	-0.16	0.10
C_2	-0.034	0.118
C_3	-0.22**	0.097
LD_1	-0.47***	0.10
LD_2	-0.10	0.106
LD_3	0.0007	0.042
F(15, 212)	6.32***	
Constant	1.29***	0.24
R^2	0.26	

*, ** and *** indicates significant at 10, 5 and 1 percent level respectively

The results consists of the estimates of the regression co-efficient, standard error, the values of R^2 – the coefficient of determination for the fitted equation and the values of the F- statistic for testing the overall significance of the estimated regression equation.

It has been found that the coefficient of the variable YS i.e. year of schooling is significant at 5 percent. Negative value of the coefficient indicates that larger the year attended by the women lesser is their extent of participation. The dummy variable 'R' is also significant which indicates differential affect i.e. women belonging to Hindu religion participated actively in livestock activities than the reference

category i.e. Muslims. Again coefficient of LH and male participation index are significant at 1 percent. Both the coefficients are negative which indicates that higher the amount of land owned by the household lesser the extent of participation of women in livestock activity. Similarly higher the extent of participation of male family member lesser is the extent of participation of female and vice versa. Significance of the locational Dummy for Darrang at 1 percent indicates that extent of participation of women in Darrang is lesser than the reference category i.e. Morigaon.

Remarking An Analisation

Conclusion

From the above analysis it has been observed that women actively participate in all activities related to livestock management. Their participation has found to be significant in activities like preparing food, cleaning shed and utensil, offering water and health care. But they rarely participate in other activities like fodder collection, grazing animals, cleaning animals and milking. Thus, In case of livestock management, activities are pre dominantly performed by women. The main factor that influences their participation is land holdings of the household. Higher the amount of land owned by the household lesser the extent of participation of women in livestock activity. Other social factors such as caste, religion and location also influence the extent of women's participation in livestock activities. For improving the efficiency of female workers, government should provide proper training so that women can improve their economic condition through livestock management.

References

1. Hirway, I and Roy, A K (1999) 'Women in Rural Economy: The Case of India', Indian Journal of Agricultural Economics, Vol.54,No.3,pp. 251-271.
2. Jamali, K (2009) 'The Role of Rural Women In Agriculture and It's Allied Field: A case Study of Pakistan' Europian Journal of Social Sciences, Vol. 7, No. 3, pp. 71-77.
3. Mulugeta Mihiret and Amsalu Tadesse (2014) ' Women's Role and their Decision Making in Livestock and Household Management', in Journal of agriculrture Extension and Rural Development, Vol-6 No-11 Pp 347-353.
4. Sethi, R. M. (1991), "Women in Agriculture: A Study of Himachal Pradesh", Rawat Publications, NewDelhi and Jaipur.
5. Zahoor A., Fakher,A., Ali S., and Sarwar F (2013) 'Participation Of Rural Women In Crop And Livestock Activities: A Case Study Of Tehsil Tounsa Sharif Of Southern Punjab (Pakistan)' in International Journal of Advanced Research in Management and Social Sciences, Vol-2 No-12 pp 98-121
6. Economic Survey of Assam 2014-15
7. NSSO report of different round