AN ECONOMETRIC ANALYSIS OF FEMALE PARTICIPATION IN DAIRY COW KEEPING AT THE VILLUPURAM DISTRICT OF TAMIL NADU

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Abstract : A study was undertaken to analyse the association between the socio-economic characteristics of farm women and the extent of their participation in livestock farming . The sample households consisted of 30 women respondents each from the categories of landless, marginal, small and large farmers in the Villupuram district of Tamil Nadu. On an average, farm women in the family spent 294.42 minutes daily for large ruminants keeping with the imputed value of Rs.122.67 .The coefficients of multiple determination (R^2) obtained for the linear regression model fitted for average time spent on animal keeping by farm women were 0.947**.** The independent variables, educational status of female head, total economically dependent members of the family, community, average hired labour hours per day for large ruminants and total large ruminants in animal units were significantly affected the average time spent by women in the farm households on large ruminants keeping. Highly significant positive coefficient for factor, community, indicated that SC women spent more time on large ruminants keeping. The significant negative coefficient for the variable, educational status of the female, indicated that literate females spent lesser time on large ruminant keeping than illiterate females.

IndexTerms - livestock keeping, female participation, socio-economic factors, linear regression

I. INTRODUCTION

In India, about 80 percent of the female population live in rural areas and 86 per cent of the rural women work in agriculture and allied activities (Borah, 1998). Rural women perform a variety of roles, of which many are of greater economic significance (Bhople and Palki, 1998 and Moser, 2007).

Farm women play a significant role in domestic and socio-economic life of the society and therefore, national development is considered less feasible without developing this important and substantial segment of our society (Luqman *et al.*, 2006). Having been highly employed in livestock rearing activities (Birader, 1986 and Bhogal *et al.*, 1988), rural women were found to devote 90 percent of their time on cattle care, making it more or less a female domain (Veena *et al.*, 1986).

Caring animals is considered as an extension of domestic activities in Indian social system, and most of the animal husbandry activities like bringing fodder from field, chaffing the fodder, preparing feed for animals, offering water to animals, protection of animals from ticks and lice, cleaning of animals and sheds, preparation of dung cakes, milking, ghee-making and marketing of produce are performed by women (Arshad *et al.*, 2013).

A systematic valuation of time spent by females for household activities including animal care needs attention for policy intervention (Guleria and Agnihotri, 1985). The contributions of rural women, though not less than that of men in terms of time and effort, are invisible because they are largely unpaid and home based.

Their contributions are continued to be given lesser importance while formulating livestock / rural development programmes. Though the association between women and livestock production needs productive exploitation, especially while aiming at rural development through livestock development, lack of empirical evidence on the magnitude of the female participation and the extent and nature of their association in livestock farming operations, however, limit our efforts in exploiting this linkage (Narmatha et al., 2009). This study has been planned to fill this gap, arising out of the dearth of documented evidence on female participation in livestock farming. The specific objective of this study is to analyse the association between the socio-economic characteristics of farm women and the extent of their participation in livestock farming.

II. METHODOLOGY

Villupuram District of Tamil Nadu was randomly selected for the present study Multistage random sampling technique was used to select the respondents. The chosen district comprised 22 blocks of which, two blocks, viz., Kallakurichi and Thiyagadurgam were randomly selected. In the next stage, two villages from each selected block were chosen randomly. In total, 120 farmers were chosen again randomly from the selected four villages, 30 from each village, and it was ensured that the sample represented all the landholding class categories. The study was taken up during the months of April and May, 2018 and the data collected from the sample units related to the year 2017-2018. Relevant data were collected from the chosen respondents through personal interview using a pre-tested interview schedule. Cross checks were made to minimise the errors due to recall bias and also to ensure reliability of the information provided by the respondents.

Linear regression model was fitted to assess the factors influencing the extent of women participation in dairy cow farming. The form of the linear regression function fitted to assess the variables influencing average time spent by farm women in dairy cow keeping was as follows

$$T_1 = A + ß_1 X_1 + ß_2 X_2 + ß_3 X_3 + ß_4 X_4 + ß_5 X_5 + ß_6 X_6 + ß_7 X_7 + ß_8 X_8 + ß_9 X_9 + \mu$$

where,

T_1 = Average time spent by female members of the family in large ruminants keeping in minutes per day

X_1 = Dummy variable for type of family (Nuclear =0; and Joint =1)

X_2 = Age of women head

X_3 = Dummy variables for educational status of the female head (Illiterate =0; and Literate = 1)

X_4 = Number of economically dependent members in the family

X_5 = Number of economically active members in the family

X_6 = Score for community of the respondent (OC/BC=1; MBC/DNC=2; and SC/ST=3)

X_7 = Hired labour for animal husbandry in hours per day

X_8 = Total large ruminants in animal units

X_9 = Total small ruminants in animal units

$A, ß_1$ = Co-efficients to be estimated

μ = error term

III. RESULTS AND DISCUSSION

Table 1

Regression Coefficients of the Linear Regression Model fitted
(Dependent Variable : Average time spent by female per day
per household in minutes)

Independent Variables	Regression Coefficient
Constant	356.744 (20.139)
Type of Family	7.339 (7.532)
Age of women head	-0.241 (0.312)
Educational status of female head	-5.836* (5.513)
Total number of economically dependent members in the family	-31.357** (3.359)
Total number of economically active members in the family	-1.554 (2.138)
Community	4.024** (2.489)
Average hired labour hours per day	-0.913* (1.880)
Total large ruminants in animal units	24.323** (1.972)
Total small ruminants in animal units	-4.162 (2.235)
R^2	0.947
Adjusted R^2	0.943
F Statistics	171.564**
Sample Size	120

Figures in the parentheses indicates respective standard errors.
** Significant at 1 per cent level of probability.
* Significant at 5 per cent level of probability.

Table 2
Average time spent on animal based tasks by farm women

Tasks	Average time spent per day per household (in minutes)
Feeding	134.55 (45.71)
Watering	24.92 (8.46)
Housing	9.15 (3.16)
Breeding	7.04 (2.38)
Animal Health Care	9.26 (3.14)
Milking	60.74 (20.63)
Hygiene	13.16 (4.47)
Marketing	35.61 (12.47)
Total	294.42 (100)
Imputed economic value of the time spent (in Rs.) per day per household*	122.67

Figures in the parentheses indicate percentages to their respective totals.
* Imputed economic value was calculated at the rate of Rs.200/- per 8 hours of work.

The coefficient of multiple determination (R^2) obtained for the model fitted was 0.947 indicating that 94.7 per cent of variations in the average time spent by females per household for large ruminants were explained by the chosen variables. 'F' value demonstrated the statistical significance of R^2 in the model fitted.

It can be seen from the Table 1, that the variables such as educational status of female head, number of economically dependent members of the family, community, average hired labour hours and number of large ruminants in animal units significantly influenced the average time spent by women on large ruminants keeping. These findings were supported by the findings of Ghosh (1985), Sirohi (1985) , Sisodia (1985), Martins (1990), Susheela *et al.* (1991),Borah (1998) and Kishor *et al.* (1999) and Meinzen-Dick *et al.*(2011).

The coefficient for number of large ruminants in animal units indicated that every unit rise in this variable above the mean level would result in an increase of average time spent by females by 24.323 minutes per day per household. The coefficient for number of economically dependent members in family and average hired labour hours utilised for large ruminants keeping indicated that every unit increase in these variables would decrease the time spent by women by 31.357 and 0.913 minutes respectively. Significant and positive coefficient for the variable community indicated that lower caste women spent more time on large ruminants keeping. This result is similar to the reported findings of Ghosh (1985), Sirohi (1985) , Sisodia (1985) and Johnson et al., (2013).

The significant negative coefficient for the variable educational status of the female indicated that literate females spent lesser amount of time on large ruminant keeping than illiterate females.

The results of the study revealed that most of the tasks related to livestock keeping were performed by the farm women. On an average farm women household about 294.42 minutes per day per household on dairy cow keeping.

IV. POLICY SUGGESTIONS

The results emanating from the study produce well-documented evidence that farm women have a close association with livestock farming in the state. These results tend to suggest a more active role for this segment of the rural society so as to achieve rural development through combining women and livestock development. In the light of these results the following policy suggestions are made to fully and productively exploit the women- livestock linkage.

1. Channels of information, credit, inputs and access to markets have to be aimed at women as they played a very important role in livestock keeping and decisions related to livestock productions.
2. The existing extension setup working to promote livestock production in the rural areas has a typical social obstacle not being able to contact the farm women to extent transfer of technology. This difficulty posses problems for the extension wing to approach those who actually undertake and decide livestock production activities. This warrants positioning appropriate female front line extension officers to interact and offer first hand information to the farm women.
3. Bringing the services available to rear the animals physically closer to women.
4. Inspite of the fact that there is a close and more productive association between farm women and livestock, women participation in training programmes have not been satisfactory primarily due to the socio-economic impediments exisiting. Hence, efforts are the need of the hour to make appropriate measures to train the farm women in scientific management practices.
5. Promoting intensive livestock rearing in rural areas may encourage female to participate more in livestock keeping as this practice did not require farm women to take animals for grazing far away from home.
6. Encouraging the formation of rural women livestock farmer's co-operative society may increase female participation in livestock rearing.

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