FACTORS INFLUENCING MUTTON PRODUCTION IN TAMIL NADU

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ABSTRACT

A study was carried out on the factors influencing mutton production in sheep farming in different categories of farms in southern districts of Tamil Nadu. Cobb-Douglas production function was used to identify the factors contributing to the efficiency in sheep production per flock in the study area. The results of the production function analysed for overall farm category showed that the co-efficient of multiple determination (R2) was 0.884 indicating that 88.4 per cent variations in the mutton production can be attributed to the independent variables chosen for the study. The flock size was the important factor influencing the sheep farming, since regression co-efficient (0.705) for this variable is statistically significant at 1 per cent level. As for as the estimates for labour charge and health care charges are concerned their respective regression co-efficients (0.086 and 0.291) were statistically significant at 1 per cent level ($p<0.01$). The regression co-efficient suggests that if there is one per cent increase in the labour charge and health care charge, there could be about 0.086 and 0.291 per cent increase in mutton production respectively, ceteris paribus.

KEY WORDS : Mutton production, Cobb-Douglas Production function, Flock size.

INTRODUCTION

The sheep and goat farming activities offer ample opportunities for the dry land farming situations since these small ruminants are in a position to retrieve the otherwise wasted organic matter. Sheep has got special importance among all other livestock due to their multifaceted utility. Sheep play an important role in generating income and employment to the farmers in the arid and semi-arid regions where rainfall is scanty. In India, there are vast marginal and sub marginal lands unfit for agricultural production. Sheep are perhaps the most appropriate livestock species for utilizing sparse vegetation and shrubs and tree tops available in such areas and convert them into valuable products (Waghmare and Kasar, 1991). The Food and Agricultural Organisation has recommended sheep and goat production in marginal lands and lands unsuitable for crop production. Integration of livestock with crop production would restore soil health leading to sustainable agriculture (Jayaramakrishna, 1996). In Tamil Nadu, mixed farming involving crop-livestock integration has been a way of life since the beginning of agriculture. Also, it is now widely realized that this is one of the important ways of providing additional income and employment to the small farmers, marginal farmers and landless labourer families, especially in dry land area. Particularly in Tamil Nadu, with the fluctuating annual rainfall over the time period, the farmers are not able to get even the break even income from agriculture which forced them to choose some other alternative for their livelihood. The focus of this study is on the role of sheep production particularly in drought prone areas of Tamil Nadu, which are maintained largely on common property resources. Under such circumstances it becomes essential to study about the way in which the scarce resources are utilized in sheep farming. Although attempts had been made to study the sheep production across the country, few studies are available on the resources which influence the production function of sheep farming in semi-arid areas of Tamil Nadu. Hence, the present study was undertaken with the objective of analysing the factors influencing mutton production in sheep farming in different categories of farms.

MATERIALS AND METHODS

The data for the study was collected from the drought prone areas of southern Tamil Nadu namely Ramanathapuram, Sivagangai and Pudukottai districts. Altogether a total of 36 villages were selected from the three selected districts of the state. From each selected district, a sample of 100 households was randomly selected. A total of 300 households were selected from the study area. The total households were post-stratified according to the land holding viz., landless, marginal, small and large with a view to

study various economic aspects of sheep farming in different socio-economic situations. Simple random sampling without replacement was employed for selecting sample households in each category. Information on various aspects of sheep farming were collected from selected farmers by survey method using designed and pre-tested interview schedules through personal visits to each farmer. Information on inputs used like green fodder, tree leaves, concentrates consumed and expenditure on them, labour charges and health care charges were collected. The field survey for this study was conducted during March to June 2004 and the data collected from the sample farmers related to the year 2003 to 2004.

Cobb - Douglas Production Function

A study of scatter diagram and review of past studies (Sharma et al., 1987; Shiyani et al.,1992; Sharma and Singh ,1993 ; and Rao, 1995) suggested a log linear form was the best fit for sheep production function. To examine the resource use efficiency of sheep rearing, the Cobb-Douglas function was used. The production function analysis was done to identify the factors contributing to the efficiency in sheep production per flock in the study area. The general form of function is Y = a Xi bi ei

Where, X = Variable source of measure Y = Output i = 1,2,…..n (n = number of variables)

The value of 'b' estimates the extent of relationship between X and Y, when X and Y are at different magnitudes. The 'b' co-efficient is also the elasticity of production. The equation is estimated in log-linear form by the method of ordinary least squares. Cobb-Douglas function of following form was used for the analysis of the present study.

Y = aX1 b1 X2 b2 X3 b3 X4 b4 ei

Where, Y = Mutton production per farm per annum (in Kgs)

X1 = Flock size (number of sheep per farm)

X2 = Labour charges per farm per annum (in Rupees)

X3 = Health coverage charges per farm per annum (in Rupees)

X4 = Experience in sheep rearing (in Years)

a = Constant term bi = Regression co-efficients ei = Random term

The function was converted into linear form by making log transformations of all the variables. U = A+ b1Z1 + b2Z2 + b3Z3 + b4Z4

Where, U = log y A = log a and Zi = log Xi (i = 1,2,…4)

RESULTS AND DISCUSSION

To analyze the input - output relationship of sheep farming, a modified Cobb-Douglas production function was fitted for different categories of farms as well as for overall farm situation. The total mutton production per farm was used as dependant variable in the production function and the independent variables were flock size (X1), labour charge (X2), health care charges (X3) and experience in sheep farming (X4). The results of the regression analysis for different categories of farms are presented in Table 1. A perusal of the table showed that the coefficient of multiple determination (R2) for the production function fitted to different categories of farms viz., landless, marginal, small and large farmers category was 0.724, 0.971, 0.969 and 0.978 respectively, which indicates that about 72.4 per cent, 97.1 per cent, 96.9 per cent and 97.8 per cent variation in mutton production by the respective farmers category could be attributed to the resource variables chosen for the study.

The results of the production function analysis for overall farm category is given in table-1. From the table it could be observed that the co-efficient of multiple determination (R2) was 0.884 indicating that 88.4 per cent variations in the mutton production could be attributed to the independent variables chosen for the study. A perusal of the table showed that the flock size was the important factor influencing the sheep farming, since regression co-efficient (0.705) for this variable is statistically significant at 1 per cent level. From this result it could be inferred that if there is 1 per cent increase in the flock size, then mutton

production will be increased by 0.705 per cent, ceteris paribus. As for as the estimates for labour charge and health care charges are concerned, their respective regression co-efficients (0.086 and 0.291) were statistically significant at 1 per cent level ($p<0.01$). The regression co-efficient suggests that if there is one per cent increase in the labour charge and health care charge, there could be about 0.086 and 0.291 per cent increase in mutton production respectively, ceteris paribus. Thus, the results of the production function analysis indicated that flock size, labour charge and health care had significant impact on mutton production by sample farmers in the study area.

STANDARDISED REGRESSION CO-EFFICIENTS

TABLE –1

REGRESSION CO-EFFICIENTS FOR SHEEP PROD

VARIABLES			**S**
	LANDLESS	**MARGINAL FARMER**	**SMA FARM**
Constant	--	--	
Flock Size (X_1)	0.798** (6.203)	0.940** (26.778)	0. (2
Labour charge (X_2)	0.308* (2.723)	-0.005 NS (0.250)	0. ((
Health care charges (X_3)	0.256* (2.074)	0.033 NS (0.983)	0. (2
Experience in Sheep Farming (X_4)	0.189 NS (1.646)	0.049* (2.241)	0. (1
R^2	0.724	0.971	(
Adjusted R^2 (F value)	0.681 (17.037)	0.969 (614.197)	((59
Number of observations	**44**	**83**	

(Figures in parentheses indicate 't' value) ❑

* Significant at five per cent level
** Significant at one per cent level
NS

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