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Some Economic Characteristics of Mixed Farming in Coimbatore District

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A study was undertaken to investigate the economics of mixed farming in Coimbatore district and it revealed a close relationship between size of farming and type of farming. It is necessary that farmers are educated and encouraged to improve the breed stock, feeding methods and production technique so as to make mixed farming more productive. In view of the periodic monsoon failures and depletion of ground water, mixed farming is less risky and has to be adopted widely to improve the economic conditions of the farmer. A past of land should be set apart exclusively for fodder production to improve the stock of cattle and increase the overall income.

Farming in India is subjected to high degree of risk and uncertainties and provides only seasonal, irregular and uncertain income to the farmers. In order to mitigate the risks and uncertainties of income from crop enterprises and reducing the time lag between input costs and returns, it is essential that the farmers incorporate such enterprises in their production programme which yield regular and evenly distributed income throughout the year. Dairying is one such enterprise which provides a more certain and regular flow of income. The problem facing farmers is the scarcity of farm resources, particularly land and capital, and the available resources should be allocated among different crops and livestock enterprises to maximise the returns to the fixed farm resources. With this view in mind, a study was conducted to estimate the percentage of income from crop compared to income from livestock, to analyse the employment opportunity and cropping pattern and to formulate a production function to evaluate the resource use efficiency of mixed farming in order to suggest reallocation of resources.

MATERIAL AND METHODS

The data for this study were based on multi-stage random sampling of irrigated farms in Coimbatore taluk with the village as the primary unit and the farm holding as the ultimate unit. The farms which did not practise mixed farming were excluded from the study. A total of ten villages and 90 holdings was selected in random. The selected farms were classified into three groups based on the cropped area as small (five acres and below), medium (5-10 acres) and large (above 10 acres but not exceeding 15 acres). Holdings were selected at random from each size group at the rate of three per village under small, medium and large farms.

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The data were collected by survey method.

Data regarding the various resources used on the farm and gross income of the farm by way of receipts from crops and livestock were collected. Table analysis was used to present size group-wise base on expenditure on other resource aspects. The percentage of income contributed by livestock enterprise to the gross income of the farm was calculated for each of the 90 farms. The Cobb-Douglas production function was computed by taking into account the value of gross product as dependent variable and different inputs as independent variables. From the fitted function the marginal value productivities of resources were worked out.

RESULT AND DISCUSSION

i. Cropping pattern

Cropping pattern in mixed farming system is designed to provide cash income, grain for food and fodder for livestock and there were not much differences between the size groups is now aspect. However, a slight degree of variation was found in the area of different crops grown in the farms in view of the irrigation facilities and soil fertility. The main cropping pattern in mixed farms was cotton, sorghum/ragi or rice and sugarcane. Some vegetables are also grown in small areas to meet home consumption needs.

ii Enterprise combination

The evolution of some distinct ratations has facilitated the farmers to maintain a small number of milch animals depending on the size of farms. Crops were the chief enterprises and livestock was the important complementary enterprise for generation of the income. Generally, the trend of enterprise combination seemed to be similar in all size groups. Most of the farms were self sufficient in fodder requirement and among the three size groups, large groups of farms ranked first in meeting the fodder requirements of livestock i.e. 83.3 per cent compared to medium and small size groups (56.7 and 43.3 per cent respectively) (Table I). Only a few farms which maintained a large number of animals were deficient in fodder supply. It was interesting to note that no farm set apart any area for rising a pure fodder crop.

TABLE I. Farm supply of fodder

Size of farms	No. of farms surveyed	No. of farms selfsufficient in fodder requirement	Percentage
Small	30	13	43.1
Medium	30	17	56.7
Large	30	25	83.3

The livestock enterprise maintained in all the size groups of farms was of similar type. The principal difference among farms was in the number of animals maintained. A few farmers maintained cross bred cows while the rest had local breed. In general as the farm size increased, a few more cows and milk buffaloes were added to the livestock strength of the farm (Table II).

The area under gardenland increased with the investment on wells and more livestock have been added recently with the local Kangayam breeds availing the facility of artificial insemination, there by indicating an increased activity of mixed farming in the tract.

TABLE II Size groupwise distribution of livestock (Per acre of farm)

Item	Size Groups		
	Small	Medium	Large
Total No. of farms	30	30	30
Average size of farm	3.17	7.21	12.35
Total No. of livestock	2.4	1.5	1.1
Work bullock	0.69	0.31	0.56
Buffaloes	0.47	0.34	0.22
Milch cows	0.48	0.38	0.24

iii. Intensity of Cropping:

Shastri (1961) and Rajagopalan (1961) have advocated cropping intensity as a measure of mixed farming. From this study it was indicated that small farms practised intensive mixed farming when compared to the medium and large farms exhibiting an inverse relationship between farm size and cropping intensity (Table III).

iv. Bullock labour:

The average number of pairs of draught cattle per farm, the area commanded by a pair of bullocks and the number of bullock pairs per acre are presented in Table IV.

All the farms maintained draught cattle of their own for cultivation of crops and transportation and this explains the absolute necessity for bullock labour. The advent of electric power as an aid for lifting water and at times in threshing grains of sorghum and ragi led to the displacement of draught cattle. This may be the reason for low number of pairs of bullocks per acre in large farms when compared to small and medium size farms.

v. Employment opportunity:

Due to the diversified cropping pattern adopted in this region, the combination of livestock enterprise increased the employment opportunities to the farmer. The labour potential of not only the farm servants but also that of family members of the farmer were put to maximum use. It was interesting to note that the increase in employment opportunity was greater in small farms and showed an inverse relationship with the size of farm.

TABLE III Farm size and cropping intensity.

Size groups	Average area in acre	Total cropped area in acre	Intensity of cropping (percent)
Small	3.17	5.57	177.90
Medium	7.21	12.43	172.89
Large	12.35	20.78	166.52

vi. Feeding and Feed stuffs

The main source of fodder was from sorghum and ragi and to some extent

from rice and sugarcane. Sorghum, ragi and rice straw fed as the dry fodder while sugarcane tops as green fodder. It is interesting to note that there was no definite ratio between green and dry fodder since the farmers feed their cattle whichever is available at the time. Regarding concentrates the main constituents were cotton seed, groundnut cake and bran. Feeding the animals with concentrate was confined to work bullocks put to work or milch animals in location.

TABLE IV Bullock labour per farm and acre

Size groups	Average size of farm in acre	No. of pairs of bullocks per farm	No. of pairs of bullocks per acre	No. of acres for each pair of bullocks
Small	3.17	1.10	0.35	2.88
Medium	7.21	1.43	0.19	5.04
Large	12.35	2.03	0.16	6.08

vii. Optimum share of milch animals in a mixed farming unit

Based on the availability of capital, labour and fodder resources, optimum share of livestock in a mixed farming unit with various size groups have been arrived at are presented in Table VI.

TABLE V Employment opportunities in crop and livestock

Size group	Average mandays required by crop enterprise alone	Crop and livestock together	Percentage increase in employment
Small	502	616	23
Medium	1000	120	20
Large	1987	2176	9

TABLE VI Optimum size of livestock

Farm size	Cows	Buffaloes
Small	1.5	1.5
Meduim	2.77	2.47
Large	2.93	2.53

viii. Income

The gross income per acre as contributed by the crop and livestock enterprises is presented in Table VII.

TABLE VII Cross income from crops and livestock (Rupees per acre)

Farm size	From crops	From livestock	Total
Small	3134.52 (73.30)	781.11 (26.70)	3915.63 (100.00)
Medium	3416.98 (89.70)	524.50 (10.30)	3941.48 (100.00)
Large	3791.81 (89.95)	401.05 (11.05)	4192.94 (100.00)

The per acre gross income of crop enterprise increased with increase in farm size, while the contribution by livestock enterprise decreased with farm size. The Table also revealed that intensity of mixed farming was higher in small farms.

Functional Analysis

The relationship between the gross income and the contributing factors is presented in Table VIII.

Where Y = gross income from crops and livestock in rupees

X_1 = area cropped in acres

X_2 = human labour in mandays

X_3 = Capital in rupees includes the cultivation cost

X_4 = dairy animals in number

Table VIII Elasticity coefficient, standard Error and 't' values of significance of coefficients

Factor inputs	bi value	Standard error of bi	t value
X_1 Land	0.2303	0.0555	4.415**
X_2 Human labour	0.4025	0.0571	7.047**
X_3 Capital	0.6729	0.0894	7.522**
X_4 Dairy Animals	-0.4055	0.5707	-7.088**

$\Sigma bi = 0.9012$

$N = 90$ $R^2 = 0.9247$

** – Significant at one per cent level

The coefficient of determination (R^2) was 0·92. The variables X_1, X_2, X_3 and X_4 are significant at one per cent level but for dairy animals it was negative. In all three cases (X_1, X_2, X_3) one per cent increase in them will increase the gross income by 0·23, 0·40 and 0·67 rupees taking into account their respective units and keeping other factors constant at mean level. The negative coefficient for diary animals implied that the number of animals might be more than the requirement. One possible explanation for this negative elasticity for diary animals is that the milch animals that were kept are of poor breeds. Another reason might be the long dry periods of these animals. In calculating the input values the total expenditure not only on milch animals but also on dry animals and calves were taken into account. This might have also contributed to the negative coefficient for dairy animals in the equation. The sum of elasticities was 0 90 which showed decreasing return to scale as it was less than one.

The marginal value productivity was worked out and is presented in Table IX.

TABLE IX Marginal value Productivity of Resources.

Particulars	Marginal value productivity
Land (Rupees per acre)	537.08
Labour (Rupees per manday)	8.60
Capital (Rupees per rupee)	3.01
Dairy animals (Rupees per number)	–267.68

The marginal value products of mixed farms showed that every additional units of land input would push up the output by Rs. 537.08. Every additional manday would result in additional product worth of Rs. 8.60. It could be said that human labour was not profitably used in the farms in the area under study. Therefore there is great scope for increasing labour input in the mixed farms. Similarly in the case of capital also one rupee investment brought about a net return of Rs. 3.01. The marginal value productivity for diary animals worked out to be Rs. 267.28 but was negative. This

showed that if the number of animals is increased by one there will be a reduction in total output by Rs. 267.28. The high as well as negative level of marginal value of productivity could be attributed to unprofitable dairy animals maintained in the farms. Therefore, instead of increasing the number it would be better to have less number of good breed milch animals which would increase the total output.

ix. Proximity

Another interesting observation of this study was that the location of the farms from the city is a contributing factor to mixed farming. It was found out in the farms and villages locatad farther away from the city, the intensity of mixed farming was low.

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