

EFFICIENCY OF MIXED FARMING SYSTEM IN THE TRIBAL AREAS OF SHEVROY HILLS

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Five farming Systems, viz., dairy based, poultry based, dairy cum poultry based, improved pure cropping and tribal farmers method of cropping were compared under rainfed conditions during 1976-81 Horticultural Research Station, Yercaud. In the farm unit of 3 acres, dairy (3 milch cows) cum poultry (6 layers) based farming gave a higher net annual income of Rs.5529/ and provided more employment of 556 man days per year as against Rs. 1107/- and 304 man days respectively in the tribal method of cropping alone. The next best system was dairy based mixed farming. Cropping pattern drawn to link dairy cum poultry consisted of Coffee 1.0 acre, finger millet 0.40 acre, maize + cowpea 0.50 acre, pulses 0.50 acre during first season followed by wheat 0.40 and vegetables 1.0 acre in the second season with perennial grass N.B.21 and lucerne 0.30 acre each. By recycling the animal waste the value of nutrients added to soil is Rs.1000/- and Rs. 90/- per year by dairy and poultry respectively.

Poverty, under - employment and malnutrition are the causes for the poor status of tribal farmers Fitch and Nordblom (1977) reported that new technologies of crop rotations giving importance to cereal and legume, forage crops and live stock production may have more chances of success than cereal production alone. With the limited possibility of expansion of land for cultivation in hilly areas integration of enterprises such as crop, livestock, poultry, farm forestry appears to be a logical approach towards the improvement of tribal farmers. Raheja and Oberai (1953) has defined mixed farming as a system of crop and animal husbandry for EFFICIENT AND EFFECTIVE use of land, labour and capital. Chaurstylan Lee (1980) had reported the contribution of

different cropping based enterprises (crop, crop-fish, crop live-stock, crop-livestock-fish based farming) to the total income and better utilization of family labour when mixed farming practices are followed. Elivino (1980) reported the practice of pig-crop-fish system and poultry - cattle - vegetable system for higher income and better recycling of farm and biological wastes. Hence with the objective of increasing income and employment of tribal farmers the present study was undertaken.

MATERIALS AND METHODS :

The mixed farming study was undertaken at Horticultural Research Station Yercaud which is at an altitude of 1200-1700 metres in the Shevroys hills

of Tamil Nadu. The total area of the hill is 382.7 sq m. The mean average annual rainfall is 1500 mm which is distributed as 760 mm in South West Monsoon, 490 mm in North East Monsoon and 250 mm in Summer. The minimum and maximum temperatures are 7.5°C and 32°C in winter and summer respectively. The soil is red lateritic which a pH ranging from 5.5 to 6.5.

A preliminary survey was conducted in Shevroy's hills. Twenty five farmers in twelve villages were selected at random for the survey. Majority of the farmers (16) possessed land area ranging from 2 to 5 acres, the average size being 3.2 acres. These farmers used to grow local varieties of grain crops like finger millet and samai, in south west monsoon and mixture of leguminous vegetables and pulses during North East Monsoon season. Most of the farmers prefer samai and finger millet as grain crops, beans redgram and lab-lab as pulse crops. Besides coffee is grown as perennial cash crop in small areas by the individual farmer.

Of the 25 farmers, one maintained cow alone, 14 farmers only bullocks and six farmers both and four farmers none. The cows kept by the farmers were used both as work and milch animals. The milk produced was consumed by the family. The average milk yield per lactation was 150 litres in 125 days. Besides cattle, the farmers also maintained goats and sheep, Six farmers maintained goats and seven sheep. Except three farmers, the others kept poultry in their backyard, the number varying from one to six.

Based on the survey, the unit fixed was 3 acres, for farming under rainfed condition, 3 cows for dairy and 6 layers for poultry. To have representative data on the mixed farming experiment with livestock and poultry, non-replicated field trials was conducted over five years each treatment occupying an area of 3.00 acres. Based on the daily requirements of dairy and poultry cropping pattern was worked out and the following treatments were fixed.

Cropping system	CROPPING AND SEASON		Area	Dairy	Poultry
	I (June-Sept)	II (Sep.-Jan)			
(1)	(2)	(3)	(4)	(5)	(6)
T1 - Dairy based	Finger millet	Vegetables (0.40) wheat (0.60)	1.00	3 cows	—
	Pulses (0.40)	wheat (0.40)	0.40		
	Grass NB 21		0.30		
	Lucerne		0.30		
	Coffee		1.00		

T2 Poultry based	finger millet	Vegetables	1.00	—	6 layers
	Maize +				
	Cowpea	Wheat	0.50		
	Pulses	Wheat	0.50		
	Coffee		1.00		
T3 Dairy cum Poultry	finger millet	Wheat	0.40	3 cows	6 layers
	Maize +				
	Cowpea	Vegetables	0.50		
	Pulses	Wheat			
	(0.50)	(0.40)	0.50		
		Vegetables			
		(0.10)			
T4 Improved cropping	Grass HB 21		0.30		
	Lucerne		0.30		
	Finger millet	Vegetables	1.00	—	—
	Maize +				
	Cowpea	Wheat	0.50	—	—
	Pulses	Wheat	0.50	—	—
	Coffee		1.00	—	—
T5 Tribal farmers cropping	Samai				
	(1.00)	Wheat			
		(0.50),	1.00	—	—
		Beans			
	(0.50)				
	Finger millet mixed Tenai,				
	mustard, lablab,	1.00	—	—	
	and redgram.				
	Coffee	1.00	—	—	

In the improved method of cropping high yielding short duration varieties like finger millet (Indaf), maize (Ganga.5) Cowpea (C 152), Wheat (UP 301), beans (Wata) peas (Gloriosa;) grass (NB. 21) lucerne (Co.1,) were raised in line, across the slope. Need based plant protection measures and fertilizers were applied. For the tribal method of farming, local varieties were sown by broadcasting and covered by country plough. In the dairy, cross breed

Jersey cows and hybrid layers in poultry were tried. The recommendations of the coffee board were followed in the improved method of cropping.

RESULTS AND DISCUSSION:

Results of mean values of different treatments obtained from 1976 to 1981 is given in table. The dairy cum poultry based farming (T3) gave the maximum mean annual net income of

Rs. 5529/- with a per day income of Rs. 15.15. The dairy based farming (T₁) gave a yearly mean net income of Rs. 5094/- with the per day income of Rs. 13.96. The contributions by the dairying aspect in the treatments 1, 2 and 3 were 51.4 and 43.2 percent respectively. The poultry based mixed farming gave on yearly mean annual net income of Rs. 3192/- with the per day income of Rs. 8.75. The improved cropping pattern (T₄) drawn by the research station as the cropping enterprise gave a mean net income of Rs. 2878/- year with a per day income of Rs. 7.88 as compared to the annual net income of Rs. 1107/- realised from the farmers method of cropping.

Of the different cropping patterns linked to poultry keeping (T₂) was found more profitable with the annual mean income of Rs. 3206/- for the three acre farm unit. This cropping pattern consisted of maintaining coffee in 1.00 acre and growing finger millet (1.00 acre), maize and cowpea (0.50 acre) and pulses 0.50 acre during first season followed by vegetable (1.00 acre) and wheat (1.00 acre) during second season. The next best cropping pattern was the one linked to dairy cum poultry keeping (T₃).

The total employment generated through different mixed farming practices and additional employment created over pure cropping under tribal farmers conditions were assessed. The maximum of 556 man days were generated through dairy cum poultry based mixed farming followed by 539 man days through dairy based system and

it was 387 and 304 man days for poultry based mixed farming and pure cropping system respectively. The additional employment generated through different mixed farming patterns over pure cropping were 235, 83 and 252 man days respectively for dairy based, poultry based and dairy cum poultry based mixed farming systems respectively. Chinnaswamy *et al* (1980) observed higher net income under dairy based mixed farming and the added employment generated under dairy based mixed farming was 174 man days over monocropping.

By recycling the animal residues, the value of major nutrients added to the soil was approximately Rs. 1000/- in a year in the dairy based systems and about Rs. 90/- in the poultry based system.

The data have clearly shown that in the tribal farm unit of three acres introducing the practicing of dairy cum poultry based mixed farming was both feasible and profitable and provided more employment opportunities with assured regular income. Thus under farmer's conditions also, mixed farming could pay more than pure cropping. Reddy *et al* (1975) reported the advantage of higher income with integrated farming over arable farming. The farmers could obtain higher profit if cross breed dairy animals are maintained. The poor socio-economic conditions of the tribal come in the way and the government and financial agencies should come to help them in a big way to improve their economic status by extending financial assistance.

Table 1. Summary of economics and employment generated under different cropping systems (mean for 4 years) at Horticultural Research Station, Yercaud.

Cropping system	Input Rs	Output Rs	Income Rs	Per day income Rs	Input output ratio	Employ- ment generated (Man days)	Additional employ- ment generated (Man days)
T1 a	8919.12	14013.28	5094.16	13.96	1:1.57	539	235
b	10480.77	—	3532.51	9.68	1:1.34	—	—
T2 a	4056.94	7246.99	3192.05	8.75	1:1.79	387	83
b	4872.74	—	2376.25	6.51	1:1.49	—	—
T3 a	9225.16	14754.56	5529.40	15.15	1:1.60	556	252
b	10753.13	—	4001.43	10.96	1:1.37	—	—
T4 a	3707.54	6585.23	2877.69	7.88	1:1.78	304	—
b	4478.54	—	2106.69	5.77	1:1.47	—	—
T5 a	1285.85	2392.42	1106.57	3.03	1:1.86	—	—
b	1814.45	—	577.57	1.58	1:1.31	—	—

- a. Input cost excluded the rental value of land, interest on working capital and livestock cost
 b. Input cost included rental value for coffee Rs.250/acre and for other crop Rs.75/acre
 Interest on working capital @ .0% per annum and on livestock cost @ 9% per annum.

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REFERENCES

- CHINNASWAMY, K.N., G. SELVARANGARAJU, G. RAJENDRAN and P. SENTHAMILSELVAN 1980. Economics of mixed farming TNAU News Letter 9 (12):4-5
- ELVINO O. Tan 1980. Integrated crop livestock-fish farming. FFTC book series No-6 Taiwan. Rep. of China: 43-51.
- FITCH, J.B. and T. L. NORDBLOM 1977. Agricultural decision making in drylands. proc. of symposium on rainfed agriculture in semiarid regions. Arid land abstract 2(2):510-1981
- RAHEJA and OBERAI. 1953 why practice mixed farming. Ind. Fmg.3(3):20-21
- REDDY, Y. V. R. K. RANGANATHAN and S.R. JAYASANKAR 1975. Annual report. National Dairy Res. Institute, Karnal 256-258.
- CHAUR - STYLAN LEE - 1980. An economical analysis of integrated crop, livestock and fish farming in Taiwan. FFTC Book series No.16. Taiwan Rep. of China: 107-18