The Pharma Innovation Journal 2022; SP-11(2): 745-747

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(2): 745-747

www.thepharmajournal.com
Received: 25-12-2021
Accepted: 27-01-2022

Ajit Singh
Department of Agricultural Economics, S.V. Agricultural College, Tirupati, Andhra Pradesh, India

I Bhavani Devi
Department of Agricultural Economics, S.V. Agricultural College, Tirupati, Andhra Pradesh, India

Corresponding Author
Ajit Singh
Department of Agricultural Economics, S.V. Agricultural College, Tirupati, Andhra Pradesh, India

An economic analysis of identified farming systems in Chittoor district of Andhra Pradesh

Ajit Singh and I Bhavani Devi

Abstract
Farming systems represent integration of farm enterprises such as cropping systems, animal husbandry, fisheries, forestry, etc. for optimal utilization of resources bringing prosperity to the farmer. The present study has been made to identify types of farming system and to assess the potentialities for increasing farm income through reallocation of resources in farming system. The data were collected from 90 respondents pertaining Chittoor district of Andhra Pradesh during 2012-13. The study revealed that maximum return obtained from dairy based farming system.

Keywords: costs, returns, returns per rupee outlay

Introduction
Agriculture constitutes one of the most crucial sectors of Indian economy by virtue of its being the single largest contributor to National Gross Domestic product (GDP) which hover around 15.7 percent (2011). With the declining farm sizes, it is becoming increasingly difficult to produce enough food to country. At the farmer's level, the incomes that were obtained from the small holdings are not adequate to meet the requirements of the family with no scope existing to increase the land area there is a possibility to enhance the income of the farmers through farming systems approach. This forms the background of the present study.

Methodology
The study will be conducted in Chittoor district of Andhra Pradesh. In the selected district, the farming systems practiced will be identified along with the mandals. From the mandals identified two mandals with existing farming system will be purposively chosen. Following the same criteria three villages will be selected from each mandal. From the villages so selected 30 farmers from each farming systems will be randomly selected. The collected data were analysed using statistical techniques such as, mean, percentages and ratios for better precision of analysis.

Results and Discussion
(a) Costs and returns in farming system- I
The costs incurred and returns realized from different crop enterprises and their shares in total cost and returns were calculated and presented in Table 1. It is observed that among the seven major enterprises, expenditure made towards dairy component was the highest (37.10%), followed by sugarcane (15.22%), *rabi* groundnut (12.36%), *kharif* groundnut (11.52%), *kharif* paddy (9.10%), *rabi* paddy (8.63%) and bajra (6.06%) accordingly to the total variable cost. Among the enterprises, highest share in total cost was in dairy with 33.18 per cent, followed by sugarcane (14.82%), *kharif* groundnut (13.52%), *rabi* groundnut (12.11%), *kharif* paddy (9.24%), *rabi* paddy (8.84%) and bajra (7.76%). The total cost of the Farming System as a whole was ` 282908.19 and the gross returns were ` 456151.45. The contribution of dairy enterprise to the net returns was 48.31 per cent. Among field crops, *rabi* groundnut (17.48%) contributed maximum and stood next to dairy, followed by *kharif* groundnut, *kharif* paddy, sugarcane, bajra and *rabi* paddy with a share of 12.02, 8.66, 7.75, 3.37 and 2.38 per cent, respectively to the net returns in the Farming System. The net returns obtained from the Farming System as a whole was ` 1, 73243.26. The returns per rupee of expenditure was observed to be the highest in dairy (1.89), followed by *rabi* groundnut, *kharif* paddy, *kharif* groundnut, sugarcane, bajra and *rabi* paddy with 1.88, 1.57, 1.54, 1.37, 1.27 and 1.17, respectively and for the system as a whole it was found to be 1.61.

(b) Costs and returns in farming system – II

There were mainly seven enterprises identified under this Farming System. Costs and returns of each of the enterprises were calculated and presented in Table 2. The cost of cultivation observed for the Farming System-II as a whole was ` 3,27,826.54, where as the gross returns and net returns were ` 4,99,637.01 and ` 1,71,810.47, respectively. Further, with the existing enterprises in Farming System-II, the maximum share of 52.87 per cent in the total variable cost of the system was absorbed by poultry enterprise, followed by *kharif* paddy (10.50%), *rabi* groundnut (9.93%), *kharif* groundnut (8.38%), *rabi* paddy (6.92), ragi (6.47%), and fodder jowar (5.12%).

Under this Farming System, the share of poultry enterprise in total cost of the system was observed to be maximum (46.27%). Contribution of *Kharif* paddy stood next to poultry with 11.67 per cent, followed by share of *rabi* groundnut (10.16%), *kharif* groundnut (8.60%), *rabi* paddy (8.20%), ragi (8.16%) and fodder jowar (6.46%).

The contribution of poultry to the net returns was maximum (41.76%), followed by *rabi* groundnut (16.61%) to the net returns. The share of remaining enterprise was *rabi* paddy, *kharif* groundnut, *kharif* paddy, fodder jowar and ragi 13.60%, 12.43%, 7.07%, 4.57% and 3.97% respectively.

The returns per rupee of expenditure was observed to be more in *rabi* paddy (1.87), followed by *rabi* groundnut (1.82), *kharif* groundnut (1.76), poultry (1.47), fodder jowar (1.37), *kharif* paddy (1.32) and ragi (1.25), whereas for the system as a whole it was 1.52. The results were in corroborated with Rai J and Tiwari, U. S. (2011).

(c) Costs and returns in farming system – III

The per farm cost and returns of enterprises in Farming System-III were calculated and presented in the Table 3. It can be observed that among the five enterprises practiced under this Farming System, the major share of total cost was incurred in sheep enterprise (40.99%), followed by *rabi* groundnut (20.95%). *Kharif* groundnut, *kharif* paddy and *rabi* paddy, accounted for 20.82, 16.03, and 12.97 per cent, respectively to the total cost. The total cost of the Farming System was ` 184375.16.

Among the enterprises, the contribution of net returns to total returns was maximum in sheep rearing, which contributed 41.14 per cent to the total returns, where as the share of total net returns by *kharif* paddy enterprise was 29.19 per cent. The share of *rabi* paddy, *rabi* groundnut and *kharif* groundnut were 28.49, 26.12 and 11.34 per cent, respectively.

The returns per rupee of expenditure was observed to be more in *rabi* groundnut (1.94), followed by sheep rearing (1.75), *kharif* groundnut (1.41), *rabi* paddy (1.17) and *kharif* paddy (1.14), where as for the system as a whole it was 1.75.

Table 1: Costs and Returns structure of different enterprises under farming system – I

Sl, No.	Particulars	Kharif groundnut	Rabi groundnut	Kharif paddy	Rabi Paddy	Bajra	Sugarcane	Dairy	Farming system as a whole
I.	**Costs**								
	Total variable costs	24802.8 (11.52)	26596.8 (12.36)	19602.5 (9.10)	18565 (8.63)	13033.1 (6.06)	32756.8 (15.22)	79855.1 (37.10)	215212.1 (100)
	Total fixed costs	13456.89 (19.88)	7655.0 (11.31)	6543.9 (9.67)	6430.0 (9.50)	8931.9 (13.19)	10654.5 (15.74)	14024.0 (20.72)	67696.1 (100)
	Total costs	38259.6 (13.52)	34251.8 (12.11)	26146.4 (9.24)	24995 (8.84)	21965.0 (7.76)	43411.3 (14.82)	93879.1 (33.18)	282908.2 (100)
II.	**Returns**								
	Gross returns	59077.0 (12.95)	64532.8 (14.14)	41142.8 (9.01)	29120.1 (6.38)	27850.6 (6.10)	56846.1 (12.46)	177581.9 (38.93)	456151.4 (100)
	Net returns	20817.3 (12.02)	30280.1 (17.48)	14996.5 (8.66)	4125.1 (2.38)	5885.7 (3.39)	13434.8 (7.75)	83702.8 (48.31)	173243.3 (100)
	Returns per rupee outlay	1.54	1.88	1.57	1.17	1.27	1.31	1.89	1.61

*Figures in parentheses indicate percentage to respective totals

Table 2: Costs and Returns Structure of different enterprises under farming system – II

Sl	Particulars	Kharif groundnut	Rabi groundnut	Kharif paddy	Rabi paddy	Ragi	Fodder jowar	Poultry	Farming system as a whole
I.	**Costs**								
	Total variable costs	21745.63 (8.38)	25762.53 (9.93)	26716.36 (10.50)	17939.19 (6.92)	16775.7 (6.47)	13284.05 (5.12)	137132.6 (52.87)	259356.06 (100)
	Total fixed costs	6453.78 (9.43)	9067.5 (13.24)	11543.3 (16.86)	8956.7 (13.08)	9987 (14.56)	7896.9 (11.53)	14565.3 (21.27)	68470.48 (100)
	Total costs	28199.41 (8.60)	34830.03 (10.16)	38259.66 (11.67)	26895.89 (8.20)	26762.7 (8.16)	21180.95 (6.46)	151697.96 (46.27)	327826.54 (100)
II.	**Returns**								
	Gross returns	49563.9 (9.92)	63360 (12.68)	50400 (10.09)	50261.54 (10.06)	33564.9 (6.72)	29040 (5.81)	223446.67 (44.72)	499637.01 (100)
	Net returns	21364.49 (12.43)	28529.97 (16.61)	12140.34 (7.07)	23365.65 (13.60)	6802.2 (3.96)	7859.05 (4.57)	71748.71 (41.76)	171810.47 (100)
	Returns per rupee outlay	1.76	1.82	1.32	1.87	1.25	1.37	1.47	1.52

*Figures in parentheses indicate percentage to respective totals

Table 3: Costs and Returns Structure of different enterprises under farming system – III

Sl. No.	Particulars	Kharif groundnut	Rabi groundnut	Kharif paddy	Rabi paddy	Sheep rearing	Farming system as a whole
I.	**Costs**						
	Total variable cost	24503.36 (17.80)	27386.2 (19.89)	21665.4 (15.74)	20290.9 (14.74)	65453.33 (47.56)	137633.79 (100)
	Total fixed cost	13875.6 (29.68)	11243.87 (24.05)	7890.8 (16.88)	3617.3 (7.75)	10113.8 (21.64)	46741.37 (100)
	Total cost	38378.96 (20.82)	38630.07 (20.95)	29556.2 (16.03)	23908.2 (12.97)	75567.13 (40.99)	184375.16 (100)
II.	**Returns**						
	Gross returns	54080 (16.75)	74800 (23.17)	33600 (10.41)	27855 (8.63)	132540.54 (41.05)	322875.54 (100)
	Net returns	15701.04 (11.34)	36169.93 (26.12)	4043.8 (29.19)	3946.8 (28.49)	56973.4 (41.14)	138500.38 (100)
	Returns per rupee outlay	1.41	1.94	1.14	1.17	1.75	1.75

*Figures in parentheses indicate percentage to respective totals

(d) Costs and returns in identified major farming system in study area

The total cost incurred, gross returns generated, net returns and the BC ratios in different Farming Systems were computed and depicted in Table 4. It was observed that the returns per rupee outlay ratios in all the Farming Systems ranged between 1.52 and 1.75. The farmer was getting as much as ` 1.75 per rupee of investment in Farming System-III, followed by Farming System-I (1.61). It was found to be the lowest in Farming System-II (1.52). The maximum cost was observed in Farming System-II (3, 27, 826.54) and the least was in Farming System-III (1, 84, 375.16) where the respondents were following only field crops. However, net returns was highest in Farming System-I (1, 73, 243.26) and the same was comparatively less in Farming System-II (1,71,810.47), and followed by Farming System-III (1,38,500)

Table 4: Costs and returns Structure under existing farming system in the study area

Sl. No.	Particulars	Farming systems		
		I	II	III
I.	**Costs**			
	Total variable cost	215212.12	259356.06	137633.79
	Total fixed cost	67696.07	68470.48	46741.37
	Total cost	282908.19	327826.54	184375.16
II.	**Returns**			
	Gross returns	456151.45	499637.01	322875.54
	Net returns	173243.26	171810.47	138500.38
	Returns per rupee of investment	1.61	1.52	1.75

*Figures in parentheses indicate percentage to respective totals

Conclusion

It has been found that groundnut and paddy are dominant in all the farming systems in the Chittoor district. The study has observed that farmers of the area follow traditional farming systems, which do not provide adequate income for a good living there is a need to develop low cost technologies like simultaneous planting of sugarcane with paddy using improved verities and site specific nutrient management with emphasis on balanced nutrition deserve due attention for increasing profitability of farming systems. A combination of technology, policy and institutional innovations is needed for improvement in productivity and profitability of crop and livestock sectors in the area, as has been suggested by Birthal *et al.* (2006) [1] also.

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