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Socio-economic Impact of Flue-Cured Tobacco in Northern Light Soils Zone of Andhra Pradesh

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ABSTRACT

The present study attempts to assess the impact of FCV (Flue Cured Virginia) tobacco crop on socio-economic transformation of tobacco farmers in NLS (Northern Light Soils) zone of Andhra Pradesh. A total of 10 villages were selected by purposive sampling representing progressive tobacco growing villages and non-tobacco growing villages. Twelve farmers were randomly selected from each village so that 60 tobacco and 60 non-tobacco farmers represented the total sample of the study. Tobacco is adequately financed by the banks to an average extent of up to ` 72,000/acre in addition to inputs supplied by Tobacco Board, whereas for other selected crops, the average scale of finance restricted to a maximum limit of ` 30,000/acre. The average net returns per acre of own land is higher for tobacco (` 49,806) than other selected crops grown in the region. The socio-economic impact analysis revealed that tobacco farmers are comparatively having well-furnished houses (38.34%), possession of vehicles like two wheelers (96.66%), four wheelers (31.66%), tractors (28.33%), more number of livestock with 5-10 animals (20%), more than one bore well for farm irrigation (11.66%), access to refrigerators (61.66%) in addition to televisions (100%), having bank accounts (100%) and also, access to overseas higher education (11.67%) than non-tobacco growers. The total labour employed per acre for tobacco (131) is comparatively higher than paddy (31), maize (40) and sugarcane (52) including mechanization.

Keywords: FCV tobacco, net returns, socio-economic impact

INTRODUCTION

In India, tobacco occupies a meager 0.24 per cent of the country's total arable land area. The Flue-Cured Virginia (FCV) tobacco, major type of tobacco used in making Cigarettes, accounts for around 40 per cent of total tobacco produced in India (Tobacco Board, 2016). Tobacco is a highly remunerative crop providing economic/social benefits to farmers in the tobacco growing regions. Tobacco and tobacco products earn a substantial amount of about ` 23,318.45 crores to the national exchequer in terms of excise revenue and foreign exchange of ` 6058.13 crores (Tobacco Board, 2017). It is a highly labour intensive crop and is grown largely in semi-arid and rain-fed areas where the cultivation of other crops is economically nonviable. Although, there are many drastic tobacco control measures taking place, this puts into a question the future of a time tested cash crop and jeopardizes the livelihood of millions of tobacco farmers because till now, there is no sole alternative crop to tobacco. This also raises serious questions on the future of India's millions of farmers besides depriving the crucial foreign exchange earnings being currently generated from tobacco exports.

In India, as in many other countries, tobacco yields higher net returns per unit of land than most other cash crops, and substantially more than food crops. This economic security also helps in mobilizing the farmers towards social empowerment. Therefore, the present study is worthwhile in comparing socio-economic impact of tobacco with competing major crops in the present conflicting scenario against tobacco. So far, studies have been largely restricted to analyzing the economic impact of technologies therefore, the comparative study with the other crops fills the research gap.

METHODOLOGY

Northern Light Soils (NLS) region of Andhra Pradesh was selected purposively as a representative study area for FCV tobacco. A total of 10 villages were selected by purposive sampling representing both progressive tobacco growing villages and non-tobacco growing

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villages with major crops paddy, maize and sugarcane. Twelve farmers were randomly selected from each village so that 60 tobacco and 60 non-tobacco farmers represented the total sample of the study. The statistical tools used in the analysis are parametric tests like Independent samples 't' test, One way Analysis of Variance (ANOVA), Benefit Cost ratio analysis for economic impact and Non-parametric tests like Wilcoxon Mann Whiney test and Friedman test. The statistical software used for the analysis are SPSS and XL STAT.

RESULTS AND DISCUSSION

Land size

The land size of the respondents was compared between tobacco (n_1=60) and non-tobacco (n_2 =60) growers with respect to own, leased in and leased out land. For analysing the significant difference between two independent groups, independent samples 't' test was carried out and the results are presented.

Table 1: Land size compared using independent samples 't' test

n=120

Category of farmers		Mean (acres)	Standard deviation	Standard Error of Mean	Levene's Test for Equality of Variances	t-test for Equality of Means (Eq.Variances)
					F (Prob. F)	t, DF(Prob. t)
Own	Tobacco	15.83	22.08	2.85	1.92	1.97, 118
	Non-tobacco	8.80	16.46	2.12	(p =0.168)	(p =0.051)
Leased in	Tobacco	7.38	13.34	1.72	11.38*	2.34*, 118
	Non-tobacco	2.96	5.86	0.75	(p =0.001)	(p =0.021)
Leased out	Tobacco	0.01	0.00	0.00	29.36*	-2.71*,118
	Non-tobacco	1.20	3.42	0.44	(p =0.000)	(p =0.008)

* p<0.05, F=Value of the F-statistic; t= Value of the t statistic, DF = degrees of freedom

Table 1 clearly showed that there is no significant difference in the extent of own land size between tobacco and non-tobacco growers (t = 1.97, p > 0.05). Whereas leased in land of tobacco growers (mean 7.38) was significantly higher than the non-tobacco growers (mean 2.96) with test statistic (t = 2.34, p< 0.05). As far as leased out land is concerned, there is significant difference (t = -2.71, p < 0.05) between the two groups as non-tobacco growers are opting more for leasing out the land (mean 1.20) than tobacco growers (mean 0.01). From these results it has been inferred that in addition to own land, tobacco growers are opting for substantial land lease for cultivation. It shows the propensity to the extent of increase in land size for obtaining higher income due to their progressive nature.

Socio-personal profile

The personal characteristics and the extent of involvement of tobacco and non-tobacco growers were analysed by non-parametric Wilcoxon Mann Whitney test in order to identify the significant difference between the two groups.

Table 2. Socio-personal characteristics comparison by using Wilcoxon Mann-Whitney test

n=120

Category	Mean rank		Mann - Whitney U value	Wilcoxon W	Z value	Asymp. Sig. (2-tailed)
	Tobacco (n_1=60)	Non-tobacco (n_2=60)				
Age	58.32	62.68	1669	3499	-0.689	0.491
Education	55.04	65.96	1472	3302	-1.840	0.066
Occupation	61.50	59.50	1740	3570	-0.488	0.626
Social participation	69.72	51.28	1247*	3077	-2.968	0.003
Mass media exposure	63.36	57.64	1628	3458	-0.976	0.329

The data from the table 2 indicates that the tobacco growers (mean rank 69.72) have comparatively high mean rank than non-tobacco growers (mean rank 51.28) with respect to social participation due to membership in tobacco growers' association and active involvement in social activities. It is also evident that there is no significant difference with respect to age, education, occupation and mass media exposure between the two groups. Further the test statistics of Wilcoxon Mann Whitney 'U' value (1247.0) for social participation revealed that there is significant difference between the two groups. As large farmers are progressive, it can be concluded that socio-economic characteristics of the farmers influences their level of participation. The results are similar to the findings of Singh et al. (2016) who reported that majority of the respondents registered their membership in professional/cooperative societies and other organizations.

Information seeking behavior

The information seeking behavior of the respondents was analyzed by using Friedman's test and the responses were recorded on five-point continuum starting from 1= to a very low extent to 5= to a very high extent on different components. Total score of each component was taken into account and further compared by using multiple pairwise comparisons.

Table 3.1: Information seeking behavior by using multiple pairwise comparisons

n=120

Particulars	Mean rank	Standard deviation	Groups		
Tobacco growers (n_1=60)					
ICAR-CTRI	4.08	0.92	A		
ITC Ltd	3.93	0.94	A		
Tobacco Board	3.47	0.78	A		
Progressive farmers	1.78	0.95		B	
Input dealers	1.72	0.96		B	
Non-tobacco growers (n_2=60)					
Input dealers	3.32	0.47	A		
Progressive farmers	3.16	0.55	A		
Government officials	2.50	0.49		B	
Private companies	1.00	0.50			C

Table 3.2: Friedman test statistics of information seeking behaviour n=120

Test statistic value	Tobacco growers ((n_1=60)	Non-tobacco growers (n_2=60)
Q (Observed value)	143.36*	147.27*
Q (Critical value)	9.48	7.81
Df	4	3
p value	< 0.0001	< 0.0001

* p<0.05 significant difference at 5 per cent level

Results from table 3.1 shows that majority of the tobacco growers seek information from CTRI (mean rank 4.08) followed by ITC (mean rank 3.93) and Tobacco Board (mean rank 3.47). Multiple pair wise comparisons revealed that CTRI, ITC and Tobacco Board are on par in providing information on technologies and varieties. Whereas in case of non-tobacco growers, majority seek information from input dealers (mean rank 3.32) and progressive farmers (mean rank 3.16).

It is also identified that in both the groups, majority of large farmers seek information from authorized government sources as they have greater scope for interaction with officials and for authentication of information. Whereas, small farmers seek information from local sources as they are having less contact with external agents.

The findings are in accordance with Majumder (2013) and Roy et al., (2016) who reported that only a few progressive farmers had good extension linkages. Distance of the various agricultural institutions from the village, lack of time for visit due to intensive farming activities and non-availability of the extension personnel in the offices are some of the reasons as mentioned by the farmers for moderate extension linkages. The farmers had more trust on the input dealers and the fellow farmers rather than the agricultural institutes/organizations viz. SAU, KVKs etc.

Further, Friedman's test statistic results (table 3.2) revealed that the computed p-value is significant at five per cent ($p < 0.05$) with Q value 143.36 and 147.27 for tobacco and non-tobacco growers respectively. It can be inferred that the information seeking behavior of the respondents differs in both the groups.

Credit

The source of credit for farming is analyzed between the tobacco (n1=60) and non-tobacco growers(n2=60). For analyzing the significant difference between two independent groups, independent samples 't' test was carried out and the results are presented.

Table 4: Comparison of source of credit using independent samples 't' test

n=120

Particulars		Mean (/acre)	Standard deviation	Standard Error of Mean	Levene's Test for Equality of Variances	t-test for Equality of Means(Eq. Variances)
Source	Category				F(Prob. F)	t, DF (Prob. t)
Bank	Tobacco	72000	709	91.65	63.34 (p = 0.000)	153.75*, 118 (p = 0.000)
	Non-tobacco	27800	2063	266.41		
Money lenders	Tobacco	12800	7155	923.82	5.38 (p = 0.022)	-13.95*, 118 (p = 0.000)
	Non-tobacco	34800	9890	1276.8		
Friends/ relatives	Tobacco	4733	2406	310.70	7.62 (p = 0.007)	-1.43, 118 (p = 0.154
	Non-tobacco	5633	4226	545.63		

* p<0.05, F=Value of the F-statistic; t= Value of the t statistic, DF = degrees of freedom

The data from table 4 revealed that, tobacco is a crop financed adequately by the banks to an extent of up to ` 72000/acre, whereas for other selected crops, the scale of finance is restricted to a maximum limit of ` 30000/acre. It was found from the study that banks are major sources of credit in case of tobacco as it is a highly remunerative crop and in other crops, money lenders and banks are major sources of credit. All the tobacco grower respondents emphasized on bank credit which is one among the solutions to improve tobacco production because various activities to manage the farm operations cannot be done without credit support.

While majority of non-tobacco growers preferred credit from informal sources due to complex procedural formalities. The 't' test statistic results also showed that there is significant difference in source of credit between the two groups with respect to banks ($t = 72.63$, $p< 0.05$) and money-lenders ($t = -13.95$, $p< 0.05$). It is also found that there is no significant difference in seeking credit from friends/relatives between two groups. It can be inferred that tobacco grower's gets financial assistance in the form of input loans through nationalized banks at competitive rate of interest. The results are in support with the findings of Prasad (2007) who concluded that tobacco farmers depend significantly on financial institutions and moneylenders to meet the heavy costs of tobacco cultivation, and finance (credit) is easily available to the farmers.

Income

Income is an important indicator to measure the standard of living of an individual. The different sources of income between tobacco (n_1=60) and non-tobacco growers (n_2=60) is identified. For analysing the significant difference between these two groups, independent samples 't' test was carried out and the results are presented.

Table 5: Comparison of sources of income using independent samples 't' test

n=120

Particulars		Mean (`) Per acre	Standard deviation	Standard Error of Mean	Levene's Test for Equality of Variances	t-test for Equality of Means(Eq. Variances)
Source	**Category**				**F (Prob. F)**	**t, DF(Prob. t)**
Farming	Tobacco	49806	745	96.27	79.322	71.383*, 118
	Non-tobacco	18500	2310	298.3	(p = 0.000)	(p = 0.000)
Livestock	Tobacco	6850.0	1190	153.72	116.777	26.475*, 118
	Non-tobacco	2651.6	301	38.94	(p = 0.000)	(p = 0.000)
Hiring of tractors	Tobacco	4500.0	504	65.09	22.102	16.534*, 118
	Non-tobacco	1311.6	1406	181.52	(p = 0.000)	(p = 0.000)
Non-farm sources	Tobacco	5166.6	762	98.48	0.140	.000, 118
	Non-tobacco	4123.3	784	101.31	(p = 0.709)	(p = 1.000)
Total income	Tobacco	57596	1792	231.3	10.291	68.351*, 118
	Non-tobacco	26585	2857	368.8	(p = 0.002)	(p = 0.000)

* p<0.05, F=Value of the F-statistic; t= Value of the t statistic, DF = degrees of freedom

Table 5 indicates the different sources of income between two groups. From the study it was found that the average returns per acre of own land is high for tobacco (49806 96.27) than other selected crops (18500 298.3). It is also evident that the income from livestock (6850.0 153.72), hiring income from tractors (4500 65.09) is also high for tobacco growers. This has resulted in higher total income. It is also found that there is no significant difference in non-farm sources of income between the two groups. From these results it is inferred that, the income from farming (t = 71.383, p< 0.05), livestock (t = 26.475, p< 0.05), hiring (t = 16.534, p<0.05) and total income (t = 68.351, p< 0.05) are significantly differed than non-tobacco growers. The different sources of income of the tobacco farmers makes them relatively financially independent and leads to better living standards.

Expenditure pattern

The monthly expenditure pattern between tobacco (n1=60) and non-tobacco growers (n2=60) was analysed by using independent samples 't' test and the results presented.

Table 6: Comparison of expenditure pattern using independent samples 't' test

n=120

Particulars		Mean (`)	Std. deviation	Std. Error of Mean	Levene's Test for Equality of Variances	t-test for Equality of Means(Eq.variances)
Category	**Category**				**F (Prob. F)**	**t, DF (Prob. t)**
Food	Tobacco	9883.3	577	74.56	54.579	20.373*, 118
	Non-tobacco	6450.0	1170	151.12	(p = 0.000)	(p = 0.000)
Clothing	Tobacco	4531.6	759	98.04	82.449	27.708*, 118
	Non-tobacco	1433.3	416	53.76	(p =0.000)	(p = 0.000)
Children education	Tobacco	6998.3	670	86.57	0.741	40.673*, 118
	Non-tobacco	2160.0	631	81.58	(p = 0.391)	(p = 0.000)
Health	Tobacco	1231.6	214	27.66	0.000	0.000, 118
	Non-tobacco	1106.2	198	22.34	(p = 1.000)	(p = 1.000)
Recreation	Tobacco	4293.3	865	111.76	71.495	26.510*, 118
	Non-tobacco	1105.0	344	44.431	(p = 0.000)	(p = 0.000)
Vehicles	Tobacco	4338.3	792	102.26	52.499	28.876*, 118
	Non-tobacco	1040.0	394	50.879	(p = 0.000)	(p = 0.000)

* p<0.05, F=Value of the F-statistic; t= Value of the t statistic, DF = degrees of freedom

It is well apparent from table 6 that the monthly average expenditure of tobacco growers for food (mean 9883.3 74.56), clothing (mean 4531.6 98.04), children education (mean 6998.3 86.57), recreation (mean 4293.3 111.76) and vehicle expenses (mean 4338.3 102.26) is comparatively higher than other selected crops. From these results, it can be interpreted that the expenditure towards various needs is higher for tobacco farmers. The test statistic values also shows that there is significant difference between tobacco and non-tobacco growers in expenditure towards food (t = 20.373, p< 0.05), clothing (t = 27.708, p< 0.05), children education (t = 40.673, p < 0.05), recreation (t = 26.510, p < 0.05) and vehicle expenses (t = 28.876, p < 0.05). It is also found that there is no significant difference in expenditure towards health. The expenditure indicators showed a propensity for consumption and asset creation amongst those who cultivate tobacco than other crops.

Socio economic status

Socio-economic status was compared between tobacco and non-tobacco growers in the study area to analyze the empowerment of the respondents.

Table 7: Comparison of socio-economic status

n=120

Particulars	Tobacco (n_1=60)		Non-tobacco (n_2=60)	
	Frequency	**%**	**Frequency**	**%**
Housing				
Semi pucca	37	61.66	43	71.67
Pucca	23	38.34	17	28.33
Basic amenities				
Electrified houses	60	100.00	60	100.00
Toilet facilities	60	100.00	60	100.00
Tap connections	60	100.00	60	100.00
Gas connections	60	100.00	60	100.00
Vehicles *				
Bicycles	2	3.33	9	15.00
2 wheelers	58	96.66	49	81.66
4 wheelers	19	31.66	2	3.33
Children education				
Local schools	-	-	6	10.00
Private schools	53	88.33	54	90.00
Abroad settlement	7	11.67	-	-
Health security				
Government hospitals	41	68.33	47	78.33
Private hospitals	19	31.67	13	21.66
Livestock*				
<5 animals	43	71.66	51	85
5-10 animals	12	20.00	6	10
>10 animals	5	8.34	3	5
Cattle shed	11	18.33	7	11.66

Farm irrigation*				
Canal water	-		7	11.66
1 bore well	53	88.33	58	96.67
>1 borewell	7	11.66	-	-
Farm implements/machinery*				
Sprayer	60	100	60	100
Tractors	17	28.33	7	11.66
Other implements	58	96.67	49	81.66
Savings*				
Bank	60	100	9	15
LIC	53	88.33	43	71.66
Private chit funds	57	95.00	58	96.67
Social involvement				
High extent	49	81.66	33	55
Low extent	11	18.34	27	45
Trainings				
Yes	60	100	39	65
No	-	-	21	35
Access to electronics*				
Radio	2	3.33	5	8
Television	60	100	60	100
Mobiles	60	100	60	100
ovens	5	8	-	-
refrigerators	37	61.66	9	15
others				
No purchase	37	61.66	56	93.33
Land purchased	5	8.33	1	1.67
Land leased out	18	30.00	3	5

*Multiple response

Data from table 7 reveals that tobacco farmers are having comparatively high values in well-furnished houses (38.34%), possession of vehicles like two wheelers (96.66%), four wheelers (31.66%); tractors (28.33%), more number of livestock with 5-10 animals (20%), more number of bore wells for farm irrigation (11.66%), access to refrigerators (61.66%) in addition to televisions, maintaining bank accounts (100%) and abroad settlement of children (11.67%) than non-tobacco growers. This clearly shows that tobacco farmers are comparatively well empowered in socio-economic status than others which is due to high economic gain from tobacco. The existence of basic civic facilities is considered as the determining factors for the development. It is also found that a few tobacco farmers have sent their children to abroad for higher studies due to their progressiveness. The social and economic indicators in the predominantly tobacco growing regions compare favourably with non-tobacco areas. Hence, tobacco does create an earning and other social capability to those who are engaged in its cultivation. The results are in line with the findings of Kranthi (2015) who reported that tobacco cultivation has not only acted as a money multiplier, but has brought about a very high degree of social awareness and the respondents are highly conscious of their political and social rights for improving themselves.

Cost of cultivation

The analysis of cost of cultivation for the selected crops presented below shows the average comparative rate of returns realized by the respondents.

Table 8: Cost of cultivation

Operations (` /acre)	Tobacco	Paddy	Maize	Sugarcane
Seed/planting material	5000	800	2000	12000
Land preparation	4600	2900	1700	1900
Fertilizers	8544	4150	4185	6350
Pesticides	3100	1200	1120	1500
Irrigation	3000	1200	1800	2400
Labour wages (male@300, female@150)	22950	5850	7350	10800
Harvesting and post-harvest operations	25000	2000	900	19500
Miscellaneous	5000	1500	1500	5000
Total costs	77194	19600	20555	59450
Yield (q/acre)	10	26.25	30	300
Average price/q	12700	1000	1300	285
Gross returns	127000	26250	39000	85500
Net returns (without lease)	49806	6650	18445	26050

It is perceived from the table 8 that the net returns/acre without lease (own land) is comparatively high for tobacco (` 49806). Sugarcane stands next to tobacco in net returns (` 26050) followed by maize (` 18445) and paddy (` 6650). This is because the average price per quintal is more for tobacco as it is being highly remunerative commercial crop. It is found that the B:C ratio of tobacco is on par with other crops, due to high cost of cultivation of tobacco. High B:C ratio in maize is due to less cost of cultivation and more returns. Even then the farmers in the study area gave more importance to cultivate tobacco than other food crops due to the fact that tobacco is highly facilitative crop in terms of timely finance from banks, guaranteed market, inputs and other welfare benefits from Tobacco Board.

Labour utilization

The gender wise labour utilization/employment generation is analyzed for the selected crops and the results are presented.

Table 9: Gender wise labour utilization for different farm operations

n=120

Operations	Gender (per acre)	Tobacco		Paddy		Maize		Sugarcane	
		F	%	F	%	F	%	F	%
Preparatory cultivation	Male	4	9	3	18	6	28	6	16
	Female	-	-	-	-	-	-	-	-
Sowing/transplantation	Male	2	5	4	25	-	-	-	-
	Female	7	8	10	66	4	21	10	63
Manures & fertilizers	Male	5	12	3	19	3	15	4	11
	Female	5	6	-	-	-	-	-	-
Intercultural operations	Male	3	7	-	-	-	-	14	39
	Female	15	17	5	34	2	11	6	37
Plant protection	Male	4	9	2	13	2	10	4	11
	Female	2	2	-	-	-	-	-	-
Irrigation	Male	10	24	4	25	6	28	8	22
	Female	-	-	-	-	-	-	-	-
Harvest & post-harvest	Male	14	34	Machine		4	19	Contract	
	Female	60	67	Contract		13	68	-	-
Total labour	Male	42	32	16	51	21	52	36	69
	Female	89	68	15	49	19	48	16	31

Data from table 9 shows that compared to other crops, the total labour employed per acre for tobacco (131) is comparatively higher than paddy (31), maize (40) and sugarcane (52). It is due to the fact that tobacco is highly labour intensive crop and is more women oriented (68%) than men (32%). In the present challenging scenario of finding ways of how to effectively utilize seasonal agricultural labour in providing employment opportunities during slack season, tobacco cultivation provides continuous employment throughout the year during season and post-harvest product management operations. The findings are in accordance with Kranthi (2012) who reported that tobacco cultivation engages a large amount of labour and provides employment. The total average number of labour employed per acre for the selected crops is given in fig 1.

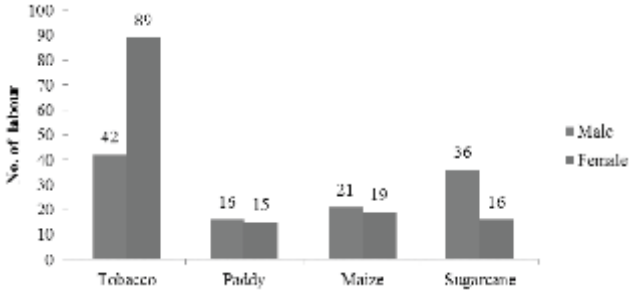

Fig. 1. Gender wise labour utilization for the crops

Average price of tobacco

One way ANOVA analysis was applied to test whether the average price of tobacco differs significantly among the five APF areas of study.

Table 10.1: Descriptive analysis of tobacco prices across Auction Platforms

Year	Study area	N	Mean (`)	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
						Lower Bound	Upper Bound
2013	JR Gudem I	12	129	9.30	2.68	123.41	135.24
	JR Gudem II	12	120	9.00	2.59	114.46	125.91
	Koyyalagudem	12	120	16.69	4.82	109.83	131.05
	Gopalapuram	12	128	12.01	3.46	120.52	135.80
	Deverapalli	12	137	9.51	2.74	131.66	143.76
	Total	60	127	13.03	1.68	123.80	130.53
2014	JR Gudem I	12	117	4.74	1.36	114.77	120.79
	JR Gudem II	12	124	6.29	1.81	120.56	128.56
	Koyyalagudem	12	110	8.17	2.39	105.53	115.92
	Gopalapuram	12	118	6.15	1.77	114.32	122.14
	Deverapalli	12	124	10.28	2.96	118.38	131.45
	Total	60	119	8.86	1.14	116.67	121.53
2015	JR Gudem I	12	133	14.44	4.17	123.93	142.29
	JR Gudem II	12	127	10.25	2.95	121.32	134.34
	Koyyalagudem	12	132	14.91	4.30	122.82	141.77
	Gopalapuram	12	140	10.95	3.16	133.63	147.55
	Deverapalli	12	140	9.13	2.63	134.32	145.94
	Total	60	134	12.79	1.64	131.50	138.08

The table 10.1 gives the mean, standard deviation; standard error and 95 per cent confidence interval for mean price of tobacco for the selected sample of farmers in five Auction platforms for the three years. Year wise APF data of the selected sample revealed that the average price in 2013, 2014 and 2015 are ` 127, `119 and ` 134 respectively. It is also evident that the highest average price increased from 2013 to 2015 with price drop in between in 2014. This may be due to supply and fluctuations in price by the marketing bodies. It is also found that in 2015, the APFs Gopalapuram and Deverapalli are on par in tobacco price.

Table 10.2: ANOVA for price comparison

Year	Groups	Sum of Squares	df	Mean Square	F	Sig.
2013	Between Groups	2529	4	632.2	4.638*	0.003
	Within Groups	7498	55	136.3		
	Total	10027	59			
2014	Between Groups	1633	4	408.4	7.494*	0.000
	Within Groups	2998	55	54.51		
	Total	4631	59			
2015	Between Groups	1435	4	358.9	2.426	0.059
	Within Groups	8139	55	147.9		
	Total	9574	59			

*p<0.05 significant at 5 per cent level

In the ANOVA table10.2, the significance value is 0.003, 0.000 and 0.059 for the years 2013, 2014 and 2015,respectively. From these results, it can be inferred that the average price differs between the years 2013 and 2014 among the 5 APF areas, where as there is no significant difference in 2015. The F test statistic values for the selected years are, in 2013 (f = 4.638, p<0.05), 2014 (f = 7.494, p< 0.05) and in 2015 (f = 2.426, p> 0.05).

Table 10.3: Duncan analysis for price comparison

Year	Study area	N	Subset for alpha		
			1	2	3
2013	J R Gudem II	12	120.19		
	Koyyalagudem	12	120.44		
	Gopalapuram	12	128.16	128.16	
	J R Gudem I	12	129.32	129.32	
	Deverapalli	12		137.71	
	Sig.		0.085	0.062	
2014	Koyyalagudem	12	110.72		
	J R Gudem I	12		117.78	
	Gopalapuram	12		118.23	
	J R Gudem II	12			124.56
	Deverapalli	12			124.91
	sig.		1.000	0.882	0.907

2015	J R Gudem II	12	127.83	
	Koyyalagudem	12	132.29	132.29
	J R Gudem I	12	133.11	133.11
	Deverapalli	12		140.13
	Gopalapuram	12		140.59
	sig.		0.322	0.133

From the Duncan table 10.3, it is revealed that among average price of each APF of the selected sample of farmers, the major mean price is ` 137.71, ` 124.91 and ` 140.59 in 2013, 2014 and 2015 respectively. This analysis revealed a fluctuation in price which might be due to variation in price for the low, medium and bright grades.

CONCLUSION

An attempt has been made to assess the socio-economic impact of FCV tobacco and other crops grown in NLS area. The results have revealed that tobacco has a profound effect on the economic prosperity of the farmers in the region where it is grown. Further, tobacco crop enjoys the elements of institutional support and employment generation in a chosen area. The remunerative returns from tobacco production facilitates for creation of wealth and enhanced care on health and education. It has brought dramatic changes in overall farming, employment, income and socioeconomic balance. The wealth indicators in rural household's shows a propensity for consumption and asset creation amongst those who predominantly grow tobacco compared to cultivation of other crops. This is manifested by well-furnished houses, better education to children, savings etc., than in the corresponding areas that do not grow tobacco. The other manifestation of prosperity comes in the form of ownership of assets like mobile phones, cars, two wheelers and television sets, which are indicators of economic well-being. The study concluded that despite health-related issues, tobacco, a non-food cash crop showed major impact on socio-economic well-being and provides livelihood security to tobacco farmers in irrigated NLS zone of Andhra Pradesh.

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