

ECONOMICS OF CULTIVATION AMONG THE SMALL AND MARGINAL FARMERS IN ANDHRA PRADESH

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ABSTRACT

Small and marginal farmers have a significant role in ensuring social stability whose benefit cannot be qualified in monetary terms. Hence no agricultural policy will succeed without making these farms economically sustainable and vibrant. The paper discusses the causes of agrarian distress. Due to high cost of cultivation, the small and marginal farmers are still in the clutches of indebtedness and poverty. This agrarian crisis has manifested in the form of suicides and has reached to dangerous levels in the State of Andhra Pradesh. The gravity of this problem as well as its causes point out that most of the suicides were among cultivators who belong to the category of marginal and small farmers. These farmers are facing severe problems in access to timely quality inputs including capital and marketing of their produce in an efficient manner apart from the general problems being faced by the agrarian sector, ranging from poverty to crop failure, indebtedness, marital discord and alcoholism. Their ability to absorb high cost technologies is also limited as compared to both medium and large farmers. The main objective of the paper is to analyze the economics of cultivation of marginalized farmers in the Andhra Pradesh. The study was conducted in the State of United Andhra Pradesh. The primary data used for this paper are based on the crop year of 2013-14. A multi-stage random sample method has been employed to select 405 sample households from three regions namely Coastal Andhra, Rayalaseema and Telangana of pre-partition Andhra Pradesh. In the first stage three districts were selected at random from the list of districts in each region where more than 80 percent of farmers are marginal and small farmers. Thus, for this study, Warangal from Telangana, Guntur from Coastal Andhra and Chittoor district from Rayalaseema region were selected. In the second stage, two mandals from these districts were selected at random. Altogether six mandals were selected from the list of mandals. In these mandals, more than 80 percent of marginal and small farmers depend on cultivation. In the third stage, one village from each selected mandal was selected. As many as 20 percent farm households consisting of marginal and small farmers formed the sample for the survey. Thus altogether 405 farm households were selected. Regional variation in cost of cultivation has been examined and discussed.

Keywords: Agriculture, cost of cultivation, farm investment income, output- input.

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INTRODUCTION

Agricultural sector extends over 60.4 percent of the total geographical area in India (FAO, 2014) and makes it a vital component for the inclusive and sustainable growth of Indian economy. Agriculture sector provides employment to nearly 58 percent of the rural population. Approximately 30.5 percent of the rural population lives below poverty line (2012-13), thus there is urgent need for high growth rate in agricultural sector.

Agricultural sector not only contributes to overall growth of economy but also reduce poverty by providing the employment and food security to the majority of the population in the country. Over the last sixty years the production of food grains has increased from 52 million tons in 1950-51 to 250 million tons in 2011-2012, at the same time the production of oil seeds also increased from 5 million tons to 28 million tons. India got a third place in terms of production in paddy, wheat, fruits, cereals, groundnut and sugarcane.

The share of agriculture and allied sector in gross domestic product declined steadily from 38.8 percent in 1980-81 to 13.7 percent in 2012-13. The share of agriculture work force in total work force also declined from 75.9 percent in 1961 to 56.4 percent in 2010-11. The performance of agriculture in the post- independence period had been impressive as compared to the pre- independence period. The overall performance of agriculture and allied sector improved during the period 2001-2011. The low growth in GDP from agriculture during 2001-2011 coupled with higher instability would have led to more vulnerability and distress among the farming community.

Small and marginal farmers have a significant role in ensuring social stability whose benefit cannot be qualified in monetary terms. Hence no agricultural policy will succeed without making these farms economically sustainable and vibrant. The small and marginal farmers are still in the clutches of indebtedness and poverty. This agrarian crisis manifested in the form of suicides and has reached to dangerous levels in the State of Andhra Pradesh. The gravity of this problem as well as its causes pointed out that most of the suicides were among cultivators who belong to the category of marginal and small farmers. These farmers are facing several problems in access to timely quality inputs including capital and in marketing their produce in an efficient manner apart from the general problems being faced by the agrarian sector, ranging from poverty to crop failure, indebtedness, marital discord and alcoholism. Their ability to absorb high cost technologies is also limited as compared to both medium and large farmers.

The rapid increase in population, subdivision and fragmentation of land holdings and the changed family system from joint to nuclear families in rural India have made the size of holdings smaller and smaller. In Indian agriculture sector, area operated by marginal farmers has increased, but not the proportional holdings. On the other hand, both the number of large holdings (10 hectares and above) and the area operated by large holders have slightly declined. This shows that in future, Indian agriculture will be dominated by small and marginal holdings, on which application of new agricultural technology would become more difficult. The prominent feature of the structural change in agriculture is the increase in the number of marginal holdings of below one hectare, without a proportionate increase in the area operated

by them. This tendency is likely to continue in the near future also. Given the demographic trend, small holdings will remain with us as far as one can see, and their persistence would give rise to many problems in the application of the new agricultural technology to Indian agriculture.

Keeping in view the vast majority of small and marginal farmers and their resource-anaemic condition, the question is- how to make these farm households viable? How can these farmers maximize their total returns from farming? It is a known fact in India that small and marginal farmers are generally resource-poor. This is more so in arid and semi-arid regions, where due to lack of adequate potential of development, like irrigation, the farmers are forced to use the available resources without caring for sustainability. As a result their poverty is further aggravated. Even in a favourable condition where facilities like irrigation, HYVs, fertilizers and bank loans for capital are available, these resource-poor farmers are unable to overcome the 'Poverty Trap' due to social, political, technical, and economic constraints.

The main objective of this paper is to analyze the economics of cultivation among the small and marginal farmers in a particular State, before bifurcation of Andhra Pradesh (Andhra Pradesh was partitioned in two States in 2014 into Telangana and Andhra Pradesh, the latter comprising two regions of Rayalseema and Coastal Andhra.)

The study was conducted in the State of united Andhra Pradesh. The primary data used for this paper are based on the crop year of 2013-14. A multi-stage random sample method was employed to select 405 sample households from these three regions. In the *first stage* three districts were selected at random from the list of districts in each region where more than 80 percent of farmers are marginal and small farmers. Thus, for this study, Warangal from Telangana, Guntur from Coastal Andhra and Chittoor district from Rayalaseema region were selected. In the *second stage* two mandals from these districts were selected at random. Altogether six mandals were selected from the list of mandals. In these mandals, more than 80 percent of marginal and small farmers depend on cultivation. In the *third stage* one village from each selected Mandal was selected. Thus altogether six villages were selected at random by following the criteria that majority of marginal and small farmers are depending on cultivation. Finally, farm households who completely depend on cultivation in each of the selected villages were listed. In the final stage, the villages were identified. The household census was conducted and a list of farm households operating below 5 acres of land holdings was prepared. Once the sample size was fixed for each village, the sample size for each stratum was determined by following the systematic sampling method using a random start. As many as 20 percent farm households consisting of marginal and small farmers formed the sample for the survey. Thus, 2024 operational farm households were listed. After arranging the list of farm households in an ascending order in terms of the size of their landholdings, the size of the sample for each village was fixed in proportion to their percentage of the farm households in that village. Out of the listed 2024 samples, 728 farm households from Coastal Andhra, 673 from Telangana and 623 from Rayalaseema regions were selected. Of the total households, 209 households were from marginal farm households and 196 households were from small farm size category. Thus altogether 405 farm households were selected.

EMPIRICAL ANALYSIS

Per acre expenditure on Inputs-All crops

The information pertaining to per acre expenditure on major principal crops and its distribution among different inputs on both categories of farm households in the three regions along with the breakup of the expenditure on marginal and small farmers is presented in the Table 1. To ascertain the relative importance of different farm inputs in the total cost, input-wise breakup of total cost and corresponding percentage of different component items to total cost are computed and presented.

Apart from overhead cost, the expenditure on fertilizers, pesticides and human labours are the predominant components of total cost. The expenditure on fertilizers and pesticides is high in Coastal Andhra region compared with Telangana and Rayalaseema regions among both marginal and small farm households. In Coastal Andhra region, the proportion of expenditure on fertilizers is 27.87 percent to total cost of cultivation followed by 26.97 percent in Telangana and 26.15 percent in Rayalaseema region. Here the proportion of expenditure on fertilizers and pesticides among marginal and small farm in three regions can be observed that they are inversely related with the farm size on both categories of farm sizes. This may be due to the fact that marginal and small farm households practice more intensive farming. The use of fertilizers and pesticides is increasing due to low fertility of soil. The fertility of soil increases with multiple crops and crop rotation. Another reason is that farmer competes with co-farmers in applications of fertilizers and pesticides without following the government extension services and scientific measures. They follow only their neighbor farmers in the village. If one applies ten bags of fertilizers another farmer applies more than ten bags. In this manner, the share of expenditure on fertilizers and pesticides in the total cost increases.

Another major input in the cultivation is hired labour. The expenditure on hired human labour constituted 22.51 percent (Rs. 12, 068) to the total cost of cultivation. Intra-regional data clearly shows that per acre expenditure on human hired labour is found to be high in Coastal Andhra region accounting for 22.07 percent (Rs. 14, 316) followed by 19.82 percent (Rs.13, 468) in Telangana and 18.97 percent (Rs. 6, 582) in Rayalaseema. The category of farm size clearly shows that the expenditure on hired labour is high among small farmers in the three regions, with 25.62 percent (Rs. 7, 526), 23.42 percent (Rs. 17, 010) and 18.97 percent (Rs. 7, 041), respectively. In case of marginal farmers, money spent on hired labour is 20.05 percent (Rs. 12, 138) in Coastal Andhra, 19.96 percent (Rs. 10, 325) in Telangana and 18.65 percent (Rs.6, 082) in Rayalaseema. This leads to the conclusion that the farmers of Coastal Andhra and Telangana regions are cultivating labour intensive crops viz cotton, chilli, paddy etc where more demand for labour reduces capacity to spend on application of fertilizes and harvesting of paddy. Nowadays the cause for increase in the wages of labour is implementation of MGNREGA works in these villages, where people get assured employment.

There is scarcity of the labour during the peak period of cultivation. During this time the labor is available at high wages and so the expenditure on hired laborers is increasing alarmingly. On the other hand, the proportion of family labour is high in Rayalaseema region, accounting for 9.07 percent. One interesting point to be observed is that the input cost of labour

is Rs. 5460/- in Coastal Andhra and it is Rs. 4672/- in case of Telangana region. Majority of marginal and small farmers work on their own farm, and hence, in such situation the imputed cost of labour will be high among the small and marginal farm in the three regions. A similar pattern has been observed among the marginal and small farms in the three regions with slight variations. It is also observed that there is direct relationship between proportion of expenditure to total cost on hired labour and farm size. There is inverse relation between expenditure on family labour to total cost and farm size.

The proportion of expenditure on seeds to total cost is 3.15 percent (Rs. 2, 037/-) in Coastal Andhra, 3.25 percent (Rs. 1126/-) in Rayalaseema and 3.04 percent (Rs. 1875/-) in Telangana region. It is clearly found that the expenditure on seeds is high in Coastal Andhra when compared to Telangana and Rayalaseema regions.

This also leads to speculation that it may be due to cropping pattern of Coastal Andhra and Telangana farmers who are cultivating commercial crops like cotton, chillies and maize. The cost of seeds of these crops is high when compared to paddy, jowar, sunflower crops. These low-cost crops are cultivated in Rayalaseema region where the expenditure on seeds is comparatively low. There is a significant difference in proportion of expenditure on seeds to total cost between regions growing commercial crops and those growing traditional crops.

Some agricultural operations like seed bed preparation, inter cultivation for weeding and land leveling for the cultivation of crops like paddy, cotton, chillies and tomato etc cannot be done in less time in the case of bullock labour hence, in these operations we found direct impact on total cost. The proportion of expenditure on bullock labour on the farm size among the three regions is found to be high in Telangana region which is accounting for 2.74 percent (Rs. 1686/-) followed by 2.59 percent (Rs. 1678/-) in Coastal Andhra and 2.66 percent (Rs. 921/-) in Rayalaseema regions. This may be due to the nature of cropping pattern. Hence, we can say that there is a direct relationship between expenditure on bullock labour and farm size.

Another important input that cause increase in the total cost is tractor (machine labour). The proportion share of expenditure on tractor to total cost is high in Telangana with 3.59 percent (Rs. 2210/-). In case of Rayalaseema region, it accounts for 4.71 percent (Rs. 1626/-) followed by Coastal Andhra which accounts for 3.37 percent (Rs. 2188/-). This may be due to cropping pattern and hardness of the soil. Commercial crops like cotton and chillies require deep ploughing. Whereas the paddy growing areas need tractor for seed-bed preparation (dammu). Another reason for this increasing hike in the tractor cost was hike in the diesel price. However, no significant relationship has been found between the farm size and proportion of expenditure on tractors to total cost.

The proportion of expenditure on traditional labour (bullock labour) accounted for 2.74 percent (Rs.1680/-) in Telangana region, 2.66 percent (Rs.921/-) in Rayalaseema and 2.59 percent (Rs. 1678/-) in Coastal Andhra region. The intra-size group data clearly reveals that the proportion of expenditure on bullock labour to total cost is high among small farmers in the three regions when compared with marginal farmers. Hence it can be inferred that small farmers are mostly using traditional methods compared to other sub sections.

Table 1: Region and Category-Wise Per Acre Expenditure –All Crops

(Values in Rupees per acre)

Farming Category	COASTAL ANDHRA			RAYALASEEMA			TELANGANA			Total		
	Mar-ginal	Small	Total	Mar-ginal	Small	Total	Mar-ginal	Small	Total	Mar-ginal	Small	Total
Seeds	1797	2392	2037	1027	1220	1128	1514	2273	1871	1527	2012	1749
Tractor	2134	2266	2188	1438	1798	1626	1861	2603	2210	1884	2256	2054
Bullocks	1548	1870	1678	867	971	921	1365	2048	1686	1333	1678	1491
Fertilizers	11966	11215	11662	6560	6385	6469	9843	12084	10897	10025	10151	10083
Manure	148	178	160	178	255	218	458	249	360	263	226	246
Pesticides	6113	6759	6374	2687	2524	2602	3756	7902	5705	4529	5967	5187
Hired labour	12138	17526	14316	6082	7041	6582	10325	17010	13468	10162	14331	12068
Owned labour	5577	5288	5460	2854	3417	3148	4780	5072	4917	4695	4672	4684
Irrigation	780	940	845	918	643	775	621	697	657	755	765	760
Transport	825	1005	898	421	626	528	539	833	677	635	833	726
IWC	2432	3412	2828	1774	1665	1717	2131	3276	2669	2181	2861	2492
IFC	1349	1670	1479	697	931	819	1526	1628	1574	1266	1443	1347
Leased in	2517	2424	2480	556	918	745	1148	3873	2429	1604	2526	2025
Owned land	9899	12271	10858	5716	7187	6482	10884	11456	11153	9316	10514	9864
Depreciation	212	375	278	287	255	270	264	348	304	247	331	285
Marketing	271	390	319	66	100	84	206	390	292	203	307	250
Miscellaneous	844	1210	992	482	674	582	510	900	693	647	942	782
Total cost	60553	71192	64852	32609	36610	34695	51731	72642	61562	51273	61817	56094

Source: Primary Data

Another major input is land. The rental values of owned land is found to be high in Coastal Andhra region which accounts for 21.04 percent (Rs. 13, 481) while it is 18.12 percent (Rs.11, 153/-) in Telangana and 18.68 percent (Rs.6, 482/-) in Rayalaseema regions. There is significant difference in proportion of rental value of land in Coastal Andhra, Telangana and Rayalaseema regions. This phenomenon leads to the conclusion that availability of water supply, cropping intensity and fertility of soil is basis for fixing the rental value of the land in Coastal Andhra.

Keeping these factors in view, an attempt has been made in this paper to examine the economics of farm business in the study area on the three regions and different size groups. The different types of cost concept of farm management have been studied by using the determinants observed by Ministry of Agriculture, Government of India and other notable agencies. Gross returns on farm production and net returns viz, farm business income, family labore income; net income and farm investment income are also computed and analyzed in detail.

REGION-WISE DISTRIBUTION OF COST OF CULTIVATION

The information pertaining to per acre cost of production according to various cost concepts viz., Cost A₁, Cost A₂, Cost B and Cost C is shown in Table- 2. Here Cost A₁ represents the out-of-pocket expenses incurred by the farmers, Cost A₂ represents rental value of leased-in land along with Cost A₁, Cost B represents imputed value of own land and interest on fixed capital along with Cost A₂ and Cost C represents imputed values like family labour income and interest on fixed capital along with Cost B.

Region-wise cost of cultivation on the basis of different cost concepts are computed and are also furnished. Here Cost A1, includes all the paid –out cost viz. expenditure incurred on owned and hired human labour, owned and purchased seed, owned and purchased organic manure, fertilizers, pesticides and other farm operating expenses such as irrigation, transport, marketing charges, miscellaneous expenditure and interest on working capital. The value of depreciation on farm assets is also included in Cost A1. Cost A2 is obtained by adding rental value of leased – in land to Cost A1. Cost B is obtained by adding rental value of leased–in land to cost A1. Cost B is obtained by adding rental value of owned land and interest on fixed capital to Cost A2. Finally, net loss can be calculated by adding family labor income to Cost B. Operational cost includes expenditure on seeds, fertilizers, pesticides, bullocks, tractors and human labour. The expenditure like depreciation, irrigation charges, rent paid on leased-in land, rental value of owned land etc., comes under overhead cost. The Cost C is found to be high in Coastal Andhra followed by Telangana and Rayalaseema regions. The intra-size analysis also clearly shows that there is positive relation with farm size in the three regions.

Table 2: Region and Category-Wise Cost of Cultivation (All Crops)

(Rs. Per Acre)

REGIONS	Farming. Category	COST A1	COST A2	COST B	COST C	PRIME COST
Coastal Andhra	Marginal	41210	43727	54976	60553	54196
	Small	49539	51963	65904	71192	64964
	Total	44576	47055	59392	64852	58547
Rayalaseema	Marginal	22786	23342	29755	32609	28837
	Small	24157	25075	33193	36610	32550
	Total	23501	24245	31547	34695	30773
Telangana	Marginal	33393	34541	46950	51731	46329
	Small	50613	54486	67571	72642	66874
	Total	41489	43918	56645	61562	55988
Total	Marginal	34392	35995	46578	51273	45823
	Small	42661	45188	57145	61817	56379
	Total	38173	40198	51409	56094	50650

Source: Primary Data**REGION AND CATEGORY-WISE OPERATIONAL AND OVERHEAD COSTS**

Region-wise distribution of operational cost and overhead cost size-wise is presented in Table 3. As the commercial crops growing farmers are considered to be more progressive as they use better inputs, the proportion of operational cost is to be more in these regions and in such holdings. In contrast, the total costs of traditional crops growing farmers are expected to have higher percentage of overhead cost as the use of modern input is lower in these holdings. Nowadays majority of farmers are using modern inputs without proper knowledge and also applying more inputs like fertilizers and pesticides even without any expert suggestions and hence the operational cost has been increasing alarmingly.

Apart from this, cash crops like cotton, chillies, groundnut are capital intensive in nature and also labour intensive crops when compared to food crops like jowar, paddy. It is well known that the operational cost depends on cropping intensity, and cropping intensity depends on availability of water through out the year. The timely completion of different operations depend on nature and climate conditions and the proportion of paid-out cost to total costs is found to be high in case of Coastal Andhra region. This may be due to predominance of input costs of intensive cash crops like cotton, chillies and maize. The data further reveals that proportion of paid-out cost to total cost is lower in Rayalaseema region.

It is also evident that there is a direct relationship between farm size and proportion of input costs to total costs in all the regions. On the other hand, the inverse relationship between farm size and proportion of input costs to total cost is associated with the negative relationship between farm size and the proportion of expenditure on family labour to total work.

Table 3: Region and Category-Wise Operational and Overhead Cost(All Crops)

(Rs. Per Acre)

Regions	Farming Category	OPERATIONAL COST	OVERHEAD COST	TOTAL
COASTAL ANDHRA	Marginal	40997	19555	60553
		(67.71)	(32.29)	(100.00)
	Small	49164	22028	71192
		(69.06)	(30.94)	(100.00)
	Total	44298	20555	64852
		(68.31)	(31.69)	(100.00)
RAYALASEEMA	Marginal	22500	10109	32609
		(69.00)	(31.00)	(100.00)
	Small	23902	12708	36610
		(65.29)	(34.71)	(100.00)
	Total	23231	11464	34695
		(66.96)	(33.04)	(100.00)
TELANGANA	Marginal	33129	18602	51731
		(64.04)	(35.96)	(100.00)
	Small	50265	22377	72642
		(69.20)	(30.80)	(100.00)
	Total	41185	20377	61562
		(66.90)	(33.10)	(100.00)
Total	Marginal	34145	17128	51273
		(66.59)	(33.41)	(100.00)
	Small	42331	19486	61817
		(68.48)	(31.52)	(100.00)
	Total	37888	18206	56094
		(67.54)	(32.46)	(100.00)

Source: Primary Data**RETURNS FROM FARMING**

Per acre returns from cultivation among different farm holdings region- wise are analyzed by calculating the following concepts of returns viz. gross return, farm business income, family labour income, net income and farm investment income.

Gross Income

The data pertaining to per acre gross returns from the cultivation of all crops by region and farming category wise are given in Table 4. It is observed from the Table that per acre gross returns are high in Coastal Andhra region (Rs.57, 064/-) which is higher by 60.45 per cent and 9 per cent than that of Rayalaseema (Rs.27, 674/-) and Telangana regions (Rs.52, 633/-), respectively. Further, the data reveals that the gross returns per acre constantly are higher among the marginal and small farmers in Coastal Andhra farm households than that of Telangana and Rayalaseema regions. A positive relationship is observed between farm size and gross returns among the farm households of three regions. This leads to conclusion that the marginal and small farmers face constraints like inefficient management of farms.

Farm Business Income

Farm business income represents returns to the farmers from land, family labour, interest on fixed capital and management. It can be obtained by deducting the paid-out costs i.e., Cost A1 or Cost A2 as the case may be from gross returns per acre. Region-wise farm business incomes on all crops in cultivation by different farm sizes are shown in Table 4. From the Table, it is observed that the farm business income is high in Coastal Andhra farm households (Rs. 10, 009/-) followed by Telangana region (Rs.8714/-) and Rayalaseema region (Rs. 3428/-). The intra-size group analysis clearly reveals that farm business income is increasing with the farm size in both Coastal Andhra and Rayalaseema. It is found that there is an inverse relationship between farm size with farm business income in Telangana region farm households

Family Labour Income

Family labour income gives the return to the family labour and management of the crop enterprise and can be obtained by deducting Cost B. Region-wise family labour income by size-wise has been computed and presented in the Table 4. From the Table, it can be observed that the family labour is negative in all the three regions. The farmers in the study area did not get even the family labour income from the cultivation.

Net Income

Net income indicates profit or loss from farm business. It is residual of gross income after deducting total Cost C from it. Per acre net return or loss is presented in Table 4. From the Table it can be observed that per acre net return is found to be negative among marginal and small farmers in the three regions, where there is net loss of Rs. -7, 788/- in Coastal Andhra region farmers; Rs. -7, 021/- in Telangana region and Rs.-8, 930/- in Rayalaseema region. This has led to the conclusion that cultivation is not at all economical in the three regions. In the absence of alternative livelihood sources, farmers cultivate the land even at negative returns.

Farm Investment Income

The farm investment income represents the income remaining with the farmer for his investment which comprises of the rental value of owned land, interest on fixed capital and return to the management. The value of farm investment income for all the farming categories is presented in the Table 4. It can be observed that the farm investment income is found to be positive in all farming categories. Per acre farm investment income is higher in case of

Coastal Andhra (Rs. 4,827/-) when compared to Telangana (Rs. 401/-) and Rayalaseema region (Rs. 551/-). The per acre farm investment income is increasing with the farm-size except in Telangana region. This is in conformity with the economic theory. It is clearly observed from the foregoing analysis that the intensive use of modern inputs is rampant in Coastal Andhra cultivation. Higher per acre investment is popular in Coastal Andhra and Telangana when compared to Rayalaseema region. Mechanization has also altered the total costs structure, between operational and overhead costs and also between paid-out cost and imputed costs.

Table 4: Region and Category-Wise per Acre Returns (All Crops)

(Rs.Per Acre)

Regions	Farming Category	AGRI CUL-TURAL INCOME	FARM BUSINESS INCOME	FAMILY LABOUR INCOME	NET IN-COME	FARM INVEST-MENT INCOME
COASTAL ANDHRA	Marginal	52350	8623	-2626	-8203	3258
	Small	64016	12054	-1888	-7176	7140
	Total	57064	10009	-2327	-7788	4827
RAYALA-SEEMA	Marginal	25043	1701	-4711	-7565	-866
	Small	30090	5015	-3104	-6521	1852
	Total	27674	3428	-3873	-7021	551
TELAN-GANA	Marginal	43845	9304	-3105	-7886	4788
	Small	62537	8050	-5034	-10106	3327
	Total	52633	8714	-4012	-8930	4101
Total	Marginal	43322	7327	-3256	-7951	2879
	Small	53749	8562	-3395	-8067	4220
	Total	48090	7891	-3320	-8004	3492

Source: Primary Data

Output-Input Ratios

To estimate the returns per rupee of investment in cultivation, the output-input ratios have been calculated and presented in the Table 5. It can be observed from the Table that the output-input ratio is 0.968 in Coastal Andhra followed by 0.926 in Rayalaseema and 0.846 in Telangana. It can be observed that the return per rupee investment is lower among marginal farms followed by smaller farms in all the three regions. However, there is a positive relationship between the rate of returns and farm size. The low output-input ratio reflects the uneconomical crop production enterprise. These farm holdings have cultivated crops without any economic gain. Thus it leads to the conclusion that all the marginal and small farm households attain the negative returns on agriculture and have not received back even their investment cost in

most of the locations. From the foregoing analysis it can be concluded that the cultivation is associated with risk and uncertain yields. Consequently, gross income, farm business income, family labour income and net income are very low.

Table 5: Region and Category-wise Output-Input Ratios (All Crops)

(Rs. Per Acre)

Regions	Farming category	OUTPUT-INPUT
COASTAL ANDHRA	Marginal	0.963
	Small	0.975
	Total	0.968
RAYALASEEMA	Marginal	0.828
	Small	0.863
	Total	0.846
TELANGANA	Marginal	0.925
	Small	0.926
	Total	0.926
Total	Marginal	0.920
	Small	0.925
	Total	0.922

Source: Primary Data

CONCLUSION

After the analysis of the economics of cultivation, it is established that the intensive use of modern inputs in cultivation, and per acre investment by all cost concepts is high in Coastal Andhra region when compared with Telangana and Rayalaseema regions and intra-category analysis shows that it is high with small farmers in the three regions. Per acre expenditure on rental value of owned land is higher in Coastal Andhra region when compared with Telangana and Rayalaseema regions due to high cropping intensity and growth in plantation of commercial crops. It is also found that per acre expenditure is positive or directly related to farm size in the three regions.

The proportion of expenditure on fertilizer and pesticides to total cost is higher in Coastal Andhra region when compared to Telangana and Rayalaseema regions. In Coastal Andhra and Telangana regions, fertilizers and pesticides are used extensively for both traditional and commercial crops. Among these crops, more number of bags are utilized when compared to traditional crops. The analysis also shows a significant difference in the proportion of expenditure on hired labour to total cost in the three regions. Coastal Andhra and Telangana regions have spent major share on human labour as cotton and chilli are labour intensive crops,

when compared to jowar, groundnut and sunflower etc. The intra- size group comparison reveals that there is a direct relation between the proportion of expenditure on hired labour to total cost and the size of farm and an inverse relationship is found in family labour and farm size.

The proportion of paid- out cost to total costs is found to be high in Coastal Andhra region whereas it is lower in Rayalaseema region. There is a direct relationship between farm size and proportion of input costs to total costs in all the regions. On the other hand, there is inverse relationship between farm size and proportion of input costs to total cost. The gross return per acre is constantly higher among the marginal and small farmers in Coastal Andhra than Telangana and Rayalaseema farm households. A positive relationship is observed between farm size and gross returns in the three regions which reflects that the marginal and small farmers face constraints and inefficient management of farms.

With respect to the farm business income, it has been found to be high for Coastal Andhra farm households. The intra- size group analysis clearly reveals that farm business income is increasing with the farm size in Coastal Andhra and Rayalaseema regions, where there is an inverse relationship between farm size with farm business income in Telangana region. Per acre family labour income is found to be negative in all size groups in the three regions and the rental value of own land and interest on fixed capital is found to be high in case of Coastal Andhra and Telangana regions.

Per acre net return is found to be negative for marginal and small farmers in the three regions, where the net loss is found to be more in Rayalaseema followed by Telangana and Coastal Andhra. It proves that the cultivation is uneconomic for these selected households. But tragically in the absence of alternative livelihood sources, the farmers cultivate their land even at negative returns. Per acre farm investment income is higher in Coastal Andhra when compared to Telangana and Rayalaseema regions. Per acre farm investment income is increasing with the farm size in the regions except in Telangana region. The output-input ratio of Coastal Andhra farm holdings is 0.968 followed by 0.926 in Rayalaseema and 0.846 in Telangana. It can be observed that the return per rupee investment is lower for marginal farm households followed by small farm households in all the three regions. Hence the paper concludes that the cultivation is associated with risk and uncertain yields. And hence, gross income, farm business income, family labour income and net income are very low.

The total cost of production of paddy per acre was found to be high in Coastal Andhra region followed by Telangana and Rayalaseema. The cost of cultivation per acre has been increasing with the decreasing farm size and per acre expenditure of all modern inputs is found to be high for small farmers in the three regions.

There is a considerable difference in the use of other inputs like tractors and bullocks between the Coastal Andhra and Telangana region. In cotton cultivation, per acre expenditure on fertilizers, hired human labour, seeds and the use of tractor labour was found to be high in Telangana region whereas the expenditure on pesticides, rental value of owned and leased land was high in Coastal Andhra region. The total cost of cultivation was found to be high for marginal farmers in Coastal Andhra region. In case of Telangana, it was high among small

farmers. In case of maize, the per acre expenditure of all modern inputs like seeds, fertilizers and pesticides was high in Coastal Andhra. The expenditure on hired labour was found to be high in Telangana region. The cost of cultivation was found to be high in Coastal Andhra region when compared with Telangana region. The reason for widespread agrarian distress is quite evident. Small farm holdings have become financially unviable for marginal and small farmers.

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