



A STUDY ON PADDY CULTIVATION IN WEST GODAVARI DISTRICT OF ANDHRA PRADESH

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ABSTRACT :

Andhra Pradesh is one of the major states in producing Paddy in India. Paddy is the principle food crop providing food for the growing population, fodder to the cattle and employment to the rural masses. The main source of irrigation is canals, tube wells, tanks and other sources. As the Paddy farmers in Andhra Pradesh are not able to get better returns it resulted in down fall of Paddy output, so Paddy cultivation has become uneconomic over the years. Unless the central and state Governments extend their support to the farmers, they may not be able to take up Paddy cultivation actively. In Andhra Pradesh Paddy cultivators have been facing various problems like very lesser levels of reasonable price for their output even though there is enormous increase in the cost of cultivation. Weeding, fertilizers, plant protection measures, irrigations for raising a good Paddy crop, then harvested and threshed. Keeping in view the importance of research in this area, the present study is made an attempt to study the Paddy production in Andhra Pradesh with special importance on Tadepalligudem mandal (Madhavaram and Jagannadhapuram two villages) in West Godavari District of Andhra Pradesh. The compound growth rate of area and production shows the negative growth rate over the base period (2006-07) while the productivity has positive compound growth rate indicating the productivity over the base period. The average value of production per acre was highest for marginal farmers (Rs. 37079.43) followed by small farmers (Rs. 36159.63) and medium and large farmers (Rs. 34205.06). The cost varies from Rs.1006 in small farmers to Rs.1271 in medium and large farmers and Rs.1131 for all types of farmers. The present study would design to examine the trends in area, production and productivity at state and West Godavari district level, cost and return and Farm size and Value of Paddy Production.



KEYWORDS : Paddy Production, Cost of Cultivation, West Godavari and Farm size.

INTRODUCTION

The role of agricultural sector in Andhra Pradesh state economy is very significant. The contribution of agriculture and livestock under primary sector to the State Gross Domestic Product (SGDP) for the year 2015-16 is 21.48 per cent on the basis of current prices. However 62.17 per cent of the working population is still depends on agriculture sector. Primary sector has been the chief source of income and main occupation for the Andhra Pradesh state majority population engaged in agriculture sector. The proportion of area under agriculture is 38.10 per cent. The Gross Irrigated area is 47.10 per cent of Gross area sown in the state.

Andhra Pradesh state is “the bejeweled rice bowl of India”. Agriculture plays an important role in the livelihoods of people as 63 per cent of the population in Andhra Pradesh live in rural areas and depend on agriculture and related livelihood opportunities. The agriculture plays an important role not only in the economy but also for achieving the food security for the state and also for the country. Our main challenges are growing water scarcity degrading natural resources like land and decreasing per capital availability of land water resources. Further rain fed agriculture in the whole state and agriculture in the coastal region is very much vulnerable to the impacts of natural calamities and state is stepping ahead against these challenges. The state of Andhra Pradesh with 13 districts has great potential for agriculture sector. Agriculture sector in Andhra Pradesh is mostly dependent on rainfall. Monsoon and seasonal conditions play a major role in the agriculture production. Agricultural production includes two components. They are food grains and non-food grains. All food grains like Paddy, Wheat, Jowar, Ragi, Bengal gram, Maize and Bajra are the main food grain crops in Andhra Pradesh. All commercial crops are under the category of non-food grains. Paddy is the major food crop and main importance to the economy of the state of Andhra Pradesh and its people wherein a large percentage of labour force earns a living from agriculture by cultivating paddy crop. Andhra Pradesh has significant strengths in Paddy production enjoying the right conditions for growing paddy which is predominantly irrigated and is grown in 13 districts of the state. Considering the importance of paddy production in promoting agricultural development in India in general in Andhra Pradesh state in particular and West Godavari district in specific an attempt has been made in this study to area, production and productivity and the average cost of cultivation, farm size and value of paddy production and returns from paddy crop cultivation.

OBJECTIVES OF THE STUDY

1. To study the trends in area, production and productivity of paddy in Andhra Pradesh and West Godavari district.
2. To analyze the cost and return of the paddy cultivation in the study area.

RESEARCH METHODOLOGY

The present study is based on the both primary and secondary data. The primary data was collected from through schedules for 90 sample Respondents (Marginal, Small, Medium and Large) farmers are selected on simple random sampling method. The sample households are selected from Madhavaram and Jagannadapuram two villages of Tadepalligudem mandal in West Godavari district based on both Kharif and Rabi seasons average paddy cultivation in the year 2016-17. From each village selected 45 sample paddy farmers. The primary data particularly collected the information about the cost of cultivation and income from the paddy cultivation farmers in this study. The secondary data was collected from the relevant publications of Agricultural Statistics at a Glance Government of Andhra Pradesh, 2015-16, Directorate of Economics and Statistics, seasonal crop reports, Annual reports and Hand book of Statistics West Godavari district, 2016. To analyse the growth rate for 10 years i.e., (2006-07 to 2015-16) Compound Growth Rate, t-value and R^2 are used in this study.

PADDY PRODUCTION SCENARIO OF ANDHRA PRADESH

Paddy is the major staple food grain crop which is predominantly irrigated is grown in both Kharif and Rabi seasons in Andhra Pradesh. Paddy is known as “King of Cereals”. Andhra Pradesh stands eighth place in area and fifth place in production of Paddy crop during the year 2015-16. Paddy crop accounted for 28.38 per cent of the total cropped area 80.47 per cent of the total food grains production during 2016-17.

The area under paddy during 2016-17 was 21.05 lakh hectares as against 21.61 lakh hectares in 2015-16, recording a decrease of 2.59 per cent. The area under paddy decreased due to mainly adverse seasonal conditions during the South West monsoon period. West Godavari district is the first place occupies an area of 3.99 lakh hectares, followed by East Godavari district 3.84 hectare and Krishna district 2.32 lakh hectares. The production of Paddy during 2016-17 was estimated at 120.03 lakh

tonnes as against 112.33 lakh tonnes in 2015-16, recording an increase of 6.85 per cent. The productivity of Paddy is 5702 Kgs/hectare in 2016-17 as against 5198 Kgs/hectare in 2015-16.

Year wise Area, Production and Productivity of Paddy in Andhra Pradesh

The information on the Year wise Area, Production and Productivity of Paddy in Andhra Pradesh during 2006-07 to 2015-16 has been presented in the Table 1.

Table -1
CGR, t-value and R² of Area, Production and Productivity of Paddy in Andhra Pradesh during the year 2006-07 to 2015-16

Sl. No	Year	Area (in lakh hectares)	Production (in lakh Tonnes)	Productivity (Kgs/Hectares)
1	2006-07	24.89	114.25	4590
2	2007-08	25.78	133.21	5168
3	2008-09	26.96	133.25	4943
4	2009-10	23.26	133.54	4882
5	2010-11	27.72	188.25	4265
6	2011-12	23.46	116.16	4951
7	2012-13	22.09	102.94	4660
8	2013-14	25.83	119.90	4641
9	2014-15	23.94	126.83	5298
10	2015-16	21.61	112.33	5198
CGR		-1.40	-1.37	0.60
t-value		1.70	0.74	0.79
R ²		0.26	0.06	0.07

Source: Agricultural Statistics at a Glance – Government of Andhra Pradesh, 2015-16

Table - 1 give a clear picture of the Paddy area, production and productivity in Andhra Pradesh. The area of paddy cultivation is not increased from the year 2006-07 to 2015-16. The maximum area cultivated during the year 2010-11 was 27.72 lakh hectares and minimum area cultivated is 21.61 during the year 2015-16. The reasons for the declining trend of paddy area are mainly change of cropping pattern and low rainfall.

The production of paddy is slight decreased from the year 2006-07 to 2015-16 in Andhra Pradesh. The high at 188.25 lakh tonnes during the year 2010-11 and is low at 102.94 lakh tonnes during the year 2012-2013 and in the same year production of paddy was low due to low rainfall.

The productivity of paddy in Andhra Pradesh was 4590 Kg/hectare in 2006-07 and it increased to 5198 Kg/hectare in 2015-16 and is highest at 5298 Kg/hectare in the year 214-15 and lowest at 4265 Kg/hectare in 2010-11. Overall the period of paddy crop productivity is increased.

The compound growth rate of area and production shows the negative growth rate over the base period (2006-07) while the productivity has positive compound growth rate indicating the productivity over the base period.

PADDY VARIETIES IN ANDHRA PRADESH

Chitti Mutyalu, Sona masoori or Kurnoor Sona, Bangaru Theegalu, Pusa-677 (IET – 12617), Krishna Hamsa, Triguna (IET – 12875), Indur Samba, Kesava, Swathi, Vedagiri, Maruteru Sannalu, Cottondora Sannalu, Bharani, Deepti, Srikakulam Sannalu, Vasundhara, Early Samba, Surya, Tholakari, Godavari, Shanthi, Indra, Sree Kurma, BPT Rice, RNR 15048, 1010, Aarkalu, BPT – 3291 – Sona Mahsuri, WGL – 48684 –Kavya, Nellore Molagolokulu, MTU- 1001 –Vijetha, MTU -7029 – Swarna, MTU – 2077 – Krishnaveni, Jaya.

ROLE OF AGRICULTURE SECTOR IN WEST GODAVARI DISTRICT

The district total geographical area is 8507 Sq. Kms. Total population (2011 Census) in this district is 3936966. Gross area sown 691109 hectares in 2015-16 and gross area irrigated is 624255 hectares in the same year. Around 90.33 per cent of Gross Area sown is under irrigation in the district. Canals and tube wells are major irrigation sources in the district. The West Godavari district GVA contributes nine per cent to state economy for the year 2015-16.

The net area cultivated from about 89.80 per cent of the total geographical area of the district. Out of the net area sown a large portion of the area is irrigated by the network of irrigation canals. The irrigation system of the river Godavari, irrigated all the mandals in delta region, whereas Pendyala, Gutala, Vegeswarapuram pumping scheme irrigates some parts Kovvuru, Nidadavole, Tallapudi, Polavaram and Gopalapuram mandals. The irrigation system of river Krishna irrigates entire portion of Eluru, Pedapadu mandals and parts of the area in Denduluru and Bhimadole mandals. In upland tracks, there are irrigation tanks fed by hill streams besides other number of tube wells, Dug wells and schemes supplements the irrigation sources. Paddy, Sugarcane, Tobacco, Banana, Maize, Chillies, Coconut are the main growth engines of agriculture sector. Oil palm and cocoa are the new emerging crops for enhancing the income of the agriculture sector in the district. The West Godavari district is a Rice Granary of Andhra Pradesh. Paddy cultivation 65 per cent of the total area sown with an average productivity of 3597Kgs/Hectares in the district. The Tadepalligudem mandal is a one of the major paddy producing mandal in this district. Farmers in the area call the Kharif and Rabi seasons as sarwa and dalwa respectively. It is a one of the nine districts in the Coastal Andhra region of Andhra Pradesh state and lies between 80° 50' and 81° 55'E of the eastern longitudes and 16° 15' and 17° 30' N of northern latitudes. The West Godavari is in the delta region of the Godavari and Krishna rivers.

PADDY PRODUCTION IN WEST GODAVARI DISTRICT

The West Godavari district is a Rice Granary of Andhra Pradesh. Paddy cultivation 65 per cent of the total area sown with an average yield of 3597Kgs/Hectares in the district, the year-wise Area, Production and Productivity of Paddy in West Godavari district during 2006-07 to 2015-16 has been presented in the Table 2.

Table -2

CGR, t-value and R² of Area, Production and Productivity of Paddy in West Godavari district during the year 2006-07 to 2015-16

Sl. No	Year	Area (in'000'hectares)	Production (in'000'Tonnes)	Productivity (in Kgs/Hectares)
1	2006-07	434	1557	3587
2	2007-08	446	1639	3681
3	2008-09	451	1600	3681
4	2009-10	326	1115	3394
5	2010-11	456	1491	3265
6	2011-12	364	1308	3597
7	2012-13	423	1289	3052
8	2013-14	420	1342	3191
9	2014-15	409	2436	5954
10	2015-16	404	2338	5790
	CGR	-0.63	3.61	4.16
	t-value	0.52	1.33	1.73
	R ²	0.03	0.18	0.27

Source: Directorate of Economics and Statistics, Andhra Pradesh

The table - 2 shows the clear picture of the paddy area, production and productivity in West Godavari district for the year 2006-07 to 2015-16. The area of paddy cultivation not increased steadily

from 2006-07 to 2015-16. The maximum area cultivated during the year 2010-11 was 456 thousand hectares and the minimum is 326 thousand hectares in the year 2009-10.

The production of paddy in 2015-16 is 2338 thousand tonnes. The production is less than 2000 thousand tonnes from 2006-07 to 2013-14, it is high at 2436 thousand tonnes during the year 2014 -15 and is low at 1115 thousand tonnes in the year 2009 -10.

The productivity of paddy in West Godavari district was 3587 Kg/hectare in 2006-07 and it increased to 5790 Kg/hectare in 2015-16 and is highest at 5954 Kg/hectare during 2014 -15 and low at 3052 Kg/hectare in 2012-13.

The compound growth rate of the area for 10 years (2006-07 to 2015-16) was negative and the production and productivity of paddy crop for same period was positive for West Godavari district. It can be observed from the Table 2 that the production and productivity of paddy in West Godavari district are showing a steady growth with increased trend. The total area under paddy decreased from 434 thousand hectares in 2006-07 to 404 thousand hectares in 2015-16 recording a compound growth rate of -0.63 per cent. Similarly, the production of paddy has increased from 1557 thousand tonnes in 2006-07 to 2338 thousand tonnes in 2015-16 registering an increase of 3.61 per cent. The productivity was increased from 3587 Kgs/Hectares in 2006-07 to 5790 Kgs/Hectares in 2015-16 recording an increase of 4.16 per cent.

ANALYSIS OF COST OF CULTIVATION FOR PADDY CROP

Paddy is main crop for the study area and food grain crop for the present study. The details of the average cost of Cultivation of Paddy in the Tadepalligudem mandal of West Godavari district furnished in the Table 3.

The table-3 shows that hired human labour is high in marginal farmers at Rs.3329 per acre, and low at Rs.2725 in small farmer while it is at Rs.3098 in all type farmers. The bullock labour is high at Rs. 1110 in medium and large farmers and low at 962 in small farmers while it is Rs.1023 for all types of farmers. In case of the tractor power, the cost is lowest at Rs.2355 in small farmers and highest at Rs.2895 in marginal farmers and in all types it is Rs.2667. The cost of seeds is high at Rs.1078 in medium and large farmers and low at Rs.896 in small farmers while it is Rs.976 for all types of farmers.

Table -3
Average Cost of Cultivation of Paddy crop in the West Godavari district
(in Rupees / per acre)

Sl. No	Cost of Production of items	Type of Sample Farmers in the Study Area			
		Marginal Farmers	Small Farmers	Medium & Large Farmers	All Type
1	Hired Human Labour	3329 (14.74)	2725 (13.15)	3240 (13.20)	3098 (13.70)
2	Bullock labour	1000 (4.42)	962 (4.64)	1110 (4.52)	1023 (4.52)
3	Tractor Power	2895 (12.82)	2355 (11.37)	2752 (11.21)	2667 (11.79)
4	Seeds	954 (4.22)	896 (4.32)	1078 (4.39)	976 (4.31)
5	Manures	1116 (4.94)	1006 (4.85)	1271 (5.18)	1131 (5.00)
6	Fertilizers	1465 (6.48)	1433 (6.91)	1548 (6.30)	1482 (6.55)
7	Pesticides	1020 (4.51)	917 (4.42)	1200 (4.89)	1046 (4.62)
8	Irrigation	1005 (4.45)	917 (4.42)	1152 (4.69)	1024 (4.52)
9	Land Revenue	2 (0.00)	2 (0.00)	2 (0.00)	2 (0.00)

10	Miscellaneous Cost	303 (1.34)	276 (1.33)	327 (1.33)	302 (1.33)
11	Rent Paid to leased-in land	63 (0.27)	56 (0.27)	46 (0.18)	55 (0.24)
12	Interest on Working Capital	1115 (4.93)	1016 (4.90)	1132 (4.61)	1088 (4.81)
13	Depreciation and Repairs	60 (0.26)	51 (0.24)	55 (0.22)	55 (0.24)
14	Cost (A)	14295 (63.32)	12586 (60.79)	14891 (60.70)	13924 (61.63)
15	Rental Value	4763 (21.09)	4185 (20.20)	5425 (22.11)	4790 (21.18)
16	Interest on fixed Capital	1732 (7.67)	1665 (8.03)	1810 (7.37)	1736 (7.67)
17	Cost (B)	20789 (92.08)	18436 (89.01)	22126 (90.17)	20450 (90.45)
18	Family labour	1785 (7.90)	2275 (10.98)	2410 (9.82)	2156 (9.52)
19	Cost (C)	22575 (100.00)	20711 (100.00)	24536 (100.00)	22607 (100.00)

Source: Survey data.

Note : Figures in brackets are percentages of the total.

The table-3 shows that hired human labour is high in marginal farmers at Rs.3329 per acre, and low at Rs.2725 in small farmer while it is at Rs.3098 in all type farmers. The bullock labour is high at Rs. 1110 in medium and large farmers and low at 962 in small farmers while it is Rs.1023 for all types of farmers. In case of the tractor power, the cost is lowest at Rs.2355 in small farmers and highest at Rs.2895 in marginal farmers and in all types it is Rs.2667. The cost of seeds is high at Rs.1078 in medium and large farmers and low at Rs.896 in small farmers while it is Rs.976 for all types of farmers.

In case of manures, the cost varies from Rs.1006 in small farmers to Rs.1271 in medium and large farmers and Rs.1131 for all types of farmers. The cost of fertilizers varies from Rs.1433 in small farmers to 1548 in medium and large farmers and it is Rs. 1482 for all types of farmers. In case of pesticides the average cost is minimum at Rs.917 in small farmers and maximum at Rs.1200 in marginal farmer with Rs.1046 in all types of farmers.

Regarding irrigation, the average cost is lowest at Rs.917 in small farmers, highest cost at Rs.1152 in medium and large farmers and it is Rs.1024 in all categories of farmers. The average miscellaneous cost varies from Rs.276 in small farmers to Rs.327 in medium and large farmers and it is Rs.302 in case of all types of farmers. The average cost of interest on working capital varies from Rs.1016 in small farmers to Rs.1132 in medium and large farmers with Rs.1088 in all categories of farmers. Similarly in all respects, the medium and large farmers have more incurred the average Cost of Cultivation of Paddy in the West Godavari district. Cost A is highest at Rs.14891 in medium and large farmers and lowest at Rs.12586 in small farmers.

The average cost of rental value is minimum at Rs.4185 in small farmers and maximum at Rs.5425 in medium and large farmers and it is Rs.4790 in all categories of farmers. The average cost on interest on fixed capital is lowest at Rs.1665 in small farmers and highest at Rs.1810 in medium and large farmers and it is Rs.1736 in case of all categories of farmers.

The Cost B varies from Rs.18436 in small farmers to Rs.22126 in medium and large farmers and it is Rs.20450 in all category farmers. The average cost of family labour is minimum at Rs.1785 in marginal farmers and maximum at Rs.2410 in medium and large farmers and it is Rs.2156 in case of all type farmers. The Cost C is highest at Rs.24536 in small farmers and lowest at Rs.20711 in small farmers and it is Rs.22607 in all types of farmers. Hence, it is concluded that the cultivation of cost of

Paddy crop was found marginal, small and medium and large farmers in the Madhavaram and Jagannadhapura villages of Tadepalligudem mandal in West Godavari district of Andhra Pradesh.

AVERAGE VALUE OF PADDY PRODUCTION

Table 4 establishes the relation between farm size and value of production of Paddy Crop in the West Godavari district.

Table -4
Farm size and Value of Paddy Production in the West Godavari district

Sl. No	Farm size of the Sample Farmers	Average Value of Production* (in Rs. per acre)
1	Marginal Farmers	37079.43
2	Small Farmers	36159.63
3	Medium and Large Farmers	34205.06
	All Sizes	35814.71

Source: Survey data.

Note: *Represents value of both main and by-produce of Paddy.

It is observed from the data presented in table 4, the average value of production per acre was highest for marginal farmers (Rs. 37079.43) followed by small farmers (Rs. 36159.63) and medium and large farmers (Rs. 34205.06).

RETURNS FROM PADDY CULTIVATION ACCORDING TO FARM SIZE

To find the profitability of Gross Income, Farm Business Income, Family Labour Income, Net Income and Farm Investment Income presented in the Table-5.

Table-5
Returns from Paddy Cultivation in West Godavari district Farm size

Sl. No	Farm Income (Rs.)	Average farm income per acre (in Rs)			All Farmers in all Farm sizes
		Marginal Farmers	Small Farmers	Medium and Large Farmers	
1	Gross Income	37079.43	36159.63	34205.06	35814.71
2	Farm Business Income	22784.43	23573.63	19314.06	21890.71
3	Family Labour Income	16290.43	17723.63	12079.06	15364.71
4	Net Income	14504.43	15448.63	9669.06	13207.71
5	Farm Investment Income	20999.43	21298.63	16904.06	1973.71

Source: Tables 3 and 4.

The data in Table-5, gross income was found to be highest on marginal farmers (Rs. 37079.43) compared to the small and medium and large farmers. Farm business income was found to be highest for small farmers (Rs. 23573.63). Family labour income was found to be highest for small farmers (17723.63). The net income was estimated at Rs. 13207.71 for all farm sizes and found highest for small farmers (Rs. 15448.63) followed by marginal (Rs. 14504.43) and medium and large farmers (Rs. 9669.06). The farm investment income has been calculated by deducting the imputed wages for family labour from the business income. The average farm investment income was found to be highest for marginal farmers (Rs. 20999.43).

CONCLUSION

The role of primary sector development in overall economic growth, employment generation, eradication of rural poverty, food security and in improving overall quality of life of the rural population is well accepted. Since paddy crop cultivation is one of the significant crops grown the state of Andhra Pradesh is largely cultivated districts West Godavari, East Godavari, Krishna, Nellore and Guntur. West Godavari district is the first place occupies an area of 3.99 lakh hectares, followed by East Godavari district 3.84 hectare and Krishna district 2.32 lakh hectares. The production of Paddy during 2016-17 was estimated at 120.03 lakh tonnes as against 112.33 lakh tonnes in 2015-16, recording an increase of 6.85 per cent. The productivity of Paddy is 5702 Kgs/hectare in 2016-17 as against 5198 Kgs/hectare in 2015-16. The West Godavari district is a Rice Granary of Andhra Pradesh. The production of paddy is slight decreased from the year 2006-07 to 2015-16 in Andhra Pradesh. The high at 188.25 lakh tonnes during the year 2010-11 and is low at 102.94 lakh tones during the year 2012-2013 and in the same year production of paddy was low due to low rainfall. The Cost B varies from Rs.18436 in small farmers to Rs.22126 in medium and large farmers and it is Rs.20450 in all category farmers. The average cost of family labour is minimum at Rs.1785 in marginal farmers and maximum at Rs.2410 in medium and large farmers and it is Rs.2156 in case of all type farmers. The Cost C is highest at Rs.24536 in small farmers and lowest at Rs.20711 in small farmers and it is Rs.22607 in all types of farmers. Paddy cultivation 65 per cent of the total area sown with an average productivity of 3597Kgs/Hectares in the West Godavari district. The area, production and productivity of paddy crop in West Godavari district of Andhra Pradesh was increase over the study year. In this study also revealed that cost of cultivation of paddy increased with increase in farm size. Human labour constituted the major component of the total cost of cultivation which confirms the labour intensive nature of paddy cultivation. The cost incurred on hire human labour was found to increase with farm size whereas the cost incurred on family labour decreased with increase in farm size. The money spent on pesticides, fertilizers and machinery use was highest on large farms.

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