DRYLAND FARMING IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH

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Abstract : The main objective of the paper is to compare the dryland crops in two sample mandals of Srikakulam district. It is found that paddy had a lions' share 13.41, followed by brinjal 10.12, ladysfinger 10.09, tomato 9, gherkin 7.14, sugarcane 6.35, chillies 5.57 and the remaining crops less than having below 5 per cent of the total cropped area. Of the 21 crops, 18 crops in Ponduru and nine crops in Gara raised by the farmers in the study area but there are 8 common crops in the two sample mandals. Both in the yield levels as well as value of per acre crop is significantly higher in case of four crops 'viz' paddy, maize, chillies and sugarcane in Gara mandal, while the remaining four crops namely tomato, brinjal, lady's finger and sesamum are more in Ponduru mandal. The average farm income of the dryland farmers is considerably more in Ponduru (Rs.142567) compared with Gara (Rs.118209).

IndexTerms – **Dryland Farming, Cropping Pattern, Agriculture, Irrigation, Farmer.**

I. INTRODUCTION

Dryland agriculture has been in practice from time immemorial. The area under dryland has shown varied changes in the past decades. Contribution of dryland agriculture is of utmost importance to our country, as 44 per cent of the nation's total food production comes from the drylands. Dryland agriculture has attracted the attention of many academicians and the concerned since long. In the recent past there are many comparative studies of rainfed and irrigated areas. "studies on dry farming have thrown valuable insights on the various facets of dry farming in Indian agriculture. However, studies reflecting on the emerging shifts in dry land farming viz., changes in cropping pattern, the attendant tasks and constraints, and institutional mechanisms in vogue to mitigate the hardships of dryland farmers are rather limited. The need for such studies assumes significance in the current context to strengthen dryland farming to increase agricultural production.

Review of literature

Adeppa, D (2020) conducted a study in Ananthapur district of Andhra Pradesh. Major crops cultivated in this area are maize (29.5%), Jowar (25.7%), bajra (23%), red gram (11.9%) and cotton (9.9%). The cost per acre is up to 3000 rupees in case of 64.9 per cent of the sample farmers followed by 3001-5000 rupees in case of 26.3 per cent of the farmers. The income per acre is up to 10000 rupees per acre in case of 55.3 per cent of the sample farmers followed by 10001-15000 rupees in case of 25.1 per cent of the farmers, 15001-20000 rupees in case of 12.9 per cent of the farmers and above 20000 rupees per acre in case of 6.7per cent of the sample farmers.

Mohammad Abdul Kader (2019) paper explained that mulching is a water-saving technique in dryland areas for conserving soil moisture, regulating temperature, and reducing evaporation. Mulch can be used in fields before and after crop plantation as well as around the young plants. The use of plastic film mulch in agriculture is generally recommended for profitable row crops. He concluded that many mulching material uses for saving water resources in agriculture lead to improve crop yield in rain-fed cultivation.

Suseela K and M.Chandrasekaran (2018) analysed that across crops drought tolerant high yielding variety was adopted between 71.0 per cent and 84.31 per cent; with the exception of castor and tobacco, sowing with machinery was adopted between 61.76 per cent and 84.38 per cent indicating higher rate of adoption. The medium range adoption included; seed treatment between 32.29 per cent and 53.13 per cent, mulching between 51.60 per cent to 82.86 per cent and foliar spray between 32.35 to 51.43 per cent. The percentage of farmers adopting dryland technologies was high in Prakasam district followed by Kurnool and Ananthapur districts. The number of farmers in the medium adoption category was higher compared to all other adoption categories in groundnut, bengal gram, red gram and castor with 23.08 per cent, 25.49 per cent, 28.13 per cent and 29.41 per cent, respectively, with an adoption index of 42.22, 40.00, 40.00 and 50.00, respectively. In the case of cotton, jowar and tobacco the number of farmers in the low adoption, non-adoption and high adoption categories was high with 27.42 per cent, 28.13 per cent and 31.43 per cent, with an adoption index of 14.29, zero and 60, respectively.

Amare Haileslassie et. al. (2016) paper analysed that the majority of farms (>70%) in the study area an average farm in the study farming system, groundnut (50%), millet (20%), pigeon pea (10%) and foxtail millet were important crops. About 46 per cent

replied that productivity has stagnated. With increasing family size, shrinking landholding and declining yield, depending only on crop production can be a challenge. Irrigation water, diversification of crop and livestock, and access/level of production of organic fertilizer access to irrigation water and improved irrigation methods are directly related to increasing plant water availability and also increasing plant water uptake.

Objectives

To analyse the socio-economic characteristics of the dryland farmers in Ponduru and Gara mandals.

To examine the cropping pattern of dryland agriculture in the two sample mandals.

Methodology

Srikakulam district is selected because of its backward nature and a major proportion of population depends on predominantly agriculture. More than fifty (58%) percent of the total cropped area under un-irrigated in the district. The study has selected two mandals, Ponduru mandal having the highest share of un-irrigated area and the mandal Gara with the lowest share of un-irrigated area for comparison. From each mandal three sample villages and from each village 60 dryland farmers were selected under three groups of farmers namely marginal, small and large farmers undertaken for intensive study. The three villages are VR Gudem, Kancharam and Dharmapuram in Ponduru mandal and another three villages from the lowest un-irrigated mandal Gara 'viz' Kotturusyrigam, Buravalli and Korlam. Altogether six (06) sample villages and 360 dryland farmers were covered under study. The reference date is 31st March 2021 and all the information relates to the financial year of 2020-2021

Age Group

Age of the farm operator has a bearing on one's proneness to change and experimentation. The young people are more likely to welcome change compared to the aged. The age composition of the dryland farmers is shown in Table 1. The age structure of the sample dryland farmers between the two different samples i.e., Ponduru and Gara mandals show slight differences. According to the presented data, 33.3 per cent of the dryland farmers are in the age group of 31-40 years in Ponduru mandal, followed by 30 per cent in 51-60 years, 27.78 per cent of them under age group of 41-50 years and 4.4 per cent each for below 30 and 60 & above age groups. The corresponding figures are 25.56, 16.11, 37.78, 16.11 and 4.44 per cent respectively in Gara mandal. Similarly, the farmers 31-40 years age are more in Ponduru mandal 60 (33.33 %) than Gara mandal (25.56 %). Another close look at the data in the table shows, that 37.78 per cent of the dryland farmers were found in the age group of 41-50 years while only 27.78 per cent of the same are found in the Ponduru mandal. In Ponduru mandal above 91 per cent of the dryland farmers are in the age group of 31-60 years while the corresponding number in is Gara mandal is 79.5 per cent. The major difference between these two samples is that Gara mandal has larger share of below 30 years farmers (16.11 per cent) compared to that of 4.44 per cent in Ponduru mandal. On the whole, 85.28 per cent of the dryland farmers are in the age group of 31-60 years in the study area.

Table 1
Age Composition of Dryland Farmers

SI. No.	Age in Years	Ponduru		Gara		Grand Total	
		No.	%	No.	%	No.	%
1	<30	8	4.44	29	16.11	37	10.28
2	31-40	60	33.33	46	25.56	106	29.44
3	41-50	50	27.78	68	37.78	118	32.78
4	51-60	54	30.00	29	16.11	83	23.06
5	60 and above	8	4.44	8	4.44	16	4.44
	Total	**180**	**100.00**	**180**	**100.00**	**360**	**100.00**

Source: Field Survey 2020-2021

Literacy Status

Literacy exposes people to the world at large and they come to know of advances made in the field of agriculture. As such those with higher level of literacy are likely to possess greater awareness about farm technologies compared to the illiterate. In the present day world, technology plays a vital role in each and every sector of economy. In the same way in agricultural sector also, the technology helps a lot to the farmers in their farming activities and marketing their produce etc. Awareness on modern agriculture technology is possible only through education. Table 2 furnishes the particulars of educational levels of dryland farmers in two sample mandals. Across the respondents illiterates are found to be very high among the dryland farmers of Gara mandal (27.22%) compared to Ponduru (16.11%). It is observed that Ponduru mandal boasts of higher education levels with high school (21.67%) and college (20%) compared to Gara mandal where the corresponding numbers are 14.44% and 10.56% respectively.

Table 2
II. Distribution of Dryland Farmers by Literacy Status

SI. No.	Education	Ponduru		Gara		Grand Total	
		No.	%	No.	%	No.	%
1	Illiterate	29	16.11	49	27.22	78	21.67
2	Literate	29	16.11	28	15.56	57	15.83
3	Primary	29	16.11	40	22.22	69	19.17
4	Middle School	18	10.00	18	10.00	36	10.00
5	High School	39	21.67	26	14.44	65	18.06
6	College	36	20.00	19	10.56	55	15.28
	Total	**180**	**100.00**	**180**	**100.00**	**360**	**100.00**

Source: As ex ante

Cropping Pattern

Table 3 gives the data on the area under different crops in two selected sample mandals. In Ponduru, as many as 18 of 21 crops raised among sample farmers. The total cropped area in Ponduru is accounted for higher that is 525.60 acre and it is 446.40 acres in Gara. The highest share of cropped area reported like gherkin 13.20 followed by brinjal 9.59, tomato 9, ladysfinger 8.85, onion 8.30, carrot 7.19, chillies 5.19, beans and hoursegram each 5.10 per cent in Ponduru mandal, while the share of all other crops are less than 5 per cent. In case of Gara, 1/4th of the area come under paddy, followed by sugarcane 11.82, ladysfinger 11.56, brinjal 11, tomato 9, sunflower 8, chillies 6, sesamum and maize each having 5 per cent, blackgram 3 and greengram 2.35 per cent. The data on cropping pattern indicates that of the 18 crops the highest share recorded among dryland farmers in Ponduru accounted for 13.20 per cent in case of gherkin and the proportion is more than 10 per cent reported among crops like paddy, sugarcane, ladysfinger and brinjal in Gara. Another observation is that out of 8 common crops in both the mandals share of area under 7 crops is higher in Gara compared with Ponduru viz., paddy, sugarcane, brinjal, ladysfinger, chillies, sesamum and maize. On the whole, it is found that paddy had a lions' share 13.41, followed by brinjal 10.12, ladysfinger 10.09, tomato 9, gherkin 7.14, sugarcane 6.35, chillies 5.57 and the remaining crops less than having below 5 per cent of the total cropped area.

Table 3
Cropping Pattern of the Dryland Farmers in the Study Area :2020-2021

(Area in Acres)

SI. No.	Crop	Ponduru		Gara		Grand Total	
		Area	%	Area	%	Area	%
1	Paddy	17.5	3.33	112.8	25.27	130.3	13.41
2	Ragi	23.4	4.45	0	0.00	43.4	4.47
3	Maize	14	2.66	22.3	5.00	36.3	3.73
4	Greengram	0	0.00	10.5	2.35	10.5	1.08
5	Blackgram	0	0.00	13.4	3.00	13.4	1.38
6	Redgram	8.2	1.56	0	0.00	8.2	0.84
7	Horsegram	26.8	5.10	0	0.00	26.8	2.76
8	Tomato	47.3	9.00	40.2	9.01	87.5	9.00
9	Brinjal	50.4	9.59	49.1	11.00	99.5	10.24
10	Ladysfinger	46.5	8.85	51.6	11.56	98.1	10.09
11	Beans	26.8	5.10	0	0.00	26.8	2.76
12	Bitterguard	21.3	4.05	0	0.00	21.3	2.19
13	Carrot	37.8	7.19	0	0.00	37.8	3.89
14	Gherkin	69.4	13.20	0	0.00	69.4	7.14
15	Sweet potato	15.8	3.01	0	0.00	15.8	1.63
16	Onion	43.6	8.30	0	0.00	43.6	4.49
17	Groundnut	21.5	4.09	0	0.00	21.5	2.21
18	Sesamum	8	1.52	22.3	5.00	30.3	3.12
19	Chillies	27.3	5.19	26.8	6.00	54.1	5.57
20	Sunflower	0	0.00	35.7	8.00	35.7	3.67
21	Sugarcane	20	3.81	61.7	13.82	61.7	6.35
	Total	**525.6**	**100.0**	**446.4**	**100.0**	**972**	**100.0**

Source: As ex ante

Per Acre Yield and Value of Crops

The details on yields and value of different crops in the two sample mandals are presented in Table 4.. Of the 21 crops, 18 crops in Ponduru and nine crops in Gara raised by the farmers in the study area but there are 8 common crops in the two sample mandals. Both in the yield levels as well as value of per acre crop is significantly higher in case of four crops 'viz' paddy (2400 kg. & Rs.36000), maize (2000 kg. & Rs.30000), chillies (5100 kg. & Rs.76500) and sugarcane (30000 kg. & Rs.120000) in Gara mandal, while the remaining four crops namely tomato (4500 kg. & Rs.90000), brinjal (3900 kg. & Rs.117000), ladysfinger (3650 kg. & Rs.73000) and sesamum (320 kg. & Rs.19840) are more in Ponduru mandal.

Table 4
Per Acre Yield and Value of Various Crops in Two Sample Mandals:2020-2021

SI. No.	Crop	Ponduru		Gara	
		Yield (in Kgs.)	Value (in Rs.)	Yield (in Kgs.)	Value (in Rs.)
1	Paddy	1334	20010	2400	36000
2	Ragi	405	12150	0	0
3	Maize	1417	21255	2000	30000
4	Greengram	0	0	400	18000
5	Blackgram	0	0	430	17200
6	Redgram	390	16770	0	0
7	Horsegram	350	12250	0	0
8	Tomato	4500	90000	4000	80000
9	Brinjal	3900	117000	3600	108000
10	Ladysfinger	3650	73000	3400	68000

11	Beans	4050	72900	0	0
12	Bitterguard	2800	84000	0	0
13	Carrot	3850	65450	0	0
14	Gherkin	4170	96550	0	0
15	Sweet potato	2797	44752	0	0
16	Onion	3085	67870	0	0
17	Groundnut	607	12140	0	0
18	Sesamum	320	19840	300	18600
19	Chillies	4850	72750	5100	76500
20	Sunflower	0	0	2000	70000
21	Sugarcane	28000	112000	30000	120000

SOURCE: AS EX ANTE

Per Acre Value, Cost and Profit of Various Crops

Information was collected from the dryland farmers on the value of per acre produce, cost and profit in the study areas. The details are shown in Table 5. The data reveals that of all the vegetable crops, per acre cost of Gherkin is reported higher at Rs.60,000 followed by ladysfinger at Rs.16000, brinjal Rs.13000, carrot Rs.11500, tomato Rs.11000, bitterguard Rs.10500 and beans Rs.9000. The highest profitable crop among these vegetables is brinjal (Rs.104000) next in order comes tomato (Rs.79000), followed by bitterguard (Rs.73500), beans (Rs.63900), ladysfinger (Rs.57000) and carrot (Rs.53950). The cost of chillies constitute Rs.12000 and its net profit is reported at Rs.60750 and in case of cost of sugarcane is at Rs.45000 and its net income is about Rs.67000, the cost of sweet potato and onions are at Rs.16000 & Rs.25000 and their net income Rs.28752 & Rs.42870 respectively among dryland farmers in Ponduru mandal. In Gara mandal, the farmers raised only three vegetables crops, the per acre cost of brinjal is accounted as Rs.15000 and its net income is significantly higher at Rs.93000 followed by tomato with a per acre cost of Rs.10000 and a profit of Rs.70000 and the per acre cost of ladyfinger cultivation is at Rs.14000 and its net income is reported at Rs.54000. The dryland farmers also reported higher income from sugarcane (Rs.80000), chillies (Rs.66500), sunflower (Rs.51000) and maize (Rs.26000). On the whole, out of 8 common crops in both the mandals the net profit is significantly higher among four crops 'viz' brinjal, tomato, ladysfinger and sesamum in Ponduru mandal and the remaining four crops like sugarcane, chillies, sunflower and paddy are higher in Gara mandal. The average income of the households is considerably more in Ponduru (Rs.142567) compared with that of the Gara (Rs.118209).

Table 5
Cost and Profit of Crops in the Two Sample Mandals:2020-2021

(All values are calculated per acre in Rs.)

SI. No.	Crop	Ponduru			Gara		
		Produce Value	Cost of Production	Net Profit	Produce Value	Cost of Production	Net Profit
1	Paddy	20010	15000	5010	36000	21000	15000
2	Ragi	12150	7000	5150	0	0	0
3	Maize	21255	15000	6255	30000	14000	26000
4	Green gram	0	0	0	18000	9000	9000
5	Black gram	0	0	0	17200	9500	7700
6	Red gram	16770	4000	12770	0	0	0
7	Horse gram	12250	3500	8750	0	0	0
8	Tomato	90000	11000	79000	80000	10000	70000
9	Brinjal	117000	13000	104000	108000	15000	93000
10	Ladyfinger	73000	16000	57000	68000	14000	54000
11	Beans	72900	9000	63900	0	0	0
12	Bitter guard	84000	10500	73500	0	0	0
13	Carrot	65450	11500	53950	0	0	0
14	Gherkin	96550	60000	36550	0	0	0
15	Sweet potato	44752	16000	28752	0	0	0
16	Onion	67870	25000	42870	0	0	0
17	Groundnut	12140	7500	4640	0	0	0
18	Sesamum	19840	4500	15340	18600	4000	14600
19	Chillies	72750	12000	60750	76500	10000	66500
20	Sunflower	0	0	0	70000	19000	51000
21	Sugarcane	112000	45000	67000	120000	40000	80000
Average Income		**1,42,567**			**1,18,209**		

Source: As ex ante

Conclusion

The age structure of the sample dryland farmers between the two different samples i.e. Ponduru and Gara mandals show slight differences. About 85.28 per cent of them are in the age group of 31-60 years in the study area. Across the respondents illiterates are found to be very high among the dryland farmers of Gara (27.22%) compared to Ponduru (16.11%). Paddy had a lions' share 13.41, followed by brinjal 10.12, ladysfinger 10.09, tomato 9, gherkin 7.14, sugarcane 6.35, chillies 5.57 and the remaining crops less than having below 5 per cent of the total cropped area. Of the 21 crops, 18 crops in Ponduru and nine crops in Gara raised by the farmers in the study area but there are 8 common crops in the two sample mandals. Extension efforts should be

supplemented by more demonstration farms developed on the fields of progressive farmers, as they go a long way in creating greater confidence and motivation to the farmers rather than the demonstration plots under Government auspices, managed by qualified extension workers and with relatively higher investments which the farmers feel they cannot afford.

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