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## Farmers Perception On Land Use Pattern

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### Abstract

*In drought prone Rayalaseema region agriculture is the principal occupation of the people and is influencing the land use pattern. The study of Farmer's perception on land use and its planning has a considerable importance. To find out the farmers perception on the agricultural land use pattern in Chittoor district of Rayalaseema region, farmer's opinion on land use pattern and its related aspects have been collected. For this, a field survey was conducted through questionnaire with different parameters like total agriculture land, land under different crops, total cultivated area, area under food crops, area under commercial crops, land under fruit gardens, land under fallow land. etc. For this 6 mandals have been selected for sample field survey. The sample mandals are selected on the basis of factors like mandals which are located in drought prone area, located in high rain fall receiving area. located in irrigation source area, located in fruit growing dominance and areas with high intensity of commercial cropping pattern. Apart from these factors, distribution of mandals based on nature of topography like plain, valley and plateau land forms were also taken in to account. To know the farmers perception on cropping pattern. 6 mandals have been selected for sample field survey. The study has indicated agricultural land use, cropped area, crops cultivated, shifting from traditional cropping system to commercial and cash crops in different farming communities.*

**Keywords:** Perception; Holdings Commercial Cropping; Mechanization; Drought Prone Area

### Introduction

Land use pattern for cropping is representations of hierarchal association of different crops at a point of time in a particular area of unit. It also represents the relation of different important crops grown in a region in terms of their areal extent. In Chittoor district where agriculture is the chief occupation of the people, the study of farmer's perception on crop farming, agricultural land use and its

planning has a considerable importance. Always micro level study stand for generalisation of regional agricultural land use patterns.

To find out the farmers perception on the cropping pattern in Chittoor district, farmer's opinion on cropping pattern (Agricultural Land use) and its related aspect have been collected. To know the farmers perception on land use pattern for cropping, 6 mandals have been selected for sample field survey.

The sample mandals are selected on the basis of factors like mandals which are located in drought prone area, located in high rain fall area, located in irrigation source area. located in fruit growing dominance and areas with high intensity of commercial cropping pattern. Apart from these factors, distribution of mandals based on nature of topography like plain, valley and plateau land forms were also taken in to account

## Objectives

The following objectives are framed for the present study.

1. To examine farmers perception on land use for cropping pattern in the district
2. To suggest various measures for up keeping and maintaining good agricultural Practices and cropping pattern in particular.

## Hypotheses

The following hypotheses are formulated as follows.

1. Irrigation and cropping patterns controls land utilization
2. Farmers are more interesting in commercial and short term crops rathe than traditional and long duration crops.

## Study Area

Chittoor district, the present study area lies in the southern most part of Andhra Pradesh state. It forms a part of the semi-arid as well as backward Rayalaseema region Geographically, it is located between the 12° 37' and 14° 8' Northern latitudes and between the 78° 33' and 79° 55' Eastern longitudes.

## Database

For the present study, primary data is used. The secondary date is also used for selecting sample mandals and villages. To analyze the farmer's perception on cropping pattern, the sample villages are chosen randomly based on location and agricultural potentiality. In this respect, 6 mandals have been chosen and in each mandal minimum three and maximum five villages were taken into consideration for data collection with the well prepared questionnaire. Accordingly, 600 samples were collected relating to cropping pattern by following social divisions as Scheduled caste. Scheduled Tribes. Backward Caste and Other Caste farmers.

## Methodology

To trace land utilization for the cropping pattern and cultivation of different crops the following methodology is adopted. To find out the degree and intensity of cropping

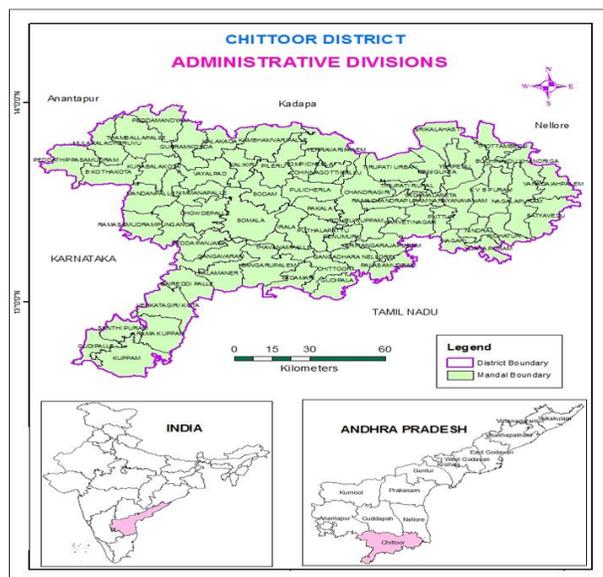


Fig. 1. Location of Study area

Pattern. cultivation of different crops. Land utilization and farmers perception the percentages were calculated with suitable pictorial representation.

## Analysis

The sample mandals are selected based on different factors such as, mandal namely Yerpedu is located in high rain fall receiving as well as this mandal has high potentiality in ground water. Nagari mandal comes under the high irrigation intensity (Arenior minor irrigation project). Sodom mandal has identified as high fruit garden erop dominating mandal. Molakalacharuvu is located in drought prone area which accounted frequent rain failures and low rainfall occurrences. Gangavaram mandal where dominated mixed farming and V. Kota mandal is located in narrow zone between Tamilnadu and Karnataka states. Moreover, this mandal is transforming from traditional cropping pattern to commercial pattern. In each mandal five sample villages are selected for house hold survey. The list of sample mandals and village wise samples are shown in the following Table 1.

As shown in the below Table 1 , in each mandal 100 samples were taken and distributed to all social groups such as SC (Scheduled Cast). SI (Scheduled Tribesi, BC (Backward Cast), OC (Other Caste). Total samples collected were 600 of which 120 belongs to SC farmers (20%). ST samples are 60 accounted for 10 per cent. BC samples are 189 which accounted for 30 per cent and OC samples are 240 which accounted for 40%.

**Table 1.** Sample mandals and villages

S.No.	Name of the sample mandal	Name of the villages	Total samples				Total
			SC	ST	BC	OC	
1.	Nagari	Ginrajukuppam	19	10	14	3	46
		Rajulakandriga	-	-	-	37	37
		Ramapuram	-	-	5	-	5
		Dhrmapuram	-	-	4	-	4
		Kannam Mitta	1	-	7	-	8
		Vaddipalli	-	-	8	-	8
2.	Molakalacheruvu	Nallagutlapalli	1	1	19	1	22
		Burakayalakota	1	9	-	-	13
		Malapallew	10	-	-	16	26
		Durgasanipalle	5	-	1	23	31
		Mattem	10	-	10	10	30
3.	Santhipuram	Nakkanapalle	-	5	-	10	15
		Moresonapalle	5	-	10	10	25
		Tulasinayanipalle	5	5	5	5	20
		Bommanapalle	-	-	5	5	10
		N. Kurapalle	4	-	16	-	20
		S.M.Palle	16	6	-	-	22
4.	Sodam	Agraharam	-	-	4	14	18
		Nadigadda	-	-	10	10	20
		Jandrapeta	-	1	-	16	20
		Torlapalle	5	2	8	5	20
		Gangavaram	5	-	3	6	14
5.	Gangavaram	Kallupalle	3	-	3	2	8
		Kapakada	4	8	7	23	42
		Melumai	3	-	9	4	16
		Yerpedu	5	2	8	7	22
		Rasigunneri	5	-	10	7	22
6.	Yerpedu	Pallam	5	1	5	8	19
		Pullampeta	5	2	2	10	19
		Chitalapalem	-	5	5	8	18
<b>Total</b>			<b>120</b>	<b>60</b>	<b>180</b>	<b>240</b>	<b>600</b>

### Total agricultural land of the sample farmers

The analysis revealed that 600 sample farmers belong to different community are having 2698.4 Acres of agriculture land. Out of this 344.45 acres (12.76%) belong to SC community, 109 acres (4.04%) belongs to ST community 867.65 acres (32.15%) belongs to BC community and 1377 Acres (51.04%) belong to OC community farmers respectively.

The above mentioned information is clearly indicates that ST community farmers representing the lowest per centage of agricultural land followed by SC. BC. OC, community farmers. It can be stated that, OC community farmers are sowed with more agricultural land than SC, ST farmers. However B.C. community farmers represented considerable agricultural land.

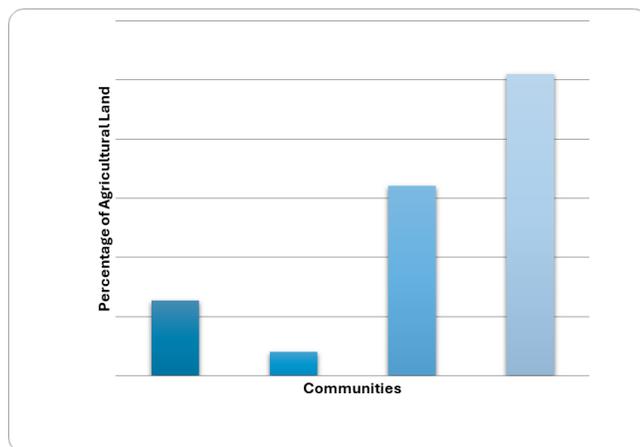
### Community wise sample agricultural holdings

It is interesting to state that, in ST community sample farmers, 92 per cent of the land is under less than 5 acres categories only 8 per cent of land holdings of ST community farmers comes under 5-10 acres category, and no ST Farmer comes under remaining category of land holdings. ST community sample farmers share in total agricultural land of sample farmers is only 4 per cent. In SC community 87 per cent of that farmers land is under less than 5 acres category. Only 13 per cent farmers are having agriculture land which comes under 5-10 acres category. No SC farmers come under remaining category of land holdings. The share of the SC farmers among the total sample farmers is only 13 per cent.



**Table 2.** Total agricultural land of the sample farmers in Acres

S. No.	Name of the sample mandal	SC	ST	BC	OC	Total
1.	Nagari	71.00	2.00	207.50	106.50	387.00
2.	Gangavaram	58.50	14.50	104.00	245.75	422.75
3.	Santhipuram	65.95	28.00	172.45	356.05	622.45
4.	Mulakakacharuvu	49.25	28.50	137.50	177.50	392.75
5.	Sodum	47.75	15.00	90.20	229.50	382.00
6.	Yerpedu	52.00	21.00	156.00	262.00	191.00
Total		344.45	109.00	867.65	1377.30	2698.40
<b>Per cent</b>		<b>12.76</b>	<b>4.04</b>	<b>32.15</b>	<b>51.04</b>	<b>100</b>

**Fig. 2.** Total agricultural land of the sample farmers in acres (per cent)

With respect to BC community farmers, 56 per cent farmers comes under less than 5 acres category, 25% under 5-10 acres. 16% under 10-15 acres, 1% under 15-20 acres and 2° farmers comes under 20-25 category respectively. No BC farmer comes under more than 25 acres category. The share of the BC community sample farmers in total agricultural land is 32 per cent.

As far as OC community farmers representation 42 per cent of farmers comes under less than 5 acres category, 35 per cent farmers represented 5-10 acres, 17 per cent farmers represented 10-15 acres category, and in 15-20 acres, category 20-25 acres and more than 25 acres category has 2 per cent of farmers in each category. The share of OC community farmer's agricultural land is 51 per cent.

With respect to all community farmers, 60 per cent of farmers comes under less than 5 acres category, 25 per cent of farmers comes under 5-10 acres category. 11.50 per cent farmers comes under 10-15 acres category and only 12 per cent, and 0.8 per cent farmers comes under 15-20 acres category 20-25 acres category and more than 25 per cent acres of agricultural holding categories respectively.

The above analysis clearly indicates that. SC and ST community farmers are having very small size holdings and less amount of agricultural land with comparison to BC and OC farmers. However. BC farmers also represented moderate amount of land holdings and whereas OC community farmers are having high per cent in large area holdings when compared to others. Out of the total agricultural land the share of OC category farmer is very high (52%) comparatively other community farmers. So it can be concluded that, SC and ST farmers having very low share of agricultural land and also low range of agricultural holdings.

### Total cropped area of the sample farmers

As a part of analysis land under different crops is also calculated on par with different communities. Community wise, 89 per cent land is cropped by SC farmers. 79 per cent land is cropped by ST farmers, 93 per cent of BC farmers and 95 per cent of OC farmers land is under crops. There is a very vast gap among shares of the agricultural land of the different community farmers. They represented community wise 13 per cent by SC, 4 per cent by the ST farmers, 32 per cent share by the BC farmers and 51 per cent share by OC farmers. The above analysis clearly indicated that though percentage of agricultural land is high among SC, ST, BC farmers their share of cropped land percentage is high due to developmental activities taken by the government and most of the land is cultivated under rain fed dry crop during south western monsoon period.

### Community wise land under different crops

To find out community wise cultivation under different crops, analysis is made. On an average all community farmers have been cultivating nine crops including other crops. The crops cultivated sample farmers listed as paddy, groundnut, mango, Sugarcane, vegetables, ragi, jowar, mulberry and others. However. ST farmers have found in cultivation of 6 crops only.

Under paddy crop total sample farmers represented 590 acres out of total cropped area. Which is accounted for 23 per

**Table 3.** Community wise agricultural holdings in acres

Land holding size	SC	%	ST	%	BC	%	OC	%	Total	Per cent
>5	105	87	55	92	100	56	100	42	360	60
5-10	15	13	05	08	45	25	85	35	150	25
10-15	-	-	-	-	29	16	40	17	69	11.5
15-20	-	-	-	-	02	1	5	2	07	1.2
20-25	-	-	-	-	04	2	5	2	09	1.5
<25	-	-	-	-	-	-	5	2	05	0.8
<b>Total</b>	<b>120</b>	<b>100</b>	<b>60</b>	<b>100</b>	<b>180</b>	<b>100</b>	<b>240</b>	<b>100</b>	<b>600</b>	<b>100</b>

**Table 4.** Community wise total crop land under different crops in acres in percent

S.No	Community	P	G.N	M	S.C	V	R	J	Mal	O	Total
1	SC	26	17	27	7	10	8	3	-	2	100
2	ST	12	58	12	-	-6	6	6	-	6	100
3	BC	25	31	25	12	6	0.4	0.4	-	-	100
4	OC	22	15	31	15	6	0.8	1	8	0.9	100
<b>Total</b>		<b>23</b>	<b>22</b>	<b>28</b>	<b>13</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>0.9</b>	

Note: P-Paddy, GN- Groundnut, M-Maize, SC- Sugarcane, V- Vegetables, R- Ragi, J-Jowar, Mal- Mulbury, O-Other crops.

cent of the total cropped area, it is to indicate that 26 per cent of SC farmers land. 12 per cent of ST farmers land. 25 per cent of the BC farmers land and 23 per cent of the OC farmers land is under paddy crop. With regard to groundnut cultivation out of total cropped area 553 acres are under groundnut cultivation. Community wise, groundnut share is represented as 17 Per cent of SC cropped area 58 per cent of SI cropped area 31 per cent of the BC cropped area and 15 per cent of OC farmers cropped area is under groundnut cultivation.

Under mango cultivations, 695 acres land is identified as under mango gardens out of total cropped area of sample farmers. Community wise Land under mango crop indicating as 27 per cent of SC farmers cultivated area, 12 per cent of ST farmers cultivated area, 25 per cent of BC farmers cultivated area and 28 per cent of OC farmers cultivated area is under mango cultivation.

With regard to sugarcane cultivation. 320 acres is under practice. Community wise per cent of sugarcane cultivation has indicated as. 7 per cent of SC farmers cropped area 12 per cent BC farmers cropped area and 15 per cent of OC farmers cropped area is under sugarcane cultivation and no ST farmer is cultivated sugarcane. On an average 13 per cent of land of total cropped area of all farmers is under sugarcane cultivation.

The another crop practiced by sample farmers is vegetables. Vegetables cultivated in 150 acres out of total cropped area by the sample farmers. Community wise 10 per cent of cropped area of SC farmers, 61 per cent of cropped area by BC farmers and 6 per cent of OC farmers cropped area is under vegetables. No ST share of farmers is cultivated vegetables.

Under Ragi cultivation 45 acres are identified out of total sample cropped area Community wise 8 per cent of SC cropped area. 6 per cent of ST cropped area 0.5 per cent of BC cropped area and one per cent of OC farmer's area is under ragi cultivation In Jowar cultivation 28 acres were identified out of total cropped area of the sample farmers. 3 per cent of SC farmers cropped area 5 per cent of ST farmers cultivated area, 0.5 per cent of BC farmers cropped area is under jowar cultivation.

As far as Mulberry cultivation is concerned, 100 Acres under mulberry cultivation. It is interesting to state that only OC farmers are practicing Mulberry cultivation and 8 per cent of total cropped area of OC farmers is under mulberry cultivation. Mulberry cultivation is required suitable climate which can be noticed in south western part of the district

(Santhipuram mandal), moreover it requires high capital investment, long practicing activities and different market facilities. Therefore SC, ST and marginal farmers cannot come forward to cultivation mulberry as a crop.

Apart from above discussed crops it is to mention that sample farmers are also cultivating some other crops like flowers, onions, pulses, grams, etc, which have been treated as other crops for the analysis. Under other crops 23 acres are found.

### Community wise land under food crops

As a part of farmer's perception land use for agricultural cropping pattern, an analysis is made on community wise land under food crops and commercial crops. Out of total cropped area by the sample farmers 661 acres land is cultivated under food crop known as paddy. Ragi, Jowar, which is accounted



for 26 per cent in total cropped area. Community wise SC farmers cultivated 38 per cent of land under food crops. ST farmers cultivated 25 per cent, BC farmers cultivated 26 per cent land and OC farmers cultivated 25 per cent of land under food crops,

Among the food crops, 89 per cent of land is under paddy cultivation and only 7 and 4 per cent under Ragi and Jower respectively. It resembles that the importance of paddy crop in food crops. In paddy cultivation SC farmers cultivated 69 per cent land. ST farmers 50 per cent land, BC farmers 90 per cent of land and OC farmers 94 per cent of land under paddy cultivation out of total food crops cultivation. In Ragi cultivation 22 per cent of SC Farmers cultivated land. 25 per cent of ST farmers cultivated land. 1.4 per cent, of BC farmers cultivated respectively. In Jower cultivation SC farmers cultivated 9 per cent of land. ST farmers cultivated 25 per cent of land BC farmers cultivated 1.5 per cent land OC farmers cultivated 3 per cent of land respectively. The above analysis reveals that, the share of food crops percentage in all community is less. However SC farmers contributed 38 per cent of land which has slight higher with comparison to other community farmers. It is also interesting to state that the share of paddy cultivation is very low among SC and ST farmers comparatively BC and OC of farmers. In contrast to this, the share percentage of Ragi and Jower crops is high among SC and ST farmers, comparatively BC and OC farmers. It can be concluded that more per cent OC and BC farmers land is under principle crop (Paddy) rather than small millets (Ragi and Jower) which have low price in market.

### Community wise land under commercial crops

Under commercial crops five crops like Groundnut, Mango, Sugarcane, Vegetables, and Mulberry are identified which are cultivating by the sample farmers. Out of the total cropped area of the sample famers, 74 per cent of cropped area is under commercial crops. Among commercial crops, Mango cultivation occupies first position which is accounted for 38 per cent followed by Groundnut (30%), Sugarcane (18), Vegetables (91%) and Mulberry (5%). Community wise per centage of land under commercial crops reveals that 62 per cent cultivated land of SC farmers, 75 per cent of cultivated land of ST, 74 per cent of cultivated land of BC farmers, 75 per cent of OC farmers cultivated land is under commercial crops, The per cent of land under commercial is high since subsistence of type of agriculture has been transforming towards commercial crops.

Under Mango cultivation 45 per cent of SC farmers, 17 per cent of ST farmers, 33 per cent of BC farmers and 41 per cent of OC farmers land is under Mango crop out of total land under commercial crops.

In Groundnut cultivation, community wise distribution having considerable variation which indicated as 28 per cent of SC farmers cropped area, 83 per cent of S1 farmers cropped

area 41 per cent of BC farmers cropped area and 20.5 per cent of OC farmers cropped area is under groundnut cultivation out of total cropped area under commercial crops.

Under Sugarcane cultivation ST farmers are not having any land. However the highest per cent of land under sugarcane cultivation is noticed in OC community farmers which accounted for 25 per cent followed by BC farmers (17%) and SC farmers (11%) respectively.

The above analysis with respect to SC, clearly indicating that high share of land under sugarcane cultivation belongs to OC farmers and very low share belongs to SC farmers. Sugarcane cultivation involves huge amount of investment for arrangement of continues irrigation facilities, operational cost and harvester expenses. Hence small and margattal farmers could not offer more amount of investment, so per cent of share under sugarcane cultivation is low among the small and marginal farmers.

Vegetables cultivation is the other commercial crop cultivated by the sample farmers. Out of the sample farmers cropped area 155 acres land is under vegetables, which is accounted for 9 per cent. Community wise cultivated land under vegetables indicated as 16 per cent by SC farmers and 8 per cent by each BC and OC farmers. In this crop also no SI farmer land is under vegetables.

Cultivation of vegetables also requires huge amount of investment for providing irrigation facilities, cropping implements, pet control measures and marketing which small and marginal farmers (SC,ST) cannot offer.

Mulberry is another commercial crop cultivated by sample farmers. It is to note that only OC farmers in Santhipuram mandal are cultivating mulberry in 100 acres which accounted for 10 per cent of the total OC sample farmer's commercial crops. The weather conditions of Santhipuram mandal are more suitable for the cultivation of mulberry crop and also good market facilities are found in Bangalore city which is located very near to Santhipuram mandal.

The above analysis reveals that high per cent of commercial crops have been cultivated by the OC and BC farmers rather than SC and ST farmers. Because SC and ST farmers are having small holdings and low economic status are the important reasons for concentration of food crops rather than the commercial crops.

Fruits crops are also a part of commercial crops which is explained in the above pages. However to find out the intensity of fruits crops alone a separate analysis is made for better understand on fruit crops. It is interesting to state that out of the total cropped area all the sample farmers have been cultivating Mango as a fruit crop. Mango is cultivated in 695 acres by the sample farmers which accounted 28 per cent of total cropped area and 38 per cent of total commercial crops.

Apart from mango cultivation, some of the sample farmers are also cultivating papaya, Guava, Sapota, pomegranate etc, as fruit crops But all these fruit crops are cultivated in

**Table 5.** Community wise land under food crops in Acres (In per cent)

Community	Items	Paddy	%	Ragi	%	Jower	%	Total	%
SC	Total cropped area	80	69	25	22	10	9	115	38
	% of share	13	-	58	-	36	-	17	-
ST	Total cropped area	10	50	05	25	05	25	20	25
	% of share	02	-	12	-	18	-	03	-
BC	Total cropped area	200	97	03	15	03	1.5	206	26
	% of share	34	-	7	-	11	-	31	-
OC	Total cropped area	300	04	10	23	10	3	320	25
	% of share	51	-	23	-	36	-	49	-
Total	Total cropped area	590	89	43	7	28	4	661	100
	% of share	-	-	-	-	-	-	-	-

**Table 6.** Community wise land under commercial crops in acres

S.No	Items	M	%	G.N	%	S.N	%	V	%	Mal	%	Total	%
SC	Total cropped area	85	45	53	28	20	11	30	16	-	-	188	62
	% of share	12		10		6		19		-	-	10	-
St	Total cropped area	10	17	50	83	-	-	-	-	-	-	60	75
	% of share	1	-	9	-	-	-	-	-	-	-	13	-
BC	Total cropped area	200	33	250	41	100	17	50	8	-	-	600	74
	% of share	29		45		31		33		-	-	33	-
OC	Total cropped area	400	41	200	20.5	200	20.5	75	8	100	10	975	75
	% of share	58.0		36		63		48		100		53	-
Total	Total cropped area	<b>695</b>	<b>38</b>	<b>553</b>	<b>30</b>	<b>320</b>	<b>18</b>	<b>155</b>	<b>9</b>	<b>100</b>	<b>5</b>	<b>1823</b>	<b>100</b>
	% of share	100		100		100		100		100		100	

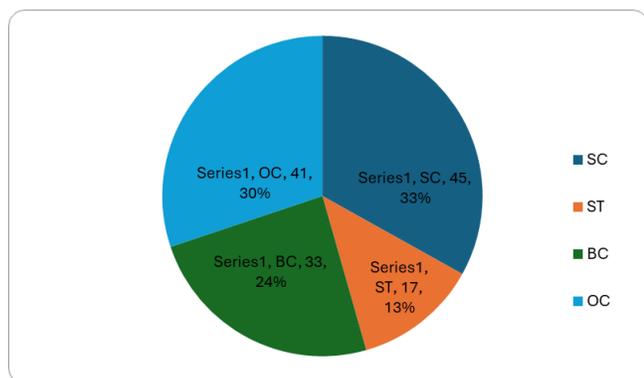
Note: M-Mango, GN- Groundnut, SN- Sun flower, V- Vegetables, Mal- Mulberry.



very negligible area. Government encouragement for fruit gardens. implementing of modern irrigation techniques, frequent rain failures for cultivation of primary crops, severe labour problems, and reduction of cultivations in each family are the important responsible factors for remarkable increase in mango cultivation.

**Table 7.** Community wise distribution of land under fruit crops

S.No	Community	Land under fruits crop (in acres)	Per cent
1	SC	85	45
2	ST	10	17
3	BC	200	33
4	OC	400	41
<b>Total</b>		<b>695</b>	<b>38</b>



**Fig. 3.** Community wise distribution of land under fruit crops

### Community wise Fallow land

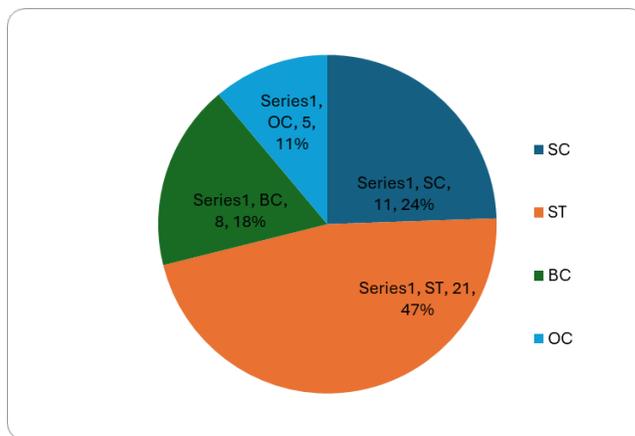
To find out the structure of agricultural operations according to the communities, in first step cropped area has been calculated. In the next step, community wise the amount of fallow land is also cultivated.

Out of total agricultural land of all total sample farmers 189 acres of the land, which is accounted for 7 per cent is under current follows, Community wise the structure of fallow land represented as 11 per cent in SC farmers 21 per cent in ST farmers, 8 per cent in BC farmers and 5 per cent among the OC farmers.

The highest amount of fallow land is noticed among ST farmers whereas lowest is noticed among OC farmers. The low economic status, small size of holdings and frequent rainfall failures are responsible for the high per cent of fallow land among ST and SC farmers.

**Table 8.** Community wise total Fallow land in acres

S. No	Community	Land under fallow	%
1	SC	37	11
2	ST	23	21
3	BC	59	8
4	OC	70	5
<b>Total</b>		<b>189</b>	<b>7</b>



**Fig. 4.** Community wise distribution of land under Fallow land (in per cent)

### Conclusion

The analysis revealed that, less investment, easy to cultivation, high income, less investment less labour requirements are the important individual reasons for shifting of agriculture from subsistence to commercial cropping system. Therefore the hypothesis "Farmers are more interesting in commercial crops rather than and long period crops" has been tested and accepted. In farmer opinion on advantage of agriculture, majority SC and SI Farmers revealed income source as main advantage.

It is interesting to mention that, no sample farmer has poultry farm. However, majority farmers having country chicks for domestic as well as for village peoples. Among SC and SI farmers majority rearing sheep and goats. However the percentage of raring Sheep and Goats is observed among BC farms.

### Suggestions

1. To maintain the irrigation potentiality, it should be made rain harvesting as an important social activity with the help of this social activity. The potentiality of ground water and surface water capacity would be positively influenced.



2. In different parts of the study area micro-Irrigation systems have been adopting mainly for plantation crops. This is time to transform towards modernization of irrigations techniques and use of irrigation technology for more number of crops.
3. Farmers are to be familiarized with techniques of irrigation and implementation.
4. Sustainable irrigation water consumption is to be included among farmers rather than flooding fields/reckless use of water for fields.
5. By adapting measures to improve cropped area and forest cover, the economic status of the farmers and ecological imbalances can be maintained. This can lead to minimize desertification of western mandals of the study area.
6. It is suggested further micro study in the field of cropping pattern for sustainable agricultural development.

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