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Profile characteristics of the sugarcane growers for jaggery

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Abstract

A study was conducted on sugarcane growers for jaggery in Andhra Pradesh. Ex-post facto research and descriptive research designs were followed for the investigation. Three districts were purposively selected based on the highest area under sugarcane cultivation. Four mandals from each district, two villages from each mandal and ten sugarcane growers for jaggery from each village were selected by using simple random sampling method. Thus, making a total of 12 mandals, 24 villages and 240 respondents for the study respectively. Eighteen independent variables were selected as profile of the sugarcane farmers. The results of the study shown that majority of the respondents were old aged (48.75%) with primary school education (27.92%) having marginal (36.25%) land holdings. They had medium level of farming experience (60.00%), annual income (40.83%), material possession (53.33%), extension contact (55.00%), nature of social contact (55.00%), mass media utilization (37.50%), innovativeness (61.30%), economic orientation (51.25%), scientific orientation (54.20%), management orientation (63.80%), risk orientation (55.00%) and achievement motivation (59.20%). They had high decision-making ability (47.90%) and drudgery perception (57.92%).

Keywords: Sugarcane growers, jaggery, profile characteristics

Introduction

Sugarcane is one of the most important commercial/cash crops grown in India. There are three types of significant products that arrived from sugarcane viz., sugar, jaggery and khandasari. Among the three, jaggery is one of the principal components that provides employment to lakhs of rural people in the country from the cultivation of cane to the production of jaggery. Being the unorganized sector, jaggery in the country is run by most of the small and marginal farmers. In Andhra Pradesh, it is employing three lakh people who live in rural areas and relies on quick returns from jaggery (Rao & Sriram, 2016). However, cane cultivation and jaggery production was reduced over the years and also sugar has substituted jaggery as most of the cultivated cane was diverted for the production of sugar (Cooperative sugar, 2020). On the other side, in this era of health consciousness, in terms of medicinal and nutritional values of jaggery implies that it is a better sugar substitute. To meet the growing demand, some of the farmers are producing jaggery to grab the consumers attention. Hence, there is an urgent need to popularise jaggery among the consumers and to produce quality jaggery. Considering the criteria, this study has been undertaken to study the profile characteristics of the sugarcane growers.

Objective of the Study

To study the profile characteristics of the sugarcane growers for jaggery.

Methodology

Based on the objective of the study, ex-post facto and descriptive research designs were followed in the present investigation. The state of Andhra Pradesh was chosen as the locale of the study. By following purposive sampling procedure, a total of three districts viz., Vishakapatnam (from North Coastal Region), West Godavari (from Coastal Region) and Chittoor (from Rayalaseema Region) were selected and four mandals from each district were selected randomly thus the sample constituted to a total of twelve mandals. Two villages from each mandal were selected randomly thus the sample constituted to a total of twenty-four villages. From each of the selected village, ten sugarcane growers for jaggery were selected randomly by following simple random sampling procedure. The sample constituted to a total of 240 respondents.

Statistical Tools and Procedures Followed

Quartile Deviation (QD)

Quartile deviation = $(Q_3 - Q_1)/2$

Q_1 is called lower quartile and Q_3 is called the upper quartile. Second Quartile (Q_2) is also called the median because it divides the data into equal parts.

Arithmetic Mean ($\bar{X}$)

$$\bar{x} = \frac{\sum x}{n}$$

where,

$\bar{X}$ = Mean

Σx = Sum of scores

n = Number of respondents

Standard Deviation (σ)

$$\sigma = \sqrt{\frac{1}{n} \left(\Sigma x^2 - \frac{(\Sigma x)^2}{n} \right)}$$

where,

σ = Standard Deviation

Σx^2 = Sum of squares of observations

$[\Sigma x]^2$ = Square of sum of 'x' values

n = Number of observations

Frequency and Percentage

Frequency was represented by 'f' and percentage was represented by '%' in the results of the study.

Chi-square Test for Independence of Attributes (χ^2)

$$\chi^2 = \sum_{i=1}^n \frac{(O_i - E_i)^2}{E_i}$$

where,

O_i = Observed frequencies

E_i = Expected frequencies

n = Number of cells (or classes)

Results and Discussion

An attempt has been made to analyse the selected profile characteristics of the sugarcane growers for jaggery. In all the selected three regions of Andhra Pradesh viz., North Coastal Region (NCR), Coastal Region (CR) and Rayalaseema Region (RR), 80 respondents from each region were selected as sample to draw the results.

1. Age

The data regarding the table 1 portray that, 48.75 per cent of the sugarcane growers for jaggery in all the three regions were found to fit in the old age category followed by 42.92 per cent in the middle age and remaining 8.33 per cent of the respondents were in young age category. The Chi-square test of independence for age distribution of sugarcane growers for jaggery has shown $\chi^2 = 0.389$ with p value 0.98 concluded that age distribution was not related and independent to the region.

The probable reason for the above trend might be due to the shifting of the young farmers towards short duration crops like vegetables *etc.*, and non- agricultural occupations as well as agricultural labour to realize early profits as compared to sugarcane cultivation for jaggery. The lack of enthusiasm towards farming in general and sugarcane cultivation for jaggery in particular might be due to drudgery, low level of pride, lack of assured and incremental income. On the other side, the old age and middle age farmers might be continuing sugarcane cultivation for jaggery as a part of their traditional occupational entity. Similar findings were reported by Bharati *et al.* (2018) [1] and Karpagam *et al.* (2019) [19].

2. Education

The table 1 clearly depicted that, 27.92 per cent of the sugarcane growers for jaggery had primary education. Nearly one-fourth (26.25%) of the respondents were functionally literate followed by having secondary (17.91%) level of education and illiterates (15.00%). About 7.50 per cent of them were having intermediate level of education. A meagre of 3.75 and 1.67 per cent were studying graduation and post-graduation respectively. The Chi-square test of independence for distribution of education of sugarcane growers for jaggery has shown $\chi^2 = 39.350^*$ with p value 0.00 concluded that distribution of education was related and significantly associated with the region. Majority of the farmers might be treating sugarcane cultivation for jaggery as an occupation for educationally poor farmers. The farmers with highest educational qualifications might be seeking job opportunities either in public or private sector. Illiterate and less educated farmers might be continuing sugarcane cultivation for jaggery as there is no other opportunity for them to get into professional avenues. Majority of the farmers in the Coastal Region were found to have primary and secondary education and were cultivating sugarcane for jaggery. These results were in line with the findings of Swamy (2012) [21], Jagatpal *et al.* (2017) [7] and Karpagam *et al.* (2019) [19].

3. Farming Experience (Experience in sugarcane cultivation for jaggery)

It can be observed from the table 1 that, most (60.00%) of the sugarcane growers for jaggery were having medium level of experience in sugarcane cultivation for jaggery followed by 21.67 per cent with low and only 18.33 per cent with high level of experience. The Chi-square test of independence for distribution of experience in sugarcane cultivation of sugarcane growers for jaggery has shown $\chi^2 = 2.691$ with p value 0.61 concluded that distribution of experience in sugarcane cultivation for jaggery was not related and independent to the region.

The farmers who are cultivating sugarcane for jaggery might be taking it as their one of the livelihood activities and continuing it as a major source of their income over a period of time. The above reason might have resulted in the trend observed. On the other side, some of the farmers who have entered into cultivation of sugarcane for jaggery in the recent past to continue it as a source of their family income might be having low farming experience. These results were in agreement with the findings of Subhash (2014) [19], Rohidas (2016) [15] and Dahyabhai (2017) [3].

4. Land Holding

The land holding of the sugarcane growers for jaggery was analyzed by taking into consideration of both total land holding of the respondent as well as land under sugarcane cultivation for jaggery.

4.1 Total land holding

It can be noticed from the table 1 that, 36.25 per cent of the sugarcane growers for jaggery were marginal farmers. About 33.75 per cent of the respondents were small farmers followed by 17.08 per cent were semi-medium farmers. A meager of 7.92 and 5.00 per cent were medium and large farmers respectively. The Chi-square test of independence

for distribution of total land holding of sugarcane growers for jaggery has shown $\chi^2 = 31.995^*$ with p value 0.00 concluded that distribution of total land holding was related and significantly associated with the region.

4.2 Land under sugarcane cultivation for jaggery

It is evident from the table 1 that, 83.33 per cent of the sugarcane growers for jaggery cultivating sugarcane in <1ha followed by size of 1.01-2 ha (10.41%). About 3.75 and 2.08 per cent were cultivating in sizes of 2.01-4 ha and 4.01-10 ha holdings respectively. A meager of 0.41 per cent of the respondents were cultivating sugarcane in >10 ha. The Chi-square test of independence for distribution of land holding under sugarcane cultivation for jaggery has shown $\chi^2 = 3.516$ with p value 0.89 concluded that distribution of land under sugarcane cultivation for jaggery was not related and independent to the region.

It can be interpreted that, majority of the medium to large farmers might not be taking up agriculture in general and sugarcane cultivation for jaggery in particular due to giving their land for lease to other farmers in the village. The reasons might be the lack operational manpower or to be with their settled children in the urban areas. Land ceiling act and nuclear family approach also might have resulted in the above trend.

On the other side, majority of the small and marginal farmers continuing sugarcane cultivation for jaggery have assimilated the culture of cultivation of jaggery and leading their life with the available resources. Further it could also be interpreted that because of diversification of farming as well as crops, majority of the farmers might be going for cultivation of sugarcane for jaggery with less than 1 ha of land. The remaining area, they might be going for cultivation of different crops duly utilizing the natural resources effectively. Sugarcane cultivation for jaggery, being a cumbersome process, involves heavy labour requirement and jaggery making, being a cottage industry, can be taken up on a limited scale, which might have restricted the farmers to go for limited areas under sugarcane cultivation for jaggery. The findings were in accordance with the studies conducted by Chandrapal *et al.* (2012) [2], Vaijanath (2014) [23] and Islam *et al.* (2016) [6].

5. Annual Income

An outlook from the table 1 inferred that 40.83 per cent of the sugarcane growers for jaggery had medium level of annual income followed by 31.25 per cent of them had high and 27.92 per cent of them with low level of annual incomes. The Chi-square test of independence for distribution of annual income of sugarcane growers for jaggery has shown $\chi^2 = 10.134^*$ with p value 0.03 concluded that distribution of annual income was related and significantly associated with the region.

Income is the back bone for the subsistence of a family. Everybody strives hard to earn as much as possible to meet the demands of the family. Depending upon the nature of the work they were involved and the role they were played, the people will receive the income from different sources by the members of the family and accordingly, they allocate the same for the family management. Similar results were reported by Rangarao (2016) [14], Jagatpal *et al.* (2017) [7]

and Kumar *et al.* (2017) [10].

5.1 Contribution of income from sugarcane cultivation for jaggery

It can be clearly seen from the table 1 that the contribution of income from sugarcane for jaggery to the annual income was found to be less than 25 per cent for 85.00 per cent of the respondents. About 11.25 per cent of the sugarcane growers were in the range of 25-50 per cent of income contribution of sugarcane cultivation for jaggery to their annual income. Contribution of 50-75 per cent of the income from sugarcane for jaggery to their annual income was found in only 2.50 per cent of the farmers. Only 1.25 per cent of the farmers had more than 75 per cent of the contribution of income from sugarcane for jaggery to the total annual income. The Chi-square test of independence for distribution of respondents according to contribution of income from sugarcane cultivation for jaggery has shown $\chi^2 = 15.770^*$ with p value 0.01 concluded that distribution of Contribution of income from sugarcane cultivation for jaggery was related and significantly associated with the region.

Farmers cultivating sugarcane for jaggery might be resorting to different ways of earning by involving all the family members to run their family. According they might be involved in labour work and allied activities apart from sugarcane cultivation for jaggery. But the contribution of income from jaggery was found to be very low and farmers might be continuing sugarcane cultivation for jaggery as a traditional occupation rather than the primary income source.

6. Material Possession

It can be observed from table 1 that, 53.33 per cent of the sugarcane growers for jaggery had medium level of material possession followed by 29.58 and 17.09 per cent had high and low levels of material possession respectively. The Chi-square test of independence for distribution of material possession of sugarcane growers for jaggery has shown $\chi^2 = 4.655$ with p value 0.32 concluded that distribution of material possession was not related and independent to the region.

Sugarcane cultivation for jaggery, being the commercial entity, farmers might be procuring the necessary equipment for sugarcane cultivation and jaggery making so as to avoid dependence on other farmers. It could also be interpreted that, the well settled children of the farmers might be arranging the goods for the family to see that their parents lead a comfortable life. On the other side economically, poor farmers might be resorting to hiring of farm equipment and leading their life with limited household equipment/goods. The findings were in line with the studies reported by Jagatpal *et al.* (2017) [7] and Kumar *et al.* (2017) [10].

7. Trainings Undergone

The table 1 projected that, 53.75 per cent of the sugarcane growers for jaggery have not received any training and remaining 46.25 per cent of the respondents had received trainings. Out of which 22.08 per cent of them had received 1-2 trainings followed by 3-5 trainings (19.58%) and >5 trainings (4.58%). The Chi-square test of independence for

distribution of trainings undergone by the sugarcane growers for jaggery has shown $\chi^2 = 12.798^*$ with p value 0.04 concluded that distribution of trainings undergone on sugarcane cultivation and jaggery making was related and significantly associated with the region. Training is a process which enriches the knowledge, skills and attitude of the people towards the attainment of any occupational endeavour. The farmers who are cultivating sugarcane for jaggery might not be having either intrinsic motivation by themselves or extrinsic motivation by the developmental departments. Further, the farmers might be receiving training on sugarcane cultivation from the officials of the Department of Agriculture/ Research stations/ Scientists of agricultural university and developmental departments and the same might not be there on jaggery making.

On the other side, the progressive farmers might be attending the training programmes regularly to update their knowledge and skills on sugarcane cultivation for jaggery. Being the potential region for cultivation of sugarcane for jaggery, there might be more number of training programmes organized by the state department of agriculture officials and university scientists in NCR. These results were in line with the findings of Swetha (2017) [22].

8. Extension Contact

It can be noted from table 1 that 55.00 per cent of the sugarcane growers for jaggery had medium level of extension contact followed by low (27.08%) and high (17.92%) level of extension contact. The Chi-square test of independence for distribution of extension contact of the sugarcane growers for jaggery has shown $\chi^2 = 3.435$ with p value 0.48 concluded that distribution of extension contact was not related and independent to the region.

The probable reason for the above trend might be due to the fact that, the sugarcane cultivation for jaggery, as one of the unorganized sectors, is not much in the focus of the different developmental departments. Further, it can also be interpreted that the majority of the farmers cultivating sugarcane for jaggery were small and marginal and engaged in different agri and allied activities and keeping themselves busy in realization of income to meet their day-to-day expenditure. On the other side, the farmers who had zeal of entrepreneurial culture might be approaching the scientists and other extension functionaries to realize maximum profits per unit area. These findings were in confirmation with the results of Sandhya (2014) [16], Prasad (2016) [13] and Swetha (2017) [22].

9. Social Contact

9.1 Nature of social contact

It is obvious from the table 1 that, 55.00 per cent of the sugarcane growers for jaggery had medium level of involvement in formal social organizations followed by high (30.00%) and low (15.00%) level of involvement. The Chi-square test of independence for distribution of nature of social contact of the sugarcane growers for jaggery has shown $\chi^2 = 1.765$ with p value 0.77 concluded that distribution of nature of social contact was not related and independent to the region.

9.2 Frequency of social contact

It is clear from the table 1 that, 57.08 per cent of the

sugarcane growers for jaggery had medium level of frequency of social contact followed by high (25.42%) and low (17.50%) level of frequency of social contact. The Chi-square test of independence for distribution of frequency of social contact of the sugarcane growers for jaggery has shown $\chi^2 = 6.900$ with p value 0.14 concluded that distribution of frequency of social contact was not related and independent to the region.

Farmers cultivating sugarcane for jaggery might have been enjoying themselves in different organizations such as co-operatives, rythu mitra groups, Farmer Producer Organizations which are directly and indirectly supporting the farmers in acquisition of inputs and credit. As sugarcane cultivation for jaggery requires ample financial and technical support, the farmers might be utilizing these organizations by maintaining adequate contacts with different social organizations. On the other side, farmers with illiteracy and poor economic status might not be maintaining contacts with these organizations. These results were in accordance with the findings of Sujaykumar (2012) [20], Jamal (2015) [8] and Prasad (2016) [13].

10. Mass media Utilization

The table 1 projected that, 37.50 per cent of the sugarcane growers for jaggery had medium level mass media utilization followed by 35.00 per cent of them had low and only 27.50 per cent had high mass media utilization. The Chi-square test of independence for distribution of mass media utilization of the sugarcane growers for jaggery has shown $\chi^2 = 11.773^*$ with p value 0.01 concluded that distribution of mass media utilization was related and significantly associated with the region.

Mass media is an important tool in transfer of technology and requires an immediate persuasion from the personnel channels. The farmers cultivating sugarcane for jaggery might be exposed to all the mass media channels as a part of their day-to-day communication system, but missing the core link of getting convinced and encouraged to adopt the technology learnt through mass media. The farmers having good networking with scientists and extension agencies might be utilizing mass media effectively in enhancing their income. These results were supported by Devi *et al.* (2013) [5], Nishitha (2016) [12] and Prasad (2016) [13].

11. Decision Making Ability

It is indicated from table 1 that, 47.90 per cent of the sugarcane growers for jaggery had high level of decision-making ability followed by medium (38.30%) and low (13.80%) levels of decision making. The Chi-square test of independence for distribution of decision-making ability of the sugarcane growers for jaggery has shown $\chi^2 = 2.146$ with p value 0.70 concluded that distribution of decision-making ability was not related and independent to the region.

Decision making is one of the important psychological traits which reflect the confidence levels of an individual with or without needed comprehension. The farmers cultivating jaggery might be taking decisions based on their experience of being in sugarcane cultivation for jaggery with or without proper technological backup to substantiate their decisions. On the other side, some of the farmers might be regularly consulting their family members as well as other members

in the society who have been in their confidence to finalize their decisions. The results were in disagreement with the findings of Naidu (2012)^[11] and Prasad (2016)^[13].

12. Drudgery Perception

An overview of the table 1 projected that, 57.92 per cent of the sugarcane growers for jaggery had high level of drudgery perception followed by medium (28.33%) and low (13.75%) level of drudgery perception. The Chi-square test of independence for distribution of drudgery perception by the sugarcane growers for jaggery has shown $\chi^2 = 17.127^*$ with p value 0.00 concluded that distribution of drudgery perception was highly related and significantly associated with the region.

As the farmers cultivating sugarcane for jaggery are involved in three diversified activities viz., sugarcane cultivation, making and marketing of jaggery, they might have perceived arduous hurdle in managing these three operations.

Further they also might have been rigidly forced to engage the entire family to realize the profits on the sugarcane cultivation for jaggery. They also might have the problem of poor mechanization, which resulted in high drudgery in sugarcane cultivation for jaggery and the same has been documented in both North Coastal Region and Rayalaseema Region, indicating under-utilization of farm machinery. These findings were similar with the findings reported by Sarada (2015)^[17].

13. Innovativeness

The table 1 highlights that, 61.30 per cent of the sugarcane growers for jaggery had medium level of innovativeness followed by 23.80 per cent of them had high level and only 15.00 per cent of them had low level of innovativeness. The Chi-square test of independence for distribution of innovativeness of the sugarcane growers for jaggery has shown $\chi^2 = 0.207$ with p value 0.99 concluded that distribution of innovativeness was not related and independent to the region.

Innovations are the stepping stones for progressive development. The farmer cultivating sugarcane for jaggery might be taking up different technological interventions time to time both in sugarcane cultivation and jaggery making to improve the quality and quantity of the farm produce. On the other side farmers with low educational status and poor economic resources might have shown low innovativeness. The findings were in congruence with the results of Naidu (2012)^[11], Devi *et al.* (2013)^[5] and Sonu (2014)^[18].

14. Economic orientation

It can be observed from table 1 indicated that, nearly half (51.25%) of the sugarcane growers for jaggery had medium level of economic orientation followed by 27.50 and 21.25 per cent of them had high and low level of economic orientation respectively. The Chi-square test of independence for distribution of economic orientation of the sugarcane growers for jaggery has shown $\chi^2 = 10.045^*$ with p value 0.03 concluded that distribution of economic orientation was related and significantly associated with the region.

Realization of profits is the motto of any economic

endeavour. Sugarcane cultivation for jaggery is an important source of income for the farmers and they might be thinking towards effective utilization of all the available natural resources as well as manmade resources to maximize the production as well as net returns per unit area. In the process, the farmers might be keen in reducing the cost of production both at sugarcane cultivation and jaggery making. Further they also might be exploring all the possible ways and means to market the jaggery for getting maximum returns. On the other side, the farmers having low knowledge and skills in operation, cultivation and marketing of jaggery might be restoring to traditional and orthodox approaches and ending up with less profits. The farmers in the Coastal Region might be utilizing their intellect towards best management practices and had relatively high economic orientation by exploring the best possible ways of marketing of jaggery. These results were in confirmation with the findings of Verma (2012)^[24], Nishitha (2016)^[12] and Rohidas (2016)^[15].

15. Scientific Orientation

The data pertaining to table 1 revealed that, 54.20 per cent of the sugarcane growers for jaggery had medium level of scientific orientation followed by 30.40 per cent of them had high and only 15.40 per cent of them had low level of scientific orientation. The Chi-square test of independence for distribution of scientific orientation of the sugarcane growers for jaggery has shown $\chi^2 = 1.289$ with p value 0.86 concluded that distribution of scientific orientation was not related and independent to the region.

Science is the mother of invention. One should have orientation towards science to bring innovations in their field of specialization. Mere having scientific orientation without having access to the technological and financial resources may not yield desired results. Farmers cultivating sugarcane for jaggery might have developed a strong base to transform their existing farming practices in both sugarcane cultivation as well as jaggery making. Because of their exposure and expertise in adopting innovations at different phases of sugarcane cultivation for jaggery. These findings were supported by Naidu (2012)^[11], Sandhya (2014)^[16] and Prasad (2016)^[13].

16. Management Orientation

It is evident from the table 1 that about 63.80 per cent of the sugarcane growers for jaggery were with medium level of management orientation followed by 20.80 per cent with high and only 15.40 per cent with low level of management orientation. The Chi-square test of independence for distribution of management orientation of the sugarcane growers for jaggery has shown $\chi^2 = 0.770$ with p value 0.94 concluded that distribution of management orientation was not related and independent to the region.

Management is the art of life. It involves logic, tactic and organization of thoughts to portray the actions towards their accomplishment. Through the experience gained by the farmers cultivating sugarcane for jaggery, they might have acquired necessary skills in operating their farm both for sugarcane cultivation and for jaggery through substantial internalization of experiences. The farmers with higher education might be more efficient in their management orientation due to their high technical know-how in

sugarcane cultivation or jaggery making. On the other side, farmers with illiteracy might be ignorant about managing their farm. These findings were similar with the findings revealed by Devi *et al.* (2013) [5] and Prasad (2016) [13].

17. Risk Orientation

It could be observed from the table 1 that, 55.00 per cent of the sugarcane growers for jaggery had medium level of risk orientation followed by 30.42 per cent of them had high and only 14.58 per cent of them had low level of risk orientation. The Chi-square test of independence for distribution of risk orientation of the sugarcane growers for jaggery has shown $\chi^2 = 2.060$ with p value 0.72 concluded that distribution of risk orientation was not related and independent to the region.

Risk is the prerequisite for any progressive development. The ability of taking risk depends on the acquired and accumulated experiences coupled with self confidence in taking right decision at right time with strategic adaptability to the changing environment. Being farmers cultivating sugarcane for jaggery, they might be duly utilizing their experiences for taking calculated risk in operating their farm activities. On the other side, some of the farmers might be influenced by the fellow farmers and get afraid of bringing innovations in their farm. These findings were in line with

the findings of Dange (2012) [4], Naidu (2012) [11] and Karpagam *et al.* (2019) [9].

18. Achievement Motivation

It could be noticed from the table 1 that, the 59.20 per cent of the sugarcane growers for jaggery had medium level of achievement motivation followed by 25.00 per cent of them had high and only 15.80 per cent of them had low level of achievement motivation. The Chi-square test of independence for distribution of achievement motivation of the sugarcane growers for jaggery has shown $\chi^2 = 2.21$ with p value 0.69 concluded that distribution of achievement motivation was not related and independent to the region.

Achievement motivation depending on event, lies with the intellectual potential of an individual along with his/her desire in achieving the set goals with prescribed normalities. The farmer cultivating sugarcane for jaggery might be very cautious and systematic in framing reasonably attainable goals and realizing the fruits of success. Other side, the farmers experiencing thwarting of goals might have demotivated some of the farmers and made them traditional and orthodox in their life style without any zeal and enthusiasm. These findings were in accordance with the findings reported by Naidu (2012) [11], Devi *et al.* (2013) [5] and Prasad (2016) [13].

Table 1: profile characteristics of the sugarcane growers for jaggery in Andhra Pradesh

S. No	Profile characteristic	Category	NCR (n=80)		CR (n=80)		RR (n=80)		Total (n=240)		Q1 (25 th percentile)	Q2 (Median)	Q3 (75 th percentile)	Mean	SD	χ ²	P
1	Age		f	%	F	%	f	%	f	%	-	-	-	52.35	10.66	0.389	0.98
		Young age (35 years & below)	06	7.50	07	8.75	07	8.75	20	8.33							
		Middle age (36 to 55 years)	34	42.50	36	45.00	33	41.25	103	42.92							
		Old age (56 years & above)	40	50.00	37	46.25	40	50.00	117	48.75							
2	Education	Illiterate	16	20.00	05	6.25	15	18.75	36	15.00	-	-	-	-	-	39.350*	0.00
		Functionally literate (can write & read)	30	37.50	13	16.25	20	25.00	63	26.25							
		Primary education (Up to 5 th class)	17	21.25	20	25.00	30	37.50	67	27.92							
		Secondary education (Up to 10 th class)	07	8.75	28	35.00	08	10.00	43	17.91							
		Intermediate	06	7.50	08	10.00	04	5.00	18	7.50							
		Graduation	03	3.75	04	5.00	02	2.50	09	3.75							
		Post-graduation & above	01	1.25	02	2.50	01	1.25	04	1.67							
3	Farming experience (Experience in sugarcane cultivation for jaggery)	Low	14	17.50	16	20.00	22	27.50	52	21.67	29	35	44	35.70	10.63	2.691	0.61
		Medium	51	63.75	48	60.00	45	56.25	144	60.00							
		High	15	18.75	16	20.00	13	16.25	44	18.33							
4	Land holding																
4.1	Total land holding	Marginal (< 1 ha)	41	51.25	18	22.50	28	35.00	87	36.25	-	-	-	-	-	31.995*	0.00
		Small (1.01-2 ha)	25	31.25	21	26.25	35	43.75	81	33.75							
		Semi-medium (2.01-4 ha)	08	10.00	23	28.75	10	12.50	41	17.08							
		Medium (4.01-10 ha)	04	5.00	10	12.50	05	6.25	19	7.92							
		Large (> 10 ha)	02	2.50	08	10.00	02	2.50	12	5.00							
4.2	Land under sugarcane	<1 ha	66	82.5	69	86.25	65	81.25	200	83.33	-	-	-	-	-	3.516	0.89

	cultivation for jaggery	1.01-2 ha	09	11.25	07	8.75	09	11.25	25	10.41							
		2.01-4 ha	03	3.75	02	2.5	04	5.00	09	3.75							
		4.01-10 ha	02	2.5	01	1.25	02	2.50	05	2.08							
		>10 ha	0	0.00	01	1.25	0	0.00	01	0.41							
5	Annual income	Low	25	31.25	18	22.50	24	30.00	67	27.92	9.30	14.85	23.82	20.74	18.19	10.134*	0.03
		Medium	40	50.00	30	37.50	28	35.00	98	40.83							
		High	15	18.75	32	40.00	28	35.00	75	31.25							
5.1	Contribution of the income from sugarcane cultivation for jaggery	< 25%	76	95.00	60	75.00	68	85.00	204	85.00	-	-	-	-	-	15.770*	0.01
		25-50%	03	3.75	14	17.50	10	12.50	27	11.25							
		50-75%	01	1.25	03	3.75	02	2.50	06	2.50							
		> 75%	0	0.00	03	3.75	0	0.00	03	1.25							
6	Material possession	Low	11	13.75	17	21.25	13	16.25	41	17.09	04	06	06	5.42	1.46	4.655	0.32
		Medium	47	58.75	35	43.75	46	57.50	128	53.33							
		High	22	27.50	28	35.00	21	26.25	71	29.58							
7	Trainings undergone	No trainings	32	40.00	47	58.75	50	62.50	129	53.75	-	-	-	-	-	12.798*	0.04
		1-2 trainings	19	23.75	16	20.00	18	22.50	53	22.08							
		3-5 trainings	24	30.00	13	16.25	10	12.50	47	19.58							
		>5 trainings	05	6.25	04	5.00	02	2.50	11	4.58							
8	Extension contact	Low	22	27.50	24	30.00	19	23.75	65	27.08	05	07	10	7.85	3.41	3.435	0.48
		Medium	45	56.25	38	47.50	49	61.25	132	55.00							
		High	13	16.25	18	22.50	12	15.00	43	17.92							
9	Social contact																
9.1	Nature of social contact	Low	14	17.50	11	13.75	11	13.75	36	15.00	13.75	15	16.25	15.07	2.20	1.765	0.77
		Medium	46	57.50	42	52.50	44	55.00	132	55.00							
		High	20	25.00	27	33.75	25	31.25	72	30.00							
9.2	Frequency of social contact	Low	20	25.00	12	15.00	10	12.50	42	17.50	15	18	20	17.78	2.97	6.900	0.14
		Medium	45	56.25	43	53.75	49	61.25	137	57.08							
		High	15	18.75	25	31.25	21	26.25	61	25.42							
10	Mass media utilization	Low	36	45.00	16	20.00	30	37.50	84	35.00	08	12	17	11.90	2.17	11.773*	0.01
		Medium	24	30.00	36	45.00	27	33.75	90	37.50							
		High	20	25.00	28	35.00	23	28.75	66	27.50							
11	Decision making ability	Low	10	12.50	14	17.50	09	11.30	33	13.80	23	25	27	24.95	2.24	2.146	0.70
		Medium	31	38.80	27	33.80	34	42.50	92	38.30							
		High	39	48.80	39	48.80	37	46.30	115	47.90							
12	Drudgery perception	Low	10	12.50	11	13.75	12	15.00	33	13.75	29	30	30	29.10	1.65	17.127*	0.00
		Medium	13	16.25	35	43.75	20	25.00	68	28.33							
		High	57	71.25	34	42.50	48	60.00	139	57.92							
13	Innovativeness	Low	13	16.30	12	15.00	11	13.80	36	15.00	21	24	26	23.3	3.73	0.207	0.99
		Medium	48	60.00	49	61.30	50	62.50	147	61.30							
		High	19	23.80	19	23.80	19	23.80	57	23.80							
14	Economic orientation	Low	20	25.00	14	17.50	17	21.25	51	21.25	25	25	26	25.41	1.18	10.045*	0.03
		Medium	45	56.25	34	42.50	44	55.00	123	51.25							
		High	15	18.75	32	40.00	19	23.75	66	27.50							
15	Scientific orientation	Low	10	12.50	14	17.50	13	16.30	37	15.40	23	24	25	24.07	1.95	1.289	0.86
		Medium	47	58.80	41	51.30	42	52.50	130	54.20							
		High	23	28.80	25	31.30	25	31.30	73	30.40							
16	Management orientation	Low	13	16.30	13	16.30	11	13.80	37	15.40	53	56	59	55.61	4.56	0.770	0.94
		Medium	50	62.50	49	61.30	54	67.50	153	63.80							
		High	17	21.30	18	22.50	15	18.80	50	20.80							
17	Risk orientation	Low	10	12.50	13	16.25	12	15.00	35	14.58	20	21	23	21.16	2.29	2.060	0.72
		Medium	42	52.50	47	58.75	43	53.75	132	55.00							
		High	28	35.00	20	25.00	25	31.25	73	30.42							
18	Achievement motivation	Low	16	20.00	10	12.50	12	15.00	38	15.80	17	19	21	18.73	2.29	2.21	0.69
		Medium	45	56.25	51	63.75	46	57.50	142	59.20							
		High	19	23.75	19	23.75	22	27.50	60	25.00							

Note: NCR= North Coastal Region CR= Coastal Region RR= Rayalseema Region f= Frequency%= Percentage

Conclusion

Most of the sugarcane growers for jaggery were of old aged with primary education and functional literacy, there is a need to encourage educated youth towards jaggery making. Even though there are considerable large farmers in the study area, most of them were allotted less than 1 ha area under sugarcane cultivation. This indicates the smaller area allocation to sugarcane cultivation. Hence, the share of

income from jaggery to total annual income was very low (<25.00%). Due to high drudgery associated with the sugarcane cultivation and jaggery making, there is a need to develop economically feasible and farmer friendly machinery to counter the high drudgery perception. Registering all the jaggery units under MoMSME, Attracting the youth towards jaggery making, marketing and Distribution of jaggery through PDS are the some of the

policy recommendations to encourage the jaggery industries.

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