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A STUDY OF PEOPLE'S AWARENESS ON VARIOUS SUGARCANE PRODUCTS & ITS IMPACT ON THEIR CONSUMPTION PATTERN

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ABSTRACT

Sugarcane is a major commercial crop of India. It is being used in various forms including sugar, juice and sugar, apart from this it also has other uses which include ethanol, rum, bio-fuel, live-stock food. The main objective of this study is to create awareness among the public about various products of sugarcane. Or we also need to know which are the factors that determine consumers in purchasing various sugarcane products. Through a combination of a questionnaire, surveys and data analysis, we found out the awareness level of the respondents about various sugarcane products. At the same time, we have also focused on factors that influence consumers' purchasing decisions. These factors include purity, freshness, smoothness, health, price, factors nutritional value, traditional factors, taste etc. With the help of this study, we will be able to have a better understanding of the purchasing decisions of consumers regarding various sugarcane products.

Keywords: sugarcane, consumers, sugarcane products, commercial crop, awareness.

INTRODUCTION

Sugarcane is one of the most important cash crop of India. It is these second largest industry in India followed by cotton textile industry. "Cotton textile industry contribute 2.3% to the country's GDP and Sugarcane industry contribute 1.1% to GDP" **(Solomon 2016)**.

In India Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Odhisa, Gujarat, Bihar, Haryana, Goa and Punjab are sugarcane producing states where Uttar Pradesh, Maharashtra and Karnataka are at First, Second and Third place respectively.

Table 1: Top 10 Sugarcane producing states in India

States	Production (in Tonnes)	(%)
U.P.	177.43	45.89%
Maharashtra	113.37	79.18%
Karnataka	56.45	36.24%
Tamil Nadu	14.53	16.04%
Bihar	13.97	14.26%
Gujarat	17.44	12.55%
Haryana	8.75	8.52%
Punjab	7.51	7.55%
Andhra Pradesh	3.65	6.91%
Uttarakhand	3.52	6.6%

Source: https://sugarcane.dac.gov.in

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These 3 states together produces around 80% of the sugarcane in India. In these 3 states Uttar Pradesh as known as the "Sugar Bowl of India". According to sugar industry & cane development department – "The total sugarcane area of the state is 28.53 lakhs hectares and sugarcane productivity is 839 quintals per hectare which is 16 quintal per hectare more than previous year". **(upcane.gov.in)**

Different Uses of Sugarcane:

Sugarcane has different uses or we can say there are various products of sugarcane which can be produce through sugarcane. Today various products of sugarcane like- Sugar, Jaggery, Baggase, Molasses, Tableware Fabrics - lyocell, viscose, modal etc. are manufactured by sugarcane. These products like Tableware, fabrics are eco-friendly.

1. **Sugar –** Sugar is primarily made from sugarcane. India is the largest sugar producing country in the world followed by Brazil, Thailand, China, United States of America, Russia, Mexico, France, Pakistan and Australia.

Table 2: The countries with the highest sugar production are: -

Countries	India	Brazil	Thailand	China	U.S. A.	Russia	Mexico	France	Pakistan	Australia
Sugar Production (Tonnes)	34300000	27732026	14866800	11760000	7374045	7309657	6710121	4897000	4881225	4516700

2. **Sugarcane Juice-**Sugarcane juice is obtained after crushing sugarcane. It is a main beverage during summers. People drink a lot of sugarcane juice these days. However, it contains a lot of sugar. "Sugarcane juice, which is extensively consumed in India, particularly during summers, is high in sugar and hence its consumption should be minimized". **(https://m.economictimes.com)**
3. **Jaggery-** It is a sweet solid food item made by drying sugarcane juice. It is used in both rural and urban areas in India. In rural areas jaggery is used in place of sugar. Jaggery is a good source of iron and anemia patients are advised to use jaggery. The industry of making jaggery has been prevalent for a long time. In India wherever sugarcane is cultivated, jaggery is prepared there. Asia's largest jaggery market is in Muzaffarnagar district of Uttar Pradesh and the second largest market is in Vishakhapatnam Andhra Pradesh.
4. **Bagasse-** The dry part that remains after crushing the sugarcane and extracting the juice is called bagasse. Bagasse was not used widely but today bagasse is used as Biofuel in the manufacturing of building materials and in making paper are cardboard. Different packaging material, cutlery items are also made by bagasse are eco-friendly and harmless for environment.
5. **Molasses-** Molasses it is made by crystallizing sugar made from sugarcane juice. In the sugar production, the sugar juice is boiled several times, which results in different types of molasses being produced. On boiling the sugar syrup for the first time, light coloured molasses are obtained and on boiling it for the second time, dark coloured molasses are obtained which taste sweet but when the sugar syrup is boiled for the third time, a thick coloured and bland tasting molasses is obtained which is called backstrap. Molasses is used to make syrup for pancakes, baking items and rum.

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6. **Sugarcane Tableware**- In the last few years, the use of plastic tableware has decreased. Instead attention is being paid to alternatives that are environmentally friendly, such as products made from sugarcane bagasse. Being made from sugarcane waste, this table ware does not harm the environment and its demand in market is also increasing. "The Indian Sugarcane bagasse bio- de- gradable disposable tableware market has witnessed substantial growth in from USD 161.37 million in 2021to USD 365.21 million by2030 at a CAGR of9.5 % during the forecast period of 2022-2030".**(MITCOIN)**
7. **Sugar Cane Fiber**– The textile industry is a transformative industry. Various raw materials are used to make fabric. One of those material is sugarcane. Sugarcane bagasse is used in the textile industry to make Rayon fibres such as Viscose, Modal and Lyocell.

REVIEW OF LITERATURE

a. ***Dataniya et al., (2016)*** identified in their studies Sugarcane industries produces significant amount of by products as waste and management of these by products are huge task, because those require lot of space and storage. These by-products help farmers to enhance nutrient availability to plants and crops. These wastes / by products are also use as fertilizers for crop production.

b. ***Chakraborty and SahuPriya (2020)*** stated in their study if we use sugarcane by –products it could be helpful in enhance farmer's income and also help in generate other opportunities. By- products of sugar cane like ethanol, pressmud, bagasse could be used as biofuel, paper, animal feed etc. Ethanol can be used as biofuel which can help to reduce environmental pollution.

c. ***Raneand Takker (2023)*** found due to wide spread consumption of plastic, the environment is becoming highly populated. To deal with this problem agricultural waste can be used in place of plastic. The objective of this study was to explore the potential of bagasse and paddy straw for manufacturing cheap and sustainable tableware products. India's sugarcane bagasse bio-de-gradable disposable tableware market was 161.37 million USD in 2021, which is estimated to reach 359.84 million USD by 2030. The main factors driving the demand growth in the market are the ill effects caused by plastic and the government reducing the use of single use plastic.

d. ***Arunand Premkumar (2022)*** discussed sugarcane growth in India and changes in time trend of harvested area. They found that most of the states, nominally increased production of sugarcane but at the world's level it was lesser then world production of sugarcane. They suggested for improved sugarcane productivity, sustainable agro- techniques, climate resilient varieties bio-intensive module are needed to be developed.

e. ***Almazan et al.,*** showed the synopsis of the assessment of diversification strategies of the sugar industry. According to them a special attention given to the diversification of uses of sugarcane for increasing the efficient uses of sugarcane. Bagasse obtained as a by-product of sugarcane processing. Bagasse is as used as fuel in mills and for making paperboard, animal feed, thus saving all in mills and also reducing cutting of trees.

f. ***Singh et al., (2021)*** stated in their study the recent developments in converting sugarcane waste into unable products through modern technology, thereby generating income, improving product quality, reducing waste and meeting the product requirements in the market. For the last few decades sugar mills which used to manufacture only sugar have now converted their mills into biorefinery. Through these bio-refineries they are producing different by products such as bagasse, molasses disposable plates, cane trash, filter mud etc. from sugarcane waste.

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g. ***Singh and Katyar (2015)*** stated if various products of sugarcane are used on a large scale, then it will not only benefit the farmers producing sugarcane but will also have an impact on the economy of the nation. Press mud obtained from sugarcane waste is used to protect the properties of plants and soil. Bagasse is used to make bio-de-gradable plastic, ethanol obtained from sugarcane is used as green fuel the damaged caused to the environment can be prevented.

h. ***Mohan and Agarwal (2021)*** identified sugarcane is the main cash crop of India while producing sugar from sugarcane, sugar mills also get a lot of waste products like bagasse, molasses filter cake, boiler ash etc. These materials can also be used by adding value to them. These materials can be used through innovation so that one does not have to depend only on the income obtained through sugar. It also help to boost economic condition.

i. ***Othman and Azmi*** highlighted due to the increasing use of paper, forest are being cut down rapidly, which is the biggest reason for deforestation. Due to the increase in demand for wood, the cost of timber has also increased significantly, due to which non- wood plant fiber are being used by developed countries for the production of paper. Considering the increasing demand in the market as well as the impact on the environment non-wood plants are being used bagasse obtained from sugarcane is a better solution for non-wood plants to prevent deforestation.

OBJECTIVES OF THE STUDY

The research objective of the study is to know people's knowledge and perception about various sugarcane product.

1. To know about the awareness and perception of people about various sugarcane products.
2. To study about people consumption pattern of various sugarcane product.

RESEARCH METHODOLOGY

Research methodology is a systematic way of studying the research problem. The research methodology for this study is as follows:

Area of the Study: Muzaffarnagar City was selected as area of study. The reason for choosing this city is the abundance of sugarcane in this area.

Nature of the Study: This study is a descriptive and analytical in nature.

Sources of Data: The study is mainly based on primary data.

Sampling Technique: Random sampling technique is used to choose the sample from the population.

Tools and Technique: Correlation has been used to find out the relationship between consumer's level of awareness and their perception about various sugarcane products and also chi square test was used to find out the association between variables.

DATA ANALYSIS AND INTERPRETATION

Table-3: Gender respondent

	Frequency	Percent	Cumulative Percent
male	32	64.0	64.0
female	18	36.0	100.0
Total	50	100.0	

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Gender wise distribution of the respondents: As show from Table-3 that out of total sample of the study majority of the sample is male i.e.32 and 18 are female respondents.

Graph1

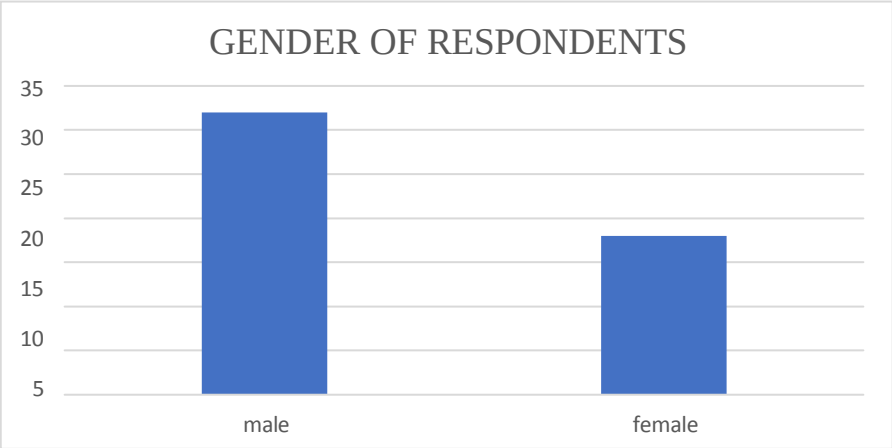

Chart1

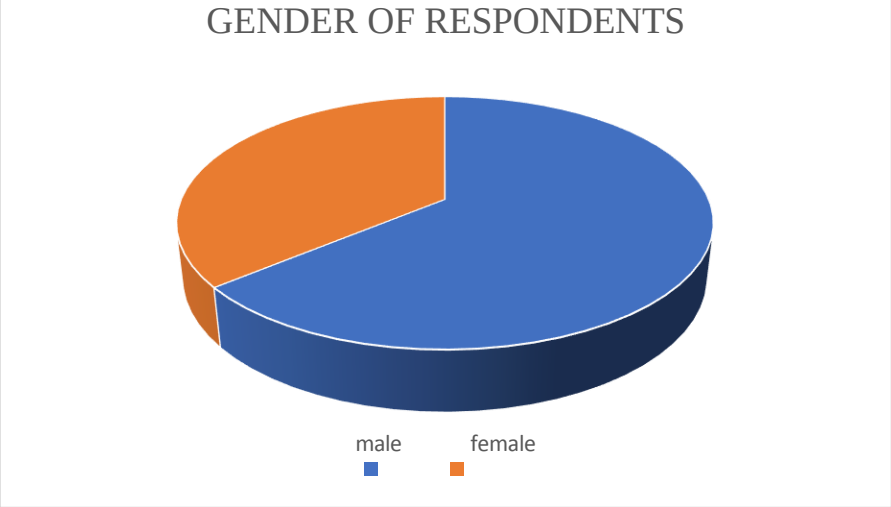

Table-4: Age of respondents

	Frequency	Percent	Cumulative Percent
below 18	7	14.0	14.0
18-30	23	46.0	60.0
31-40	14	28.0	88.0
41-50	3	6.0	94.0
above 50	3	6.0	100.0
Total	50	100.0	

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Age wise distribution of the respondents: Table -4shows that majority of the respondents from total sample are in the age groupof18-30 years i.e. 23, 14respondents are 31-40years age group,7 respondents are below 18, 3 respondents are 41-50 years, and 3 respondents are above 50 years.

Graph-2

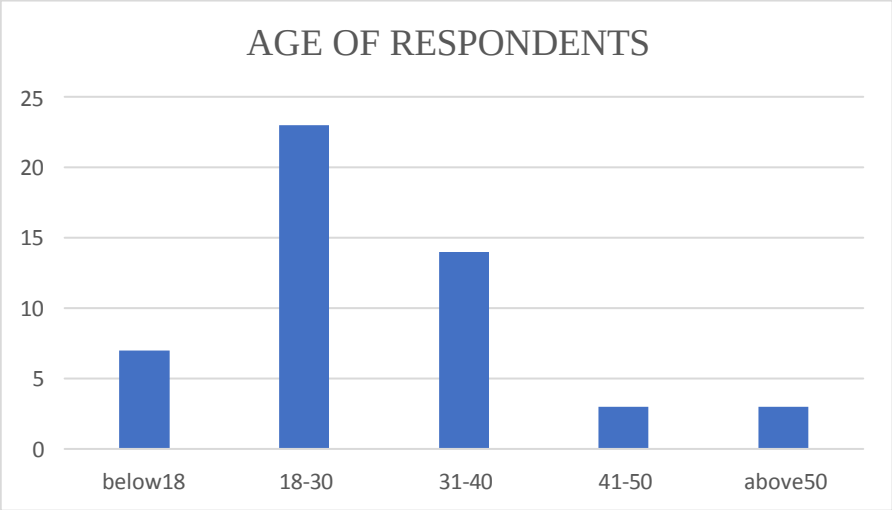

Chart-2

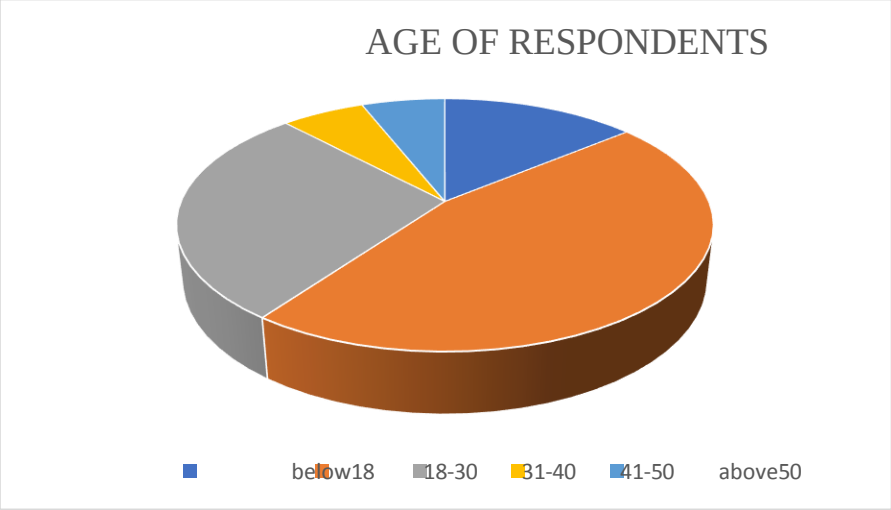

Table-5: educational qualification of respondents

	Frequency		Percent	umulative Percent
	Illiterate	1	2.0	2.0
	Up to high school	3	6.0	8.0
	Intermediate	10	20.0	28.0
	Graduation	22	44.0	72.0
	Post graduation	14	28.0	100.0
	Total	50	100.0	

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Educational Qualification wise distribution of respondents: It is observed fromTable-5 that out of 50 respondents 1 respondent is illiterate, 3 respondents have studied up to high school, 10 respondents have completed intermediate, 22 respondents have completed graduation, 14 respondents have completed their post graduation.

Graph-3

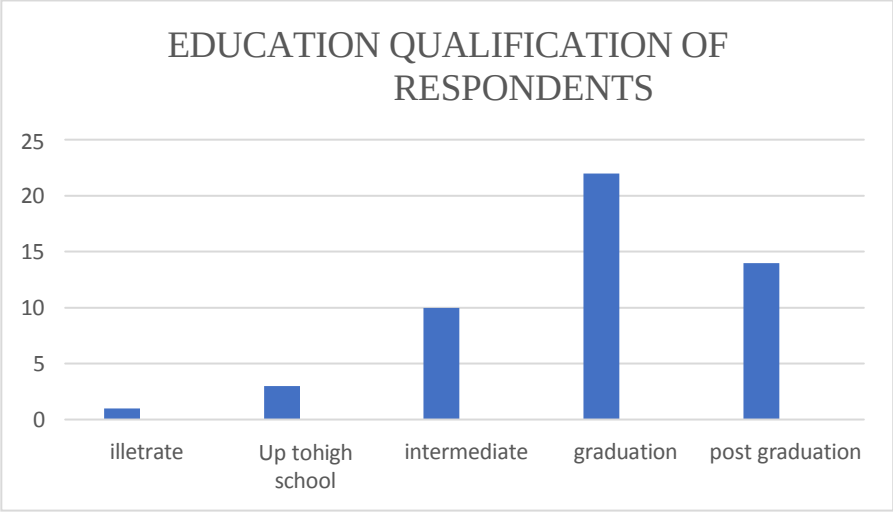

Chart-3

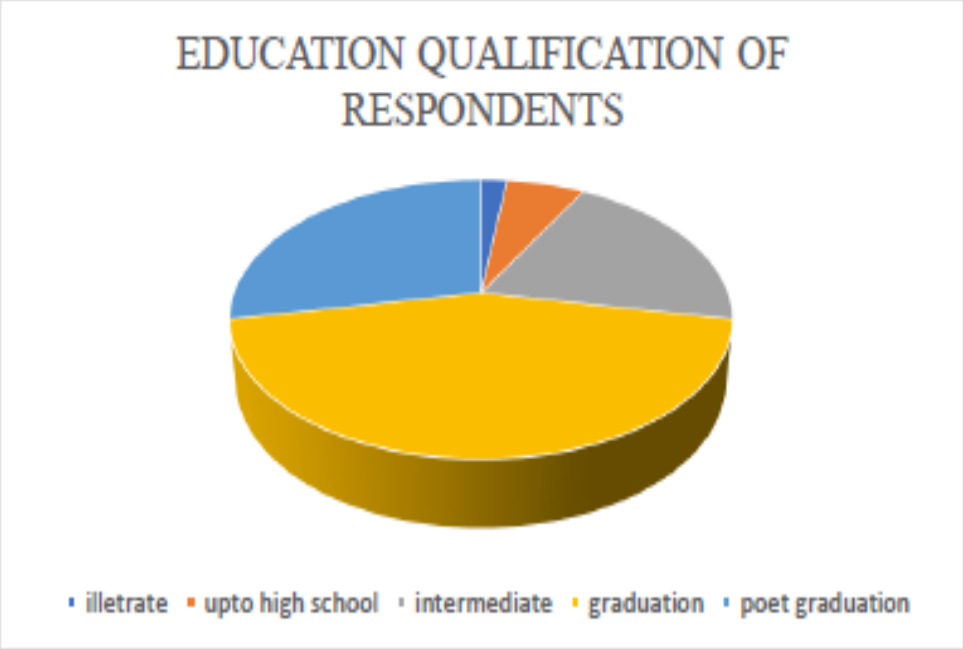

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Table-6: occupation of respondents

	Frequency		Percent	Cumulative Percent
	student	12	24.0	24.0
	self-employed	9	18.0	42.0
	salaried	19	38.0	80.0
	unemployed	7	14.0	94.0
	Farmer	3	6.0	100.0
	Total	50	100.0	

Occupation wise distribution of respondents: Table 6 shows that out of total 50 samples, 19 respondents are salaried, 12 respondents are students, 9 respondents are self-employed, 7 respondents are unemployed and 3 respondents are farmers.

Graph-4

Chart-4

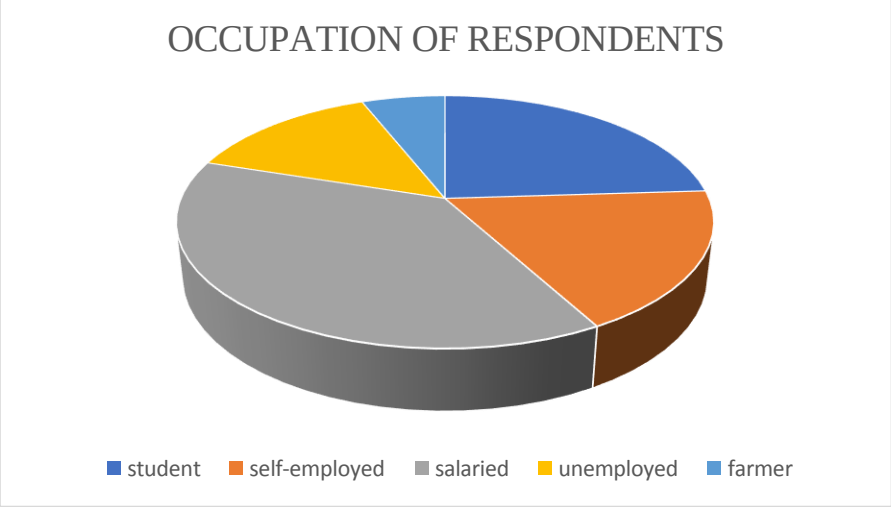

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Table-7: income of respondents

	Frequency	Percent	Cumulative Percent
lessthan15000	27	54.0	54.0
15000-30000	15	30.0	84.0
30000-45000	6	12.0	96.0
above45000	2	4.0	100.0
Total	50	100.0	

Income wise distribution of respondents: The study revealed that out of a total of 50 respondents, 27 have an income less than Rs.15000, 15 respondents whose income is between Rs.15000 and Rs.30000, 6 respondents whose income is between Rs.30000 and Rs.45000, 2 respondents have an income above 45000Rs.

Graph-5

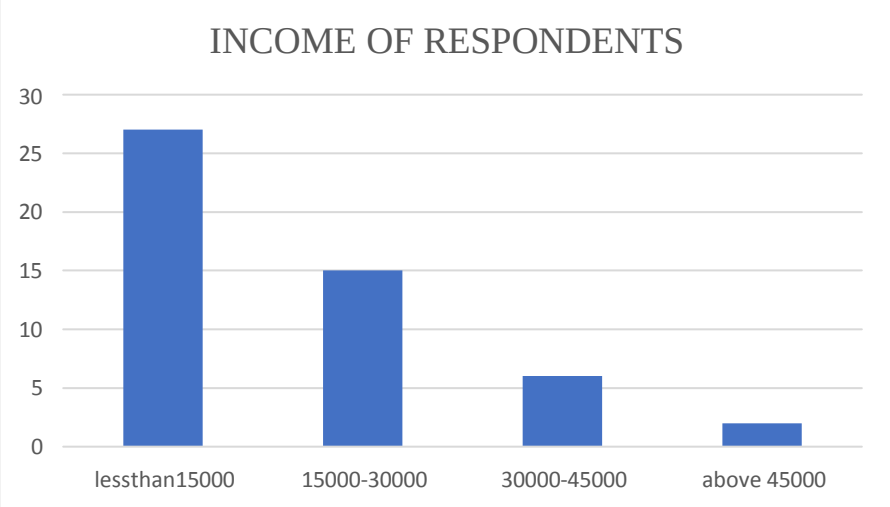

Chart-5

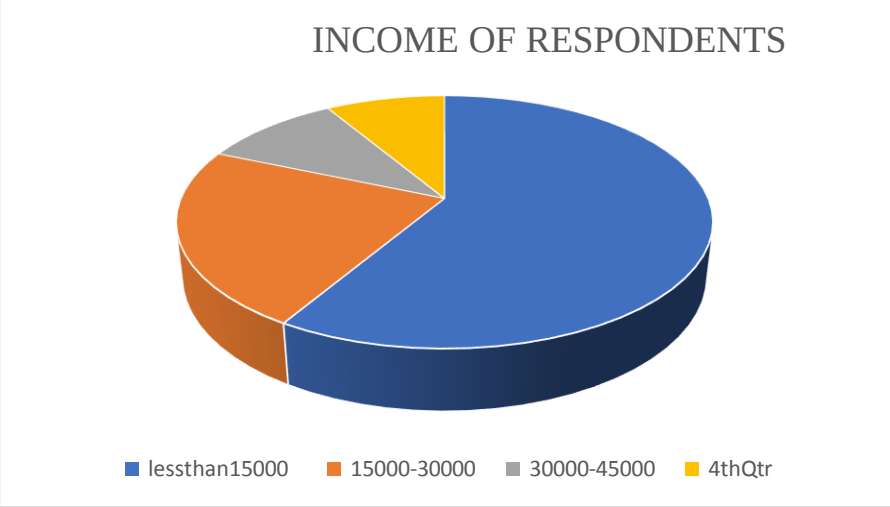

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Table 8: marital status of respondents

	Frequency		Percent	Cumulative Percent
	married	27	54.0	54.0
	unmarried	23	46.0	100.0
	Total	50	100.0	

Marital Status wise distribution of respondents: It is observed from above Table that out of total sample of the study majority of the sample is marriedi.e.27 and 23are unmarried respondents.

Graph-6

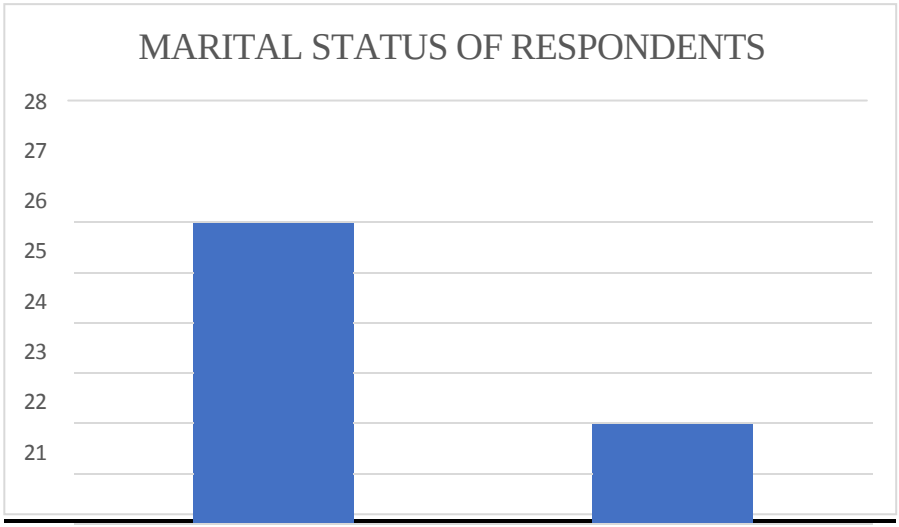

Chart-6

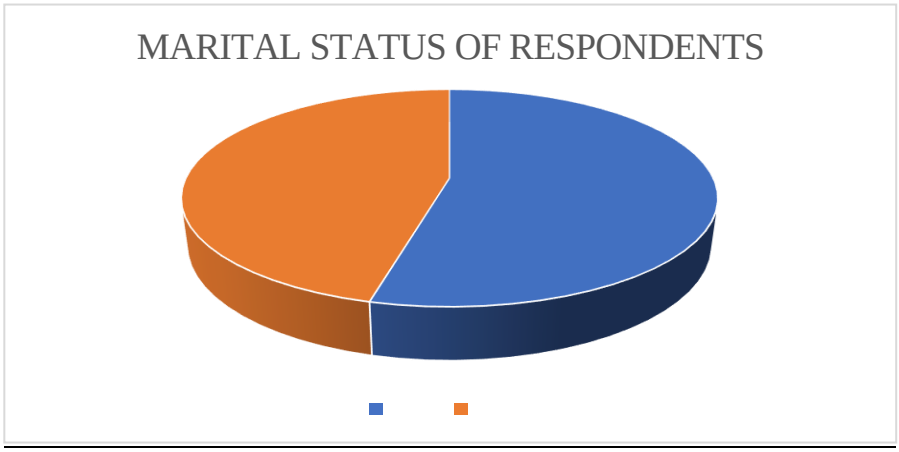

Table-9: awareness of sugarcane products

	Frequency	Percent	Cumulative Percent
yes	50	100.0	100.0

Awareness of Consumer regarding the Sugarcane Products

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Sugarcane is a special cash crop of India. Today it is not being used only for making sugar, juice and jaggery, but today it is also being used for making other products. As a result, the frequency table that follows the answers respondent's awareness of various sugarcane products on Yes/No basis.

Chart-7

Null Hypothesis: There is no significant relationship between awareness and perception of people about various sugarcane products.

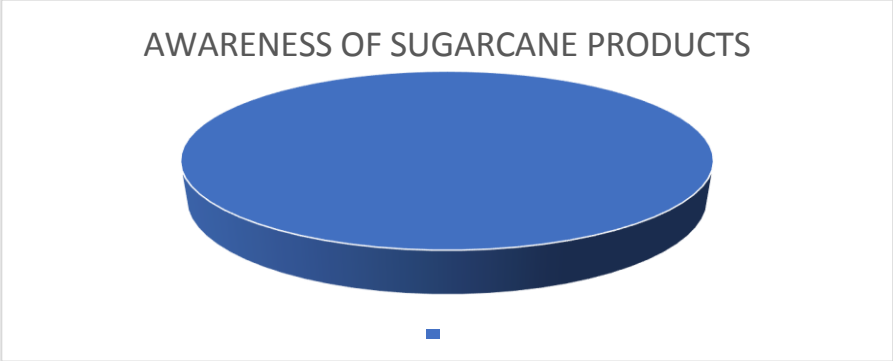

Table-10: Correlation between awareness and perception of people about various sugarcane products

		awareness of sugarcane product	purity	freshness
awareness of sugarcane product	Pearson Correlation	.[a]	.[a]	.[a]
	Sig. (2-tailed)		.	.
	N	50	50	50
purity	Pearson Correlation	.[a]	1	.469
	Sig. (2-tailed)	.		<.001
	N	50	50	50
freshness	Pearson Correlation	.[a]	.269	1
	Sig. (2-tailed)	.	.059	
	N	50	50	50
smoothness	Pearson Correlation	.[a]	.155	.153
	Sig. (2-tailed)	.	.283	.288
	N	50	50	50
taste	Pearson Correlation	.[a]	.425**	.293*
	Sig. (2-tailed)	.	.002	.039
	N	50	50	50
nutritiional value	Pearson Correlation	.[a]	.303*	.489
	Sig. (2-tailed)	.	.032	<.001
	N	50	50	50
price	Pearson Correlation	.[a]	.324*	.139
	Sig. (2-tailed)	.	.022	.336
	N	50	50	50
availablity	Pearson Correlation	.[a]	.082	.210
	Sig. (2-tailed)	.	.573	.144
	N	50	50	50
health benefits	Pearson Correlation	.[a]	.106	.500*
	Sig. (2-tailed)	.	.463	<.001
	N	50	50	50
environmental impact	Pearson Correlation	.[a]	.139	.507**
	Sig. (2-tailed)	.	.335	<.001
	N	50	50	50
cultural / traditional significance	Pearson Correlation	.[a]	.074	.284*
	Sig. (2-tailed)	.	.612	.046
	N	50	50	50
overall satisfication	Pearson Correlation	.[a]	.265	.392**
	Sig. (2-tailed)	.	.063	.005
	N	50	50	50

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A significant positive relation was found between awareness and perception of people about various products, purity (r=.469 and p=<.001), nutritional value (r=.489, p=<.001), health benefits (r=.500p=

<.001), environmental impact (r=.507p=<.001) indicating a very strong relationship between the two variables.

purity		freshness	smoothness	taste	price	availability	Health benefits
Chi-Square	18.800[a]	10.320[a]	23.440[a]	37.400[b]	11.920[a]	42.600[b]	36.200[b]
df	3	3	3	4	3	4	4
Asymp.Sig.	<.001	.016	<.001	<.001	.008	<.001	<.001

	Environmental impact	cultural / traditional significance	Overall satisfaction	Used sugarcane based biofuel	used bagasse based packing material
Chi-Square	18.400[b]	15.120[a]	16.080[a]	88.360[c]	53.520[a]
df	4	3	3	2	3
Asymp. Sig.	.001	.002	.001	<.001	<.001

	Used sugarcane waste based tableware products	nutritional value	prefer sugarcane products over alternative products	consume for health benefits	Importance the taste of sugarcane products
Chi-Square	6.760[c]	9.000[b]	51.800[b]	64.800[b]	30.480[a]
df	2	4	4	4	3
Asymp. Sig.	.034	.061	<.001	<.001	<.001

The study has shown that consumers mainly pay attention to these factors while purchasing various sugarcane products: Purity, Smoothness, Taste, Availability, Health benefits, Environmental impact, Overall satisfaction. These factors influence their decision to buy sugarcane products.

CONCLUSION

This study demonstrates a significant correlation between consumers' awareness of different sugarcane products and their awareness of various sugarcane products. The findings indicate a strong positive link between the different sugarcane products and the customers of those items. Agricultural techniques that are sustainable will follow from these findings. The primary data for this investigation were obtained. But this research was done in a particular location. In the future, this research can be conducted in additional fields.

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