International Journal of Innovative Research in Engineering & Management (IJIREM)
ISSN: 2350-0557, Volume-8, Issue-6, November 2021
https://doi.org/10.55524/ijirem.2021.8.6.120
www.ijirem.org

A Survey on Different Uses of Sugarcane in Different States of India

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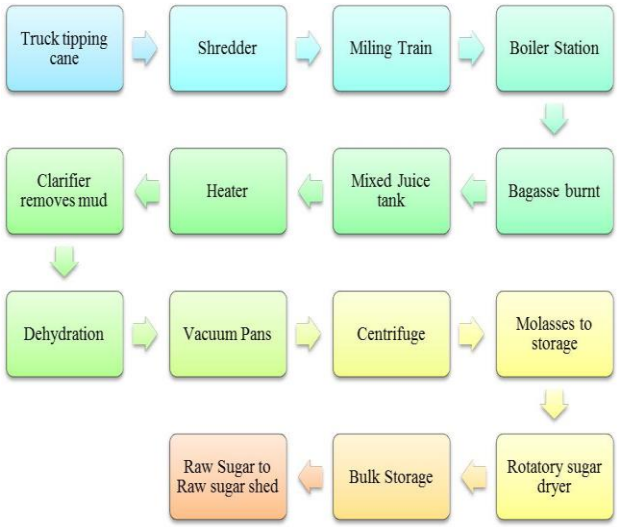
ABSTRACT
Sugarcane is a perennial grass that is planted in various regions of the country. Each state has a unique Sugarcane need, and each state requires a comparatively large quantity of Sugarcane for that particular industrial application. However, it is a question of study to determine which state in India requires more sugarcane for a certain industrial requirement. It will be easier to enhance crop output according to the industrial demand in that state by evaluating the relative demand of sugarcane for industrial production of certain items. Thus, the current study sheds light on the demand for sugarcane for various purposes in the states of Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu, and it pave the way for future research into the relationship between different varieties of cereals and pulses and average consumption of that variety in a given state.

Keywords
Alcohol, Bio-Plastic, Cane, Fertilizer, Skin Care.

1. INTRODUCTION
Cane sugar is made from a variety of species and hybrids of large perennial grasses belonging to the Andropogoneae tribe, genus Saccharum, which are used to make sugar. The plant grows to a height of 6 to 20 feet (2-6 metres), with a thick, fibrous stalk that is sucrose-rich and accumulates in the internodes of the stalk. Sugarcane is a flowering plant that belongs to the Poaceae family, which also includes wheat, maize, sorghum, rice, and numerous other species. It is found in India's tropical region with high temperatures, as well as New Guinea and Southeast Asia. Sugarcane is widely farmed across the world; in 2017, Brazil produced 1.8 billion tonnes of sugarcane, accounting for 40% of total worldwide production. Sugarcane is farmed on 64 million acres (26 million hectares) in 90 countries or more, according to the FAO (Food and Agriculture Organization) [1].
Sugarcane species known as Saccharum officinarum and hybrids of the species account for 70% of all produced sugar in the world. Interbreeding of all sugarcane species is possible, and complex hybrids yield the most significant industrial breeders. Sugarcane accounts for 79 percent of produced sugar, with sugar beet accounting for the majority of the remaining sugarcane. Sugarcane is grown in subtropical and tropical climates, while sugar beet requires a cold temperate climate [2].
Table sugar, also known as sucrose, is extracted from sugarcane in specific mills and used as a raw ingredient in the food industry or fermented to make ethanol. Figure 1 depicts the process of converting sugarcane into raw sugar. Molasses, falernum, cachaca, bagasse, and rum are all products made from sugarcane. Sugarcane reed is utilised by the inhabitants in a few locations to make mats, pens, thatch, and screens. The shrunken juvenile head of flower Saccharum edule (duruka) is edible in its unripe form, roasted or steamed, and prepared in a variety of ways throughout Asia's Southeast region, notably in Fiji and the Indonesian island communities [3].

Figure 1: Shows the process of synthesis of raw sugar from sugarcane



1.1. Skin Care
Because of the gritty texture used to create it, refined sugarcane is a common ingredient in exfoliating products and body scrubs effective for washing off dead skin cells. Sugarcane is combined with other ingredients and lemon juice to create an organic wax that is used to naturally eliminate body hair [4].

1.2. Alcohol
Molasses, a byproduct of sugarcane processing, is a key ingredient in the alcoholic beverage rum. Sugarcane was first utilized to make rum in the West Indies in the 17th century. Molasses may also be used to produce a pure form of alcohol [5].

1.3. Bio-Plastics
Traditional plastics are not biodegradable, but with the progress of technology in recent years, scientists have developed bio-plastics that are "compostable," utilizing sugarcane as a key raw ingredient [6].

1.4. Tobacco
Tobacco is frequently sweetened with pure sugar or molasses, which produces a sweet flavour when smoked with a hookah. Hookah tobacco, often known as "shisha," comes in a variety of flavors, including fruit flavors.

1.5. Cane Ethanol

A bio-fuel gasoline that is beneficial to the environment is comparable to ethanol made from sugarcane. Sugarcane is a more dependable, renewable resource than traditional gasoline since it is manufactured at a fast pace with less environmental impact.

1.6. Fertilizers

Lime may be used to make organic fertilizers when combined with other ingredients such as sugarcane. The use of sugarcane fertilizer helps to improve soil quality, which improves the food quality of the raw material cultivated in the soil.

2. LITERATURE REVIEW

B.A. Keating et al. did the research on 35 different treatments or crops to see how well the model worked. The prime angle growth of the crop was investigated using model work that included the time-course of LAI, stalk mass, green mass, N absorption, and stalk sugar in the biomass, millable stalk, and leaf. LAI, which was chosen as an accurate variable in the research, has a significant impact on biomass segregation and ray interception. Stalk mass and stalk sugar are cultivatable and cost-effective sugarcane products, and hence are of primary importance in model performance analysis. Because of the area of crop that contains N that is carried at harvest from the field, the nitrogen absorption of millable stalks was investigated. Nitrogen in the leaf N is an important aspect of the shoot's physiological functioning. As a result, both leaf N and millable stalk N are important components of the crop's nitrogen cycle [7].

M.L Dotania performed research on the sugarcane industry, which is a typical industrial use in India that produces a significant amount of waste residue. The management and control of these leftovers is a major undertaking, since they need a large amount of storage and space. However, it provides an opportunity to employ such residues in crop production and farm manufacturing as an organic nutrition source. As a result, efforts are undertaken to determine the influence of sugar residue industries, their availability, and their use in agricultural output [8].

Preria S performed a research on energy consumption, natural resource consumption, and pollution effect as a measure of the severity of the manufacturing process. On the contrary, rising population and the demand for large quantities of safe, hygienic food prompted producers to increase their efficacy and energy. The research' goal is to look at the input energy in every hectare of sugarcane manufacture in Iran's planted system and ratooning. It has been concluded that decreasing mechanical effort by using no tillage or zero tillage systems, modern irrigation systems, and renewable energy sources will increase energy efficiency and minimise GHG emissions [9].

S.Solomon discussed that sugarcane is the most efficient energy converter, converting solar energy into sugar and biomass. Effective biochemical, microbiological, and chemical methods may convert the biomass that contains lignin, fibre, pentosans, and pith into useful products. Molasses, press mud, and bagasse are all high-cost byproducts of the sugarcane processing. Aside from the prime residues, there are several additional sugarcane residues that are of little commercial importance, such as fly ash, green tops, garbage, wasted wash, and wax. The Sugar-Agro-industrial Complex in India produces these leftovers in order to produce bio-generated energy, bioethanol, and a number of other goods [10].

Research Question:

- In Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu, what is the most frequent usage of sugarcane?

3. METHODOLOGY

3.1. Design

In wholesale markets in Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu, a questionnaire form is issued. The questionnaire form was sent to various wholesale grain dealers, and the forms filled out by various wholesale Sugarcane dealers were selected for further research, and a further study was done based on the data submitted by the wholesale dealers. The questionnaire form was given to wholesale dealers in several places throughout Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu, and the average result of the various sites within each state was taken as the result[11-15].

3.2. Data Collection

Use of sugarcane for different purposes such as Skincare, Alcohol, Bio-plastics, Cane Sugar, and Fertilizer in Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu according to the data collected by the survey shown in table 1.

Table 1: Shows the average demand of different regions for diverse purposes such as Skin Care, Alcohol, Bioplastics, Cane Sugar, and Fertilizer in Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu

State	Sugarcane's average requirement for skin care	Sugarcane requirement for alcohol production on average	Sugarcane Bioplastics Production's Average Demand	Sugarcane demand on average for cane production	Sugarcane demand for fertilizer production on average
U.P.	5 %	47%	12%	15%	21%
Gujrat	8%	39%	12%	16%	25%
Maharashtra	5%	46%	10%	17%	22%
T.N.	8%	48%	12%	10%	22%

3.3. Data Analysis

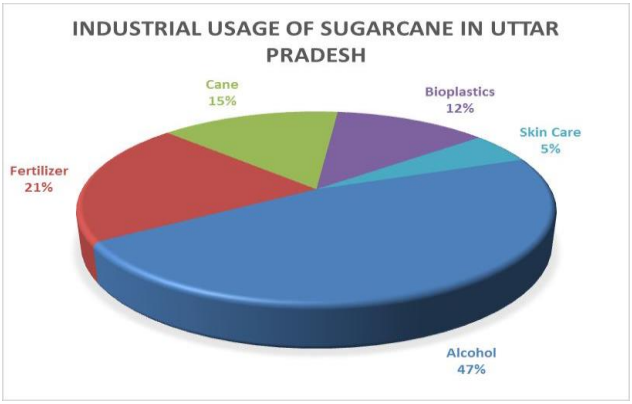


Figure 2: Shows use of sugarcane cultivated in manufacturing alcohol, fertilizer, cane, bioplastics, skin care in Uttar Pradesh

Figures 2, 3, 4, and 5 depict the usage of sugarcane in Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu for the production of alcohol, fertilizer, cane, bioplastics, and skin care.

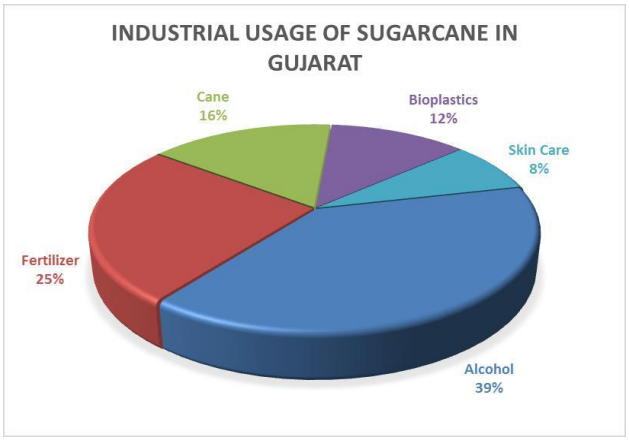


Figure 3: Shows use of sugarcane cultivated in manufacturing alcohol, fertilizer, cane, bioplastics, skin care in Gujarat

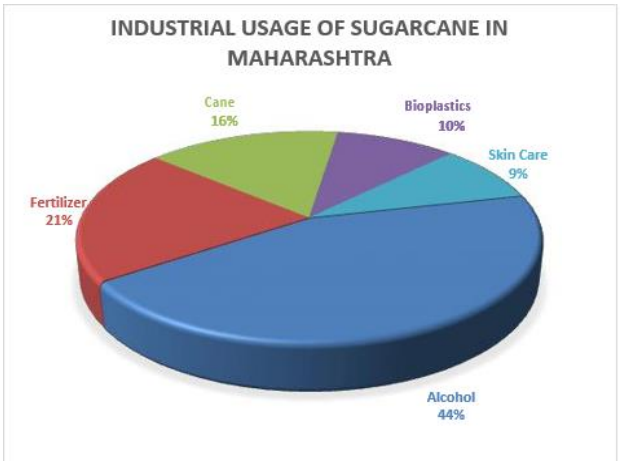


Figure 4: Shows use of sugarcane cultivated in manufacturing alcohol, fertilizer, cane, bioplastics, and skin care in Maharashtra

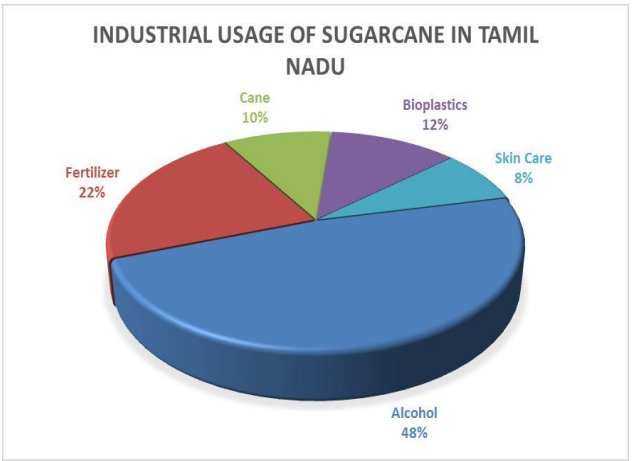


Figure 5: Shows use of sugarcane cultivated in manufacturing alcohol, fertilizer, cane, bioplastics, and skin care in Tamil Nadu

2. RESULT AND DISCUSSION

Sugarcanes are part of the Poaceae family of grasses, which includes rice, maize, a variety of forage plants, wheat, and sorghum. Sugarcane is grown in high-temperature tropical parts

of India, including New Guinea and Southeast Asia. In 2017, 1.8 billion tonnes of sugarcane were produced worldwide, with Brazil accounting for 40% of the total. The findings of a research done to determine the typical utilisation of sugarcane in several states for various purposes such as skin care, alcohol, bioplastics, cane, and fertiliser. In Uttar Pradesh, the average demand for sugarcane for skin care was 5%, and in Gujarat, it was 8%. 5 percent in Maharashtra, 37% in Karnataka, and 8% in Tamil Nadu. Uttar Pradesh had a 47 percent demand for alcohol production, Gujarat had a 39 percent demand, Maharashtra had a 46 percent demand, and Tamil Nadu had a 48 percent demand. In Uttar Pradesh, 12 percent of sugarcane was used to make bioplastics, while 12 percent was used in Gujarat, 10 percent in Maharashtra, and 12 percent in Tamil Nadu. Sugarcane demand for cane output was 15% in Uttar Pradesh, 16 percent in Gujarat, 17 percent in Maharashtra, and 10% in Tamil Nadu on average. Sugarcane was used 21 percent in Uttar Pradesh, 25 percent in Gujarat, 22 percent in Maharashtra, and 22 percent in Tamil Nadu for fertiliser production. Across 70% of the sugar produced around the world comes from the sugarcane species Saccharum officinarum and its hybrids. Sugarcane species may interbreed, and complex hybrids are the most significant industrial breeders. Seventy-nine percent of all sugar produced comes from sugar beet, with the remainder sugar coming from sugar cane. Sugarcane can be grown in subtropical and tropical climates, whereas sugar beets may be grown in colder temperate climates. Table 2: According to the survey's data, the average demand for various products like as skin care, alcohol, bioplastics, cane sugar, and fertiliser in Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu is as follows[16-20].

3. CONCLUSION

The findings of a research done to determine the typical utilisation of sugarcane in several states for various purposes such as skin care, alcohol, bioplastics, cane, and fertiliser. Sugarcane for Skin Care was in high demand in Uttar Pradesh, Gujarat, Maharashtra, and Tamil Nadu, with 5 percent in Uttar Pradesh, 8 percent in Gujarat, 37 percent in Maharashtra, and 8 percent in Tamil Nadu. Uttar Pradesh had a 47 percent demand for alcohol production, Gujarat had a 39 percent demand, Maharashtra had a 46 percent demand, and Tamil Nadu had a 48 percent demand. In Uttar Pradesh, 12 percent of sugarcane was used to make bioplastics, while 12 percent was used in Gujarat, 10 percent in Maharashtra, and 12 percent in Tamil Nadu. Sugarcane demand for cane output was 15% in Uttar Pradesh, 16 percent in Gujarat, 17 percent in Maharashtra, and 10% in Tamil Nadu on average. Sugarcane was used 21 percent in Uttar Pradesh, 25 percent in Gujarat, 22 percent in Maharashtra, and 22 percent in Tamil Nadu for fertiliser production. Sugarcane is a member of the Poaceae grass family, which includes wheat, maize, sorghum, rice, and numerous other plants. It is native to New Guinea, with high temperatures in tropical India and Southeast Asia. Sugarcane cultivation in the world is quite high, with Brazil and China leading the way. Sugarcane is grown on 64 million acres (almost 26 million hectares) in more than 90 nations, according to the FAO (Food and Agriculture Organization)[21-25].

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