

PROSPECT AND CHALLENGES OF SUGARCANE AND JAGGERY PRODUCTION IN  
NAGALAND; A DESCRIPTIVE STUDY

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**Abstract**

*Jaggery is a natural product of sugarcane. It is more unrefined from than sugar. It is a brown row mass of sucrose which gets its color because of other elements found in concentration such as wood Ash and bagasse. Jaggery is commonly made from two products that are sugarcane and date palm tree. The process of making gur/jaggery is easier and more convenient than sugar, and healthier than consuming refined sugar.*

*The method of converting sugarcane and manufacturing of sugar, gur, are different but a great value is added in the manufacturing of these consumable final products. Further it offers employment opportunity to millions of people. Jaggery is prepared in almost all parts of the country where sugarcane is grown extensively. It is known by different names in different parts of the country like Gul, Gud, jaggery, vellum and Bella etc.*

*The sugarcane farmers of the state are unorganized and the jaggery production and marketing sector is still traditional one though there is a significant prospect of income generation of the sector. The paper has focused on present status of production of sugarcane and jaggery and their challenges through a descriptive study in Nagaland.*

**Keywords:** Gur, Bella, Molasses, Rashtriya Krishi Vikash Yojana

## INTRODUCTION:

Jaggery is known as the most nutritious agent among all sweeteners. The sector utilizes about 45 to 50 percent of the total sugarcane grown in the country and provides employment to about 2.5 million people. It is therefore imperative to expand this sector because it provides higher food value jaggery, it boosts up the rural economic system, the processing cost of jaggery is low and there is no need of highly technical machinery in production. These factories being located in the rural areas and provides huge economic support to rural livelihood. In addition with other agricultural practices the farmers and agricultural laborers may engaged in sugarcane farming, they also can support several activities like transport operators, agro-service agencies, input dealers, petty businessmen etc. Most of the factories are drawn from the surrounding areas of plantation. Thus sugar factories generate rural employment. Many sugar factories also promote education and cooperative movement in their areas of operation in our country.

In 2016, about 14.2% of the total sugarcane produced in India is being utilised for making jaggery and khandsari (a mixture of crystalline sugar and molasses). In India, Uttar Pradesh is the major producer of jaggery, followed by Tamil Nadu. The importance of jaggery has been recognised at the international level. Of the total world production, more than 60% of the jaggery is being produced in our country. As the major producer of jaggery, the country is recognised as one of the leading traders and exporters in the world.<sup>1</sup>

Sugarcane is the only raw materials for all the major sweeteners produced in the country. The total cane currently produced in the country is able to meet our requirements besides having potential for some exportable surplus of sugar. Sugarcane is harvested when it reaches maturity in the dry season and the harvest time can take from 2.5 months to 11 months in place to place. Harvesters (humans or machinery) chop down the stems and leave the roots to re grow for next season, collect the stems and send them to the Jaggery processing unit.

The sugar/jaggery industries are playing an important role in the national economy. Molasses, the chief by product, is the main raw materials for alcohol and thus for alcohol based industries in our country. Sugarcane bagasse the fibrous material left over after crushing is the chief source of power in the sugar mills. Excess bagasse is now being used as raw materials in the paper industry. It has been estimated that about 3500 MW power can be generated annually without extra fuel and investments much less than required for generating the same through thermal nutrients and could be an important source of organic matter, major and micronutrients. Sugarcane green tops are used as cattle feed. In urban areas sugarcane

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<sup>1</sup> <https://mofpi.nic.in/mediapr/enevsfeb4.html>

juice has great demand as a thirst quencher. In many of our festivals, sugarcane is an important item of worship. Performance of sugar industry in India is directly related to the sugarcane production.

### **Status of Jaggery Production in Nagaland:**

Jiggery production is a lucrative, unorganized and yet a very tedious business for many farmers in some parts of Nagaland. The demand of this delicious mouth-watering candied jiggery is high in towns and cities which are often not met.

Agricultural output value: sugar: sugarcane & Gur: Nagaland data was reported at 529.800 INR mn in 2011. This records an increase from previous number of 416.400 INR mn for 2010. Agricultural output value: sugar: sugarcane & Gur: data is update yearly, averaging 375.584 INR mn from Mar 2005 to 2011 with 7 observations. The data reached an all time high of 532.100 INR mn in 2009 and record low of 336,691 mn in 2005. Agriculture output value: sugar: sugarcane & Gur: Nagaland data remains active status in CEIF and in reported by Central Statistics office. The data is categorized under Global Database's India.<sup>2</sup>

Sugarcane cultivation is traditionally practiced by farmers in Nagaland although the sugar mill in the State has been defunct for many years. Now the farmers still continue to cultivate sugarcane in all the districts mainly for making molasses (Gur) to generate income as well as for other purposes. With this in mind in order to improve the economy and living standard of small and marginal cane growers the State Agricultural Department through the RKVY program is taking up various activities in order to increase the production and productivity of sugarcane in the state. The main area of focus will be multiplication and distribution of planting materials (cane sets) to increase area, demonstration technology, conducting varietal trails, farmers training etc. During 2015-16 an area about 1200 hectare is targeted to develop with an expected production of 48000 MT. This was stated in the Annual Administrative Report 2015-16 of Agricultural Department.<sup>3</sup>

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<sup>2</sup> <https://www.ceicdata.com/en/india/agriculture-output-value-20042005p-current-price-by-states-non-foodgrains-sugar-sugarcane-and-gur/agriculture-output-value-sugar-sugarcane--gur-nagaland>

<sup>3</sup> <https://morungexpress.com/sugarcane-cultivation-nagaland>

## Literature Review:

The resume of relevant literature of the present study has been reviewed to gain insight in to the scope and significance of the study to provide guidance in designing and conducting the study which would help to interpret the findings of the study. A handful literature closely related to the present study has been highlighted from the following ground.

**Nath A Dutta et al.** (2015) reported that Indian jaggery industry is the largest unorganized sector which has been one of the most ancient and important rural-based cottage industries in the country. The majority of the sugarcane growers are manufacturing jaggery with minimum capital investment which provides jobs to the unemployed rural people. The jaggery manufacturers are mostly small and marginal farmers relying on quick returns from jaggery. It is, therefore, essential to safeguard the sugarcane growers to earn more profit from their jaggery manufacturing unit by improving its qualities through value addition and packaging of jaggery and jaggery based products with modern technologies.<sup>4</sup>

**PM Formalisation of Micro Food Processing Enterprise Scheme** (E News letter) reported Sugar and jaggery (popularly known as gur) are well known as the most valued, traditional sweetener primarily obtained from sugarcane. The rising demand for sweeteners has brought focus on jaggery, an important cottage industry in economies of the nation for their implications on employment and income. As a traditional sweetener, jaggery is produced in small units using local machinery in rural areas. Jaggery is produced nearly in 25 countries with a total production of about 13 million tonnes per year. India is the largest producer of jaggery under an unorganised agro-processing sector, sharing 55% of the total world production, followed by Colombia (11%). In 2016, about 14.2% of the total sugarcane produced in India is being utilised for making jaggery and khandsari (a mixture of crystalline sugar and molasses). In India, Uttar Pradesh is the major producer of jaggery, followed by Tamil Nadu. The importance of jaggery has been recognised at the international level. Of the total world production, more than 60% of the jaggery is being produced in our country. As the major producer of jaggery, the country is recognised as one of the leading traders and exporters in the world.<sup>5</sup>

**Begum Mahima & Dhiman Deb Singha** (2016) in their research paper reported, In Assam sugarcane is grown mainly grown in sandy loam to clay loam soil under upland condition. Typical clay or sandy soil is not preferable for its cultivation. The crop performed well in medium to high fertile soil as the nutrient requirement of the crop is very high consequent upon its large biomass production. Sugarcane is grown

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<sup>4</sup> <https://www.longdom.org/open-access/review-on-recent-advances-in-value-addition-of-jaggery-based-products-2157-7110-1000440.pdf>

<sup>5</sup> <https://mofpi.nic.in/mediapr/enewsfeb4.html>

mainly in upland soil with good drainage facility. Poorly drained soil is not suitable for its cultivation. In the flood affected districts e.g., Lakhimpur, Dhemaji, Morigaon sugarcane is mainly grown in flood free uplands only. Now a day's in char areas (river bank) sugarcane is grown as autumn crop after recession of flood. The crop is mainly grown under rain fed condition. Often sugarcane planting has to be delayed till April/May due to high moisture stress in early period.<sup>6</sup>

**The Morung Express** on April 25 (2016) reported Ato (L) and Hekato Asumi (R) are sugarcane farmers in Zunheboto district, making a living through small scale production of jaggery. In 2016 alone, they have sent 400kg of jaggery to Wokha, amounting to Rs. 40,000 and 600kg to Zunheboto earning Rs. 60,000. Per year, the business has been fetching them a profit of Rs. 3-4 Lakh which helps support their family of five children, four of them in school. In 2013, Hekato won the Best Farmer Award for Zunheboto district from the Government of Nagaland. As a small trader often going to Jorhat, Hekato landed up buying a sugarcane processing unit, using it to produce and sell jaggery—"We got married and had no job. We had to find a way to survive," says Hekato. Ato, his wife, is from Peren district and they met through business related work. Later, the Department of Agriculture stepped in with seed money to help their business grow, even donating a bigger processing unit in April 2014. The couple is seen here with the same at their residence in Akuhaito village in Zunheboto district, Nagaland. Their jaggery is well known for its quality to traders and connoisseurs alike.<sup>7</sup>

### **Objectives of the Study:**

- To find out the production and productivity of sugarcane and jaggery in the state.
- To find out the challenges and prospect of jaggery production.
- To suggest policy implications.

### **Methodology:**

The present study is descriptive and based on observation and secondary sources.

### **Result and Discussion:**

Sugarcane and sugar play significant role in economy of India, trade and livelihood. Sugar is country's second largest agro-based industry, next to cotton. Sugarcane and sugar industry together impact the

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<sup>6</sup> Begum Mahima & Dhiman Deb Singha: *Trends of Sugarcane and Jaggery production in Assam and Association Problem and Prospect (eds)* SSRG International Journal of Agriculture and Environmental Science (SSRG-IJAES) Vol-3, Issue Nov-Dec 2016

<sup>7</sup> The Morung Express on April 25 2016

livelihood of over 5 crore farmers and their dependents involved in cultivating sugarcane in an area of almost 50 lakh hectares. India is the largest consumer and the second-largest producer of sugar in the world. Average annual production of sugarcane is around 35.5 crore tonnes which is used to produce around 3 crore tonnes of sugar. The domestic consumption is estimated to be around 2.6 crore tonnes in the current financial year (2019-20).<sup>8</sup>

**Table 1.01 State wise Production of Sugarcane in the Country in 2015-16 to 2020-21**

States	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Average Production & Rank ( )	Average Productivity & Rank ( )
Uttar Pradesh	145.39	140.17	177.03	179.71	179.54	177.67	164.37 (1)	74.66 (8)
Maharashtra	73.68	52.26	82.98	89.77	69.31	101.59	73.60 (2)	81.53 (4)
Karnataka	37.83	27.38	31.14	42.41	38.18	42.09	35.39 (3)	83.22 (3)
Tamilnadu	25.49	18.99	17.15	17.14	14.12	12.80	18.58 (4)	99.70 (1)
Bihar	12.65	13.04	13.83	20.12	13.58	10.71	14.64 (5)	63.01 (12)
Gujrat	11.12	11.95	12.07	11.33	11.57	15.85	11.61 (6)	70.59 (10)
Haryana	6.99	8.22	9.63	8.51	7.73	8.53	8.16 (7)	79.12 (6)
Andhara Pradesh	9.35	7.83	7.80	8.09	6.72	4.12	7.96 (8)	77.78 (7)
Punjab	6.61	7.15	8.02	7.77	7.30	7.49	7.37 (9)	80.06 (5)
Uttarakhand	5.89	6.48	6.27	6.33	6.94	6.96	6.38 (10)	69.01 (11)
Madhaya Pradesh	5.28	4.73	5.43	5.28	7.43	5.88	5.63 (11)	53.29 (13)
Telangana	2.41	2.06	2.60	3.18	2.01	1.36	2.45 (12)	74.24 (9)
West Bengal	2.08	1.55	1.13	1.34	1.53	1.56	1.52 (13)	86.44 (2)
Others	3.99	4.26	4.82	4.45	4.53	2.64	4.41	46.14
All India	348.45	306.07	379.90	405.42	370.50	399.25	362.07	76.00

**Source:** E&S. DAC, New Delhi, 4<sup>th</sup> Adv. Est.-2020-21 (Production Million tonnes, Productivity tonnes per hectare)

Table 1.01 shows leading sugarcane producing states of the country. The highest average production in period 2015-16 to 2020-21 is from Uttar Pradesh of 168.37 million tonnes. The average productivity in the same period is 7466 quintal per hectare. The average production of West Bengal is 1.52 million tonnes with average productivity per hectare is 8644 quintal in 2015-16 to 2020-2021.

Table 1.01 reveals that Tamilnadu is the state of highest average sugarcane productivity of 9970 quintal per hectare and Madhaya Pradesh is the least with average productivity 5329 quintal per hectare in 2015-16 to 2020-21.

**Table 1.02: Production and Productivity of Sugarcane in Nagaland**

States	2017-18			2019-20		
	Area	Production	Productivity	Area	Production	Productivity
Kohima	220	9570	4350.00	230	10023	4357.82
Phek	260	11310	4350.00	260	11336	4360.00
Mokokchung	340	14790	4350.00	342	14824	4334.50
Tuensang	370	16100	4351.35	370	16135	4360.81
Mon	510	22190	4350.98	510	22241	4360.98
Dimapur	1160	50480	4351.72	1160	50595	4361.63

<sup>8</sup> <https://www.niti.gov.in/sites/default/files/2020-08/SugarReport.pdf>

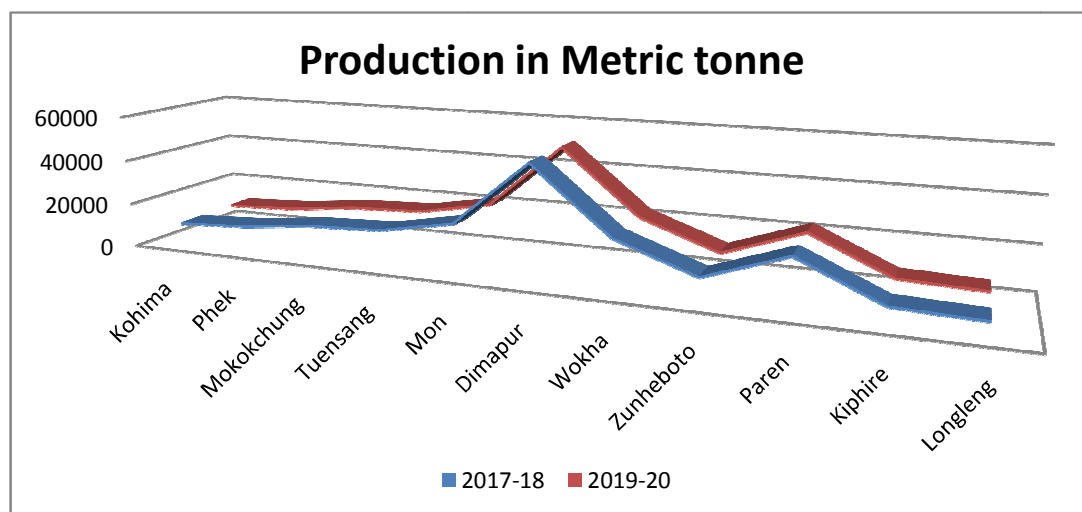
Wokha	520	22630	4351.92	523	22682	4336.90
Zunheboto	240	10440	4350.00	241	10464	4341.90
Paran	520	22630	4351.92	522	22681	4345.01
Kiphire	160	6960	4350.00	162	6976	4306.17
Longleng	130	5650	4346.16	130	5663	4356.15
Nagaland	4430	192750	4351.01	4450	193620	4351.01

**Source:** Statistical Hand Book in Nagaland 2020 (Area in hectare, Production in Metric tonnes and Productivity in quintal per hectare)

Table 1.02 shows the highest production and area recorded in Dimapur. In 2017-18 the production was 50480 metric tonnes with area of plantation 1160 hectares which increases to 50595 metric tonnes in 2019-20 with area of plantation of 1160 hectare. The productivity per hectare increases from 4351.72 quintal to 4361.63 quintal in the same period. The lowest production is recorded in Longleng of 5650 metric tonne in 2017-18 with area 130 hectares. The production of the district increases to 5663 metric tonnes in 2019-20 with 130 hecters of plantation. The productivity per hectare increases from 4346.16 quintal to 4356.15 quintal in same period.

The total area of sugarcane cultivation in the state is 4430 hectare and production is 192750 metric tonnes in 2017-18. The area and production of the state increase to 4450 hectares and 193620 metric tonnes in 2019-20. But the productivity per hectare 4351.01 quintal is same in that period. The productivity of sugarcane 4351.01 quintal per hectare of the state is found less compared to leading sugarcane producing states of our country.

**Fig 1.01: Production of Sugarcane in Nagaland (Metric tonne in 2017-18 to 2019-20)**



Sugar is harmful to our health. It creates diabetes and has some other dangerous side effects. So sugar is an evil as against jiggery. Jaggery is innocent and nutritious food and it contains many natural minerals and substances and should be used in our food instead of sugar. **Statistically 1000 kg of sugarcane gives only 100 kg of sugar**, (dreadful poison for human body) because 40 kg of molasses is thrown as non

edible substance in case of sugar making. *But same 1000kg of sugarcane can produce 140kg of jaggery* which is most nutritious and blessing substance for human body. Moreover sugar making process is very much complicated and costly. So naturally there is a huge exploitation and vested interests associated in sugar industry. Jaggery making process is very simple and very cheap. It can be done on the sugarcane farm itself at very small scale and complicated machinery is required. Any layman can master the art of jaggery making process easily. Capital requirement in jaggery making is only 2 per cent of the capital requirement for sugar plant of the same capacity. Moreover jaggery units provide 40 times more employment than sugar plant of same capacity.<sup>9</sup>

Based on the statistics that 1000 kg sugarcane produce 140 kg jaggery the expected production of jaggery in the State can be estimated from table 1.03

**Table 1.03: Expected Production of Jaggery based on Sugarcane Production in Statistical Hand Book of Nagaland 2020:**

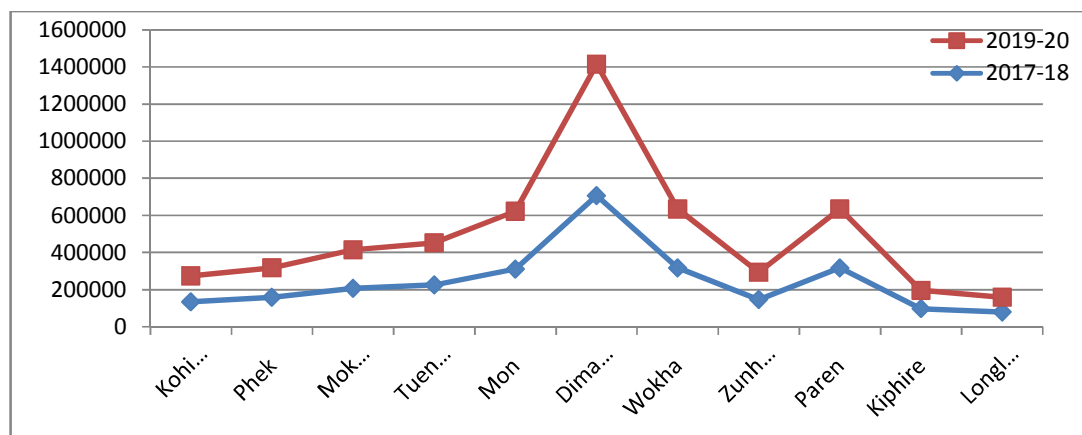
States	2017-18			2019-20		
	Area	Production Sugarcane	Jaggery Production	Area	Production Sugarcane	Jaggery Production
Kohima	220	9570	133980	230	10023	140322
Phek	260	11310	158340	260	11336	158704
Mokokchung	340	14790	207060	342	14824	207536
Tuensang	370	16100	225400	370	16135	225890
Mon	510	22190	310660	510	22241	311374
Dimapur	1160	50480	706720	1160	50595	708330
Wokha	520	22630	316820	523	22682	317548
Zunheboto	240	10440	146160	241	10464	146496
Paren	520	22630	316820	522	22681	317534
Kiphire	160	6960	97440	162	6976	97664
Longleng	130	5650	79100	130	5663	79282
Nagaland	4430	192750	<b>2698500</b>	4450	193620	<b>2710680</b>

**Source:** Estimated, Sugarcane production in Metric tonne, Jaggery production in quintal.

Table 1.03 reveals the expected production of jaggery of the state. The highest production of jaggery is in Dimapur of 706720 quintal in 2017-18 and 708330 quintal in 2019-2020. Longleng is the least jaggery producing district of 79100 quintal in 2017-18 and 79282 quintal in 2019-20.

<sup>9</sup> <https://www.tinytechindia.com/product/food-processing-machinery/jaggery-plant>



**Fig 1.02 Expected Jaggery Production in Nagaland. (in quintal)****Problems of Jaggery Production:**

- Old and inefficient method of production is first and foremost constrains of jiggery production. The farmers are following conventional method of production i.e. engagement of family labour, fire wood, lack of storage etc which leads to time consuming and wastages of final product and row sugarcane.
- Seasonal in nature is another problem. The production of jiggery is made in dry season but in other season the farmer became idle and unemployed.
- The jiggery farmers are still unorganized in the state which hinders to avail technical support, training, guidance and other subsidiary schemes from banks and concerned department.
- Lack of finance is another constrains which leads most of the time the farmers stressed due to financial insecurity which limits area expansion and introduction of modern tools and implementations, fertilizers, pesticides in their sugarcane production process.
- The demand of local product jiggery is high in the state. The price of jaggery ranges from Rs. 130-200 per kg in retail market whereas in other states it ranges from Rs 60- Rs 120. The demand of jiggery of the state is not meet by its own production. But the market is unorganized and some time the middleman captured the product by offering fewer price to the farmers.
- Due to special characteristic of hilly terrain the labour, transportation, machinery and other equipment cost is very high compared to plain areas of our country which also encourage to increases cost of production.
- Efficient use of row materials and scientific use of wastages i.e. Sugarcane bagasse, the fibrous material left over after crushing is also represents return of the farmers but these materials are not properly utilized and no processing unit come in to existence to produce power and energy and other use.

## **Conclusion:**

Jaggery processing is one of the important agro based industry of the country which is playing a dominate role in the economy of our country. The sector plays a vital role towards socio-economic development in the rural areas by mobilizing rural resources and generating higher income and employment opportunities. A large number of agricultural labours are involved in sugarcane cultivation, harvesting and ancillary activities.

Jaggery is very common in Nagaland and people different parts of the state have been surviving their lives through this (jaggery) but yet the sector is still unorganized. The demand of this delicious mouth-watering candied jaggery is high in towns and cities which are often not met. The price of jiggery ranges from Rs. 130 to Rs 200 per kg in the state is very high compared to other parts of the country whereas in other parts price ranges from Rs. 60 to Rs. 120 per kg.

The study completely based on observation and secondary sources might have some limitation because a sample of larger dimension in the field study might reflect accurate and exact picture of the problem. But yet, analyzing the secondary data with observation it is found that the future prospect of jiggery production and marketing in the state is good even though the average productivity of sugarcane per hectare is low compared to other leading sugarcane producing states of our country.

In conclusion it is expected that more area will be covered under sugarcane cultivation in the near future and it will definitely help to tackle the unemployment issue of the State. Since, the cultivator occupies significant elite strata in our society; it is expected that more and more young educated generation will be attracted towards sugarcane and jiggery production along with being involved in other agricultural production in the near future. It is also expected that a good number of research activities will expose the feasibility of Jaggery cultivation in traditional and non-traditional belts; it will ensure awareness to farmers to receive various Govt. added schemes plan and policies, providing awareness to the farmers to receive reasonable returns of their product.

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