International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 02 | Feb-2016 www.irjet.net p-ISSN: 2395-0072

STUDY ON GUR (JAGGERY) INDUSTRY IN KOLHAPUR

YOGESH SHANKAR KUMBHAR[1]

[1] *B.Tech. Production Engineering, VIT, Pune, Maharashtra, India*

Abstract - *Gur (Jaggery) is a traditional unrefined sugar, which is consumed in Asia, Africa, Latin American and also the Caribbean. The Gur industry has been considered as one of the small scale and cottage industry in India. The production of Gur ranges between five million tons to seven million tons. Maharashtra is one of the leading producers of Gur apart from sugar. Large numbers of Gur production units are located in state. Kolhapur is the main market for Gur in the country as it ranks first in qualitative terms and second in terms of quantity. Sugarcane seeds preserved by the Farmers' community by age old practice form the prime factors for good quality of Gur. Kolhapur Gur contains no chemicals, it tastes sweet and has longer shelf life as compared to the Gur produced in other areas of the country. Gur making plants are generally small units fabricated by local artisans and run by villagers in different parts of India. These plants are designed and fabricated on the basis of age old expertise without any technical support further it offers employment opportunity to millions of people of the total world production. More than 70% of the Gur is produced in India but most of the Gur business suffers from losses. The development of different value added products from Gur and their commercial availability becomes needs of the hour to sustain future profitability in the Gur trade.*

Key Words**: **Gur Industry, Profitability, Cost-Return analysis, Kolhapuri Gur

1. INTRODUCTION

Jaggery (also called as Gur in India) production in our country is mostly, confined to rural areas, which is traditional sweetener in addition to sugar from sugarcane. Gur contains iron (11%), calcium (0.4%), phosphorous (0.045%), glucose and fructose (10-15%), protein (0.25%) and fat (0.05%)[1]. Sugar cultivation is done on around 4 million hectares of land in India and its production has fluctuated between 230-300 million tons in past several years. The 250 billion sugar industry has about 450 sugar mills in India with an average installed capacity of 18 million tons. India is the largest consumer of sugar and second largest producer in the world. 90 per cent of total sugarcane and sugar production in the country is with Maharashtra and Uttar Pradesh alone, accounting for 60 per cent of Indian's total sugar production [2]. Gur is produced all over the country, wherever sugarcane is produced. Similarly, it is consumed in all parts of country. It therefore, becomes very difficult for a producer to trace the consumer, for the fulfillment of Gur consumption in large or small quantities. Further, product is seasonal in nature i.e. it's production takes place only during November to April in a year but its consumption takes place throughout the year.

1.1 Stages of Gur making

Sugarcane cutting and transportation are the two steps before extracting juice from sugarcane. The steps in Gur making are as follows:-

a. Extraction of juice from sugarcane

By using cane crusher which driven by oil engine or electric motors. About 1.5 or 2 tons of sugarcane is required to make a single pan of Gur. A pan of Gur requirement depends upon the quality of cane and its sucrose content.

b. Boiling of juice

Extracted juice from the sugarcane is taken for boiling. In all the villages of Kolhapur district open pan method is used for Gur making. Hence juice is boiled in open pans. These pans are made up of iron sheets and are of 230 to 280 cms of diameter and about 50 cm deep. For better colour of Gur even galvanized iron pans or copper pans are used. After the juice is boiled, it is heated on the furnace. Generally the baggasse is used as a fuel [3].

c. Purification of juice

The juice which is heated and boiled releases out many impurities that needs to be removed. Thus purification of juice is the main deciding factor for colour, texture, test and durability of Gur. For purification of juice the most common purificants are used like lime, sucrate, sodium carbonate, sodium bicarbonate, sujji, super phosphate, alum, sodium hydrosulphate, etc. Generally bhendi (lady finger) is used along with other purificants while juice is boiled at low temperature. It helps to bring the impurities scum to the surface of the pan. This scum is skimmed out and thus the juice is purified [3].

4. Concentration of juice

Next step after purification of juice is concentration of juice which is boiled at the striking point of temperature that normally ranges between 11.80°c to 12.30 °c. The proper concentration of juice is judged by following procedure - A small quantity of concentrated juice is taken from pan and is thrown into cold water. If it takes the shape of a ball with the metallic sound it is considered to be complete i.e. completion of the process of boiling of juice, then Pan is removed

immediately from the furnace and is stirred for some time. The boiled liquid Gur (kakavi) is transferred into a cooling pan. As the temperature falls, the Gur begins to crystallize. By stirring the juice slowly and intermittently to avoid the loss of granular structure, the semi solid mass is then put into moulds when the Gur solidifies it is removed by inverting the moulds. These lumps or moulds are made to take the shape of a bucket of different weights. These buckets are of 30 kg, 20, 19, 10, 5 or 1kg etc. these buckets are of different size but uniform shape having different weights of Gur lumps. Now-a-days small sizes of Gur lumps are available in the shape of small balls locally called modak [4].

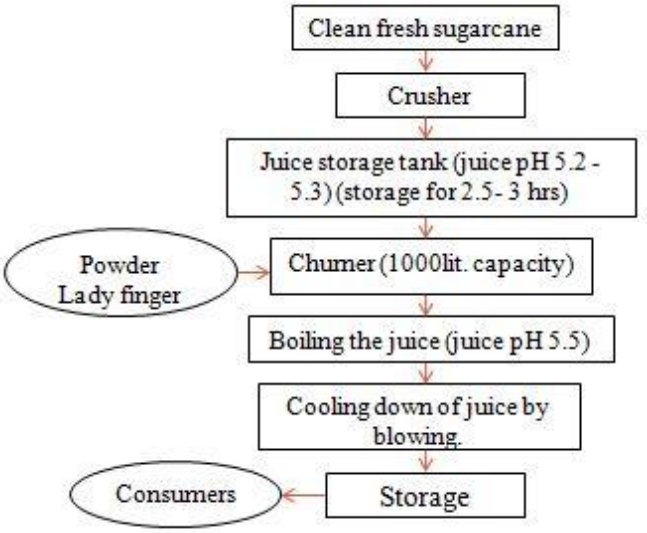

Fig-1: Flow chart for process of Gur Making

2. RESEARCH METHODOLOGY

The survey was conducted on 25 random units of Gur manufacturing units of the major clusters of Kolhapur district.7 Villages were selected, they were Balinge, Padali Khurd, Kodoli, Kotoli, Khupire, Nandgaon, Kavane, During the survey, manufacturers were asked questions regarding the Production of Sugarcane, Production of Gur cost of production, marketing channels, major-barriers to Gur industry and any kind of supports from government or private bodies. The Questionnaire and personal interviews had been conducted for data collection and conceptual thought behind this industry. During data collection it was observed that the units were producing on different scale of production ranged 5 to 10 finished Gur quintals per day in different moulds. Both Primary data and Secondary data were collected for study. Primary data was collected by preparing questionnaire and Taking interviews for one year i.e., 2015-16 as base year. With a view to show the trends in Gur marketing, Gur arrivals, principal notified commodities in the regulated market, number of intermediaries in the market, etc. Secondary data was collected for ten years (2005-06 to 2014-15).

2.1 Gur profile of Kolhapur

The District of Kolhapur lies between 16-43' North latitude and 74-14' East longitude and 574 m above MSL. It comprises an area of 3,188.4 square miles. The district had a total forest area of 1, 48,252 hectares of land, comprising 19.13 per cent of the total area. The rivers having their origin in Sahydri Mountain ranges flow calmly, long distance and with high speed on Kolhapur plateau. Because of the uniqueness of the rivers basins that they are quite big, deep and wide, huge amount of alluvial soil is stored in its river basin and on both sides of river bank which is rich in high quality soil and abundance of minerals and thus, make the land of Kolhapur fertile and unique, making it highly rich and beneficial for cultivation of quality sugarcane. In Kolhapur district, rainfall is generally between June to September from south-west and south-east monsoon. The western zone suffered from excessive rainfall, heavy erosion and poor quality of soil but the remaining parts of the districts was likely to have fertile soil, plain region and a well-developed drainage system. Since the natural conditions were favorable for the growth of sugarcane, the uneven topography did not affect the production of sugar and Gur in the district [5].

Fig-2: Location of Study Area (Kolhapur District)

2.2 Speciality about Kolhapuri Gur

Kolhapur is the main market for Gur in the country as it ranks first in qualitative terms and second in terms of quantity. Sugarcane seeds preserved by the Farmers community by age old practice form the prime factors for good quality Gur. Kolhapuri Gur contains no chemicals. It tastes sweet and has longer shelf life as compared to the Gur produced in other areas of the country. Gur is rich in Iron, Calcium, Carotene and other minerals and contains vitamin A, B and C. Today Gur from Kolhapur are being exported in great quantities to Europe, Middle East Asia, and parts of South East Asia (Around 44 countries). Kolhapur is the only place in Maharashtra where near about 25,000 farmers and their dependents are involved in Gur production. They produce around 9 lakh quintal
Gur per year. Main Forms of Kolhapuri Gur:

- Solid Gur
- Powder Gur
- Liquid Gur (kakavi)

2.2.1 Description of Kolhapuri Gur

Kolhapuri Gur is white and golden (reddish brown) color chemical free, pure and hygienically produced, made from fresh sugarcane juice gives permanent sweet taste, no added color, non harmful and recommended chemicals, additives and flavors, natural sweetener and contains glucose, vitamins, calcium, minerals. It conveys that the Geographical Origin is the entire area of Kolhapur. Kolhapuri Gur has an attractive appearance, various in shapes, excellent taste, attractive yellowish golden colour and good transport quality.

2.2.2 Health Benefit of Kolhapuri Gur

Gur is made in the natural way and no chemicals are used for its processing for which it does not lose its original properties. Hence it is rich in important mineral like salts: 2.8 gms/ 100 grams, whereas only 300 mg/ kg is obtained in refined sugar. Some benefits of Gur are
1. Magnesium present in Gur strengthens our nervous system and helps to relax our muscles and gives relief from fatigue and takes care of our blood vessels. It also along with selenium acts as an antioxidant property scavenges free radicals from our body.
2. The potassium and low amount of sodium present in it maintain the acid balance in the body cells and also combats acids and acetone and control our blood pressure.
3. Gur is rich in iron, and helps to prevent anemia. It also helps to relief tension take care of asthma as it has anti allergy properties .It is good for migraine and is good for girls those who do not get free flow at the time of their period. Even at the time of post pregnancy it has great benefits to perform to remove all clotted blood from the Body of a woman within post 40 days after the birth of a baby.
4. The preventive ability of Gur on smoker's smoke-induced lung lesions suggest the potential of Gur as a protective food for workers in dusty and smoky atmosphere even for those who are engaged in woolen industries, the wool dust clogged in the food pipe could be cleared with Gur. Thus we may conclude saying that those who are exposed to higher levels of pollution. Gur helps them to breathe easier and counter pollution problems naturally.
5. It has moderate amount of calcium, phosphorous and zinc so it helps to optimum health of a person .along with all its benefits it purifies the blood and prevent rheumatic afflictions and bile disorder thus help to cure jaundice (take pre soaked Gur juice).
6. It is good for Dry Cough, Cough with Sputum, Indigestion, and Constipation too.

3. Objective of Study

Existing problem identification of Gur industry is objective of this study. Following are some of the objectives of the research work:
1. Explore the existing situation of Gur manufactures in Kolhapur area.
2. Examine the Cost and Returns of Gur Producing units in study area.
3. Identify the major Problems facing by Gur manufacturers of this industry in study area and suggestion for that.
4. Know the Gur profile of Kolhapur district.

4. Economic analysis of Gur Producing Units:

Economic analysis of Gur Producing Units like cost and return, Efficiency Ratio, Profitability Ratio etc. factors

4.1 Cost and Return Analysis

Average Setup Cost (Cost of All equipment, Land etc.)=7.5 lakh

4.1.1 Production on Daily Basis*

Table -1: Daily Analysis of Sugarcane Production

Average No. of sugarcane Required per pan(in tons)	Juice Extracted(in litres)	Average Gur(in Kg)
2	1300	300

On an average 4 Pans juice extracted in a single day.
*This is an average analysis of 25 Gur plants.

Table -2: Cost Analysis of Gur Plant

Sr. No.	Type of Expenditure	Rate	Cost (in rupees)
1.	Sugarcane cost	2500 per Kg	20,000
2.	Labour cost	400 per person	4000 (Min.10 labors reqd.)
3.	Transportation+ Packaging Cost	-	2000
Total Expenditure			**₹ 26,000**

Average Rate of Gur in Market = ₹ 2,900 per Quintal (Per 100 Kg)

Total Revenue = ₹ 2,900 * 1.2 Quintal = ₹ 34,800

Profit = Total Revenue – Total Expenditure
= ₹ 34,800 - ₹ 26,000
= ₹ 8,800 per day

Monthly Income = ₹ 2, 20,000 (25 working days)

4.2 Efficiency Ratio (ER)

$$\text{Efficiency Ratio (ER)} = \frac{\text{Total Revenue}}{\text{Total Expenditure}}$$

$$= \frac{₹\ 34,800}{₹\ 26,000} = 1.33$$

As ER > 1, Unit is Efficient.

4.3 Profitability Ratio (PR)

$$\text{Profitability Ratio (PR)} = \frac{\text{Profit}}{\text{Total Expenditure}}$$

$$= \frac{₹\ 8,800}{₹\ 26,000} = 0.338$$

As PR < 1, Unit is Efficient

Summary of Cost-Return Analysis:

Table -3: Summary of Cost-Return Analysis

Parameters	
Total Expenditure	**₹ 26,000**
Total Cost	**₹ 34,800**
Profit	**₹ 8,800**
Efficiency Ratio	**1.33**
Profitability Ratio	**0.338**

5. Problems Facing by Gur Plant owners

In the survey, it was observed Gur plant owners are facing common problems, but the impacts of these Problems are different for each. The major problems which were identified are low profit, transportation, high raw material cost, and lack of Research & Development. But out of this low profit is the major problem of Gur plant units. If they have their own transportation they get more profit. The reason identified that due to lack of unity and of inter-competition, the plant owners are not ready to form any association, cooperative or society for development of transportation and R&D.Now a days Labour Problem is also big issue because of this number of Running Plant in Kolhapur decreases to 250 from 1000 in last 4 years. Also demand of High pay from labors reduces profit of Plant and this effect Gur market very badly. From Table-4 which was data of Production of Gur from 2005- 06 to 2014-15,
Production of Gur decreasing per year and it decreases around 25% from 2012-13 to 2014-15.

Table -4: Production and rates of Gur in Kolhapur

Year	Quintals	Rates per Quintal in Rs.	
		Maximum	Average
2005-06	6,85,704	5,555	1,850
2006-07	6,71,318	5,500	1,550
2007-08	8,01,049	3,511	1,200
2008-09	8,05,563	3,800	2,200
2009-10	8,17,659	4,840	3,200
2010-11	8,55,043	6,001	2,500
2011-12	7,70,256	7,001	2,800
2012-13	8,65,448	6,000	3,200
2013-14	7,65,264	5,500	3,000
2014-15	6,55,442	5,500	2,900

6. Suggestions

It was found during survey that there is no Research & Development for product development and value-addition of Gur products in the manufacturers units, although the value added products of Gur is having good market demand in Gujarat and Mumbai market. Development in Gur Plant machineries by adding Automation which will reduce labour cost, increase efficiency of plant and increase production of Gur will result in more profit. It was found that the Gur Plant owners are not in a mindset to form any kind of association of society for the cluster's development. One regulating authority which can conduct

R&D and develop in the business. There is need for financial assistance and marketing support (like giving subsidy in purchasing machineries) will attract more young entrepreneurs in this industry.

7. Conclusion

Gur industry of Kolhapur is having large no of units as compared to other districts in Maharashtra. Current paper Explore current situation of Gur plant, cost and return measures of production operating efficiency to examine the performance of Gur Producing units. The study found that Gur producing units are profitable if they are maintaining quality of Gur. With the development of this industry such problems like unemployment, low-level of education, could be alleviated. On the macro level this industry could be able to export good quality Gur if research and development facilities could be developed by government as well as Big Investors.

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