SUPREET

SUGAR

INDUSTRY

SUPREET KAUR
SECTION 'A'
ROLL NO. 6CS 106

INTRODUCTION

If I were to setup an industry, I would like to establish a sugar industry at Bijnor, a district about 75 kms. from Meerut in Uttar Pradesh. This sugar plant would require an area of 500-1000 acres. With about 7500 tonnes of sugar to be crushed per day, approximately 150 crores would be required to set up the plant. I also plan to set up a 36-MW co-generation power plant alongwith it at an investment of Rs.100 crores.

Why sugar industry???

I chose to setup a sugar industry because:-

- Sugar has a great demand in India and forms an essential energy source for all of us.
- To start with, the investments required to set up this plant are comparatively less than most of the big industries.
- The government has recently launched certain policies to offer tax incentives to those who are investing in the sugar industry.
- Co-generation plant was chosen because it increases profit, utilizes the bye-products and reduces the cost of electricity required for the plant.
- Sugarcane, an essential raw material for producing sugar, can be reproduced vegetatively and this reduces the labour cost.

Why Bijnor, Uttar Pradesh??

Bijnor can prove to be one of the best places for setting up of a sugar plant as:-

- It has large acres of land with the climate, temperature and soil conditions being ideal for sugar cane cultivation.
- Bijnor is well connected via road and rail to Delhi, Punjab, Haryana, Uttaranchal, etc.
- The electricity supply to this area is done effectively and that too at reduced prices especially for commercial set ups.
- It being a small and developing district, the cost of labour is very low.

PROCUREMENT OF RAW MATERIALS

Raw materials for the sugar industry include sugarcane or sugar beet, water, certain chemicals like sugar mill biocides; evaporator anti-scalants; flocculants,etc.

Bijnor is a place having large agricultural lands and conditions ideal for the production of sugarcane therefore, obtaining sugarcane (the main raw material) is quite easy and this even reduces the transportation cost that would have to be spent, had the plant been in any other part of the country.

The chemicals required are easily available from the numerous chemical industries situated in different parts of Uttar Pradesh Which are well connected with Bijnor.

PROCESSING EQUIPMENT AND MANUFACTURING PROCESS

Obtaining sugar from sugarcane involves a no. of processes right from crushing to refining for which many complicated machines are required such as-

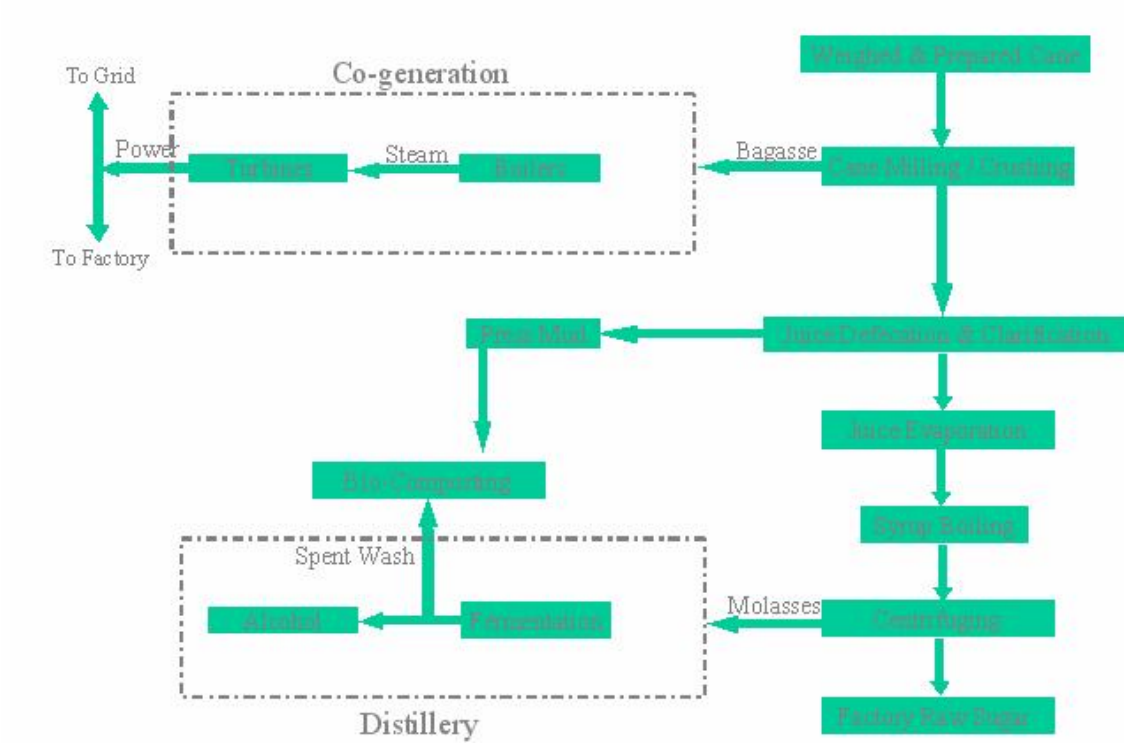
1. crushers
2. evaporators
3. limed juice heaters
4. vacuum pans
5. cane harvesters
6. rotary vacuum filters

Sugar (sucrose) is a carbohydrate that occurs naturally in every fruit and vegetable. It is a major product of photosynthesis, the process by which plants transform the sun's energy into food. Sugar occurs in greatest quantities in sugarcane and sugar beets from which it is separated for commercial use. The natural sugar stored in the cane stalk or beet root is separated from rest of the plant material through a process known as refining.

For sugarcane, the process of refining is carried out in following steps

- Pressing of sugarcane to extract the juice.
- Boiling the juice until it begins to thicken and sugar begins to crystallize.
- Spinning the crystals in a centrifuge to remove the syrup, producing raw sugar.
- Shipping the raw sugar to a refinery where it is washed and filtered to remove remaining non-sugar ingredients and color.
- Crystallizing, drying and packaging the refined sugar

Flow Diagram of the Production of Sugar

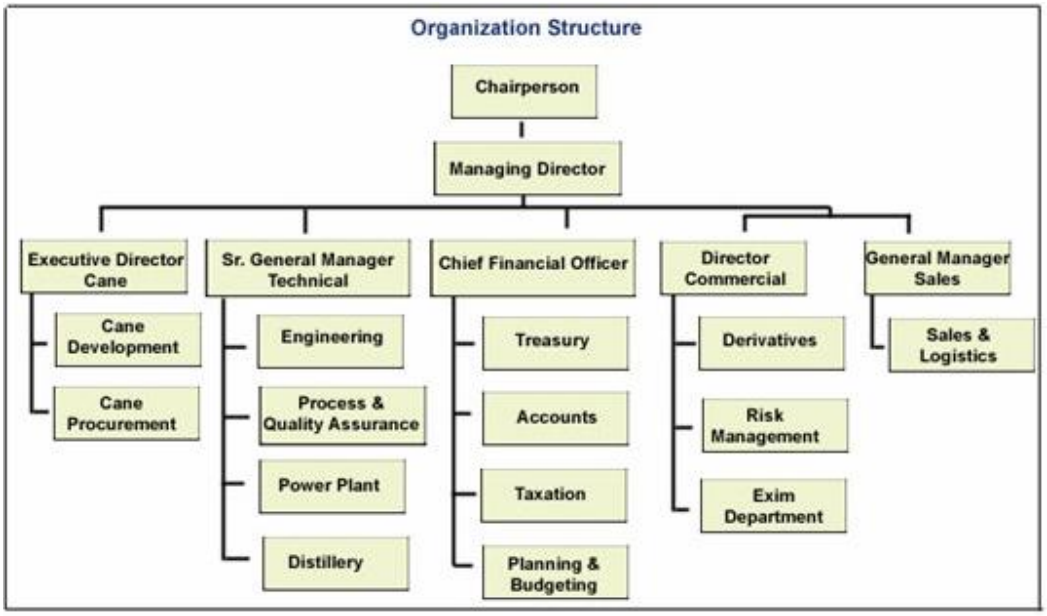


Bagasse produced as a bye-product of the sugar industry is fed into the boiler to generate steam which can be utilized to generate electricity which can be used in the sugar plant and the surplus can be used for the development of the surrounding area by sending it to the grid. Moreover, molasses (another bye-product) can be sold off to the alcohol industry wherein it is fermented to release alcohol thereby, we see that

- Wastage disposal becomes easier
- Electricity is “regenerated”
- Profit is increased

MANPOWER

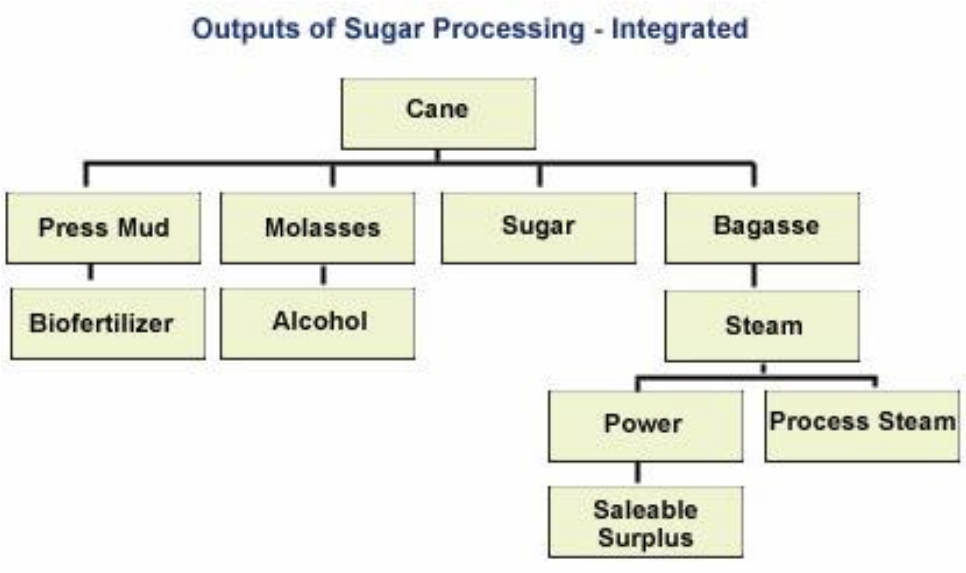
Apart from trained farmers, a sugar industry which is coupled with co-generation requires trained professionals who are well acquainted with the usage of processing equipment, engineers, accounts officers, administrators to take care of the input of raw materials and dispatch of the produce. The entire system can be summarized as given below



PACKAGING AND OUTPUT

Packing of refined sugar includes its proper packaging in rug sacks followed by the dispatch to nearby markets.

The output, as already mentioned consists of bagasse, molasses and sugar of various types such as granulated sugar, fruit sugar, baker's sugar, etc. differing from each other in their grain size.



The quality of sugar obtained can be improved by using automated machinery and using better quality of cane. Quality can also be improved by employing good quality anti-scalants as they will lead to a more efficient removal of sugar from cane juice by preventing the impurities from sticking onto the sides of the evaporator.

DOCUMENTATION REQUIRED

Setting up of an industry is impossible without fulfilling certain terms and conditions as mentioned by the government for which appropriate documents are essential.

These documents include

- Permission letter from the Govt.
- Insurance papers
- MoUs with the farmers from whom cane is bought accompanied by ‘sale-purchees’
- Documents containing the details of debentures and share certificates if finance is borne by equity funds
- Various bills associated with buying of raw materials, equipment and electricity
- Records about sale of molasses are also to be maintained

ADVANTAGES AND DISADVANTAGES

Advantages

A sugar industry coupled with co-generation has many advantages in terms of money as well as energy conservation. Some of the advantages can be enlisted as-

- ü Infrastructural development of the surrounding areas
- ü Money gain by selling molasses to distillery
- ü Electricity conservation by burning of bagasse and profit as well by selling off the surplus
- ü Press mud can be used as a biofertilizer

Disadvantages

It must be noted that this project also has a flipside attached to it. There are some disadvantages associated with the operation of a sugar plant-

- ◊ Burning of bagasse releases harmful gases into the surroundings causing air pollution
- ◊ Disposal of wastes into a nearby drain renders its water unfit for other use
- ◊ A very foul smell is felt in the vicinity of the industry
- ◊ Complete automation of the industry can lead to a loss of livelihood of some farmers

However, these disadvantages can be reduced by treating the effluents and waste chemicals before they are released into the water body, converting the harmful gases into less harmful ones before their release into the atmosphere and using proper equipment with regular maintenance to prevent wastage of fuel and hence, increase the efficiency of the plant

SAFETY MEASURES REQUIRED BY THE INDUSTRY

Accidents take place in industries quite often but if proper steps are taken then such mishaps can be avoided, after all prevention is better than cure. Some of the common accidents occurring in a sugar industry along with their safety measures are given below

1. It is observed that sometimes due to poor quality of chemicals used the impurities get deposited on the inner walls of the evaporators which cause wastage of fuel and can even lead to explosion of the evaporators due to excessive heating. Hence, anti-scalants of good quality must be purchased and used judiciously.
2. Left over sugarcane after the extraction of sugar from it is dried to be used later. This dried form of cane releases small whiskers into the air which remain suspended there and can cause choking amongst the labourers. Therefore, these people must wear masks before proceeding with their work
3. Sugarcane fields must be well protected from weeds, insects, pests and diseases else the sale of the industry can decline rapidly.
4. The sugar mill must be sprayed with fungicides to prevent the growth of fungi and bacteria on machines as well as sugar. Also safety measures regarding the safety of godowns must also be taken.