

3.7 Reducing the waiting time of sugarcane delivery tractors

The waiting line of tractors outside the industry to unload the sugarcane is on an average of 300 double trolley tractors. The average waiting time of a tractor is 3 days. The waiting line reduces the industry space and trouble to the traveler on road. As this is very high waiting time my objective is to reduce it. Figure 5 shows the tractors waiting in a queue to unload the sugar cane.



Figure 5. Queue of Sugarcane tractor for delivery.

Upon the detail study, it was found that the farmers rushed to unload the tractors to get paid early as possible. So, the solution is to pay the farmers in installment throughout season with the irrespective of date they unload. This solution is feasible as there are fixed and pre-known farmers providing the sugarcane. The second solution for this problem is to set the dates for delivery village wise, so farmers from all the villages and places do not rush at a time.

3.8 Effects of the breakdowns

Form the past is has been observed that the Industry was shut down for more than 60 hours in a season. This break down effects a lot of on the performance. The table below shows the loss incurred by the company due to break downs in year 2016. Table 10 shows the breakdown of the company in a season and the loss occurred to the company due to breakdown.

Table 10. Break down hours and total loss due to break down.

Month	Break down hours	Loss amount in US Dollars
October	8	1,09,000
November	12	1,63,500
December	10	1,36,217
January	10	1,36,217
February	12	1,63,500
March	8	1,09,000
Total	60	8,17,307

Total amount of 0.8 million dollars is been the loss company faced due to breakdowns. Break down was maximum observed in mill section. As per the survey the problem was with the motors and the alignment of rollers. The solution for this problem is to keep the spare motors, so incase the motor is not working it can be replaced soon as possible, by which the break down hours can be reduced.

3.9 Demand and Production Analysis

The table 11 shows the demand of sugar bags from 2016 to 2023. It is helpful to study the demand to know whether the company can satisfy the demand in future or not.

Table 11. Demand of Sugar bags in future

Year	2016	2017	2018	2019	2020	2021	2022	2023
Sugar Demand in (million Bags)	3.1	3.3	3.5	3.6	3.75	3.86	4.1	4.2

As the demand is gradually increasing in future the company cannot satisfy the demand with present capacity. So, it is important to increase the capacity from 8500 TCD to 12000 TCD (Tons of Crushing per day). Therefore, to increase the crushing capacity the extra mill, Boilers, Hoppers must be installed.

3.10 Cost calculation for increasing the capacity

Table 12 shows the additional resource required and cost involved in it for installment.

Table 12. Addition resource and cost calculation.

Sl No.	Additional required resource	Quantity	Cost in million dollars
1	Mill	1	0.8
2	Boilers	3	0.4
3	Centrifuges	2	0.3
4	Hoppers	4	0.2
5	Crystallizer pan	2	0.25
6	Other		0.4
Total			2.35

3.11 Payback period

The table 13 show the time for earning amount spent in installing the extra resource to increase the capacity of industry.

Table 13. Payback calculation

Year	Present crushing TCD	Required Crushing TCD	Difference TCD	Extra amount Earned in million
2018	8000	8500	500	0.36
2019	8500	9500	1000	0.72
2020	9500	10000	500	0.36
2021	10000	10500	500	0.36
2022	10500	11000	500	0.36
2023	11000	12000	1000	0.72
Total				2.88

As the demand is increasing gradually it is not possible to satisfy the demand in future so it is very important increase the capacity of industry from 8500 tons of crushing per day to 12000 tons of crushing per day. The progress of capacity can be increased gradually as the demand is increasing. The cost the cost involved in increasing the capacity is shown in table 11. The payback amount is also calculated as shown in table 12. From table 11 and 12 it is said that the money required to improve the capacity is 2.35 million dollars, the money which is put in for the development can be earned back in 6 years. So, it is feasible to put the initial investment to increase the capacity of industry.

4. Results

From this paper, the forecasting of sugarcane supply is done from which the sugarcane supply for 2017 is forecasted to be 1.33 million tons. This will help the industry to be prepared in advance to crush so much of sugarcane without any breakdowns. The forecasted value of sugar production capacity of an industry in 2017 is 2.67 million bags Whereas the demand in 2017 is 2.88 million bags. With the current capacity, the company falls short to satisfy the demand. As the company is not able to meet the demand in future extra resource should be installed like Mills, Boilers, Hoppers which cost around 2.35 million dollars. The payback period is also calculated to check the feasibility, the payback period is calculated to be 6 years by the money made by the result of extra resource. Material requirement planning of chemicals like Limestone, Phosphate and empty sugar bags is done as they are bought from outside. From the MRP the material ordering date is found to get the material well in time. The waiting time of sugarcane tractors is reduced to 6 hours from 72 hours meanwhile the breakdown of industry is also reduced.

5. Conclusion

From this research, I could forecast the supply of sugarcane in year 2017. The production capacity and demand of sugar bags was also forecasted for year 2017 which will help the company to know the status and work on it to meet the future demand. The research also predicts the demand of sugar for next 6 years, it was found that the company would not satisfy the demand, so it is recommended to increase the capacity from 8500 tons of crushing per day to 12000 tons of crushing per day. The amount associated in instalment of extra resource is 2.35 million dollars and the payback period is 6 years from the money made by the result of extra resource allocation. Therefore, it is feasible to invest to increase the crushing capacity.

6. Reference

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