

Agro-Technical Review

Of

**Nayagarh Co-operative
Sugar Industries Limited**

Prepared for

**Department of Public Enterprises
Government of Orissa**

By

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**On Behalf of
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Bhubaneswar**

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Executive Summary

1. The operational area of Nayagarh Co-operative Sugar Industries Limited at Panipoila has adequate potential to raise sugarcane to sustain a 1,250 tcd unit at 100% capacity utilisation with a gross duration of 140 to 150 days after meeting the requirements for seed, chewing and diversion to alternative sweeteners (Gur)
2. The agro-climatic conditions obtaining in the zone eminently suit sugarcane cultivation mainly for quantitative yields and the qualitative returns can be improved to optimal sugar recovery through manipulation of times of planting of sugar rich cultivars, which are currently in cultivation besides adopting a suitable varietal schedule.
3. The sugar unit has been shut down for the past two years by Daharani due to non-supply of cane by farmers. This was because of inordinate delay in payment of cane price and absence of good relations and rapport with the farmers and employees alike.
4. It is possible to revive the sugar unit because of the inherent potential its zone has for raising sugarcane (about 2.5 lakhs tonnes per season) and the scope for further development (about 3.5 lakhs tonnes) through sustained efforts on the irrigation front.
5. In spite of having been closed down for last two years the plant and equipment of Nayagarh sugar factory is reasonably in good condition subject to thorough overhauling and maintenance.
6. The venture should preferably be offered to those who have experience in sugar factory management.

1. Introduction:

The 1250 TCD sugar unit at Panipolla (V) in Nayagarh district was registered in 1982 under cooperative sector and commissioned for commercial production in 1990. The management of the plant was transferred to Dharani Sugars Ltd. on contract for a period of 12 years through a management agreement in 1991. Dharani ceased operating the plant in 1998 during 1998-1999 crushing season. However the mill was rendered functional under cooperative sector during 1999-2000 season, upto march 2000. There after the unit was shut down till today for a plethora of reasons. It has 143 acres of agricultural lands for captive cultivation of sugarcane.

2. Operational Area:

The operational area of the factory is spread over 8 blocks constituting the whole of Nayagarh dist., having a total cultivable area of 3.12 lakhs acres, as per the notification issued by Registrar of Co-operative Societies, Government of Orissa, all within a radius of 45 to 50 kms from the factory forming a compact zone. The block headquarters as also the constituent villages are reasonably well connected for accessibility by a network of roads as well as telecommunication facility. Adequate labour force is available locally to attend to various agricultural operations in sugarcane cultivation - land preparation through harvest and transport for marketing the produce. Nayagarh district, which constitutes the operational area of the factory, is bounded by Khurda district on the east, Kandhamal district on the west, Cuttack and Angul district on the north (The river Mahanadi being the divider) and Ganjam district on the south.

3. Agro Climatic Features:

The soils obtaining in the zone are predominantly light sandy loams (interspersed here and there in insignificant proportion with clay loams), which are generally well drained and are not prone to water logging. During seasons of bountiful rainfall the rivers and rivulets that cut across the tract form the natural drains. The soil is generally level in plane (except in the hilly tract as seen in Gania Block) with a neutral p^H of 6.5 with marginal variation on either side and are therefore suitable for sugarcane. The tract enjoys a typical tropical climate with moderately high atmospheric temp varying from 36 degree Celsius to 40 Celsius, the mean maximum in April and May months and a high relative humidity of 70% - 84% during monsoon months. These conditions favour luxuriant vegetative growth of sugarcane since this period coincides with the grand growth phase of the crop leading to optimum productivity and production of sugarcane. However the atmospheric parameters obtaining are not so conducive for optimum accumulation of sucrose in cane stalks on account of shorter and less severe winter period with the mean minimum temperatures hovering around $19^{\circ}C$ coupled with high atmospheric humidity at 70% or even more during the maturity phase of the crop. Also the diurnal variation of the mean maximum and mean minimum temperatures is noted to be less than $8^{\circ}C$ to $9^{\circ}C$ during that period which generally doesn't favour high juice quality of Sugarcane. Cool nights followed by dry and hot weather during day time, accounting for high diurnal variation in temperature during the maturity phase are considered conducive for optimum sucrose accumulation in sugarcane which when crushed and processed in the mills result in higher extraction of sugar. The decennial average ended 2002 season of rain fall data and atmospheric temperature as made available by the District Agricultural Office, Nayagarh are presented below

Month	Mean Rainfall (mm)	Temperatures (Centigrade)		
		Mean Max	Mean Min	
South-West Monsoon				
June	212.92	34.16	28.58	

July	307.39		31.48	26.84
August	317.00		31.58	25.96
September	160.65		31.25	25.80
Total	997.96			
North-East Monsoon				
October	104.62		31.65	26.59
November	25.76		28.45	23.75
December	5.38		26.35	19.98
Total	135.76			
Cold Weather Period				
January	12.69		25.27	19.83
February	19.86		28.96	22.70
Total	32.55			
Hot Weather Period				
March	24.04		34.06	26.23
April	36.11		36.10	27.93
May	114.28		37.01	28.26
Total	174.43			
Grand Total	1340.70			

The above data indicates that the mean annual rainfall of the tract at 1340.70 mm is fairly good and evenly distributed through the crop period. While the south-west monsoon, June through September accounts for 74.44% of the total rainfall the Northeast Monsoon(October to December) is rather weak with a precipitation amounting to 10.13% and the cold weather (January & February) and the hot weather (March to May) chipping in with 32.55% and 13% respectively. Since the sugar cane plantings are undertaken during the months November & December to January and February, the rainfall during the hot weather period followed by Southwest monsoon precipitation are highly helpful for accelerated vegetative growth of the crop leading to economic cane yields said to be about 35 tones per acre on an average. The high humidity coupled with low diurnal variations in the maximum and minim temperatures during the maturity phase of the crop are not quite conducive for optimum juice quality.

4. Irrigation Facilities:

As per the statistical data made available by the District Agricultural Office, Nayagarh, there are no major irrigation projects servicing the irrigation needs of agricultural crops in the factory zone. The data on service area under medium and minor irrigation sources catering to the crop needs are presented below:

Sl.No	Source of Irrigation	Area Irrigated in Hec	
		Khariff	Rabi
1.	Medium Irrigation (3 Nos)	9848	2500
2.	Minor Irrigation (116 Nos)	14449	2837
3.	Lift Irrigation (176 Nos)	2639	1804
4.	Natural Resources	6847	5633
5.	Bore wells (23 Nos)	46	23
6.	Open wells (8749 Nos)	1750	1609
7.	Total	35574	14406

By and large, the above statistics suggest that there is no dearth of irrigation water in the zone for cultivation of sugar cane. The census of borewells/filter points furnished however needs to be verified once again as during the course of field visits their number was noted to be manifold than the numbers actually reported. Similarly, a re-look at the lift irrigation schemes

reportedly servicing the area is necessary for realistic assessment about their usefulness for irrigation purposes since almost all of them are said to be defunct or lying idle for one reason or the other. It was also observed that vast stretches of fertile land are lying fallow for want of irrigation facilities and farmers are of very firm conviction that the subject lands are impregnated with rich ground water resources at depths varying from 30 ft (alongside the river courses) to 180 ft. This aspect needs to be investigated thoroughly in a scientific manner preferably by the factory itself and exploited for harnessing the same in augmenting cane cultivation in the zone to serve the long-term interests of the factory vis-à-vis expansion to higher capacity of crushing at the facility not only for its economic viability but also for future prospects. Perhaps it may be relevant to mention in this context that about 120 to 150 tonnes of water is required to produce one tonne of sugarcane and the importance of assured and uninterrupted water availability to sugarcane cannot therefore be gainsaid.

5. Sugar Cane Cultivation & Utilization of the produce at present:

Sugarcane cultivation is an age-old practice in this tract and the crop was being cultivated by the farmers for their own economic stability and sustenance many years before the Sugar unit's establishment. The produce was being utilized as either for gur manufacture or supply to kandasaries operating in the vicinity. Being a traditionally cane growing area, the farmers are acquainted with the farming practices and the crop husbandry though certain agronomical practices being adopted are observed to be primitive requiring fine-tuning for better results. Otherwise, by and large they are found to be knowledgeable besides being amenable and receptive to suggestions for improvement and updating their skills. Though they are anxious to have the sugar unit re-railed and made operational by whatever means and methods from the impending 2003-04 crushing season itself, it has to be taken note of that this is a traditionally jaggery making area and most of the farmers are equipped with the infrastructure required for this cottage industry besides the facilities provided by the jaggery merchants who swarm the area for their own selfish economic gains. That is why sugarcane cultivation is not extinct in the zone with the closure of the sugar unit for the last two seasons though there has been a significant decline in the area cultivated to the crop. No authentic statistical data are however available on the area and production of sugar cane in this zone to enable analysing the situation more meaningfully. For example, the projections given as estimated by different independent agencies on the current area and production vary widely from 4,700 acres to 7500 acres with a production of 1,41,000 tones to 2,10,000 tones for 2003-04 crushing season. Needless to mention that the minimum requirement of sugarcane of a 1250 tcd plant for a crushing season of 140 days gross duration would be 1,62,500 tones (installed capacity x140x13/14). Under these circumstances, it may be relevant to adopt the figures furnished by the Adam Smith Institute for the period from 1998-99 to 2001-02 as noted below.

Season	Area under Sugarcane	Average Yield Per Acre	Production	Remarks
1998-99	12,518	31.5	3,93,945	
1999-00	12,583	31.3	3,97,060	
2000-01	4,786	31.7	1,51,851	
2001-02	4,786	28.3	1,35,215	
2002-03	NA	NA	NA	
2003-04	4,735	30.0	1,39,226	As per DAO
2003-04	7,500	32.0	2,40,000	As per Independent Source

Despite the conflicting statistics given for 2003-04 season, the fact remains that the area has adequate potential to sustain a 1250 tcd plant at 100% capacity utilization. It is also true that going by the performance of the sugar unit in the recent past that the bulk of cane production was/is being diverted for jaggery making for reasons whatever. The farmers bemoan this

practice and attribute it to the poor performance of the factory leading to its ultimate shut down two seasons back to the following reasons:

- a. Complete lack of understanding and rapport between the factory management and the farmers
- b. inordinate delay in cane price payment
- c. non-supply of essential inputs such as seed, fertilizers, pesticides etc by the management on credit, thereby leaving them to fend for themselves which is beyond their means
- d. non-performance of the factory technically, administratively and on all other fronts causing untold misery and hardship to the farmers
- e. rampant corruption and unending harassment by cane development staff while regulating cane supply to the factory
- f. deployment of non-locals who do not understand the local language in all key positions especially in the cane department leading to huge communication gap to the detriment of interest of farmers
- g. lack of interest on the part of the management to launch any meaningful cane development programmes for augmentation of area and production of sugar cane
- h. no clear cut policy even for regulation of cane supply and it was all left to the whims and fancies of the lower down staff in hierarchy of cane department

Subject to removal of aforementioned impediments, the farmers, going by their version, are not averse to restoring cane cultivation to its pristine glory as in the past if not augment it further for better prospects. Their psychological anxiety is understandable with the jaggery merchants exploiting the situation by offering unremunerative price for the produce in the absence of any competition with the sugar unit rolling down its shutters. The other impediments in cane cultivation as ascertained during the field visits and discussions with all concerned are briefly enumerated below.

- a. Over 85% of the farmers belong to small and marginal category with a land holding of about 0.60 to 0.75 acres and they are naturally financially backward and always look for assistance either in form of cash or major inputs required to facilitate motivation for sugar cane cultivation. This kind of help was never forthcoming either from the factory management or from the financial institutions though the later has been providing crop production loans to the farmers on a selective basis but not all in general.
- b. Similarly, about 85% of the farmers are tenant cultivators besides being small and marginal and the lease value for the crop varies from Rs 6000 to Rs 10000 per acre depending upon soil fertility and plot location etc. Landlord is generally content with the lease revenues they realize and keep aloof from active cane cultivation.
- c. The land owners having bore wells/filter points charge exorbitant rates while hiring out water to the tenants for sugar cane irrigation at Rs 6000 per acre for a period of six months from the time of planting till onset of monsoon. The hire charge is jacked up more often than not when irrigation becomes critical for crop sustenance.
- d. The points mentioned under (b) and (c) above together account for escalation of cost of cultivation by 100% as it is doubled from Rs 16000 to Rs 32000 per acre to raise a 40

or 50 tonner. However the cost of cultivation in general is noted to be Rs 20-22 thousand per acre and the net income Rs 10 to Rs 15 thousand from 40 tonnes.

- e. there is no state law promulgated to govern regulation of cane supply to the factories or checked/curbed unlawful diversion of bonded cane to alternative sweeteners as in other states. The provisions of Essential Commodities Act need to be invoked and implemented from time to time by the state government in the absence of any other law. In the event of operating the provision of the Act a specific authority has to be prescribed by the state government for their effective implementation.

The above problems need to be addressed quickly and effectively to enable motivating the farmers to take to sugar cane cultivation extensively utilizing the infrastructure available commensurate with the requirement of the factory from time to time.

6. Incidence of Pests & Diseases

It is indeed heartening to note that the cane crop is relatively free from major pests and diseases that generally infest/infect sugarcane during its formative phase. The crop is found to be very healthy and its stand (at 3 to 4 months age as seen) does vouch for a return of 40 to 50 tonnes per acre especially in the Blocks located within a radius of 15 kilometres from the factory. It has been ascertained during discussions that the crop even when fully grown up is not generally afflicted with dreaded diseases like red rot, wilt, smut etc even though pyrilla incidence which can very easily be contained by plant protection methods is reported by a few farmers.

7. Other Commercial crops in cultivation

There are no alternative commercial crops worth the mention cultivated in the zone and sugarcane alone forms the main stay of farmers' economy. This has to be taken advantage of for promoting sugarcane cultivation commensurate with requirement.

Summing up the deliberations with the farmers, officials of the district administration, ex and present employees of the unit and the observations recorded on the agro-climatic conditions, the sugarcane crop status as at present I present below my opinion on the potential of the tract for sugarcane cultivation in the operational area for information, consideration and necessary ameliorative action if so desired.

8. Summary

1. The agro-climatic conditions obtaining are ideally suited for cane cultivation especially in respect of the quantitative yields and overall production.
2. The not-so-very-conducive atmospheric parameters prevailing during the maturity phase of the crop for optimum sucrose accumulation in the cane stalks resulting in sub-optimal recovery at the mills should not really dishearten the industrial circles as the problem can be solved by and large with the advent of sugar rich varieties which are less thermo-sensitive and capable of attaining optimum maturity time bound. By facilitating physiological age advantage at harvest and milling, manipulating the time of planting and time of harvesting, excellent results are being achieved in several sugar mills all over South India, where conducive atmospheric parameters do not obtain for sucrose accumulation during the maturity phase of the crop.
3. The zone has, as of now, adequate potential to sustain a 1250 tcd plant at 100% capacity utilization with a total cane production of 2.25 to 2.50 lakhs

tonnes for a crushing season of 140 to 150 days gross duration. 10% of the total production is generally set apart for utilization as seed, 1% for chewing purpose and the balance for crushing at the factory. This being a traditionally jaggery making area and 85% of the farmers being small and marginal, it would be difficult for them to resist the temptation of diverting the produce to jaggery making (probably to an extent of 15% to 20%) in violation of contractual obligations they have with the factory. It is therefore necessary to keep a leeway in cane production for diversion to alternative sweeteners apart from allocations for seed and chewing purposes. It is imperative therefore that the total cane production trends are maintained at about 2.5 lakhs tones to enable meeting any eventuality and yet attain 100% capacity utilization at the factory.

4. The productivity of sugar cane in the zone is estimated at 32 to 35 tones per acre and it can be stabilized at around 35 tones in a couple of seasons hence subject to grounding need based and result oriented cane development programmes which however entail huge financial investments initially. The areas to be touched upon are;
 - i. Agronomical practices such as optimum inter row and intra row spacing for different varieties in the three maturity groups, use of optimum seed rate at two tonnes per acre as against conventional practice of employing three and half to five tonnes per acre, supply of healthy, disease-free seed material of balanced nutritional status through the three-tier seed nursery programme, introduction of herbicides and weedisides to reduce the cost o cultivation, ratoon and drought management practices, inter culture and after cultivation practices where fine tuning is required, evolving need based varietal schedule couple with staggered panting, prescribing irrigation regime for different varieties at various stages of crop growth under varied soil conditions etc.
 - ii. Evolving suitable manurial schedule governing the quantities of the major plant nutrients-nitrogen, phosphorus and potash and their method and time of application.
 - iii. Integrated pest and disease management practices
 - iv. Multilocational adaptive trials of various scientific methods advocated in sugarcane farming
 - v. irrigation development programmes
5. To facilitate building up good rapport and relations with the farmer, it is important that the cane department is manned by experienced and knowledgeable personnel who can speak and read the local language down the line in the hierarchy from cane manager to field assistant lest there should be a lot of communication gap in the policies and programmes leading to utter confusion and chaos.
6. Arranging supply of major inputs namely seed, fertilizer, weedisides, pesticides etc to the farmers on credit besides crop loan through financial institutions under a tripartite arrangement would be a potent motivating factor for the farmers to take to sugar cane cultivation on a scale commensurating with requirement. The expenditure thus incurred on input

supply can however be recovered from the crop loans or the sale proceeds of the produce delivered for crushing by the beneficiaries.

7. Prompt payment of cane price (within 15 days of cane supply) to the suppliers is absolutely essential, more so since over 85% of the farmers are small and marginal who eke their livelihood only through sugarcane farming. Failure to do so earns ill will and weans them away from sugarcane cultivation or provokes them to indulge in unlawful diversion to alternate sweeteners jeopardizing the formers' interest beyond repair.
8. The hinterland of the factory zone needs to be surveyed for its groundwater potential and action taken rapidly to exploit and harness the same for sugar cane cultivation depending upon the results obtained. The farmers have a firm conviction that the soil is impregnated with abundant ground water sources and no initiative taken by any agency in this direction. In the absence of any information to the contrary, they seem to be justified in nurturing this opinion. Such a measure if taken as suggested would earn a fund of goodwill promoting the cause of sugarcane farming for augmenting both quantitative and qualitative yields. Power rigs need not necessarily be employed for sinking filter points to strike water at a depth of 30 to 50 feet as hand bore sets would suffice the need in sandy strata alongside the river courses.
9. Land owners are apprehensive of loosing ownership rights over their lands in case the land is leased out on a long term basis, say three years or more, to enable the tenant to enjoy usufruct of the plant crop and two ratoons. They therefore lease out their land on an ad hoc basis for a period of not more than eleven to twelve months and may or may not renew the lease deed thereafter. The existing provisions of the tenancy act need to be reviewed by the government and ameliorative amendments effected to allay the apprehensions of the landlords. Such a step would result in stabilizing the area and production of sugarcane in quick time besides scaling down the annual rentals burden on the tenants.
10. Producing and handling quality cane at the mill alone is not the panacea unless the sugar produced on the fields is optimally extracted and bagged by maintaining high standards of technical and administrative efficiency in running the mill by deploying experienced and quality workforce to man key positions without allowing undue outside interference.
11. it is given to understand that there is no specific legislation in the state governing regulation of cane supply to factory. It is desirable and necessary to identify an authority for the purpose as it may not be possible always to invoke the provisions of EC Act to achieve the objectives from time to time.
12. Resources to fund the cane development programmes to be implemented continuously every year will be available through the Sugar Development Fund operated by Government of India as also other financial institutions/Banks once the factory establishes its credentials on the performance front but not earlier. Funding such programmes for getting results and grounding them effectively would earn goodwill and loyalty of the farmers thereby diversions to alternative sweeteners may peter out in due course.

There is no alternative to sugarcane in the cultivation of commercial crops in the zone and there are no khandasari units operating either. Though prevention of diversion of cane to alternative sweeteners by the farmers is a contentious issue as at present no time should be

allowed to be lost in promoting sugar cane cultivation in a big way as it forms the mainstay of the economy. Subject to consideration of the above there is no reason why the economy and prosperity of the farmers in general and the tract in particular, alongside the interests of the entrepreneurs should not look up.

PLANT AND MACHINERY - TECHNICAL EVALUATION :

The plant and machinery at Nayagarh Co-operative Sugar Industries was supplied by M/s. Anand Tanks & Vessels. The specifications of the equipment confirm to standard specification laid down by Govt. of India in 1972 - 73. Major equipment like Mills, Boilers and Centrifugal machines are supplied by **M/S. WALCHAND NAGAR INDUSTRIES, PUNE** and Turbines by **M/S. TRIVENI ENGINEERING WORKS**, pumps by M/s. Kirolskar Industries.

At no Time during the period of operations between 1988 to 1999 the equipment was subjected to any performance trial, whether the plant and machinery can crush 1250 tons of cane per day. While most of the blame is shifted to non-availability of cane, even the meagre amounts crushed, was not to the rated capacity. During the entire years of operation, only on one day the plant is recorded to have crushed 1160 tons. A 1250 ton plant can become viable if it can crush 1.85 lakhs tons of Sugarcane in a season, achieving a sugar recovery % of 9.5% and above. Infact in the present day context, the plant and machinery should crush 2.25 lakhs tons of cane in 180 days to become viable.

i. CONDITION OF EQUIPMENT AS ON 25 APR. 2003 :

On visual inspection it was observed that all major equipment are in place albeit in a rusted condition.

1. The Cane Carrier and Feeder Table Structures are visibly rusted.
2. The mills and mill Turbines are in fairly satisfactory condition.
3. The Bagasse elevator is in good condition.
4. Boilers are fairly in satisfactory condition, though the furnaces are left uncleaned, and the refractory work appears to be damaged.
5. The Return Bagasse Carrier is badly rusted.
6. Power Turbine and alternator are in good condition.
7. Juice heaters, Juice Sulphitirs, Sulphur burners are in satisfactory condition.
8. Cane Juice Clarifier is in good condition.
9. The Rotary Cane Mud filter appears to be damaged and may need replacement.
10. Evaporator Set is satisfactory.
11. Vacuum Pans appear to be in good condition.
12. One of the vacuum crystallisers is in bad condition.
13. The crystallisers are in satisfactory condition but the inside coils need thorough testing.
14. One continuous centrifugal machine and three batch Centrifugal machine may need revamping / thorough repairs.
15. The hoppers and grader appear to be in satisfactory condition.
16. The Exhaust Steam and Vapour Pipe lines are badly damaged.

At the time of closure of the plant in year 2000, none of the equipment have been left protected including sensitive equipment like Turbines, Electrical motors and the drain pipe lines of steam pipes kept open to allow condensed water to flow out.

While planning to revive the plant and machinery, a through overhauling programme needs to be undertaken with emphasis on derusting, testing material strength of particularly steam and juice pipes and replace judiciously. The surrounding area of the plant building also needs to be cleaned of bushes / creepers. This exercise may cost approximately Rs. 70 to 75 lakhs.

ii. ANALYSIS OF PLANT'S WORKING RESULTS:

On going through the available final manufacturing reports, it is observed that average rate of Cane Crushing was never more than 900 Tons/day and the Cumulative average rate of crushing for all the years of working is as low as 650 Tons/day. The recorded results indicate that the Mill Extraction is as low as 92.5% as against a norm of 94-95%, the boiling house extraction is as low as 85% as against a norm of 90-92%.

There appears to be three major areas, which have let down the plant performance.

- a. Very poor cane preparation before milling.
- b. Improper steam balance
- c. Poor centrifugal performance.

Though the plant and machinery installed are as per the standard specifications of 1972-73, the norms of efficiency stipulated by Govt. of India was in 1984. Most of the 1250 TCD plants modernised their equipment to achieve the Govt. of India Norms of Efficiency so that they become economically viable.

To achieve the performance level the following corrective action may have to be taken.

- a. To improve the cane preparatory index, a Turbine Driven Fibrizer / Shredder needs to be installed.
- b. To achieve proper steam balance, a vapour cell / pre-evaporator needs to be installed.
- c. The Rotary Drum Vac filter is either to be reconditioned or replaced based on inspection to be carried out after dismantling.
- d. The three batch centrifugal machines need to be thoroughly attended by requesting the original equipment manufacturer to get dynamic balancing done.
- e. One Continuous Centrifugal machine which is reported to be out of order, also to be attended as (iv) above.
- f. The spray pond to be modified to obtain better vacuum conditions.

The above works will approximately cost Rs. 75-80 lakhs.

iii. REFURBISHING COST:

It may be observed from the foregoing that the total cost of normal overhauling, repairs and maintenance work, also incorporate equipment to correct the imbalances in the plant and equipment, will cost approximately Rs. 150-160 lakhs. The exact amount however can be arrived at only after opening the equipment for inspection, and overhaul.

iv. SWOT ANALYSIS OF NAYAGARH CO-OPERATIVE SUGAR INDUSTRIES LTD.:

Though Nayagarh District in Orissa is endowed with abundant irrigation potential, rich and suitable soils for Cane Cultivation and does not have alternative Competitive Crop for Sugar Cane, the non-performance of Nayagarh Co-operative Sugar Industries belied the expectations of the general public in bringing about socio-economic upliftment and lives of the people of the area. The main reasons are due to the following.

- a. Non-optimising the capacity utilisation commensurate with the installed capacity.
- b. Never implementing any programme to educate the farmers.
- c. Alienating the farmers from Cane growing.
- d. Non-payment of Cane Price in time.
- e. Very high incidence of Mechanical breakdowns of plant and machinery during crushing seasons.
- f. Instead of operating the sugar plant as a successful business venture, he reported dabbling with extraneous issues by the erstwhile management.

With such a scenario as a backdrop, it is sought to analyse the entire Nayagarh Sugar Factory venture by SWOT analysis, which is hoped to lead to a well-planned initiation of a plan of action.

The Analysis is as under

a. ***STRENGTHS:***

- a. Nayagarh Co-operative Sugar Industries is located in a traditionally Sugar Cane growing area. Nayagarh District in Orissa is slowly turning out to be a Sugar Cane bank, supplying Cane even to Baramba & Aska even while catering to huge jaggery market.
- b. Sugar Cane growing is well established for many years.
- c. The soils are conducive to sugar cane growing.
- d. Adequate ground water potential is available in the zone for augmenting sugar cane production to ensure 100% capacity utilisation.
- e. The agro-climatic conditions obtaining in the zone are ideal and conducive for quantitative yield of sugarcane with proper varietal manipulation and agronomical practices.
- f. The farmers, the workers and the general public are strongly rooting for revival of the plant.
- g. The plant and machinery is generally in good state of health and has a life of another 18 to 20 years.
- h. All liabilities cleared by Govt. of Orissa.

b. ***WEAKNESSES***

1. Huge financial losses and erosion of Net worth.
2. Non-operation of the plant at viable capacity.
3. Attention not having been paid to achieving higher efficiencies, commensurate with Govt. of India stipulated norms.
4. Not having educated the farmers in the improved cane growing techniques.
5. Not having supported the farmers financially to grow cane leading to achieve higher yields qualitatively and quantitatively.
6. Alienating the farmers from sugar cane growing by not paying them cane price in time.
7. No rapport built up between the management and sugar cane growing fraternity.
8. The inherent laziness and reluctance of the farmers to exploit the abundance of nature's gifts and enter the commercial exploitation of their lands to better their own standard of living.
9. The reputation of the poor relations the erstwhile managements had with the farmers and the work force in the plant.

c. OPPORTUNITIES:

- i) Availability of adequate reserves of ground water potential and other irrigation resources in the zone, affords scope for augmenting area and production of sugar cane.
- ii) As no competitive cash crop exists to sugar cane, if the farmers are supported with proper subsidies and incentives, they are willing to produce sugar cane and supply to mills.
- iii) The richness of soil and availability of huge tracts of uncultivated lands affords the possibility of raising sugar cane crops to enable the Sugar Mill capacity to be increased in future.
- iv) Due to inadequate infrastructure existing in the area, diversification to establish an agro complex producing down the line products can be planned.

d. THREATS:

- i) Unless the capacity crushing is established at the earliest, Sugar Cane diversion to Jaggery manufacture and supplies to near by sugar mills will take enormous proportions.
- ii) Varietal manipulation and ensuring varietal purity are to be urgently addressed for higher quality of sugar cane, without which higher sugar recoveries cannot be achieved.
- iii) Unless the crushing capacity is established and the farmer gets confidence that his produce can be exhausted in a reasonable period of time, it will be difficult to convince the farmer to grow sugar cane.

- iv) Unless the farmer confidence is reinstated by ensuring prompt payment of cane price, it will be difficult to achieve 100% capacity utilisation and make the venture economically viable.
- v) Unless a new work culture is introduced in the plant by making the workers understand the importance of making the plant operate at optimum level, and on this aspect alone their future survival depends, the plant may disintegrate earlier than its life.
- vi) The direct impact of higher overheads will have a bearing on the cost of conversion and hence on the economic viability of the venture.

Considering the SWOT analysis as detailed above, the Nayagarh cooperative sugar Industries Ltd may consider adopting the following place of action to revise the sugar factory.

- a. Grounding cane development programme to augment area and improve availability of cane to achieve higher capacity utilisation.
- b. Educate the farmers to introduce varietal manipulation and maintain purity of cane material.
- c. Ensure economic assistance in kind, to enable the farmer to raise healthy cane crops.
- d. Ensure cane payment with in stipulated time to farmers so as to regain their confidence in the sugar factory.
- e. Introduce suitable modifications / additions / alterations in the plant and machinery so as to achieve higher level of efficiencies and make the plant economically viable.
- f. Reduce the overheads by introducing universally accepted HRD norms.
- g. Achieve the rated capacity in shortest possible time.
- h. Ensure pr oper communication in the language farmer / worker understands.
- i. Ensure all-round development in the area increasing the profitability to farmers and returns to the sugar unit, so that the unit contributes to the socio-economic upliftment in the area.

SUMMARY :

After establishing contact with farmers in all the 8 Division of Nayagarh area, studying the soil condition and its suitability to sugar cane growing, studying the irrigation potential available, discussing with cross section of general public and he workers of the plant, it is felt that their is a strong sentiment prevailing in the area for revival of the sugar plant.

We feel confident that any entrepreneur who has initiative and zeal to improve the socio-economic environment around Nayagarh apart from making a successful commercial business venture out of the sugar factory by adopting the above study, will ensure a revival of Nayagarh co-operative Sugar Industries Ltd. and contribute to the industrial development of Orissa.