

CHAPTER V.

CANE SUPPLY AND INCENTIVES BY
UGAR SUGAR WORKS LIMITED,

CHAPTER - VCANE SUPPLY AND INCENTIVES BY UGAR SUGAR WORKS LIMITED
-----5.1. Crushing Capacity and Capacity Utilization :

The factory is licensed to increase its milling capacity from 300 T.C.D. to 5000 T.C.D. The work of expansion was taken at the close of the 1987-88 season which ended on the 16th of the June, 1988. However, owing to various difficulties, it was not possible to complete the expansion and the factory had to work at only its initial capacity of 3000 T.C.D. Because of the expansion programmes the factory started its crushing season late i.e. on the 17th Nov, 1988. Since it was optimistically hoped that the expansion programme would be completed by the middle of January 1989, the factory worked at the reduced capacity of around 1500 - 1600 T.C.D. However, when it was observed that the crushing capacity could not be geared upto the proposed 5000 T.C.D. owing to innumerable mechanical difficulties, the existing factory has worked to its full capacity from 3-2-1989. It is hopefully expected that the factory will start crushing at 5000 T.C.D. capacity from the beginning of next crushing season. The factory during the last 10 years has worked for periods ranging from

130 to 258 days depending upon the availability of the cane. The ideal crushing period on that basis the capacity utilization for the past ten years is give in the Table No. 5.1.

TABLE NO. 5.1.

Crushing Capacity and Capacity Utilization.

Season	Quantity of cane actually crushed in Tonnes.	* Quantity of Cane expected to be crushed in a season of 180 days in tonnes.	Capacity Utilization %
1979-80	3,46,783	5,40,000	64.2 %
1980-81	3,77,728	5,40,000	69.94 %
1981-82	4,05,104	5,40,000	75.02 %
1982-83	5,54,738	5,40,000	102.73 %
1983-84	3,37,184	5,40,000	62.44 %
1984-85	4,42,362	5,40,000	81.92 %
1985-86	4,30,315	5,40,000	79.69 %
1986-87	5,66,520	5,40,000	104.91 %
1987-88	6,75,730	5,40,000	125.14 %
1988-89	4,65,419	5,40,000	86.19 %

The normal surveyed area for a period 1988-89 by Ugar Sugar Works in the region allotted to Ugar Sugar Works Ltd. was as follows :

Adsali	-	9,500 Acres.
Plant	-	5,650 Acres.
Ratoones	-	20,820 Acres.
		<hr/>
		35,970 Acres.
		<hr/>

The surveyed area covered was approximately 80 % of the actual sugarcane area. So the actual sugarcane area may be in the neighbourhood of 40-42 thousand acres, Assuming that 60 % of the total irrigated area to be under sugarcane, the total irrigated could be estimated at approximately 70,000 acres. New Lift Irrigation Schemes are coming up every year and the irrigated area is increasing at a steady rate of 6 to 7 % per annum.

The inter crops generally followed by the cultivators in initial planted or Adsali sugarcane are Groundnut, Maize, Jute as Mannure, and vegetables etc. After ratoon soyabean is followed as Kharif crop. Wheat or dicocum are planted in the Adsali (July-August) or Eksali (June). A special short duration sugarcane is CoC 671.

The cane yields are generally observed as follows.

Adsali 40 Tonnes per acre (T.P.A.)

Nim Adsali - 35 Tonnes per Acre (T.P.A.)

Plant - 32 T.P.A.

Ratoon - 35 T.P.A.

Special short duration crop variety CoC671 to be crushed at 10-11 months age yield 30-32 T.P.A. for normal plantation. And for Adsali the yield goes to 60 to 70 tonnes T.P.A. Few number of growers of special season CoC 671 products to the extent of 50 to 55 T.P.A. in just 10-11 months! But such growers are only 5 to 10 % of the total growers.

5.2. Irrigational Facilities Provided by the Ugar Sugar Works Ltd.:

Irrigation facilities are most crucial for sugarcane cultivation. Hence an attempt has been made to analyse the situation in this respect. The stability and prosperity of agriculture in this region mainly depends on irrigation facilities. The Ugar Sugar Works Ltd. has made significant contribution in providing irrigation facilities ever since its establishment. The " King crop," sugarcane cultivation cannot be undertaken without irrigation facilities. The Ugar Sugar Works has increased ~~the Ugar Sugar Works has increased~~ the acreage of sugarcane cultivation by the way of lift irrigation schemes which it has which it has promoted by finance.

The river Krishna is the sole natural source of water for human beings, animals, crops and machines.

The water is the natural source but the lifting of it and feeding it to crops and human beings is a costly affair. To save the water and to minimise cost of lifting water the factory has undertaken many modern huge pipelines. The factory have a total length of pipelines of about 18 miles.

To bring more land under irrigation in its command areas, the factory has formed cooperative cane growing societies such as :

1. Better farming co-operative society limited Jugul.
2. Better farming co-operative society, Gundwad.
3. Molawad-Kusanal co-operative Lift Irrigation Society Limited Molawad.

The following table no. 5.2 gives a complete picture of various lift irrigation schemes undertaken by the Ugar Sugar Works in and around Ugar to create much needed permanent water supply facilities to the farming community. (see table no. 5.2)

TABLE No.5.2

IRRIGATION FACILITIES BY UGAR SUGAR WORKS

Sr. No.	Place of the pumping station.	Year of Establish-ment.	Installed ca- pacity in H.P.	Area covered in acres.
1	2	3	4	5
1.	<u>Ugar-Khurd</u>			
	Pumping Station No.1	1944	125 H.P.)	
	* -- do --	No.2	1944	50 H.P.)
	-- do --	No.3	1944	125 H.P.)

Table No.5.2(cont.)

1	2	3	4	5
	Pumping Station No. 4	1944	125 H.P.)	
	-- do -- No. 5	1944	125 H.P.)	153
	-- do -- NNo. 6	1944	100 H.P.)	
2.	<u>Ugar- Khurd</u>			
	Pumping Station No. 1	1944	100 H.P.)	
	-- do -- No. 2	1944	50 H.P.)	486
3.	<u>Khusanal</u>			
	Pumping Station No. 1	1953	75 H.P.)	
	-- do -- No. 2	1953	45 H.P.))	
	-- do -- No. 3	1953	50 H.P.)	
	-- do -- No. 4	1953	124 H.P.)	362
	-- do -- No. 5	1953	115 H.P.)	
	-- do -- No. 6	1953	75 H.P.)	
4.	<u>Jugul</u>			
	Pumping Stations No. 1	1964	75 H.P.)	
	-- do -- No. 2	1964	75 H.P.)	
	-- do -- No. 3	1964	45 H.P.)	176
	-- do -- No. 4	1964	115 H.P.)	
5.	<u>Sayantinagar</u>			
	Pumping Station No. 1	1970	100 H.P.)	
	-- do -- No. 2	1970	75 H.P.)	95
	-- do -- No. 3	1970	125 H.P.)	

Table No. 5.2(cont.)

1	2	3	4	5
6.	<u>Teerth</u>			
	Pumping Station No.1	1972	80 H.P.	92
7.	<u>Krishna Kitture</u>			
	Pumping Station No.1	1974	250 H.P.)	
	-- do -- No.2	1974	250 H.P.)	604
	-- do -- No.3	1974	250 H.P.)	
8.	<u>Krishnakittur</u>			
	Booster Station No.1	1985	50 H.P.)	76

With the increase in irrigation facilities initiated by the factory, the crushing capacity also increased correspondingly. We begin with, a way back in 1944 when pumping stations were started at Ugar Khurd, with installed capacity of 800 H.P. covering 639 areas of land irrigation. From these stations water was also supplied to the factory and drinking water facilities were made available to the factory colonies.

The first phase of extension of irrigation facilities, was started in 1953 during which 6 pumping stations were started on the bank of Krishna river nearby Kusanal village. These ^{Pumping} 6 stations with an installed capacity of 485 H.P.

brought 362 acres of land under irrigation. This extension of irrigation facilities was necessitated in view of the expansion of the daily sugarcane crushing capacity of the factory in 1950 from 500 T.C.D. to 800 T.C.D.

In 1960, the daily cane crushing capacity was further increased to 1200 T.C.D. pumping stations were established on the bank of the Krishna river at Juggul village in 1964 with an installed capacity of 310 H.P. to irrigate 176 acres of land for sugarcane growing. The crushing capacity of the factory was further increased to 2000 T.C.D. in 1967 and 3 more pumping stations were established at Jayanti-nagar in 1970 with an installed capacity of 300 H.P. covering additional 95 acres of land under irrigation and one pumping station at Teerth village in 1972 with an installed capacity of 80 H.P. irrigating 92 acres of land.

In 1974 an additional 604 acres of land was brought under irrigation at village Krishna Kittur by establishing 3 pumping stations each with 250 H.P. installed capacity. This additional irrigation facility increased sugarcane supply in the daily cane crushing capacity of the factory in 1976 from 2000 TCD to 300 TCD.

The latest phase of additional irrigation facilities was occurred in 1985. During this year one more pumping station

with an installed capacity of 50 H.P. to irrigate 76 acres of a land was added at Krishna Kittur. With this, in all area of 2044 acres of land has been brought under irrigation upto 1985 and this facility is provided to the cultivators irrespective of whether they are shareholders or not.

With a view to increase the supply of sugarcane to the factory, the management of the factory, acting in time, has get sanctioned a licence in 1987 for crushing additional 2000 T.C.D. raising the total crushing capacity to 5000 TCD.

A close observation of the table no. 5.2 shows an extension of irrigation facilities made available ^cacording to the crushing capacities. Above all the expansion of irrigation facilities also speaks for the fact that farmers of the area covered by the factory, have been very much attracted towards growing this " King Crop " sugarcane.

Thus the irrigation facilities from time to time, have certainly benefited the sugarcane cultivators to increase the production of sugarcane. These irrigation schemes have assured the factory the additional cane supply, which is very much essential, total. The expansion of cane crushing capacity from 500 T.C.D. in 1941 to 5000 T.C.D. in 1987-88, has been dared owing to the aforesaid and timely by irrigation schemes undertaken by the factory.

It is observed that the investment in irrigation leads to the increase in per acre yield. The factory has also introduced various plans as sugarcane development programmes. The factory has got Research ^{and} Development Department (called R & D Department) The factory has carried out different cane development programmes in the villages of its command-area. It has played an important role in carrying out agro-economic development of this rural area through its multifarious programmes.

If we consider the present crushing capacity the factory requires the sugarcane quantity to the extent of 5.72 lakh tonnes every year. But actually the cane crushing of during 1980-89 except 1987-88 is less than the required cane amount (See table 5.3).

TABLE NO. 5.3

Position of Production for last 25 years

(1962 to 1986)

Year ending	<u>Cane Crushed</u>		<u>Sugar Bags Produced</u>		Recovery %
	Tonnes in Lakhs	%	Tonnes (in lakhs)	% Index	
June					
1962	1.35	100.00	1.69	100.00	12.53
1963	1.38	102.22	1.76	104.14	12.68
1964	1.60	118.51	1.92	113.60	11.96
1965	2.15	159.25	2.47	146.15	11.54

(TABLE NO.5.3 cont..)

Year ending	Cane crushed		Sugar Bags Produced		Recovery %
	Tonnes (In lakhs)	%	Tonnes (in lakhs)	% Index	
1966	2.75	201.48	2.96	175.14	10.89
1967	1.61	119.25	1.91	113.01	11.81
1968	1.44	106.66	1.59	95.08	11.10
1969	2.25	166.66	2.38	140.82	10.41
1970	3.09	228.88	3.20*	189.34	9.93
1971	2.57	190.37	2.95	174.55	11.44
1972	2.91	215.55	3.45	204.84	11.44
1973	2.96	219.25	2.97*	175.73	9.94
1974	2.15	159.25	2.19*	129.58	9.71
1975	3.55	262.96	4.30 *	254.43	11.59
1976	3.70	275.07	4.29*	253.84	11.08
1977	4.87	360.75	5.40	319.52	10.60
1978	5.83	531.85	6.52*	385.79	10.66
1979	4.31	319.25	4.86*	287.57	10.80
1980	3.47	257.03	3.78*	223.66	10.75
1981	3.78	280.00	4.28*	253.25	11.04
1982	4.05	300.00	4.46*	363.90	10.60
1983	5.55	511.11	5.96 *	354.66	10.42
1984	3.37	359.62	3.85*	227.81	11.16
September 1985	4.87	366.74	4.87	288.16	11.02
1986	4.87	360.74	4.87	288.16	11.28
1987	5.66		6.29		
1988	6.76		7.33		
1989	4.65		5.14		

*Notes : * Including sugar produced from Jaggery and/or raw a sugar and/or cane syrup.

Table 5.3 reveals that there is fluctuation in the crushing capacities of sugarcane from 1962 to 1986. In 1978 and 1983, we see all of a sudden rise in cane crushed and from there onwards the fall in the cane crushed. Hence we can say that this company is not showing any gradual progress in crushing sugarcane. In general if we take 1962 as a base, the cane crushed has been more than tripled in 1986.

Table shows also paralalled trend of production with sugarcane crushed as these are inter-related. The company has made remarkable progress in increasing production of sugar. However, during 1967, 1968, 1969, and 1974 we observed all of a sudden fall in the production of sugar bags and from there onwards the company started slowly recovering it. Thus the company has shown fluctuating trend in producing sugar over 25 years. Taking 1962 as the base, it indicates nearly 288 % rise in the production index during 1986. The recovery is always remained at higher than 10 %, USW observed some points in this regard are,

- 1) Duration of the crushing season has a negative correlation with sugar recovery.
- 2) Date of start of the season and date of closure of season have definite bearing on the sugar recovery,

- 3) Unfavourable weather such as cloudy and showers and lack of cold weather can definitely reduce the pol. % cane.
- 4) Length of summer drought affected the quality of cane and effect the recovery prolonged drought results in higher fiber content with the consequences of lower extraction.
- 5) Rainfall has a positive correlation with the recovery. If it rains well during rainy season, the quality of cane certainly improved.
- 6) If nitrogenous fertilizers application is delayed, it can result in processing difficulties in resultant sugar cane.

5.3 Factors Affecting Cane Supply to Ugar Sugar Works Ltd.

The factors affecting cane supply to Ugar Sugar Works are as under :

1. Cane availability.
2. Irrigation potentials.
3. Cropping pattern.
4. Cane yields.
5. Rainfall pattern etc.

1. Normally surveyed area in the region allotted sugar-cane to Ugar Sugar Works Ltd. as :

Adasali	26 % acres.
Plant	16 % acres.
Ratoon	58 % acres

during a season, of 1988-89. The zonewise sugarcane acreage comes from Ainapur 7200 acres, from Athani 6200 acres, from Jugul 9000 acres and from Ugar about 12,000 acres. That is the total average area under sugarcane is about 35 to 36 thousand acres every year. This much cane is possible to be supplied by the region.

2) The actual sugarcane area in the neighbourhood excluding Ugar region is 40 to 42 thousand acres. Including this, and assuming that the 60 % of total irrigated area to be under sugarcane, then the total irrigated area estimated will be approximately 70,000 acres. Moreover irrigated area is increasing at a steady rate of 6 to 7 % per annum so as to get sugarcane supply to Ugar Sugar Works Ltd. easily.

The planting seasons in this regions are as follows :

Adsali - July-August-September.

Nim Adsali - October - November

Plant - December-January.

Ratoons - Plant cane harvested from November to February are generally maintained as ratoons.

Special Season - June to be harvested after 10 to 11 months.

The cane varieties recommended by Ugar Sugar Works, Ltd. as follows :

1) Adsali - Co-740

Late Adsali - Co 7219, Co 6415, Co 62175.

- 2) Nim Adsali - Co 8011, Co 8014, CoC 85061, CoSI 776, CON 7114.
- 3) Plant - Co 8014, CoC 671, CoC 85061, CoM 7125, KHS-3296.
- 4) Short duration CoC 671, Co 6907.

For June planting, harvesting at an age of 10 to 11 months
Co 770 and Co 8021.

The special characters of CoC 85061 and CoC 671, varieties of sugarcane grown in factory's estate are shown in Table No. 5.4. But the problem could not ^{be} understand^{able}, Which variety be used during which season.

TABLE NO. 5.4
Characters of Cane Varieties.

	<u>CoC - 85061</u>	<u>CoC-671</u>
1. Height in feet	91'	8'.4"
2. Interhodes	25	24
3. Middle grith	5"	3"
4. Average weight/cane	2.75 kg.	1.540 kgs.
5. Weight/Running foot	252gms.	184 gms.
6. Yield of cane	76 MT/acre.	55 MT/acre.
7. Plant population	40,000 cane/ acre	37,000 cane/acre.
8. Nutrients doze applied	N.K.P. 150-70-70 kg,	N.K.P. 150-70-70Kgs.
9. No.of irrigational rounds	11	12
10. Age of crop	11 months	12 months

- 3) The cropping pattern in the region is generally followed by the cultivators is planting Adsali sugar followed by a intercrops in it. Sugarcane is again planted in the following July-August (Adsali) or June a special short duration crop of CoC 671, which is favourable for cane growing in this region.
- 4) The cane yield is although declining in the Ugar Sugar Works Ltd. get sufficient potentiality of cane. The yield rates are

Adsali	40 tonnes per acre
Nim Adsali	35 tonnes per acre
Plant	32 tonnes per acre
Ratoon	25 tonnes per acre.

The yield of Adsali sugarcane goes as high as 60 to 70 tonnes. Which is obtained by a number of growers of the region. A special season CoC 671, yield to the extent of 50 to 55 T.P.A. during crop standing at 10 to 11 months. The Ugar Sugar Works Ltd. had won the " Parthasarathy Award " in factory's demonstration plot and best performance in cane development of the variety; CoC 671.

- 5) Annually on an average about 550mm to 660 mm of rainfall is obtained by this region. Its distribution is as follows :

June	-	100 mms
July	-	80 mms
August	-	70 mms
September	-	200 mms
October	-	80 mms
Summer rains	-	70 mms.
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Total :		600 mms
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The minimum summer temperature is about 105° to 106° F and the minimum temperature is about 60° F. The winter temperature is about 60° F. The climate is thus ideal for cane cultivation. The main bottleneck for cane growing in the summer months of April & May, when the sources of irrigation viz. wells, river Krishna dry up. The crop is subjected to a prolonged drought lasting for over 2 months.

5.4 Cane Procurement Procedure :

An agreement is made with the growers for a period of an 5 to 10 years or even less if the grower insists. The factory has about 19,000 growers . As soon as a farmer plants cane, he fills up a card specifying date of planting, area of planting and variety. The factory's cane Inspection starts survey work and assess whether the figure of area and date of planting supplied by the cultivators is correct or not. The factory had number of cultivators to whom it supplied irrigation water, whom it call as Estate Cultivators.

They also fill up a form and seek the factors^y approval to plant a certain area of a certain variety as also grow a certain area of ratoon of a certain variety. The USW restrict the area of June planting of CoC-671 to maintain equilibrium of different seasons of planting. Since June planted CoC-671 can avoid the summer drought, cultivators are very eager to plant this variety and hence USW had to adopt stringent measures to check the area. The USW also discourage planting low-sucrose cane like MS-6847 eventhough it is a vigorous grower.

Harvesting orders are usually issued on the basis of date of planting for conventional varieties. However, since so many varieties are planted these days it is very difficult to properly arrange harvesting. Hence a table of equivalence for various varieties is made which works as a rough guide for issuing harvesting orders. In unusual cases samples of cane are brought to the factory and analyzed for Brix, Pol, Purity and Nett Readement of the juice and harvesting orders are issued only if the cane is found sufficiently matured.

Harvesting is done manually by labour force and contracts with harvesting gangs are made a couple of months before the start of the season at a pre-determined rate of harvesting. Transporting is done by bullock carts, trucks and tractor trailers which are available in plenty in the surrounding area. Contract with transport contractors are

also made depending upon the milage of haulage etc. long before the start of the Season. Quality of harvesting is insisted. Harvesting quality is usually good till about the end of February, which usually synchronizers with the start of summer and Rabi harvests. After that, labour shortage is felt the quality of harvest deteriorates. Normally transport is done in the following percentages.

i)	By bullock cart	..	6 to 7 %
ii)	By trucks	..	20 %
iii)	By tractor trailers	..	73 to 74 %

5.5 Developmental work to improve recoveries :

The Ugar Sugar Works ■ had a well-developed R & D Farm and extremely good cultural equipment. R & D Departments main thrust is in introduction of high sucrose short-duration or early maturing varieties and Ugar Sugar Works is proudly claiming to be the pioneers in the introduction of such high class varieties like CoC-671, CoC 85061, and Co-6907, and CoC 671, CoC 85061 ' which is a later introduction) have caught cultivators 'imagination to such an extent, that these varieties (excluding Co-6907) have become major varieties and threaten to displace age-old varieties like Co-740, and Co-7219. Two other varieties viz. Co-8011 and Co-8014 are also gaining in popularity and they too will soon be a major varieties. Recently Ugar Sugar Works has introduced Co-8021 as a short duration variety

but it is still awaiting its performance.

The Ugar sugar Works has proposed soon to introduce the 3 tier nursery programme which may prolong the life of the variety at the same time ensuring better quality of cane.

Practices like trash mulching administering potassium prior to the onset of drought, use of anti-transpirants are recommended to reduce the maleffect of drought and keeping the quality of cane. Use of products like 'Jalashkti' etc. is also advocated to reduce drought injury. Trials of chemicals like 'Cytozyme' etc. are taken to study their effects as also bio-fertilizers like 'Bactin' 'Natrini' etc. Use of weedicides is advocated to reduce cost of hand weeding-weedicides and spraying equipment is supplied by Ugar Sugar Works for the purpose. Micronutrients are also supplied to cultivators when chlorotic symptoms are observed on these crops.

Introduction of new varieties and other agricultural practices will definitely raise the yields by at least 10/12 ton per hectare and will improve the recovery by at least half a unit. This is the modest ambition of Ugar Sugar Works.

The Ugar Sugar Works has recommended an annual budget on cane developmental activities to the extent of Rs. 18 lakh by 1989-90.

5.6 Other Activities :

Apart from research on sugarcane, The Ugar Sugar works is conducting a lot of research under the guidance of the Indian Agricultural Research Institute, New Delhi, particularly on crops like Wheat, Soyabean, and Sunflower. This is done as a part of Rural Development Programme. The factory's work on conducting co-ordinated trials on wheat has been applauded at All India Wheat Workshop. Work on Soybean has also been praised by the Project Director (Soybean). The USW has been recognized as a centre for carrying out co-ordinated trials on Sunflower by the Project Coordinator (sunflower) at the V.A.S., G.K.V.K. Bangalore.

The Ugar Sugar Works also planning to introduce Soybean as a companion crop with sugarcane and hope to do really very well in that,project. The Ugar Sugar Works has already started the programme in it's June this year, 1989.

Owing to unfortunate mechanical troubles, The Ugar Sugar Works had been able to implement an expansion programme this year. Otherwise the climate conditions during 1988-89 were ideal for maturation and sugar recovery of cane.

5.7 Factory's Immovative Activities :

In the introduction to his famous book 'Botany of Sugarcane' the famous Dutch Sugarcane Scientist Clive Van Dillewijn Writes as follows :

"The discrepancy between the efficiency in the factory and in the field is obvious. Whereas in the factory every effort is made to recover as much sugar as possible, in the field only a fraction of the economical yield is obtained. It seems as if the scale where the cane is weighed before entering the factory forms a boundary between low and high efficiency."

This observation made some forty years ago still holds good, with one major difference. The improvements made in the engineering and manufacturing sections in the past 2/3 decades have reached saturation-or even supersaturation-point; and inspite of that if one compares the present-day manufacturing results with those mentioned by Dr. H.C. Prinsen Geerbig in his most scholar book "Cane Sugar and its manufacture" written in 1923, one hardly note any improvement. The time therefore has come when any improvement in recovery of sugar can only be effected by improvement in field practices. In this connection Ugar Sugar Works emphasised the following points to achieve.

1. Large-Scale introduction of high-sucrose cane varieties which can build up more sugar per acre per unit of time as also per kilo of nutrient and per gallon of irrigation water. The varieties should be replaced before they run out. To increase their useful life all precautions such as MHAT and 3-tier nursery programme etc. should be taken.
2. Judicious use of macro and micro-nutrients so that too much vegetative growth at the expense of sugar storage is not encouraged.
- 3) Imparting moisture, and nutrient stress to the cane crop to hasten maturation and maintaining conditions conducive for retention of right maturity for a prolonged period of time.
- 4) Reducing cut-to-crush time and not permit any staling of cane. Introduction of harvesting based on maturity survey.
- 5) And above all to restrict the crushing season so as to avoid low recovery period at the start of the season as also at the end of it, at the same time ensuring maximum utilization of installed capacity.

5.8 Description of cane mills, recent changes made and total losses :

Cane Mills Description : The Ugar Sugar Works had two milling trains. One was installed in 1968 and was fabricated by M/s Walchandnagar Industries Ltd. The crushing capacity is 30000 T.C.D. The roller size is 33" X 66" and mill consists is of

five 3-roller mills working in tandem. It has got a satisfactory cane preparation unit consisting of cutter, leveller and kicker each of them run by a suitable horse-powered electric motors. The mills are individually driven by turbine by suitable horsepower. The peripheral speed of the mill rollers is 47.5 feet per minute. The second mill was installed in 1988 and is manufactured by Texmaco. The roller size is 28"X56" and the crushing capacity is 2000 TCD. The mill consists of six 3-roller mills working in tandem. The cane preparation unit consists of cane leveller, and 'Sumac' make cane fiberizer each driven by a suitable powered electric motor. Under-feed rollers are fitted to all mills and all the roller are arced. A prolonged trial of the second mill under full load could not be taken during 88-89 season.

Imbibition water percent fiber was 186.93 in 1987-88 season and 164.70 in the 1988-89 season.

Recent changes made in the manufacturing side are :

- i) Double effect vapour cell.
- ii) Continuous crystallisers for 'C' massecuite.
- iii) Transient heaters.
- iv) Continuous Centrifugals for B and C massecuites.
- v) Vertical crystallisers for treatment of 'C' massecuite
- vi) Continuous crystallisers for 'B' massecuite and its cooling.

The sugar balance this year compared to last year was as follows :

	<u>1988-89</u>	<u>1987-88</u>
1. Sugar in cane	13.54	13.30
2. Sugar in MJ	12.68	12.46
3. "- Bagasse	0.86	0.84
4. "- PM	0.07	0.06
5. "- Molasses	1.42	1.40
6. "- Sugars	11.02	10.83
7. "- loss undertermined	0.17	0.17
8. Total losses (3+4+5+7)	2.52	2.47

5.9 Peculiar behaviour of CoC 671. :

The yield and quality of cane is dependent mainly on the following four factors :

- i) Genetic potential of the variety.
- ii) Management of the crop.
- iii) Meteorological and conditions.
- iv) Chronological and physiological age of the crop.

It is noted that the Pol % cane figures for CoC 671 for the past three seasons in the early part of May was as follows:

Date of Big Mill Trial	Pol % Cane	Age of Crop
1.5.87	14.09	310 days
9.5.88	14.27	315 days
3. 5.89	13.09	315 days

So, one can note that the Pol % cane figure this year is clearly lower than the previous two years.

The ratoon of CoC 671 harvested at the age of approx.11 months gave the following : reading for Pol % cane.

Date of Big Mill Trial	Pol % cane	Age of crop
5.4.89	15.01	11 months
30.3.89	14.98	11 months.

So there is just no doubt about a normally-reared CoC 671 either plant or ratoon-showing a high Pol % cane figures.

The question therefore arises as to why its' quality this year as a June-planted cane is inferior to the preceding two crops at the age of 310-315 days. The reasons-explained by factory's R & D Dept. are not far to seek and are as follows :

- i) Owing to continuous rains in the months of July to Sept. 1988, the germination, early growth, and tillering were much below normal. The hours of sunshine received by the crop were also much lower than the previous two years. Hence the gapfilled cane and the tillers started their life very late. There was thus a lot of difference in the chronological and physiological age of the cane.
- ii) As the early growth was not satisfactory, cultivators connived at our suggestion of completing nitrogeneous manuring within the first 100 days of the crops life. The late application of nitrogen encouraged a flush of new tillers which were chronologically and physiologically much younger than the mother plants and remained in the vegetative phase for much longer than they would have normally done.

iii) The climatic condition since late March this year were very cloudy and humid with appreciable amount of rains. Since the 23rd of March nearly 115 mm of rains was recorded. This also encouraged vegetative growth at the expense of sugar content. This is evident from the following data.

Date of Big mill Trial	Pol % Cane.
24.4.1989	13.36
3.5.1989	13.09

The period between 24/4 and 3/5 was very cloudy and an inch of rain was received then which encouraged vegetative growth with a corresponding decrease in the Pol % Cane figures.

The late application of N and the summer rains kept the sugarcane crop in juvenile condition without ever allowing it to reach maturity. This is very manifest from the bottle green colour of the cane tops which do not show any signs of senescence which is one of the visual signs of the process of maturation.

According to the report submitted by R & D Deptt. of the Factory noted that owing to meteorological conditions the the April (1988) - harvested cane, ratooned well but flowered profusely necessitating early harvest (at the age of 10 to 11 months). It suffered moisture stress in April-May 1988 but made quick recovery after the onset of monsoons and gave a good yield of cane which showed adequate in Net Rendement. CoC 671 planted early June (1988) flowered sparsely in Nov. -December 1988 and generally showed signs of senescence even

where it had not flowered. This crop had to be harvested prematurely to avoid pith formation and general deterioration. This cane showed reasonable Rendement but understandably gave low yields. The above story is concerning CoC 671 which had not arrowed at all. Such crop formed the bulk of the CoC 671 June planting (about 95%).

5.10. The Role of R & D Deptt.

The R & D played a great significant role in innovations certain varieties of sugarcane in factory estate. Puzzled by the queer behaviour of CoC 671 during three year (86,87, 88) USW decided studying the behaviour of CoC 740 at an age much more than CoC 671, at the start of the season of our factory for the years 1986-87, 1987-88, and 1988-89 and the observations made by Ugar Sugar Works were as follows :

TABLE NO. 5.5.

Behaviours of CoC (671) Sugarcane Variety

Year	Period under consideration	Length of period	during the period	Recovery of Sugar % cane
1986-87	23.10.86 to 7.12.86	46 days	11.98	19.82
	18-12-86 to 3.1.87	27 days	12.96	10.98
1987-88	13.10.87 to 1.12.87	35 days	12.90	10.92
	2.12.87 to 5.1.88	50 days	12.36	10.31
1988-89	17.11.88 to 27.1.89	72 days	12.76	10.10
	28.1.89 to 5.3.89	37 days	14.58	12.27

Since the periods in the above table were too long, the factory resolved to break up the period in 7 days bits to study the pol.% cane and the Recovery of sugar figure week by week for the above years :

TABLE No.5.6

Break up of Behaviour of CoC 671 Variety

Week Considered	' 1986-87		' 1987-88		' 1988-89	
	Recovery.	Pol % Cane	Recovery.	Pol % Cane	Recovery.	Pol % Cane
1.11 to 7.11	9.45 (9.17)	-	9.98 (10.19)	-	-	-
8.11 to 15.11	9.73 (9.44)	-	10.07 (10.15)	-	-	-
16.11 to 22.11	9.44 (9.44)	11.73 (11.74)	10.32 (10.19)	13.16 (12.69)	8.85	12.02
23.11 to 30.11	10.09 (9.63)	12.23 (11.88)	10.71 (10.30)	12.60 (12.36)	--	--
1.12 to 7.12	10.73 (9.82)	12.46 (11.98)	10.81 (10.36)	12.87 (12.42)	8.07 (9.08)	(12.27)
8.12 to 15.12	10.53 (9.94)	12.58 (12.08)	10.55 (10.39)	12.66 (12.45)	9.38 (12.45)	(12.25)
16.12 to 22.12	10.86 (10.09)	12.98 (12.22)	10.78 (10.44)	12.84 (12.50)	9.50 (9.28)	(12.29)
23.12 to 31.12	10.98 (10.22)	13.09 (12.36)	11.55 (10.55)	13.01 (12.57)	9.89 (12.57)	12.83 (12.39)
1.1. to 7.1	11.86 (10.36)	13.48 (12.45)	11.45 (10.60)	13.20 (12.62)	9.75 (4.45)	12.59 (12.57)

(NOTE : Figures given in black are for the week under consideration and those given in bracked are for the period till that date).

It could be seen from the above table that the Pol % cane figures for 1986-87 season till about 22nd of November, 1986 was 11.74 while for 1987-88 season it was 12.69 - a difference of

almost one unit. This is when the cane was 16/17 months old.

From the above it condition is obvious that climatic conditions, and agri-managerial practices have a lot to do with the quality of cane and if no temperature stress or nutritional (or moisture) without exists, an unflowered cane will live in juvenile condition without exists, an unflowered cane will live in juvenile condition without ever showing an inclination to perfect maturation. Even than some varieties of short duration may store more sugar than others of medium and longer duration.

What happened to a 16-months old Co 740 crop in 1986-87 season happened to a 10-months old CoC 671 crop in May 1989 and it is surprising that the Pol % cane in CoC 671 at 10 months age was higher than 12.2 while Pol % cane in Co 740 at 16-months age could not reach even 11.75. All the same the fact cannot be denied that the Pol. % cane in CoC 671 in May 1989 is a good one unit less than Pol % cane in May 1987 or 1988. But things like this do happen in agriculture & where so many factors impinge, and which is still not an exact science.

Thus Maturity in the final analysis is a function of meteorological conditions and crop management and no variety is proof against unfavourable weather or unscientific management. Often times, even with the application of N in stipulated period of 90-100 days, the soil may be containing so much undecomposed debris of the previous crop or compost, that this undecomposed material may lock up the applied nitrogen for its own decomposition and releases it later on, thus keeping

the crop in vegetative phase for too long. Soil application of BHC used as an insecticide could also result in slow release of applied inorganic or organic N and delay maturation. Hence one should not be in a hurry to laud a variety to the skies by an year's good performance nor damote it because of an unspectacular performance in another year of unusual weather conditions.

TABLE NO. 5.7

Analysis of CoC - 671 Ratoon

	Bx.	Pol.	Py.	NR.
1. K.K. Patil. Circle 2. Plant crop harvested on 20-4-1988.	23.68	21.60	91.22	13.70

Age of Crop = 250 days.

2. Shri. Vithal Circle 2. Deo Thrust Plant crop harvested on 3-6-1988	22.38	21.41	91.57	13.56
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Age of crop = 210 days.

Date of analysis = 30-12-1988.

Co-740 ratoon

	Bx.	Pol.	Py.	NR.
1. Manohar Circle 2. Plant Gavandi crop harvested on 4-12-87	21.75	18.36	84.41	11.27

Age of crop = 390 days.

2. Ashok Gavandi --- do - Plant crop harvested on 29-11-87	21.28	19.29	90.65	11.97
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Age of crop = 395 days.

Date of analysis = 30-12-1988.

Table 5.7 indicated that, there is a strong case for CoC-671-April - harvested ratoons. These case studies have been examined by R & D.Deptt, during the period Dec. 1988. Table No. 5.8 explain. The equalance of harvestability of different sugarcane varieties in cultivation analysed by R & D Deptt. of the factory, which indicate the fact that,

- 1) June planted CoC 671 should get a priority of 10 days over June planted Co 6907. Co 8014 will not be permitted to be planted in June.
- 2) Ratoon of Co 740 the percent crop of which is harvested after February can be treated at par With Ratoons of all other varieties and June planted CoC 671 and Co 6907.

These recommendations are only rough guidelines and should be corroborated by sample analysis from concerned fields.

TABLE No. 5.8

Table of Equivalence of Harvestability of different sugarcane
Varieties in Cultivation

<u>Sl.No.</u>	<u>Co 740</u>		<u>Co 7219</u>	
	<u>Plant</u> Date of planting	<u>Ratoon</u> Date of Har- vesting of plant crop.	<u>Plant</u> Date of planting.	<u>Ratoon</u> Date of Har- vesting of plant crop
1.	July	July(cut for seed)	Late Aug.	October late Sept.(cut for seed)
2.	August	August(cut for seed)	Late Sept.	Early Nov.
3.	September	--	Late Oct.	Late Nov.
4.	October	--	November	Early Dec.
5.	November	--	December	Late Dec.
6.	December	--	Jan (NY)	Early Jan(PY)
7.	January	--	Early Feb.	Late Jan(PY)
8.	---	October	--	Late Jan.(PY)
9.	---	November	--	Late Jan.(
10.	---	December	--	Early Feb.
11.	---	January	--	Late Feb.
12.	---	February	--	Early March.

(PY) - Previous year.

(NY) - Next Year.

Table No.5.8(cont.)

Sl.No. -----	Co 8014 -----		CoC 671 -----	
	Plant ----- Date of planting	Ratpon ----- Date of Har- vesting of plant crop	Plant ----- Date of planting	Ratoon ----- Date of Harves- ting of plant crop.
1.	Early Sept;	October late Sept.(cut for seed)	Early October	October (cut for seed)
2.	Late Sept.	Early Nov.	Late Octo- ber	Early Novl
3.	Mid.Oct.	Late Nov.	Early Nov.	Late Nov.
4.	November	Early Dec.	Early Dec.	December.
5.	Early Dec.	Late Dec.	Late Dec.	Early Jan (PY)
6.	January(NY)	Early Jan.(NY)	Late Jan. (NY)	Jan. Late
7.	Early Feb.(PY)	Late Jan.(PY)	Early Feb.	Februry
8.	---	Early Feb.	--	Early March.
9.	---	Early Feb.	--	Late March Early April.
10.	---	Late Feb.	--	Late April Early May.
11.	---	Late Feb.	June Plant- ed(Spl. Season)	June (Cut for Seed)
12.	---	Early March	June plant- ed (Spl. season)	---

(PY) - Previous Year

(NY) - Next Year.

Sl.No. -----	Co 6908 -----	CO 8011 -----	
Plant ----- Date of planting	Ratoon ----- Date of Harvesting plant crop	Plant ----- Date of planting	Ratoon ----- Date of Har- vesting of plant crop.
1. October	October(Cut for seed)	Early Sept.	--
2. Late Oct.	Early Nov.	Early October	--
3. Early Nov.	Late Nov.	Late October	--
4. Early Dec.	December	Early November	--
5. Late Dec.	Early Jan.(PY)	Early Jan.	--
6. Jan. (PY)	Late Jan.	Late Dec.	Early Dec.
7. Early Feb.	February	Late Dec.	Late Dec.
8. --	Early March	--	Late Dec.(PY)
9. --	Late March Early April	--	Late Dec.
10. --	Late April Early May	--	January.
11. June Plant- ed (Spl. season).	June(cut for seed)	--	February.
12. June Planted (Spl.season)	April	--	Early March

(PY) - Previous Year

(NY) - Next Year.

5.11 : Factors affecting sugarcane prices in general :

Prices of sugarcane is one of the most significant incentive to the cane growers. And the prices are dependent on various factors. There is a Large number of factors that have been bearing on sugarcane price in general. The important factors are the cane acreage and cane production, the differences of prices of cane actually paid by the sugar factories, gur and Khandsari industries, execution of agreement between the factories and the cane growers or cane growers cooperative societies for supply of cane and actual implementation of such agreements process for payment of cane price and the minimum prices for sugar cane fixed by the government. Price fixation of cane has now become a statutory provision and as such the factors may have vital bearing on the supply of cane to the factories. Indeed these factors have overlapping effects on each other. Similarly, the huge piling of cane price arrears is also not without effect on the cane supply. Hence, it would be quite essential to make prompt and convenient payment of cane price as also the cane price arrears to the cane growers in order to ensure the required quantity of sugarcane to the sugar factories. It is common experience that during the periods of low production of cane, delay in payment of cane price leads to comparatively more

diversion of cane to gur and khandsari industry. In brief the most important and relevant factors that influence the the price of sugarcane are as under :

1. Seasonal factors.
2. Price of gur and khandsari.
3. Price of alternative agricultural produce and
4. Fixation of price by government.

1)
SEASONAL FACTORS :

It is mercy of the monsoon that is decisive the agricultural life of the country. There is good crop of sugarcane provided seasonal condtions such as timely and sufficient rainfall, required amount of moisture and abserce of pests and diseases prove conductive to the cane crop. Other things remaining as they are the increased supply of cane due to the higher yields to lower cane price as payable by the sugar factories. Sometimes, this price comes down to a lower level than the minimum cane price level fixed under the provision of statutoy minimum cane price. Similarly, if the demand for cane by the cane using sections falls the cane growers will have no alternative but to sell their sugarcane to sugar-mills even if the cane price goes still more downward. As against prices to cane growers in industries will be compelled to offer higher prices to cane growers in case of lower cane production as result of seasonal or weather conditions. Thus we find fluctuations in cane prices due to seasonal factors.

2) PRICE OF GUR AND KHANDSARI :

The problem of equitable distribution of available sugarcane to the sugar industry gur and khandsari industry of great

significant not only for stabilising the sugar industry but also for maintaining suitable prices for both these sectors to avert the thought competition between the two. About 34.6 % of the sugarcane produced in the country is utilized in the manufacture of sugar while about 54 to 58 % is used for the manufacture of gur and khandsari and the a balance of 12 % goes ■ to feeding chewing, seeding and other uses (see table No.5.9). In this way, a major portion of sugarcane is used for the purposes of other than manufacture of sugar.

TABLE NO.5.2

UTILIZATION OF SUGARCANE FOR DIFFERENT PURPOSES.

Year	(Cane used for in 000 Tonnes)				% of Sugarcane utilized production for			
	1 Production of sugar (000 ton.)	2 Production utilized sugar.	3 Seed, feed & chewing etc.	4 Gur & Khandasari of white sugar.	5 Production of white sugar.	6 Seed, feed & Chewing etc.	7 Gur & Khandasari.	8
1960-61	1,10,001	31,021	13,620	65,360	28.2	12.4	59.4	
1961-62	1,03,967	27,946	12,743	63,278	26.9	12.2	60.9	
1962-63	91,913	20,799	11,157	59,957	22.6	12.1	65.3	
1963-64	1,04,225	25,716	12,533	65,974	24.7	12.0	63.3	
1964-65	1,21,909	33,454	14,539	63,916	21.4	11.9	60.7	
1965-66	1,23,990	36,514	14,606	72,872	29.4	11.8	58.8	
1966-67	92,826	21,637	11,094	60,095	23.3	12.0	69.7	
1967-68	95,500	22,638	11,234	61,628	23.7	11.8	64.5	
1968-69	1,24,676	37,699	14,734	72,243	30.2	11.8	58.0	
1969-70	1,35,028	45,707	16,291	73,032	33.9	12.1	59.0	
1970-71	1,26,368	38,205	15,173	72,990	30.2	12.0	57.8	
1971-72	1,13,569	31,015	13,514	69,040	27.3	11.9	60.8	
1972-73	1,24,866	40,407	14,999	69,460	32.4	12.0	55.6	



TABLE NO.5.9(cont....)

1	2	3	4	5	6	7	8
1973-74	1,04,805	42,278	16,802	81,725	30.0	11.9	58.1
1974-75	1,44,286	48,435	17,188	78,666	33.6	11.9	54.4
1975-76	1,40,604	41,880	16,692	82,032	29.8	11.9	58.3
1976-77	1,53,007	48,819	18,317	85,874	31.1	12.0	56.1
1977-78	1,76,966	67,329	21,029	88,608	38.0	11.9	50.1
1978-79	1,51,655	59,717	27,957	74,004	39.4	11.8	98.8
1979-80	1,28,833	39,050	15,104	74,679	30.3	11.7	58.0
1980-81	1,54,288	51,584	18,201	84,464	33.3	11.8	54.8
1981-82	1,86,358	87,360	19,278	79,720	46.9	11.8	41.3
1982-83	1,89,506	82,695	22,371	84,440	43.6	11.8	44.6
1983-84	1,74,076	59,022	21,136	93,918	33.9	12.1	54.0
1984-85	1,73,569	60,092	21,000	92,477	34.6	12.1	53.3

SOURCE : Indian Sugar, September, 1986, P. XVII.

Table No.5.9 shows the quantity of cane used for different purposes from 1961-62 to 1984-85. A close persual of this table endorsed the aforementioned facts. Recently suggestions have been made from certain quarters that gur manufacture within the radius of 10 miles of sugar factories may be banned. So that the entire sugarcane produced in the area may be available to the factories. As against to the this view, it is held by some people that gur and khandsari are still now a major source of sweetning agent in rural areas & as such any ban on them, will debar the rural population from the use of even the already low amount of simplex from of carbohydrate w which is being received from gur and khandsari units. In addition neither the government nor a sugar industry will be in a position to regularise sugar supply in rural areas according to the need.

On the other hand, it is feared that any ban on gur and khandsari industry in the country might deal a fatal blow a to the very existence of the sugar industry itself. According to some authorities, imposition of any restriction on the industry is never a panacea for establishing the sugar industry on a sound footings. To them, it is coherent and melodious balances of economic measure that will be helpful, to the industry.

3) PRICE OF ALTERNATIVE AGRICULTURAL PRODUCE :

It is a well known fact that sugarcane occupied land for a long period than any other agricultural crops. It's complete

growth period extends from 10 months to 18 months. In some states like Bihar, Uttar Pradesh, Punjab, the complete growth period of cane takes a period of full one year in the normal course. During this period two or more other crops including both food crops and cash crops can be grown which can give the farmers a quicker return for their inputs invested by the farmers in place of sugarcane. Paddy, maize, wheat, oilseed, chilly and different types of crops are the alternative produces for sugarcane produce. Sugarcane also needs larger investment of the inputs when compared to the wheat and paddy crops in which technological break has already achieved. The prices of these products affects the price of cane payable by the sugar mills. Higher price of cereals and other money crops give impetus to the diversion of sugarcane area to their produce. The situations obtaining in this way compels the sugar mills to pay higher prices for the created scarcity of sugarcane supply.

TABLE No.5.10

Statement showing the minimum statutory price of Sugarcane.

<u>Season</u>	<u>Rs. per quintal</u>
1951-52	4.96
1952-53	3.52
1953-54	3.85
1954-55	3.85
1955-56	3.85
1956-57	3.85
1957-58	3.85
1958-59	3.85
1959-60	3.85 to 4.34

Table No.5.10(cont.)

<u>Season</u>	<u>Rs. per quintal</u>
1960-61	4.34
1961-62	4.34
1962-63	4.02 to 5.71 *
1963-64	4.96 to 6.46 **
1964-65	5.36 to 6.48
1965-66	5.36 to 6.88
1966-67	5.68 to 6.84 @
1967-68	7.37 to 9.35
1968-69	7.37 to 9.35
1969-70	7.37 to 9.35
1970-71	7.37 to 9.22
1971-72	7.37 to 9.48 =
1972-73	8.00 to 11.75 \$
1973-74	8.00 to 11.29 \$
1974-75	8.50 to 12.40 +
1975-76	8.50 to 12.80 +
1976-77	8.50 to 12.70 +
1977-78	8.50 to 12.40 +
1978-79	10.00 to 14.59 @ @
1979-80	12.50 to 18.68 a.
1980-81	13.00 to 18.35 b.
1981-82	13.00 to 18.81 b
1982-83	13.00 to 19.2 b.
1983-84	13.50 to 16.69 c.
1984-85	14.00 to 20.42 d.
1985-86	16.50 to 24.07 c.
1986-87	

- * Fixed on a recovery basis at Rs. 4.34 per quintal linked to a recovery of 9.8 % with increase or decrease of 4 paise per quintal for every 0.1 % rise or fall in recovery. The irreducible minimum being Rs. 4.02 per quintal for a recovery of 9% or less.
- ** Fixed on a recovery basis at Rs. 4.69 per qtl. linked to a recovery of 9% or below with a premium of 4 paise per qtl. for every 0.1 % rise in recovery above 9%.
Fixed on recovery basis at Rs. 5.36 per qtl. linked to a recovery of 10.4 % or below with a premium of 4 paise per qtl. for every 0.1% rise in recovery above to 10.4 %.
- @ Up to 26-12-1966 fixed on recovery basis at Rs. 5.36 per qtl. linked to a recovery of 10.4 % or below with a premium 4 paise per qtl. for every increase of 0.1 % rise in recovery above 10.4 %.
From 27-12-1966 fixed on recovery basis at Rs. 5.68 per qtl. linked to a recovery of 9.4% or below with a premium of x 4 paise per quintal for every 0.1 % rise in recovery above 9.4 %.
Fixed on recovery basis at Rs. 7.37 per qtl. linked to a recovery of 9.4 % or below with a premium of 5.36 paise per qtl. for every 0.1 % rise in recovery above 9.4%.
Fixed on recovery basis at Rs. 7.37 per qtl. linked to a recovery of 9.4 % or below with a premium of 6.60 paise per qtl. for every 0.1 % rise in recovery above 9.4 %.
Fixed on a recovery basis at Rs. 8.00 per qtl. linked to a recovery of 8.5 % or below with a premium of 9.4 paise per quintal for every 0.1 % rise in recovery above 8.5 %.

Fixed on recovery basis at Rs. 8.50 per quintal linked to a recovery of 8.5 %/below with a premium of 10,0 paise per quintal for every 0.1 % rise in recovery above 8.5 %.

@@ Fixed on recovery basis @ Rs. 10.00 per quintal linked to a recovery of 8.5 % below with a premium of 11.7647 paise per quintal for every 0.1 % rise in recovery above 8.5 %.

a. Fixed on recovery basis @ Rs. 12.50 per quintal linked to a recovery of 8.5 % or below with a premium of 14.7059 paise per quintal for every 0.1 % rise in recovery above 8.5 %.

b. Fixed on recovery basis @ Rs. 13.00 per quintal linked to a recovery of 8.5 % or below with a premium of 15.2941 paise per quintal for every 0.1 % rise in recovery above 8.5 %.

c. Fixed on recovery basis @ Rs. 13.50 per quintal linked to a recovery of 8.5 % or below with a premium of 15.8824 paise per quintal for every 0.1 % rise in recovery above 8.5 %.

d. Fixed on recovery basis @ Rs. 14.00 per quintal linked to a recovery of 8.5 % or below with premium of 16.4706 paise per quintal for every 0.1 % rise on recovery above 8.5 %.

e. Fixed on recovery basis @ Rs. 16.50 per quintal linked to a recovery of 8.5 % below with premium of 19.4118 paise per quintal for every 0.1 % rise in recovery above 8.5 % in 1985-86 for the season 1986-87. The minimum cane price was fixed at Rs. 17/- per quintal.

SOURCE :- Indian Sugar, September, 1986 P.XV.

The adverse situation leads to the diversion of food crop and other cash crop acreage to growing of cane crop. Consequently, the factories may enjoy the advantageous position in getting cane at the statutory minimum price fixed by the Govt. Thus the price of alternative agricultural produce has a bearing on the cane supply position and cane price.

It was recommended by the sugar Industry Enquiry Commission, 1974 that the statutory minimum cane price be fixed in such a way that the return from sugarcane has an edge over the return from other alternative products and it should be varied from year to year in accordance with changes in the alternative and competitive products for which data on sugarcane cultivation and return from sugarcane and other alternative produce should be collected and kept-up-to-date. Recently Government of India fixed the cane prices at Rs. 22/- per quintal which was Rs. 20 last year (1988-89).

4) FIXATION OF CANE PRICES BY THE GOVERNMENT :

The main principles and methods adopted by the central government and the state government in fixing the minimum cane price to time until 1962-63 were as follows :

1. Linking sugarcane price to prevailing sugar price.
2. Fixing a minimum price, unrelated to sugar price for the whole or part of a season.
3. Fixing " consolidated process, " related to percentage of sugar recovery and,
- 4.

4. Linking cane price to extra realisation from the sale of sugar. (this method can be known as the price linking formula).
5. The rayot Unions are compell the Govt. and concerned agencies to fix a favourable prices of canes. Their role is also immense and they do affect the sugarcane price.

The Ugar Sugar Works will not be kept aside from this process of fixing the prices. However, the prices at factory level are generally higher than the price fitted by Govt. Moreover the prices of sugarcane Varies from the factory to factory. After rendering all types of costs of cane processing activities, the factories used to fix the prices with the help of recovery and their financial position. Particularly profit and loss. And this is conflicting issue between the cane growers and factories. Factories buy cane on the basis of tonnes, while the Government fixes the prices on recovery basis. recovery is dependent on factory's efficiency in transporting cane from farm to factory.

Thus there is a inter factory rivalry is observed in fixing the final cane prices among sugar producing units. Table 5.11 shows the prices of sugarcane price by Ugar Sugar Works during a last few years.

TABLE No.5.11
Price of Sugarcane Paid by Ugar Sugar Works.

YEARS	PRICES PER M.T.
1984-85	Rs. 245/-
1985-86	Rs. 300/-
1986-87	Rs. 330/-
1987-88	Rs. 330/-
1988-89	Rs. 335/-

These prices are less than the other sugar factories located in the moffusil area of Karnataka and Maharashtra state. The highest prices of cane fixed by a factory in the area is Kisan Aihir (Walva Maharashtra at Rs. 457/- for 1988-89 season) which is away from Ugar to the extent of 60 Kms.

5.12. Marketing and Transport of Sugarcane :

Most of the sugar factories in India depend on their requirement of cane on a large number of cane growers. The number of farmers supplying cane varies broadly from region also from factory to factory. In the southern states the number of cane growers supplying cane to a factory ranges between 3000 and 10000 whereas in the north, the range is between 10,000 to 40,000. A noticeable feature of the sugar of industry is that majority of the factories obtain considerable quantity of sugarcane from long distance. Only a few factories

manage to get all the sugarcane they require from their gate area, that is, an area roughly within the radius of 15 K.M. or so. In south India especially in Karnataka, except for a few factories delivery is taken at the factory gate even though the sugarcane might be coming from 80-100 K.M. from the factory. The Ugar Sugar Works is obtaining cane from 35 to 75 k.m. For transport of cane over long distances the factories after transport facilities of cane growers by engaging their own vehicles or hired vehicles at their disposal. So is the case of the Ugar Sugar Works Ltd. The cost of transport is recovered from the cane growers by adjustment in the prices. In many states cane growers societies or unions have been organized for supplying cane to sugar factories. Government of India passed the Sugar Factories Control Acts to provide regularly the cane, purchase licencing of sugar factories and fixation of sugar factories.

The Acts and Rules of various states as well as Sugarcane (controls). Order, 1956 provide for reservation of areas of zones. In a reserved area a factory has the right to purchase cane to the exclusion of any other factory. And it is compelled to purchase all the cane that the zones offered to it. In an assigned area more than one factory can purchase specified quality of cane. In several cases villages are reserved or allotted to different factories are interspersed; Though there is provision in all the State Acts, rules and orders framed there under for reservation of areas of assigned area

for a season or seasons. But in actual practice all the states have to pass reservation orders annually. In view of the different commissions instituted for sugar industry, it is essential to clarify, the define the reserve the factory zones on a long-term or on a permanent basis depending upon the capacities of the factory. The sugar cane growers are expected to represent their interests with those of the factory and the factory in turn, should see to it that the growers do not suffer.

In the opinion of the sugar Industry Enquiry Commission, 1974 the annual consideration and issue of reservation order has been stated to be a very disturbing factors on several grounds. It stands in the way of long term planning for cane production as also for the development of sugar factory areas. In addition pre-sowing agreement between the factories and the cane growers cannot be made. Reservation of areas for a period of least five years with certain stipulation to meet the special situation was recommended by the Bhargava Commission.

The sugar mill owner of the every factory has to submit the information to the cane-commission. On the scrutiny of the estimate & consultation of the Advisory Committee within the Jurisdiction of which the sugar factory is situated. The cane commissioner declares an area as reserved area for the sake a supplying cane to a particular factory during the ensuing crushing season. The factors as basis for decision of reservation of areas for a factory by the commission are stated as below :

1. The distance of the factory from the area to be reserved.
2. Transport facility for carrying cane to the factory from the proposed reserved areas.
3. Whether the areas has previously supplies sugarcane to that factory in particular.
4. Any existing private arrangements made before hand among the factories in this respect.

As sugarcane is an extremely perishable commodity, development of transport facilities for its prompt carriage is an essential requirement for cane marketing. For essential marketing of sugarcane, arrangement for its quick disposed have to be made at the proper time with the help of means of suitable transport within economic distances. Well organised and efficient transport is indispensable for the development of sugar industry in the country. The location of manufacturing plants, it's production and distribution, the rise and fall in domestic foreign trade, the economic growth and above all the educational and cultural development of a region are all vitally influenced by the transport system. It is known, fact that India is a subcontinent abounding in villages and as such the outstanding importance of transportation. The scattered is land like villages in the country are now breaking their isolation from their counterparts, cities and towns by means of roads and railways.

Sugarcane cannot be transported at very distant places out of the areas as the haucase will be considerably reduce the sugar content. In addition to this, there are some lands suited

preferably to growing sugarcane sugar industry like all other large scale industries, is greatly dependent on well organised transport system. The significance of easy, cheap and quick transporting is greatly estimated. The rail and road are the two most important means of transport and communication that offer facilities to transport cane in the country.

In India about 25 % of sugarcane is transported to the factories by rail. Taking the broad features of means of transport on an all India basis for sugarcane transportation, the following means of transport may be considered.

1. Bullock-carts and rubber - tyred carts.
2. Motor-trucks, tractors with trailers and tramway vehicles.
3. Rails.

The means of transport used by Ugar Sugar Works are

- (i) Bullocks - 6 to 7 %
- (ii) Trucks -- 20 %
- (iii) Tractor-Trailers- 73 to 74 %.

During the year 1988-89 Season.

5.13 : Welfare Activities of the Ugar Sugar Works Ltd. :

The factory management believes that profit is only " one value among others in life ". As such the management from this angle has been undertaking multifarious welfare activities, for working class. Cordial relations between the management and workers is the cardinal principle of good

management and the progressive growth of the factory.

As the management believes in this standard, it has not lagged behind in adopting measures for the welfare of the employees as far as possible.

5.13.1. Educational Activities :

It has realized by all that " education is the most important single factor in achieving rapid economic development and technological progress and in creating a social order founded on the values of freedom. Social justice and equal opportunity " True to its belief in the above ideal, the founding father of the factory felt the need for some sort of the arrangements for importing education to the farm families residing in the factory colonies especially at an outlined place like Ugar-Khurd. Shri. Nanasaheb Khadilkar one of the founder Directors of the company and a social worker of Ugar khurd took the initiative in this direction and started primary Marathi School for the colony. This gradually developed into a middle school by 1948, during which year the school management was taken over by the factory.

Under the management of the factory, the school developed into a Highschool named Shri. G Hari Vidyalya, Ugar-Khurd. This Highschool is now managed by a Board of Trustees of the Trust named after Dr. Shirgaonkar. This high school has proved to be a both to the school going children of the factory employees in particular and of the Ugar-khurd village in general. The high school has

to a track history of its dedicated service in the cause of secondary education in this area. The High school with adequate accommodation is well equipped with library, reading room and spacious Gymkhana.

There is also a Balawadi facility for the small children of the factory, area. Special Training Officers, to provide upto date-training for the workers have been appointed.

The factory also arranges educational programmes for the workers by the way of seminars, lectures by eminent persons and film shows etc.

5.13.2: Economic Welfare Activities :

In order to provide for economic security and better standard of living in the employees of the factory a number of measures have been adopted apart from payment of regular and salaries and wages to its employees.

1. Provision of 475 well built R.C.C. houses, for workers till Nov. 1987. Out of these 345 houses were allotted earlier and 130 houses allotted in Nov, 1987.
2. Power and water supply at concessional rates.
3. Supply of cooking gas at cheaper rates by the way of collection of bio gas from the Lagoon-pits a special experiment made by the Ugar Sugar Works Ltd. This scheme is the first of its kind in India.
4. Worker's welfare fund to provide for financial help to the workers during serious illness and other purposes.

5. Making advances to the workers for marriages, purchase of house sites, construction of house, higher education of the worker's children etc.
6. Supply of uniforms by the factory, for certain category of workers.
7. The Ugar Sugar Works manages a consumer's co-operative society which is engaged in procuring corn and providing other necessities of life for the workers so as to cut the middlemen margin as far possible.

5.13.3 Social and Cultural Activities :

1. As a sort of incentive to the workers on 2nd October of every year and on the eve of the Karnataka workers Day prizes are awarded by the factory to the workers showing extra ordinary skill in the performance of their duties during the year.
2. Arrangement of reception ceremony by the factory for the married couples.
3. Belitting farewell to the employees with gifts retiring after services.
4. Certain facility for the workers, inside the factory providing tea, and snacks at concessional rates.
5. Celebration of National Festivals especially "Ganesh Utsava" is the factory highlight of the activities of the factory, during which special features by eminent persons of letters and concerts by noted artists are arranged. The

factory staff also arranged to stage a couple of Khannad and Marathi dramas on this holy occassion.

6. A seperate Gymkhana building "Vihar " is the most attractive recreational facility that its the eye of every one that enters factory site. The building "vihar" with stage an audience half-cum-badminton court capable of seating 700 people and with a northern wing to serve a partition has been constructed by the factory for the Gymkhana. This building has also houses, a library, and reading room at one end and green room at the other. Almost all popular news-papers and magazines in Kanada, English and Marathi are subscribed to by the Gymkhana library for the benefit of the factory employees to get acquainted with the day-to-day happenings.

The labour have welfare facilities mentioned above have been provided to the employees of the factory. But the educational, medical, social and cultural facilities of the Ugar Sugar Works, Ltd. are also being availabled of by the people of Ugar-Khurd and surrounding villages, Thus though these facilities are available on the compus of the Ugar-works, the people in general are also being benefited by them.