

## 20.0 [A] UNIT PROFILE

### **BANASKANTHA DISTRICT CO-OPERATIVE MILK PRODUCERS' UNION LTD. PALANPUR, DISTT.: BANASKANTHA, GUJARAT**

Banas Dairy was registered under the co-operative act on 31<sup>st</sup> January 1969 as “ *Banaskantha District Cooperative Milk Producers' Union limited*. The foundation stone was laid on 14<sup>th</sup> January 1971 on 122 acres land acquired near Jagana village to set up a dairy plant under the Operation Flood Programme launched by National Dairy Development Board. On 5<sup>th</sup> February 1971, the dairy started functioning with a handling capacity of 1.5 Lac liters of milk. This dairy plant was later expanded on with processing capacity of 4 Lac liters of milk per day.



**BANAS-I PLANT**

The dairy took a quantum leap in the year 1998, when it decided to go for a highly automated plant. The foundation stone of Banas II Dairy plant was laid on 1<sup>st</sup> October, 1998. This plant has a handling capacity of 6.5 lac liters of milk per day. Altogether with Banas-I and Banas II Dairy plant and five chilling centers (Khimana, Dhanera, Tharad, Radhanpur and Danta) the dairy is able to process 10.5 Lac liters of milk per day. The plant has manufacturing capacity of 110 TPD Milk Powder, 40 TPD Table Butter, 20 TPD Ghee, 1 Lac Litres of milk packing, 20000 liters of Ice Cream and 200000 liters per day of UHT Milk. The dairy plant is ISO 9002 and HACCP certified and is first co operative dairy plant in India to get this. The dairy has also set up a cattle feed plant of 100 MT / day in 1977, which was further, expanded to 140 MT / day in 1992 . Today the cattle feed plant capacity is 450 MT/ day.



**BANAS-II PLANT**

Banas dairy has handled peak milk receipt up to 21.0 Lacs Ltrs per day(LLPD) in 2007-08 and in 2008-09 peak milk receipt is expected to cross 25.0 LLPD. As on date it is the largest milk handling co-operative plant in Asia. In order to process the expected milk quantities Banas Dairy is establishing new state-of-the-art BANAS-III plant of capacity 8.0 LLPD. Additionally, construction of new facilities at two of the chilling centres is under way for improving the keeping quality of the milk and hence the products manufactured.



**BANAS-3 MODEL**

Apart from the milk business, the dairy has also ventured into reverse supplying of products. It has started selling tea under the brand name "*Banas Tea*" and presently looking for other products. In order to augment the milk production thorough balance diet to the cattle the dairy plant supplies cattle feed to the milk producers through co-operative societies. It has recently started an Internet project "*Chirag*", in which it provides Internet connection to the rural areas on subsidised rates.

In order to enhance and sustain milk production ,quality and for animal health, The extensive veterinary services are also provided farmers for their cattle at a very reasonable cost. Additionally, the dairy is also providing input services at the grass root level milk co-operative societies. The input services like Cooperative development program and Internal Consultant Development program contributes in educating producer members for socio-economic development.

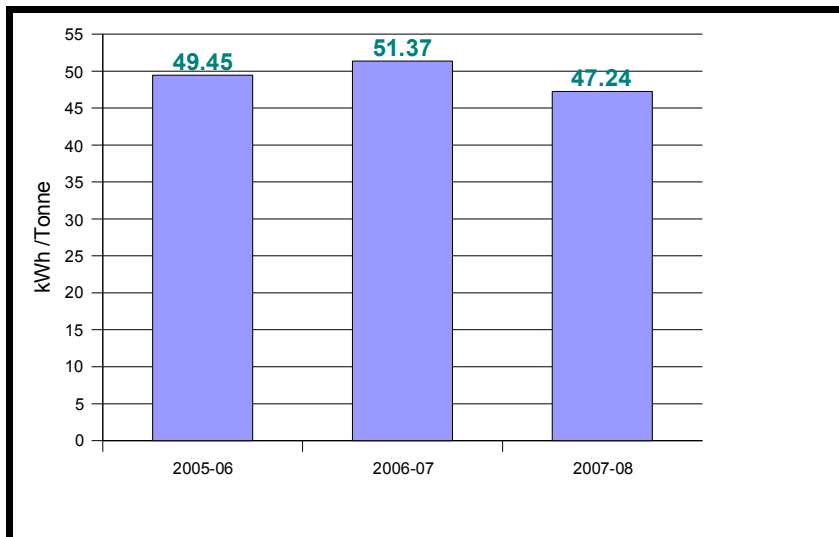
In order to reduce the cost of production and remain competitive Banas Dairy has taken several measures at all the levels and functions, energy conservation and management in one of them. Several Energy conservation measures have been taken and are in place and many other measures are being implemented . Decision for going for an ultra modern energy efficient Banas II dairy plant is also an example of energy consciousness and commitment of Management toward energy conservation.

**[B] ENERGY CONSUMPTION.**

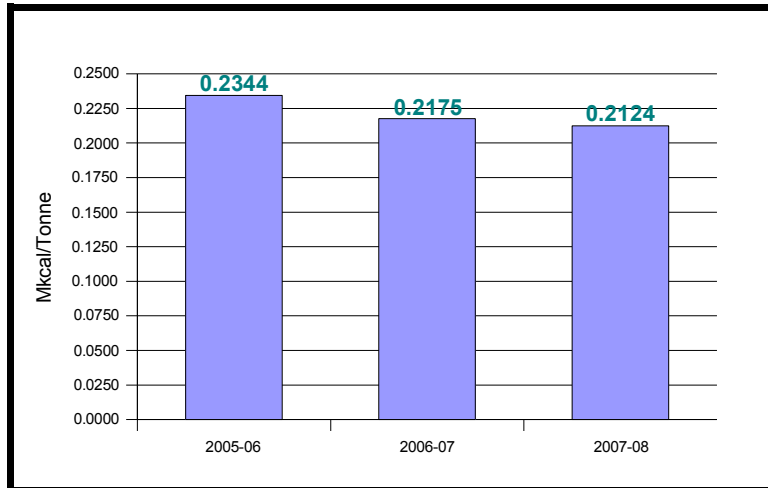
Through Systematic approach various energy audits are being regularly conducted and energy saving measures are implemented. Substantial savings have been achieved in addition to the enhanced production. The summary of Energy consumption and specific Energy consumption for the last three years is as below:

Particular		Units	2005-06	2006-07	2007-08
Milk Handled		Tonne	432120.05	441902.71	488106.88
Electrical Energy Consumption		Lakh-kWh	219.05	227.21	231.02
Thermal Energy Consumption		Mkcal	101273.58	96116.08	103693.15
		KL	10451.34	9919.10	10701.04
Specific Energy Consumption	Electrical	KWh/Tonne	49.45	51.37	47.24
	Thermal	Mkcal/Tonne	0.2344	0.2175	0.2124
		L/ Tonne	24.18	22.44	21.92
Reduction in Specific Energy Consumption	Electrical	%	12.45	-3.74	8.74
	Thermal	%	7.97	7.77	2.40
Total Energy Consumption As per above consumption details		(In Lakh Rs.)	2910.45	3116.76	3674.28
Total Energy Consumption As per Balance sheet Figures		(In lakh Rs.)	2951.53	3262.06	3705.80
Total Energy consumption as % of Manufacturing Cost (As per Annual report Data)		%	3.96	3.65	3.05

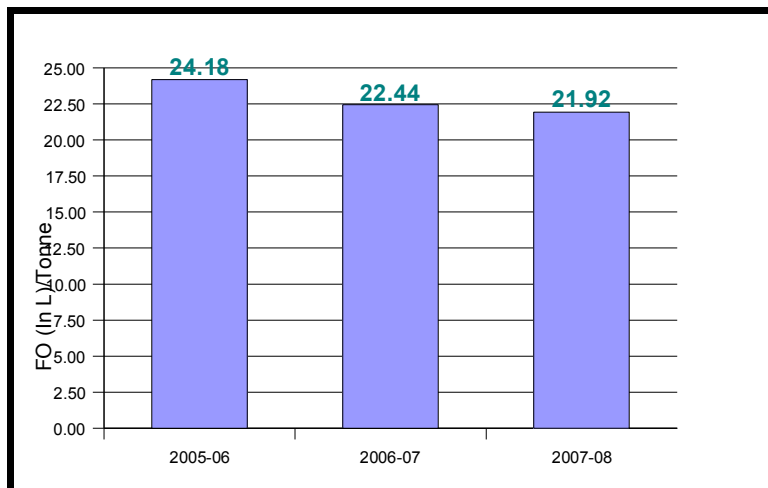
**Specific Electrical Energy Consumption in (kWh/Tonne of Milk Processed)**



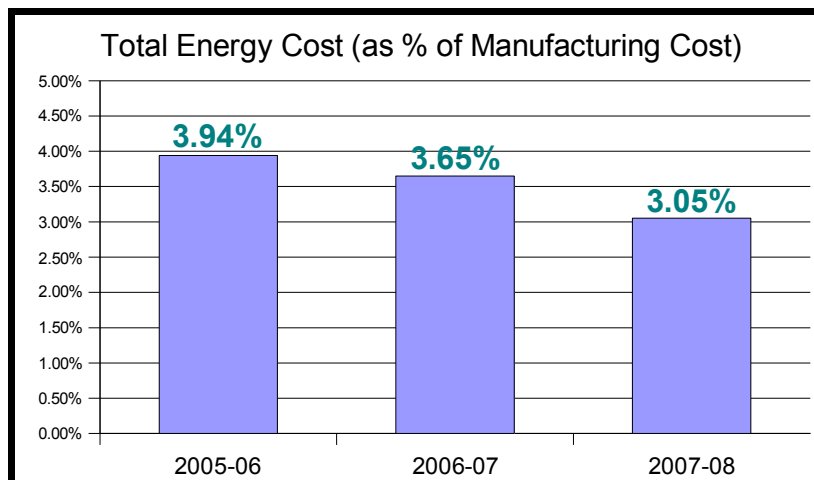
### Specific Thermal Energy Consumption (in Mkal/Tonne of Milk Processed)



### Specific Thermal Energy Consumption (FO (In L)/Tonne of Milk Processed)



### Energy Cost (as % of Manufacturing Cost)



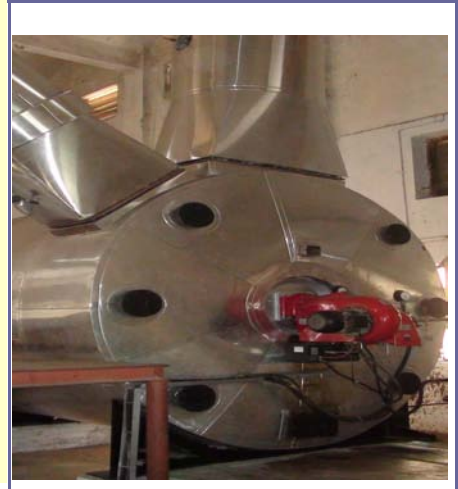
## [C] ENERGY CONSERVATION ACHIEVEMENTS

Following Energy conservation measures has been implemented during year 2007-08  
(Details of Calculation is mentioned in Annexure-A)

### 1. Up gradation and Modification of 20 TPD plant for better Energy Efficiency

Powder plant has been upgraded for better energy efficiency and to increase plant throughput.. Replacement of tubular type indirect air heating system (02) nos by single three pass indirect type air heating system. Conversion of air pressure atomization to nozzle atomization system by installaing high pressure pump

Particulars	Power	Fuel
Saving per annum	297600 KWH/Annum	91200 Kgs/ annum
Saving per annum	1562400 Rs/annum	2104896Rs/ annum
Total Saving	36,67,296.00 Rs/ annum	
Investment	90,00,000.00 Rs.	



### 2. Upgradation of 30 TPD powder plant

Powder plant has been upgraded to increase plant throughput and to achieve better specific energy consumption. Increase in heat transfer area of Evaporation with addition of 01 nos calndria in evaporation plant. Incorporation of DSI system with flash vessel. Installation of concentrate preheating system to reduce fuel consumption

Saving achieved with above Modification is as below:

Particulars	Power	Fuel
Saving per annum	24642 KWH/Annum	401220 Kgs/annum
Saving per annum	129370 Rs/annum	9260157 Rs/annum
Total Saving	93,89,527.00 Rs/ annum	
Investment	1 30 00 000 00 Rs	



### 3. Installation of VFD in Supply fan (200 kW) of 60 TPD

VFD has been installed in 200 kW motor of Supply Fan of 200 kW. Initially air quantity is controlled by throttling of damper . Now the same is controlled with use of VFD. Saving Details is as below:

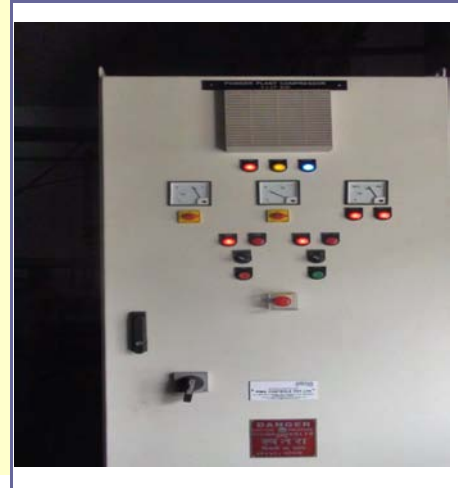
Particulars	UOM	
Total Power Saving	Kwh/annum	: 231773
Monetary Saving	Rs./ annum	: 12,16,808
Investment	Rs.	: 7,50,000



#### 4. Installation of VFD in Air compressor Motor (37 Kw) in 60 TPD

VFD has been installed in Air compressor motor (37kW). Due to nature of process load of compressor is fluctuating and there is more frequency of loading/Unloading of compressor. Saving Details is as below:

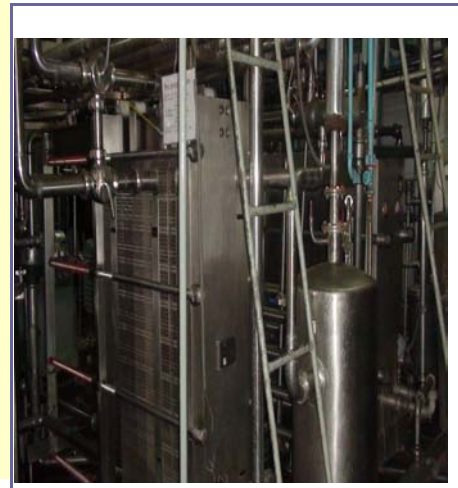
<b>Particulars</b>	<b>UOM</b>
Total Power Saving	Kwh/annum : 49640
Unit Rate	Rs. : 5.25
Monetary Saving	Rs./ annum : 2,60,610
Investment	Rs. : 2,20,000
Payback Period	Months : 6.0



#### 5. Replacement of 20 KLPH milk pasteurizer with 90% regeneration efficiency

Installation of new milk pasteurizer with 93 % regeneration efficiency in place of old milk pasteurizer. This results in to reduction of steam consumption and chilled water load. Saving Details is as below:

<b>Particulars</b>	<b>Fuel</b>	<b>Power</b>
Saving	64224 Kg/ annum	129600
Kwh/annum		
Monetary Saving	1482289 Rs./annum	680400 Rs./annum
Total saving	2162689 Rs./annum	
Investment	1000000 Rs	
Payback Period	6 Months	



#### 6. Installation of New High speed Mechanical type Pouch packing M/c

Installation of 02 nos of High speed Mechanical type pouch packing m/c instead of Pneumatic type pouch packing machine. Each machine consuming 35 CFM air. This results in complete elimination of compressed air requirement of 02 nos of machine. Saving details for 02 nos of machine is as below:

<b>Particulars</b>	<b>UOM</b>
Total Power Saving	Kwh/annum : 48384
Unit Rate	Rs. : 5.25
Monetary Saving	Rs./ annum : 2,54,016
Investment	Rs. : 12,00,000



### 7. Retrofitting present T-12 fittings by T-5 fittings having electronic ballast

Energy efficient 60 nos of T-5 type tube lights are replaced with old T-12 Type tube light. T-12 tube light fitting was consuming 52 watt power per hour while new T-5 tube light is consuming 28 watt power per hour

<b>Particulars</b>	<b>UOM</b>
Total Power Saving	Kwh/annum : 6220
Monetary Saving	Rs./ annum : 32659.00
Investment	Rs. : 20000.00
Payback Period	Months : 7.5 months



### 8. Installation of Lightning transformer for Banas-plant and

A voltage stabilizer has been installed to supply the power to the lighting load. The savings are as under:

<b>Particulars</b>	<b>UOM</b>
Units saving by voltage reducing device @20%	KWH/Annum : 26280
Total Saving per annum	Rs/annum : 137970
Investment	Rs. : 20000
Payback Period	Months : 6.0



### 9. Installation of close loop ring main system for compressed air piping

The screw type air compressor is generating compressed air at 6.9 kg/cm<sup>2</sup> and the requirement is at 6 kg/cm<sup>2</sup>. Due to pressure drop in the pipeline and non availability of compressed air at far end user has forced the compressed air generation at higher pressure. Close loop ring main system is fabricated to allow for more uniform air distribution to consumption points and to equalize pressure in the piping. The saving is as under:

<b>Particulars</b>	<b>UOM</b>
Power saving per annum	Kwh/annum : 26105
Total monetary saving	Rs./annum : 136789
Cost of carrying out modification	Rs : 30000



**10. Installation of 375 CFM new Energy Efficient air compressor with inbuilt air dryer**

Installation of New 375 CFM Energy efficient Screw compressor with inbuilt refrigerant type air dryer in place of (01 nos of 200 CFM Screw Compressor and 02 Nos of 100 CFM reciprocating and Descant type air dryer) reciprocating compressor). The saving is as under:

Particulars	UOM	
Units saving per annum	KWH/Annum	: 140160
Total Saving per annum	Rs/annum	: 735840
Investment	Rs.	: 11,80000
Payback Period	Months	: 19.24



**11. Installation of Energy efficient compressor (KC3 In place of FRICK-7X7) at DANTA & RADHENPUR Chilling center (02 Nos)**

Frick make 7X7 model ammonia compressor is replaced by energy efficient new kirlosker make KC-3 compressor. For Frick 7X7 compressor specific energy consumption is 1.5 kW/TR and for KC-3 compressor the same is 1.07 kW/TR. The saving is as under:

Particulars	UOM	
Power saving per annum	KWH/Annum	: 77760
Total Saving per annum	Rs/annum	: 4,08,240
Investment	Rs.	: 3,50,000
Payback Period	Months	: 10.5



**12. Stopping of old Frick 7X7 compressor with modification of pipelines to run with new energy efficient refrigeration compressor**

Frick make 7X7 ammonia compressor was operating as high stage compressor for Ice-cream deep fridge. With a modification of ammonia piping we can able to take load with modified refrigeration system operating on more efficient Kirlosker make ammonia compressor.

Particulars	UOM	
Power saving per annum	KWH/Annum	: 115632
Total Saving per annum	Rs/annum	: 607068
Investment	Rs.	: NIL

**13. Installation of Bio-Gas Plant at DAMA Breeding station**

Bio Gas plant of 45 Cu Feet capacity has been installed at DAMA breeding station to generate Bio Gas from cow dung. Plant has been installed with financial assistant from GEDA (Gujarat Energy Development Agency). This plant can generate domestic gas for use of 22 families. Presently domestic gas has been supplies to 06 nos of family. For complete utilization of generated Biogas We have also invited offers to install 22 KVA dual fuel DG set which consume 20% diesel and 80% Biogas.

Particulars	UOM	
Present Domestic gas consumption	Kgs/Month	: 84
Saving	Rs/Month	: 2100
Total Saving per annum	Rs/annum	: 25,200 (Investment Rs. : 1,35,000)

## [D] ENERGY CONSERVATION COMMITMENT

Top management of Banas dairy is well aware about the importance of energy conservation /energy management and committed for it so various measures have been taken from time to time for energy conservation. Banas dairy uses two sources of energy i.e. Furnace oil and Electricity. For Giving thrust to energy Conservation movement at Banas Dairy A special Energy Steering committee has been formed and is functioning very efficiently. This Committee handles all the activities related to Energy Conservation / Management like Conducting energy audits, working out energy saving potential, discussions, cost involvement, implementation, results achieved and its standardisation. Banas Dairy has arranged a few in house training and Seminars on Energy conservation with the help of National Productivity council, PCRA etc.

Banas Dairy has also formed Energy conservation steering committee. Steering Committee works in cooperation and maximum involvement of production and maintenance staff. A team comprising of production and maintenance works in each production function with an objective of efficient operation and maintenance of plant and equipment. These teams carryout periodic energy audits of respective function and are also responsible for implementing the energy conserving measures.

## [E] ENERGY CONSERVATION PLANS AND TARGETS

Banas Dairy has decided following major plans related energy consumption for new years:

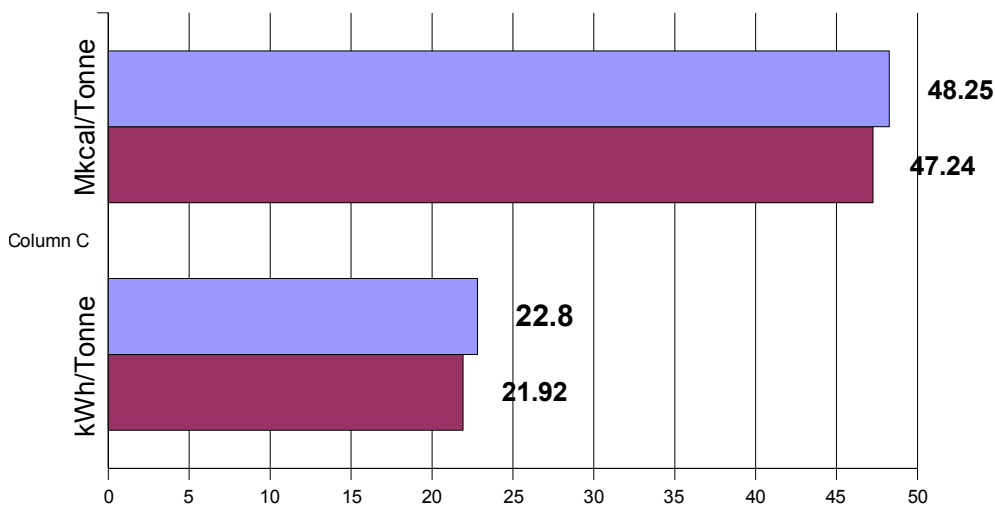
### FOLLOWING MEASURES HAS BEEN PLANNED FOR THE FUTURE

<i>Year of Project</i>	<i>Project Description</i>	<i>Total Saving (in Rs Lakhs)</i>	<i>Investment incurred on the Project (Rs. Lakhs)</i>
<b>2005-06</b>			
1	Installation of Solid Fuel fired Boilers for existing heating load of process. This shall eliminate costly liquid fuel i.e Furnace Oil	1541.00	1000.00
2	Installation of Flash steam recovery system to recover Blowdown heat for Banas-II Boiler	3.50	2.00
3	Installation of VFD for 15 kW ceiling Cooling fan of 60 TPD powder plant	1.98	0.70
4	Installation of VFD for 75 kW motor of supply fan of 30 TPD powder plant	5.40	1.50
5	Installation of VFD for 45 kW motor of supply fan of 20 TPD powder plant	3.00	1.00
6	Implementation of 'ADVANCE PROCESS CONTROL-APC' in 60 TPD powder plant in order to - Increase powder production rate - Reduce Energy consumption This shall reduce specific power consumption for Electrical as well as Thermal energy	54.28	100.00
<b>TOTAL</b>		<b>1609.16</b>	<b>1105.20</b>

## ACHIEVED ENERGY CONSERVATION TARGETS FOR YEAR 2007-08

<b>Electricals</b>	Planned Targets	48.25	Kwh /Tonne of Milk Processed
	Achieved Targets	47.24	
<b>Thermal</b>	Planned Targets	22.80	FO KL/Tonne of Milk Processed
	Achieved Targets	21.92	

### Planned V/s Achieved Sp. Energy Cons. Targets



## PLANNED TARGET FOR YEAR 2008-09 AND 2009-10

Year	Electrical*	Thermal*	Reduction over the year 2007-08	
			Electrical%	Thermal%
2007-08 (Base year)	47.24	21.92	-	-
2008 - 09	46.06	21.37	2.49%	2.53%
2009 -10	44.91	20.83	4.93	4.99

## [F] ENVIRONMENT AND SAFETY

### Environment:

Banas Dairy is committed for its responsibility towards Environment and Safety of Society and its employees as well. Banas Dairy is under process of implementing Environment Management System ISO 14001:2004 towards its commitment for environment. For implementation Manual and procedure for EMS has been documented, In-house training given to 26 nos of employee for internal audit and implementation organization is waiting for external audit and certification.

Banas dairy having Effluent treatment Plant of 1600 m<sup>3</sup>/day at its main unit. Banas dairy is installing second effluent treatment plant of 1500 m<sup>3</sup>/day under capacity expansion project 'BANAS-III'. Proposed plant will have recycling facility for maximum recycle of effluent. Banas dairy having '**ZERO Discharge**' of effluent 100 % effluent is utilizing for gardening and agricultural land. Banas dairy is maintaing its lush green campus with utilization of its treated effluent. Banas dairy is also upgrading its ETP plant of chilling center with recycling plant (Tertiary plant). In first phase upgradation of ETP facilities of KHIMANA and THARAD chilling center is under progress.



### Safety:

Safety of Employee, Society and Community is one of the primary aspect of day to day operation of organization. Banas Dairy has also arranged various seminars and trainings for safety at the work place, for knowledge of First-Ad etc internally and by external agencies also. Being a food industry various critical points have been identified to prevent any hazard during different production processes and they are continuously being monitored. Various measures have been taken too avoid accidents like smoke detectors, fire hydrant system, Ammonia leak detection system etc across the plant. And the requirements relating to various environmental legislation and environment protection were duly complied by the company.

Banas dairy has conducted various events and awareness program related to safety.

- Training Program was conducted on the “Industrial Health & Safety” for representatives of various departments on 13 to 14 Aug 2003
- Moke Drill Exercised (Demonstration & Awareness) on the Ammonia Leakage on 20 Feb 04 on 29 April 05
- Mock Drill with help of Add. Collector, Shri KM Shah Shri Factory Inspector, PBB, Utility staff at Mahalaxmi Cold storage at Dees road for public awareness
- Mock drill on Leakage of LPG gas cylinder at GIDC Chandisar for for awareness of industrial area workers