



**MYSORE DAIRY, A UNIT OF MYSORE – CHAMARAJANAGARA DISTRICT
CO-OPERATIVE MILK PRODUCERS' SOCIETIES' UNION LTD.,
T.NARASIPURA ROAD, SIDDHARTHANAGAR, MYSORE – 570 011.
KARNATKA**

UNIT PROFILE:

MYSORE DAIRY, A UNIT OF Mysore – Chamarajanagara District Co-Operative Milk producers. Union Limited registered under the Karnataka co-operative act has been commissioned in the year 1980. The rated when commissioned was 60 TKPD (Thousand Kgs per day) and was subsequently expanded to 150 TKPD by NDDDB under the turn key project in the year 1996.

The dairy receives milk in cans with temperature of 27^o C to 30^o C from village co-operatives located in the districts of Mysore and Chamarajanagara districts. and in tankers with temperature of 5^oC to 6^oC from the three chilling centers located at Hunsur, Kollegala and Chamarajanagara towns. Also the dairy receives milk with temperature of 5^oC to 6^oC in tankers from 27 Bulk Milk Coolers. These bulk milk coolers have been installed to maintain the initial quality of raw milk and also to reduce the intake of energy intensive raw materials. As on date the per day quantity of milk received through cans directly from dairy co-operatives, tankers from chilling centers and tankers from bulk milk coolers is as follows:

❖ In cans from village dairy co-operatives	65500 Kgs
❖ In tankers from chilling centers	131000 Kgs
❖ In tankers from bulk milk coolers	62000 Kgs

The dairy processes the milk and packs the following qualities of milk:

1. **Toned milk** with 3.1% Fat & 8.5% Solids not fat
2. **Standardised milk** with 4.6% Fat & 8.5% Solids not fat
3. **Double toned milk** with 1.6% Fat & 9% Solids not fat
4. **Full cream milk** with 6.1% Fat & 9% Solids not fat

In addition, the following milk products are manufactured in smaller quantities during 2006-07:

- Ghee 780.530 Metric Tonnes
- Butter 899.54 Metric Tonnes in bulk packings of 25 Kgs
- Curd 6704.547 Metric Tonnes
- Peda 50.66 Metric Tonnes
- Mysore pak 17.16 Metric Tonnes
- Sweet Lassi 218.62 Metric Tonnes
- Butter milk 214.83 Metric Tonnes
- Badam Burfi 1315 Kgs
- Cashew Burfi 1460 Kgs

The dairy markets milk and milk products under the trade name “NANDINI” a registered trade name of “Karnataka Milk Federation”, the apex institution at the state level.

The technical and financial assistance comes from National Dairy Development Board, Anand, Gujarat under operation flood and vision schemes.

The one of the market developing activities taken up by the dairy is Creating awareness about milk in public especially among the women folk and school children through “ARIVU” programs by trained employees and the dairy has conducted 300+ “ARIVU” programs wherein 41724 people took part and also under the consumers and school children awareness programs 35509 members participated and 12500 houses were visited under door to door campaign till 2006-07. **For the first time under consumer awareness program**



Farmers, School children & Consumers visit to dairy

Mysore Dairy has started Mini Bus Service to bring Consumers from different areas of the town & talukas to Dairy & explain them the activities of the Dairy as well as brief them on Saving Energy in house hold usage. Under this program during 2006-07 around 7000 consumers visited the Dairy. One of the agenda in all the above programs was educating the participants on energy conservation. The cartoon film on “Save Energy” was screened at the school children programs. And Mysore dairy has also arranged to bring the farmers from villages & to educate them on clean milk production ,Energy savings etc.

During the year 2006-2007 all the workers/employees were honored by Board of Director, Managing Director of Mysore Dairy by presenting them



a memento as a mark of remembrance for their suggestions, involvements & efforts in getting the “ **National Energy Conservation Award-2006**” for Mysore-Chamarajanagar Dist. Milk Union.

During the year 2006-07 School Children painting competition was held at Nanjanagud, Hunsur of Mysore Dist. The first three best paintings were rewarded. In this occasion the children were briefed about the Energy conservation procedures at domestic level & cartoon film “ Save Energy “ was screened & in the competition “Energy Saving “is also given as a Theme.



Children participation in Painting Competition

The dairy had secured the **ISO-9001 : 2000** certificate for the years 2004-2008. The surveillance audit was conducted by the certifying agency and **ISO-9001 : 2000** certificate has been continued to the 2007-2008.

There has been a steady increase in milk handling and notable decrease in consumption of energy during the years 2003-2007. The dairy had launched the Energy Conservation Program in the year 2001. National Dairy Development Board (NDDB), Institute Of Rural Management, Anand (IRMA) & Karnataka Milk Federation (KMF) facilitated the launching of the said program. The outcome of this program was that the dairy was able to gear up the employees towards saving of energy. This has been a continuous process and the objectives of this team has been slightly modified and this team is heading towards “TOTAL QUALITY MANAGEMENT”.

ENERGY CONSERVATION COMMITMENT, POLICY AND ORGANISATIONAL SET UP

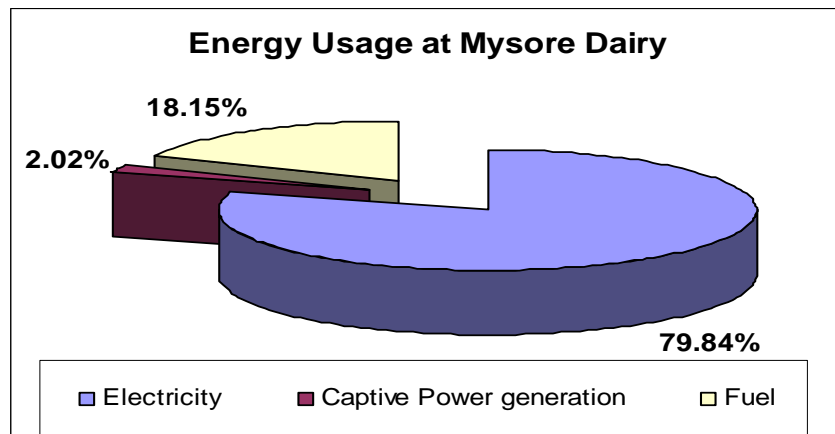
“TOTAL QUALITY MANAGEMENT TEAM”

Mysore Dairy transformed the Energy conservation team to which is putting forth a continuous approach to sustain the achievements made on energy conservation with due stress on improvement of product quality. Hence, the product quality was not sacrificed while saving energy. Cross functional teams were formed and the philosophy of energy conservation and quality improvement and sustainability were inculcated among all the employees by way of lectures and discussions. The dairy follows the 5 “S” house keeping principles with due stress on kaizen- continual improvement, Good manufacturing and hygienic practices. Two 5 S teams inspects and suggests the corrective actions on 5 S principles. The ideas from the employees contributed to a greater extent in achieving cost reduction and quality improvement.

The sources of energy in the dairy are Electricity and Furnace oil. The energy cost is 20 to 25 % of the total manufacturing cost of the dairy.

The total connected load is 776 KW or 970 KVA and maximum demand is 500 KVA.

Electricity occupies the top position in the energy profile, since 79.84% of the energy is generated with the help of electricity. The refrigeration section is the major user

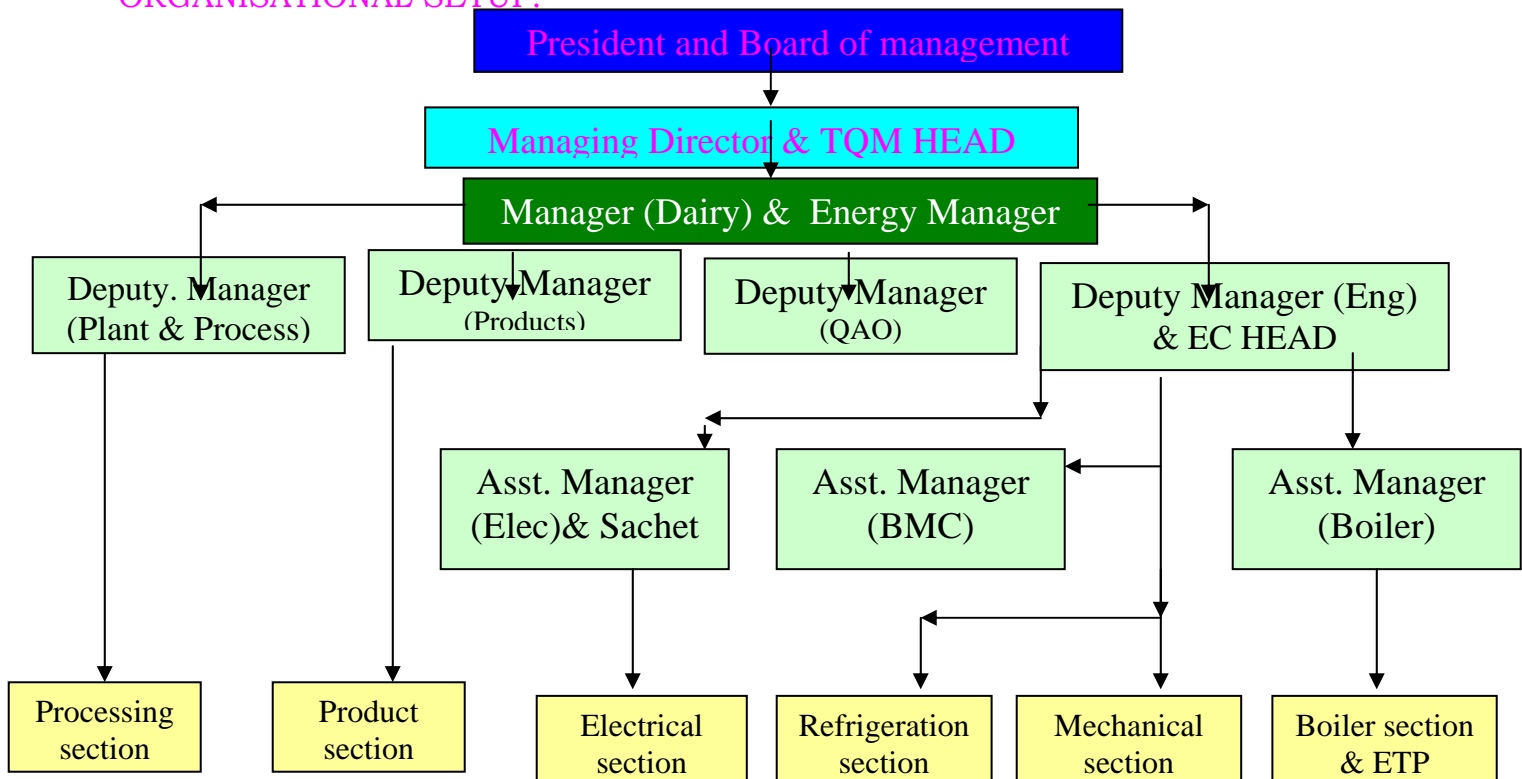


of this source of energy, wherein more than 50% of the total electrical energy is used by this section. Hence, major thrust was given in conserving energy in this section.

This section has 4 ammonia compressors, two driven by 2 Nos 100 Hp, one driven by 125 Hp and one by 120 Hp motor. In addition the dairy has 2 booster compressors driven 2 Nos. 20 Hp motors. Also there are 4 Nos. chilled water pumps driven by 4 Nos. 10 Hp motors. The section has two plate heat exchange type condensers with two 30 Hp motors. The total running hours of ammonia compressors and chilled water pumps ranges between 20-22 hours per day. At any given point of time 2 ammonia compressors and 3 chilled water pumps and one condenser will be in operation while the rest are utilised as standby.

Furnace oil is another source of energy. This constitutes 20 % of the total energy. The major user of this energy is the milk processing section wherein more than 75% of the thermal energy is utilised. Thus this was the major section wherein the thermal energy saving efforts were put forth.

ORGANISATIONAL SETUP:



ENERGY CONSERVATION POLICY:

THE EMPLOYEES & MANAGEMENT OF MYSORE-CHAMARAJANAGAR MILK UNION ARE COMMITTED TO CONSERVE & SUSTAIN THE CONSERVED ENERGY AT ALL LEVELS OF PROCESSING OF MILK & MILK PRODUCTS BY ADOPTING MODERN, ECO-FRIENDLY & ENERGY EFFICIENT TECHNOLOGIES TO OFFER THE SUPREME QUALITY MILK & MILK PRODUCTS TO CUSTOMERS AT COMPETITIVE PRICE WHILE TRANSFERRING REMUNERATIVE PRICE TO THE PRODUCERS.

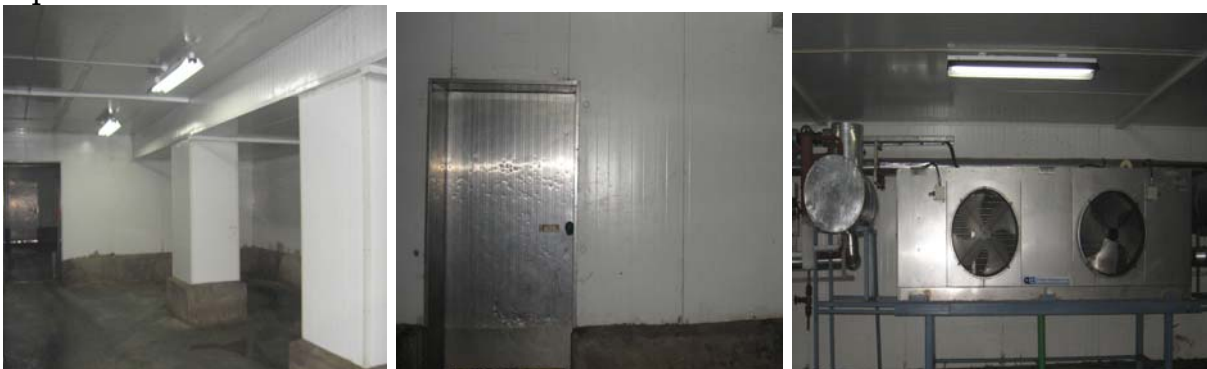
ENERGY CONSERVATION ACHIEVEMENTS:

During 2003-2007, Mysore dairy has implemented 21 energy saving projects through engineers initiatives, sub section team suggestions and innovative ideas by officers and have achieved savings of Rs. 55.93 Lakhs with an investment of Rs. 138.85 Lakhs resulting in 31.28% reduction in specific electrical energy consumption and 12.19% in specific thermal energy consumption.

The energy saving projects implemented during 2006-07:

Renovation Of The Old Milk Cold Store to avoid loss of heat :- The milk after packing is being stored in milk cold store to maintain the milk temperature at 5°C . The cold store was of three parts and all the three parts were old and the insulation was weak and the type of the insulation was of the old conventional type. This was resulting in loss of temperature causing increased refrigeration load. Hence, it was decided to renovate the cold store in phased manner with the latest available technology to avoid loss of temperature.

One part of the Milk cold store renovation has been completed during 2005-06 & During 2006-07 the entire cold store has been renovated. This resulted in reduced load on refrigeration. As a sequelae the running hours of compressors was reduced.



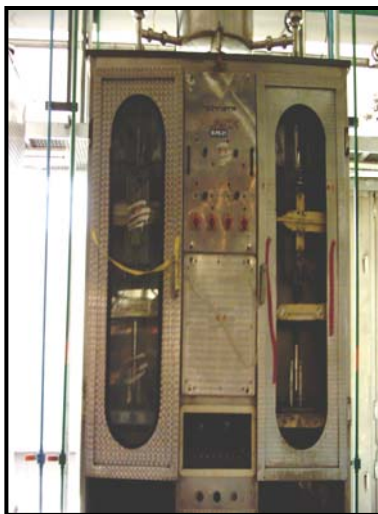
Renovated Milk Cold Store with Energy Efficient Blowers

Added to this, action was taken to insulate and revamp the chilling line wherever necessary. Thus, the running hours of two ammonia compressor which were consuming 145 KWh was reduced by One hour. This process saved

145 KWh per day and 52925 KWh were saved during the year. Thus, the money saved by this project is 2.54 Lakhs.

Introduction Of New Mechanical Milk & Curd Packing Machines :- The conventional milk packing machines are pneumatic type. The air to these was being catered from air compressors. One double head pneumatic type packing machine require 54 M³ per hour. On the contrary the newly emerged mechanical type packing machines do not require for their operations. One of these was replaced by mechanical ones since they were old and one more was added to the curd packing section. Since, these machines do not require air there was considerable reduction in running hours of air compressors and substantial electrical energy was saved. **This is in addition to the 04 machines replaced during 2005-06.**

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|---|--------------------------|
| ❑ Air requirement by one double head pneumatic machine | 54 M ³ /hour |
| ❑ Air requirement by two machines | 108 M ³ /hour |
| ❑ Running hours of these machines for packing milk | 12 hours/day |
| ❑ Air requirement per day | 1296 M ³ |
| ❑ Air displacement by air compressor with 37 KW motor | 414 M ³ /hour |
| ❑ Running hours of air compressor to displace 1296 M ³ | 3.15 hours |
| ❑ Energy consumed by air compressor for 3.15 hours | 87.40 KWh |



OLD PNEUMATIC MILK PACKING MACHINE



NEW LOW ENERGY CONSUMING MILK PACKING MACHINES



By replacing the old pneumatic packing machines with new mechanical type machines 87.40 KWh was saved by reduction in running of air compressor

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| ❑ Energy saved for one year @ 87.40 KWh per day | 31905 KWh |
| ❑ Savings per annum | Rs.1.53 Lakhs |

Water Management & Rain Water Harvesting:- This project envisaged the roof water harvesting from the Dairy building. The investment made on this project is Rs. 4.15 Lakhs. In this project the roof water collected has been routed to

- ❖ Sump tank
- ❖ Dummy bore wells dug in the dairy premises

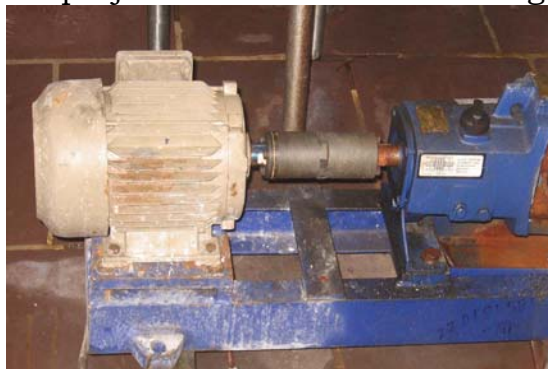
The water that was collected in the sump was used for dairy cleaning activities. In the absence of this water, the water was being pumped to this sump tank from the bore wells. During 2006-07 there was good rain in & round Mysore, so the water collected through rain water (Roof Water)harvesting is much more than 2005-06.Hence this has been taken once again as an energy saving area as the Quantity of Water to be Pumped from Bore wells to tank is saved substantially as a continual Project.



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| ➤ The Capacity of water sump | 50000 Kilo Litres |
| ➤ Electrical energy required to pump 1 KL | 0.3067 KWh |
| ➤ Electrical energy saved for 450000 KL | 33575 KWh |
| ➤ Savings per annum | 1.61 Lakhs |

Replacement of Higher Capacity Motors/pumps Of Milk Pasteuriser.

The Dairy is having three milk pasteurizers of 10 Kl capacity. Out of which one Pasteuriser was having 5Hp Hot water & 5 Hp Milk Pump which is connected to Homoginiser. (The other two Pasteuriser are having motor capacity of 6 Hp & this project was undertaken during 2005-06)



The motor Capacity of this pasteurizer was reduced to 6 Hp from 10 Hp by replacing with lower capacity Motors/Pumps with out affecting the performance of the Equipment which has resulted in saving of 13140 Kw/hr & amount saved turned out to be Rs.0.63 Lakh with an investment of Rs.0.20 lakh

Methane Gas Utilisation:-



GAS UTILISATION AT CANTEEN



GAS HOLDER

The effluent treatment plant has been expanded and renovated. Mysore Dairy made an attempt to utilize this Methane Gas for cooking purpose at Canteen. The canteen is catering everyday the food & snack needs of about 400-450 employees working in the Institution. The new system is yielding methane gas in sufficient Quantum which is used for cooking purpose at Canteen so the Electrical Steam Generator Used cooking at Canteen is stopped. The savings that could be turned out of this is estimated to be Rs. 2.80 Lakhs per annum. The investment that is being done on this project to run gas pipe line from ETP to Canteen is Rs. 1.50 Lakhs. which is one time investment.

Heater Coil used for Steam Boiler	: 20 KW
Average running of Boiler	: 8 Hrs
Saving of Energy /Year	: 58400 Kw/hr
Amount saved /Year	: Rs.2.80 Lakhs

Replacement of Old Ghee (Boiler) Vat :

The Dairy is manufacturing ample Quantity of Ghee. The Dairy was having Three Ghee Vats from which the production of Ghee was carried out & , out of this one Ghee Vat is very Old, Since the Equipment was very old, there was heavy leakage of Steam from the Equipment & the steam consumed per batch was more than the required as per the standard. During 2006-07 this Ghee vat is replaced with an investment of Rs. 2.04 lakhs. The savings by replacing these equipments is turned out to be Rs.1.18 lakhs.



NEW ENERGY EFFICIENT GHEE VAT



OLD GHEE VAT

Capacity of the Ghee Vat : 1500 ltrs of Ghee/Batch	
Steam required to prepare One Batch Ghee :	160kgs/hr
Actual consumption of Steam to prepare One batch Ghee :	200 kgs/hr
200kgs/hr as the Boiler is very old	
Cooking Time of Each Batch	: 2hrs,30 mts
Saving per Batch by replacing Ghee Vat	: 100 Kgs
Average production : 2 Batch /Day & Per Year	: 730 Batch
Saving of Steam /Year	: 73000 kgs
Saving of Furnace oil :	: 5407 ltrs
Saving /Year	: Rs. 118521/-

Replacement of Old Khoa Vat :

Mysore Dairy is manufacturing good Quantity of Peda to fulfill the demand of the market. Dairy is having Two Khoa Vats of Capacity 18 Kgs /Batch. Out of this One of the vat is very old & heavy leakage of Steam is observed & hence the steam consumption per hour is 18.20 % more than the standard requirement of 80 kgs of Steam. Hence this Khoa vat is replaced with New energy efficient equipment.



Old Khova Vat



New Energy Efficient Khova Vats



Standard requirement of Steam per Hour :	80 Kgs
Actual consumption of Steam per Hour :	90 Kgs
Time required per Batch	: 90 mts
Steam consumption per Batch	: 135 kgs
By replacing old Khoa vat	: 120 Kgs
Saving of steam per batch by replacing Vat :	15 kgs
No of Batches /Day	: 05
No of Batches /year	: 1825
Saving of steam /year	: 27375 kgs
Saving of Furnace oil	: 2027 ltrs
Amount saved per year	: Rs. 44431/-

Replacement of Tube lights with Electronic Ballasts :

The illumination lights at packing section, cold store & reception section are changed from old 40 watts choke tube lights to Electronic Ballasts which consumes less Electricity & which has helped in saving of Energy in addition to good illumination.

Mysore Dairy has changed about 50 Tube lights & in turn has saved 5445 Kwhr per annum & the amount saved is turned out to be Rs.27000/ annum.



New Energy Efficient Tube lights



Old Less energy efficient Tube lights

ENERGY CONSERVATION PLANS AND TARGETS:

- 1) Heat Recovery Units:- The project of introducing Heat recovery units could not be carried out due to some technical reasons during 2006-07, however the same project is targeted for 2007-08 with an investment of Rs.10 lakhs.
- 2) Replacement of Old inefficient 2 Mt/hr Boiler with New Energy efficient 3 MT/hr Boiler with pre Air Heater & online flue gas analyzer & online Fuel-oil meters. The same is targeted for 2008-09
- 3) Installation of butter pre-stratification tank & butter melting vat :- The dairy is manufacturing Ghee from butter by using ghee vat. The approximate savings expected is Rs. 3.30 lakhs and the proposed investment is Rs. 9 lakhs. This project is targeted for 2008-09.
- 4) Replacement of old inefficient Electrical transformers with efficient Transformers. This project is targeted for 2008-09
- 5) Replacement of 10 Kl pastueriser with 20 Kl New Pasteuriser with auto controls & accessories. This project is targeted for 2007-08
- 6) Replacement of Cream Pasteuriser with auto controls: This project is targeted for 2007-08

ENVIRONMENT AND SAFETY:

Actions have been initiated to get the HACCP & EMS 14000 certification. The target date is by the end of year 2007-08

All the safety measures suggested by the statutory authorities have been implemented. The Dairy has implemented the **ON-SIGHT EMERGENCY PLAN & ENVIRONMENTAL MANAGEMENT PLAN** successfully during the year 2006-07 & most of the employees are trained under this plan to overcome the emergencies on day to day workings. There has been no incidence of accidents from past 3 years. The ETP has been expanded to treat the additional effluent flowing due to increased milk handling.

With the completion of Effluent treatment plant the treated water is being used efficiently for gardening purpose. The garden has sufficient greenery



BEST MAINTANED GARDEN - 2006-07

to achieve the eco-balance in the Dairy premises.