Improved financial and Energy Efficient Water supply in Udupi City Municipality

A Presentation By

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Profile of the City

- Udupi city is located at western coastline of Karnataka having east longitude 74°-45′ and north latitude 13°-23′.
- The city is connected by Konkan Railway and National Highway No.17. Bajpe is the nearest airport located at a distance of 60KM.
- The famous pilgrim centre "Sri Krishna temple" is located in the heart of the city.
- University of Manipal Academy of Higher Education, Banking , industry and fishing harbour are also located in the City Municipal Area limits.
- The municipality is celebrating its Platinum anniversary of formation of the council in this year 2010

City Statistics

- **Population : 1,13,039 (2001 census)**
- **Area : 68.23 Sq Km**
- **Population Density : 1657 Persons/Sq Km.**
- **Total number of Properties : 48859**
- **Road Length : 798 K ms**
- **Avg. Rain Fall : 4235 MM**
- **Temperature : Max 37^{0}C, Min 20^{0}C.**

Geological Information about the town

The soil type in the city – Towards east Hard lateritic and towards west clay soil and Sandy soil.

Topography of the city- Towards east terrain and hilly and towards west flat. The city is having undulations , the RL varies from 0 to 103M

Because of the undulated topography and the above said soil conditions the water table varies as high as 0.0M in the rainy season and as low as 20M in the Summer season. Near to the sea shore below 6M the water contains traces of oil with sporadic turbidity which is not potable.

Profile of the Municipal Council

- The Town Municipal Council came in to existence in 1935.
- The Town Municipal Council was upgraded to City Municipal Council in the year 1995.
- The CMC have 35 wards.
- Population according to 2001 census is 1,13,039 and present population is around 1,25,000.
- Projected population for the years 2016 and 2026 is 146637 and 170179 respectively.
- Population growth, floating population, urbanization and industrialization have increased significantly in recent years.

Situation prior to the initiative

- Since from the formation of the municipality in the year 1935,(9.83Sq.KM area) the source of water supply is ground water (Open well).
- In the year 1971 a protected water supply scheme to pump 9MLD of water was executed with Swarna River as source
- In the year 1995 TMC Udupi became CMC Udupi by merging five notified areas which amounts to total area of 68.23Sq.KMs.
- The water supply in these notified areas were maintained by Village Panchayats by open wells and bore wells

Continuation…

Situation prior to the initiative

- The total number of Open wells were 28 and Bore wells were 101
- There were 8860 house connections and 236 public stand posts.
- The total water supply form these sources is only 7.75MLD
- The water supply system had 80Km distribution lines of diameter ranging from 50mm to 375mm PVC and CI pipes and covered only 15% of the road length.
- Supply hours is 8Hrs/day of around 62LPCD.

Continuation…

Situation prior to the initiative

- There use to be scarcity of water supply during summer due to inadequate water availability in the open wells and bore wells as well as in Swarna river.
- Hence, water is supplied through tankers to meet the basic demand of the town.
- The revenue generated through water supply was very meager due to 8860 tap connections and more than 236 public stand posts.

The demerits of Old System

- Inadequate water supply
- Partially treated Water Supply and inadequate pressure
- Reliability and satisfaction of water is low
- More number of Public stand posts, increased percentage of Non-Revenue Water
- Insufficient length of distribution lines
- The bore wells were located all over the town hence operations were difficult.

Continuation…

The demerits of Old System

- Maximum amount of leakage due to old PVC pipe network
- Water scarcity during summer seasons
- Maximum of 8 hrs of water supply per day
- Maintenance of Open wells and bore wells was very tedious & expensive
- Water storage facility was inadequate
- No Water audit, Energy audit & Recovery audit
- Inadequate coverage

Objectives and aims

- To have a energy efficient and sustainable water supply system for the entire City
- To augument existing storage capacity at source
- To supply treated water by having water quality monitoring system
- To reduce the quantity of Non-Revenue water in the system
- To increase Water storage capacity
- To increase in supply level from 62 lpcd to 135 lpcd for households

Continuation…

Objectives and aims

- To increase the number of hours of water supply with a resudual head of 6M
- Discouraging the public stand posts
- Increasing individual house connections
- 100% metering for efficient revenue generation
- To maintain entire water distribution system by gravity for energy savings
- To have fully efficient distribution system including water and energy audit

Strategies adopted and implementation process

- Estimated the water demand up to 2026 AD.
- Augmentation of water supply source from the near by river "Swarna" which is 14Km from the city.
- Constructed a dam, Intake well, Jack well, Water treatment plant of capacity 27.24MLD,seven new OHT's of capacity 5Lakh and 10 lakhs liters , Raw water MS raising main, Clear water MS raising main of 14 Km length, two Mother GLSR of each 25Lakhs capacity and 540Km HDPE distribution pipe lines, which covers entire CMC area except Manchi Kodi, manjusree nagar and padukere area under KUDCEMP at a cost of 60Crores.
- During the design and execution of the above said system, the topography of the city was taken as an advantage in the following manner-

Continuation…

Strategies adopted and implementation process

- All the OHT's in the distribution system are filled by gravity flow from mother GLSR.
- And also the OHT's are constructed at strategic places which helps in formation of Zones so that 6M of residual pressure is maintained.
- Because of the above facts there is a substantial savings of energy for CMC as well as the consumers as they have stopped pumping water from sump to their over head tanks.

- Implemented the water quality monitoring system.
- Revised the water tariff with respect to Kilo liter consumption.
- Compulsory metered connections.
- Water Adalats were conducted to redress the grievances during transition period

Continuation…

Strategies adopted and implementation process

- Encouraged the publics to have individual house connections.
- In phased manner the water supply in old distribution lines was stopped.
- Reduced the public stand posts in phased manner.
- Meeting the demands for new individual connections within stipulated time by authorizing more number of plumbers.
- Setting up of 24/7 Public Grievance Redresser cell as well as online complaint registration system in CMC's own web site, so that public can lodge their grievances along with the leakage in the water supply network.
- Attending the water complaints within 24 Hrs time.
- Computerized billing system is introduced .
- The consumers are allowed to remit the bills in any of the Branches of Syndicate bank in the CMC limits
- An exclusive counter to pay water charges at CMC is established
- Twice a week a special squad under the leadership of AEE of CMC which redress the consumer graveness, illegal connections and to take necessary actions.

Situation after implementation of initiative

- Sufficient water supply to the city
- Residual head of 6Mt is achived
- Sufficient length of distribution lines – 680 Km
- Since distribution lines are of HDPE and connection are of electro fusion saddles, less number of leakage problems registered.

Continuation…

Situation after implementation of initiative

- Percentage of Non-Revenue water is drastically come down due to leakage loss and prompt attending of complaints
- Treated water supply for a minimum of 18hrs in the town is ensured
- In fact out of 10 distribution zones 9 zones are under 24X7 water supply .
- No drinking water scarcity during summer seasons

Outputs and outcomes

- The system provides sufficient quantity of potable water with adequate pressure.
- The system reduced the water contamination level very close to zero.
- Better cost recovery and lower production cost.
- Better Revenue management due to 100% metering and customer satisfaction.
- Energy Savings

Continuation…

Outputs and outcomes

- Because of Reduction in NRW, which motivated CMC to give Free Drinking water to the public by setting up water booths near Bus shelters.
- CMC is giving free connections for poor people which is appreciated by NGO's.
- Excellent consumer satisfaction with willingness to pay bills promptly motivated the CMC to go for 24/7 water supply to the entire area.
- Eight neighboring Grama panchayat were given drinking water for their habitation with a reasonable cost.
- Savings in electricity bills for the consumers because of the residual head of 6M

Sustainability

- The system is 100% sustainable because the water source is river and is perennial.
- All project components are commissioned based on the long term operation and maintenance standards.
- Water tariff restructuring and metering policy which has come in to force since 2007 has ensured
- - The water wastage is negligible
- - Poor are benefited
- - O & M cost is recovered

Potential for replication

Commendable practices shall always be shared with other ULB's directly for

- Water supply system Monitoring.
- Operation and maintenance practices.
- Systematic Revenue generation.
- Energy savings due to gravity flow and less water losses.
- Regulation of Non-Revenue Water (NRW).

Comparison of Demand & Collection

Year	Opening Balance	Current Year Demand	Total Demand	Collection	Balance	% Collections	Total No. of Connections	Total No. of Public Stand posts
2006-07	29.92	60	89.92	53.56	36.36	59.56	9350	236
2007-08	36.36	120	156.36	77.07	79.29	49.29	11264	203
2008-09	79.29	164	243.29	218	25.29	89.60	12202	157
2009-10	25.29	294	319.29	297.23	22.06	93.09	13190	12
2010-11	22.06	380	402.06	389.38	12.68	96.00	14563	5

Comparison of Cost Recovery

Year	Income in Lakhs	Expenditure in Lakhs	% Recovery
1995-96	15.54	22.92	67.79
2001-02	81.72	169.03	48.35
2002-03	75.89	92.77	81.80
2003-04	67.65	80.53	84.00
2004-05	77.23	205.38	37.62
2005-06	56.63	166.10	34.04
2006-07	86.12	200.54	42.94
2007-08	205.94	279.56	73.66
2008-09	282.49	279.20	101.17
2009-10	359.40	281.82	127.52
2010-11	389.38	302.38	128.00

Energy Savings

For CMC

Year	Supply in MLD	Energy Consumption per MLD in kWh
1995-96	6.75	1980
2001-02	7.05	1980
2007-08	12	612
2009-10	19.4	588

For Citizens

Total No of Connections	Approximate no. of connections which are using pumps earlier	Avg. Power consumptions in Units per day	Total units saved per day by non usage of pumps due to good pressure
14536	10000	0.5	5000

Intangible benefit for the nation

One unit saved is two units gained

Water tariff earlier than the year1996

Sl. No	Type of Conn	Up to 18KL in Rs.	Above 18 KL Per 4KL in Rs.
1	Domestic	8.00	1.50
2	Commercial	20	2.00

Water tariff during the year 1996-2007

Sl. No	Type of Conn	Up to 18KL in Rs.	Above 18 KL Per KL in Rs.
1	Domestic	45.00	2.50
2	Commercial	90.00	5.00
3	Industrial	180.00	7.50

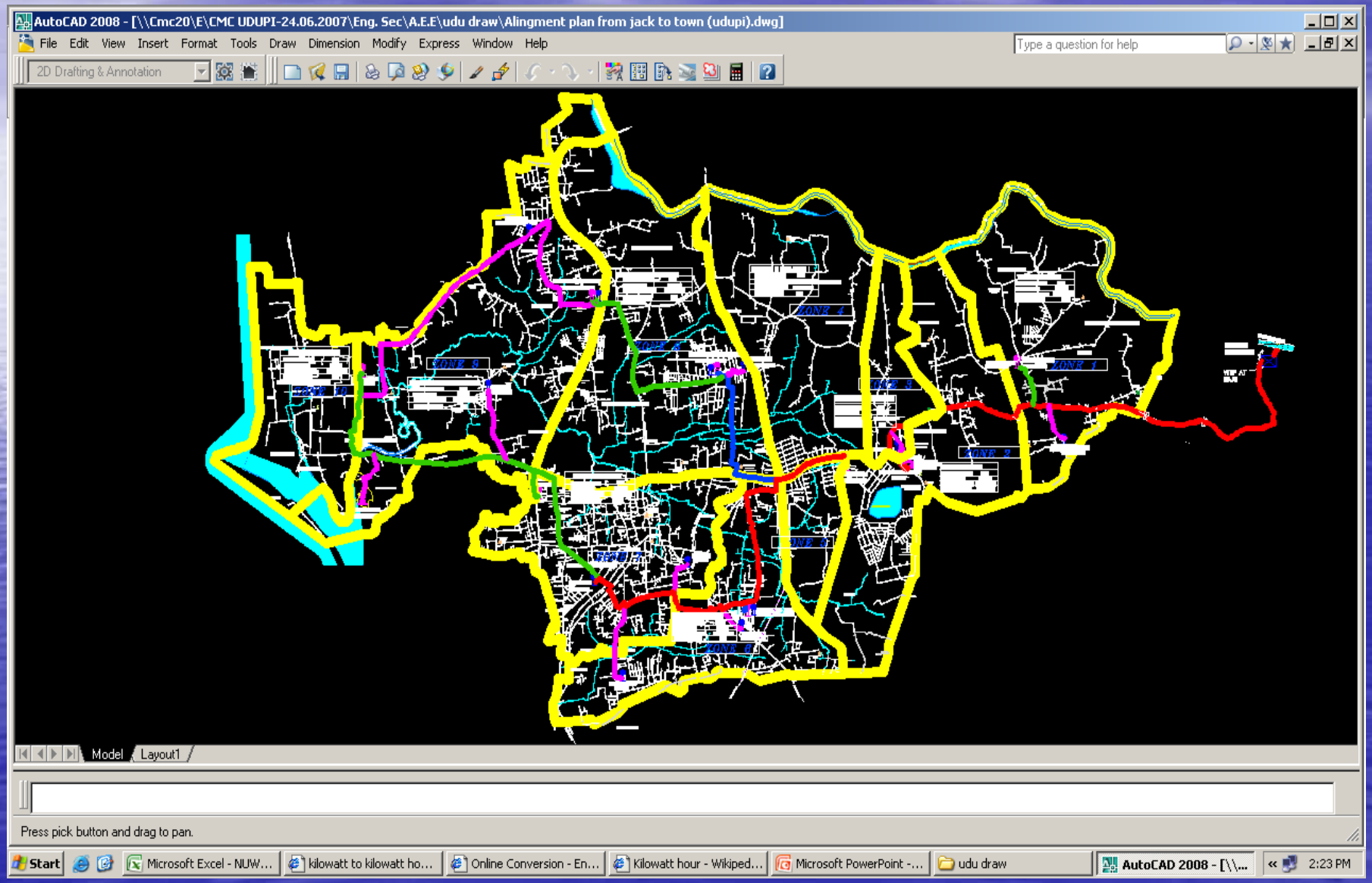
Present Water Tariff

Sl. No.	Type of Connection	Up to 18KL	18KL to 25KL	25 KL to 50KL	Beyond 50KL
1	House hold	Rs.75	Rs.7.50 per KL	Rs.10 per KL	Rs.15 per KL
2	Commercial	Rs.150	Rs.15 per KL	Rs.20 per KL	Rs. 25 per KL

Water Demand and Supply

Year	Population	Demand in MLD	Supply in MLD	LPCD
1995-96	108,563	14.6	6.75	62
2001-02	113,039	15.26	7.05	62
2007-08	121,089	16.2	12	100
2009-10	123,000	16.60	19.4	157
2010-11	125,000	16.91	19.4	154

Zonal map of Udupi CMC



Old System (Some Open Wells)

Tanker Supply

New System

Jack Well and Pumps

WTP Clarifier and Lab Facilities

WTP Chemical house and Clear Water Pump House

Transformer yard and Pipe lines

New System

Clear water Transmission Line

Zone I OHT of 5 Lacks Capacity

Zone II OHT of 5 Lacks Capacity

Zone III OHT of 5 Lakhs Capacity

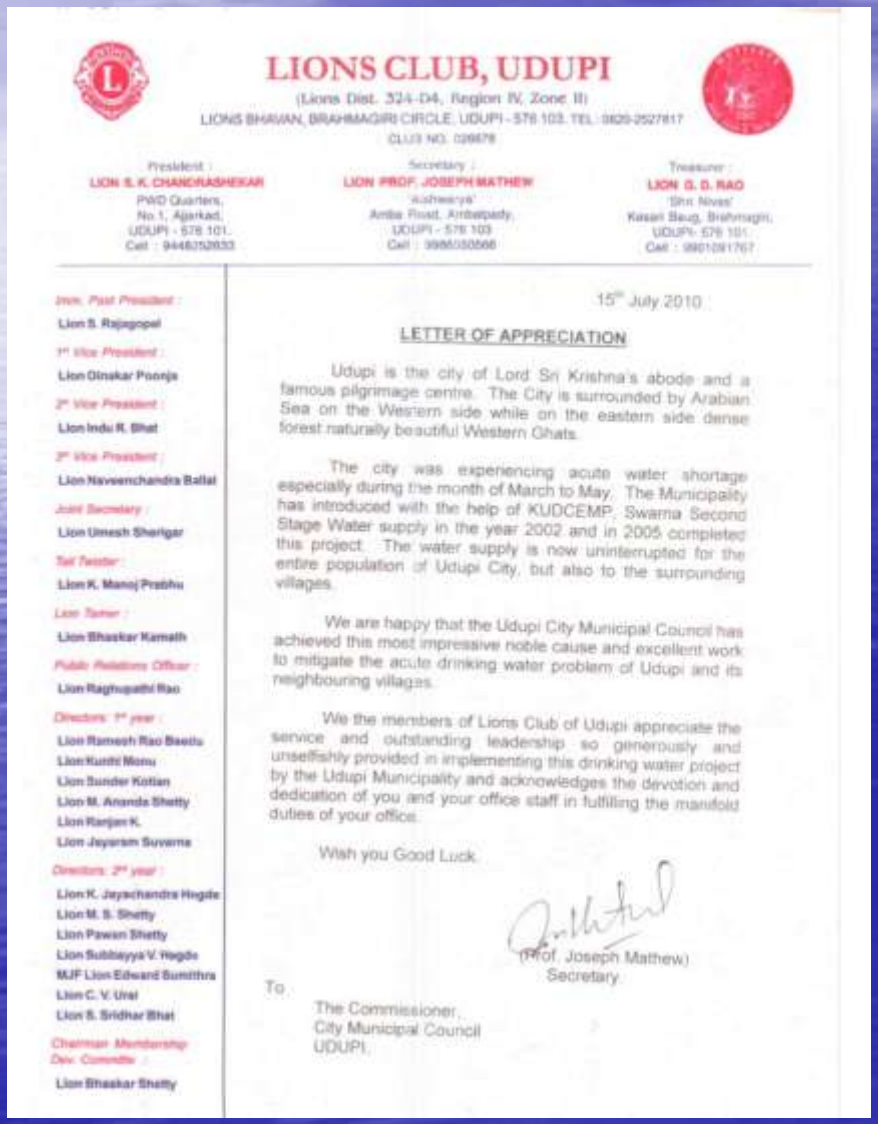
Situation Now..

Continuation…

Situation Now..

Some of the Public drinking water booths provided by CMC near Bus Shelters

Appreciation from NGO's



LIONS CLUB, UDUPI

(Lions Dist. 324-D4, Region IV, Zone II)

LIONS BHAVAN, BRAHMAGIRI CIRCLE, UDUPI - 576 103. TEL : 0820-2527817

CLUB NO. 026678

President :
LION S. K. CHANDRASHEKAR
PWD Quarters,
No.1, Ajarkad,
UDUPI - 576 101.
Cell : 9448252833

Secretary :
LION PROF. JOSEPH MATHEW
'Ashwarya'
Amba Road, Ambalpady,
UDUPI - 576 103
Cell : 9986030566

Treasurer :
LION G. D. RAO
'Shri Nivas'
Kasari Baug, Brahmagiri,
UDUPI- 576 101.
Cell : 9901091767

Imm. Past President :
Lion S. Rajagopal

1st Vice President :
Lion Dinakar Poonja

2nd Vice President :
Lion Indu R. Bhat

3rd Vice President :
Lion Naveenchandra Ballal

Joint Secretary :
Lion Umesh Sharigar

Tail Twister :
Lion K. Manoj Prabhu

Lion Tamer :
Lion Bhaskar Kamath

Public Relations Officer :
Lion Raghupathi Rao

Directors: 1st year :
Lion Ramesh Rao Baetu
Lion Kuddi Monu
Lion Sunder Kotian
Lion M. Ananda Shetty
Lion Ranjan K.
Lion Jayaram Suvarna

Directors: 2nd year :
Lion K. Jayachandra Hegde
Lion M. S. Shetty
Lion Pawan Shetty
Lion Subbayya V. Hegde
MJF Lion Edward Sumithra
Lion C. V. Urai
Lion S. Sridhar Bhat

Chairman Membership Dev. Committe :
Lion Bhaskar Shetty

15th July 2010

LETTER OF APPRECIATION

Udupi is the city of Lord Sri Krishna's abode and a famous pilgrimage centre. The City is surrounded by Arabian Sea on the Western side while on the eastern side dense forest naturally beautiful Western Ghats.

The city was experiencing acute water shortage especially during the month of March to May. The Municipality has introduced with the help of KUDCEMP, Swarna Second Stage Water supply in the year 2002 and in 2005 completed this project. The water supply is now uninterrupted for the entire population of Udupi City, but also to the surrounding villages.

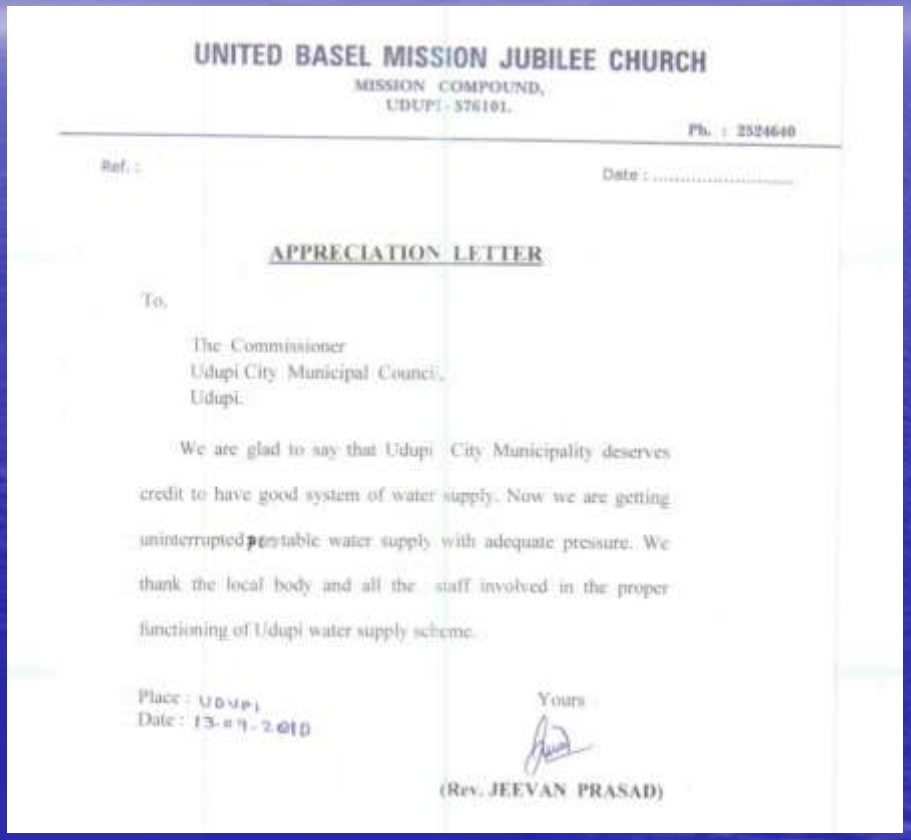
We are happy that the Udupi City Municipal Council has achieved this most impressive noble cause and excellent work to mitigate the acute drinking water problem of Udupi and its neighbouring villages.

We the members of Lions Club of Udupi appreciate the service and outstanding leadership so generously and unselfishly provided in implementing this drinking water project by the Udupi Municipality and acknowledges the devotion and dedication of you and your office staff in fulfilling the manifold duties of your office.

Wish you Good Luck.

(Prof. Joseph Mathew)
Secretary

To
The Commissioner,
City Municipal Council
UDUPI.



UNITED BASEL MISSION JUBILEE CHURCH

MISSION COMPOUND,
UDUPI - 576101.

Ph. : 2524640

Ref. :

Date : .....

APPRECIATION LETTER

To,

The Commissioner
Udupi City Municipal Council,
Udupi.

We are glad to say that Udupi City Municipality deserves credit to have good system of water supply. Now we are getting uninterrupted portable water supply with adequate pressure. We thank the local body and all the staff involved in the proper functioning of Udupi water supply scheme.

Place : UDUPI
Date : 13-09-2010

Yours

(Rev. JEEVAN PRASAD)

Computerized Billing System

Billing system

Exclusive Water Biil payment counter

Best ULB award 2010

Green Leaf Award 2010 ISWM

Thank You