GOVERNMENT OF PUDUCHERRY

PUBLIC WORKS DEPARTMENT

WELCOMES ALL
PRESENTATION

on

Urban Water Management

and

Sewerage System

By

Er. S. MANOHAR, B.E. (Honors)

Chief Engineer

PWD, Puducherry

Dt.12.08.2013
Union Territory of Puducherry

Has four Regions

- Puducherry (Tamil nadu)
- Karaikal (Tamil nadu)
- Mahe (Kerala)
- Yanam (Andrapradesh)
Urban Water Supply System in Puducherry Union Territory

Puducherry Region

- Mainly depends on ground water
- Urban water supply is maintained through more than 150 bore wells
- Main water resource is MUTHI RAPALAYAM aquifer
- Maintaining 135 lpcd and more
- 10 hrs. Water Supply (4+2+4) is maintained 365 days
Water Supply System in Karaikal Region

- Karaikal is in the Cauvery Delta
- Water Supply depends on Ground water through Bore wells
- Surface water is being taped through infiltration wells
- 135 lpcd Supply level is maintained.
- 10 hrs (4+2+4) Supply is maintained for 365 days
Water Supply in Yanam Region

- Depends on surface water from Godavari river
- 3 Treatment plants (4 MLD, 3 MLD, 2 MLD) are in use to treat water
- Andrapradesh Government releases 30 cusecs of water to Yanam region at free to cost
- 65 Km length of pumping main laid to Transmit water from Arthur Cotton barrage to Summer Storage Tank in Yanam.
- 135 lpcd Supply is maintained for 10 hrs in 365 days.
Water Supply in Mahe Region

- Due to Geographical nature there is no adequate potential to tap water
- Agreement executed with Kerala water authority for the supply
- Water is being supplied from Anjarakandy system to Mahe Region
SOURCE AUGMENTATION FOR URBAN WATER SUPPLY BY UTILISING WATER FROM OUSSUDU TANK, PUDUCHERRY
NEED FOR SOURCE AUGMENTATION SCHEME

- Over extraction of ground water causes intrusion of sea water
- Due to continuous extraction of ground water the water table has fallen drastically
- Quality of ground water changed due to over extraction
- Recharging of ground water is not equal to the extraction
- More than 20 nos of tube wells near the coastal line has been abandoned in last 10 years due to increase in total solids (brackish)
- To mitigate the sea water intrusion Government of Puducherry has issued orders, not to construct tube wells within 6 kms from shore line.
NEED FOR SOURCE AUGMENTATION SCHEME contd...

- Therefore it is proposed to augment surface water from Ouussudu tank.
- This will reduce some thrust on underground water
- Under ground water can be preserved for future generation
- Surplus water during monsoon season was let into sea which can be used for drinking purpose
- The scheme will only supplement the existing system
SCOPE OF THE SCHEME

• Drawal of 20 MLD of raw water from Ouussudu tank

• Conveying the raw water to the proposed treatment plant site at Muthirapalyam head works. (4 km)

• Treating the raw water at Muthirapalayam head works site and pumping the same to GLR after Chlorination

• Space required for structures at Ouussudu tank bund-60x60 m
Panel suggests draining of Ousteri lake

Revival of old pattern may help to accommodate more freshwater

Rajesh B. Nair

PUDUCHERRY: The Puducherry Steering Committee on Wetlands suggested revival of the old pattern of draining the Ousteri Lake annually close to the end of the monsoon for accommodating more freshwater. The suggestion was put up during the deliberations on the Comprehensive Management Action Plan for Conservation of Ousteri Lake prepared by the Salim Ali Centre for Ornithology and Natural History (SACON) at Ananjay near Coimbatore.

The 18-member committee, chaired by Chief Secretary R. Chandramohan, was given a detailed briefing on the recommendations by representatives from SACON. Though most of the recommendations were acceptable to the Puducherry Steering Committee on Wetlands, as mandated by the National Wetlands Conservation Board, the members suggested adoption of the earlier practice of draining the lake dry for some time every year.

Those who showed their disapproval are of the view that by allowing fresh water after draining the lake would create a healthy environment for migratory birds, said a senior official, who attended the meeting.

The draining work had to be coordinated with other agencies, including the Public Works Department, which could also use the water for reviving some of the nearby waterbodies. The maximum depth of the lake is about 3.5 metre and it would maintain a capacity of 2.15 metre normally, thereby reducing space for storing monsoon water during monsoon. If the lake was drained to its maximum, a large quantity of rainwater could be stored. Such a model was adopted by authorities in Bharatpur Bird Sanctuary, the official said.

The meeting also decided to seek no. 10 crore for a period of five years from the National Wetland Conservation Board for implementing the Comprehensive Management Action Plan for Conservation of Ousteri Lake, the official said.

The Steering Committee meeting under way in Puducherry on Wednesday. — PHOTO: T.SINGARAVELOU
Present Status of Water Supply System at Puducherry Urban Area:

- **Source**: Only Tube wells
- **Source Collection system**: Individual pump house, pump sets, pumping main & sump
- **Distribution components**: OHT & Distribution grid.
- **50% of area covered by OHT supply and 50% of area by direct pumping from tube wells.**
- **No Treatment Plants anywhere, except iron removal plants in some places where iron content is predominant.**
Present Status of Water Supply System contd...

- Chlorination done at all pump houses & OHT
- Presently 100 lpcd to 135 lpcd of water being supplied
- Total number of tubewells used in urban areas: 180 Nos
## Population, demand & supply details

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Urban Population (2011)</td>
<td>6.51 lakhs</td>
</tr>
<tr>
<td>Growth rate</td>
<td>28.73%</td>
</tr>
<tr>
<td>Projected Population (2026)</td>
<td>9.12 lakhs</td>
</tr>
<tr>
<td>Projected Population (2041)</td>
<td>12.70 lakhs</td>
</tr>
<tr>
<td>Present Demand</td>
<td>104 MLD</td>
</tr>
<tr>
<td>Projected Demand (2026)</td>
<td>145 MLD</td>
</tr>
<tr>
<td>Projected Demand (2041)</td>
<td>201 MLD</td>
</tr>
</tbody>
</table>
**Population, demand & supply details contd...**

- **Present supply**
  - 95 MLD

- **Deficit**
  - 9 MLD

- **Population covered by piped water in urban area**
  - 100%
# OUSSUDU TANK DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity of tank</td>
<td>15.29 mcm or 540 mcft</td>
</tr>
<tr>
<td>Proposed drawal</td>
<td>20 MLD or 7.3 mcm/year</td>
</tr>
<tr>
<td>Dead storage available after drawal</td>
<td>3.40 mcm</td>
</tr>
<tr>
<td>Water spread area</td>
<td>820 ha</td>
</tr>
<tr>
<td>Full tank depth</td>
<td>3.50 m</td>
</tr>
<tr>
<td>Free catchment area</td>
<td>16 sqkm</td>
</tr>
</tbody>
</table>

As per PWD records, there was no supply of water in the channels for last three years for irrigation purpose.
Treatment process proposed at Muthirapalayam head works

- Micro strainer for algae
- Chemical treatment with provision for high lime & carbonisation when needed
- Dual media filtration
- Activated carbon filtration
- Chlorination
## Abstract of project cost

<table>
<thead>
<tr>
<th>SL.NO</th>
<th>DESCRIPTION</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>INTAKE ARRANGEMENTS</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Construction of intake well and pump house</td>
<td>1,93,60,000.00</td>
</tr>
<tr>
<td></td>
<td>b) Construction of walkway bridge to pump house</td>
<td>64,40,000.00</td>
</tr>
<tr>
<td></td>
<td>c) Construction of retaining wall and land development</td>
<td>2,73,40,000.00</td>
</tr>
<tr>
<td></td>
<td>d) Centrifugal pumpsets at intake well pumphouse</td>
<td>79,50,000.00</td>
</tr>
<tr>
<td></td>
<td>e) EOT crane in intake well pump house</td>
<td>11,70,000.00</td>
</tr>
<tr>
<td></td>
<td>f) Genset for intake well site</td>
<td>29,85,000.00</td>
</tr>
<tr>
<td></td>
<td>g) Transformer and High tension electrification at intake well site</td>
<td>33,60,000.00</td>
</tr>
<tr>
<td></td>
<td>h) Construction of genset room and watchman room</td>
<td>38,50,000.00</td>
</tr>
<tr>
<td></td>
<td>i) Dewatering system</td>
<td>34,10,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Sub total</strong></td>
<td>7,58,65,000.00</td>
</tr>
<tr>
<td>2</td>
<td><strong>RAW WATER PUMPING MAIN</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) Pumping main from Oussudu lake to Muthirayarpalayam treatment plant</td>
<td>9,32,00,000.00</td>
</tr>
<tr>
<td></td>
<td>b) Road restoration</td>
<td>20,50,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Sub total</strong></td>
<td>9,52,50,000.00</td>
</tr>
</tbody>
</table>
## 3 TREATMENT PLANT AND ITS ALLIED ITEMS

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Construction of dual media rapid sand filter water treatment plant (20 MLD)</td>
<td>17,51,48,000.00</td>
</tr>
<tr>
<td>b) Construction of clear water reservoir (40 Lakh litres)</td>
<td>4,64,30,000.00</td>
</tr>
<tr>
<td>c) Construction of clear water pumphouse</td>
<td>86,16,000.00</td>
</tr>
<tr>
<td>d) Construction of office building and laboratory</td>
<td>67,70,000.00</td>
</tr>
<tr>
<td>e) Construction of genset room</td>
<td>16,40,000.00</td>
</tr>
<tr>
<td>f) Centrifugal pumpset and interlinking with existing supply main</td>
<td>1,63,30,000.00</td>
</tr>
<tr>
<td>g) EOT crane in clear water pumphouse</td>
<td>11,70,000.00</td>
</tr>
<tr>
<td>h) Genset at treatment plant site</td>
<td>34,80,000.00</td>
</tr>
<tr>
<td>i) Transformer and High tension electrification at treatment plant site</td>
<td>33,60,000.00</td>
</tr>
<tr>
<td><strong>Sub total</strong></td>
<td><strong>26,29,44,000.00</strong></td>
</tr>
</tbody>
</table>

## 4 DEVELOPMENT OF TREATMENT PLANT SITE

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost (INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Site development, filling of land and laying pavement around treatment plant area</td>
<td>61,40,000.00</td>
</tr>
<tr>
<td><strong>Sub total</strong></td>
<td><strong>61,40,000.00</strong></td>
</tr>
</tbody>
</table>
Abstract of project cost contd...

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Provision for furnishing of laboratory and equipments (L.S)</td>
<td>15,00,000.00</td>
</tr>
<tr>
<td>7</td>
<td>Provision for inspection vehicle, infrastructure development, computers and office accessories (L.S)</td>
<td>15,00,000.00</td>
</tr>
<tr>
<td>8</td>
<td>Provision for survey &amp; investigation (L.S)</td>
<td>15,17,000.00</td>
</tr>
<tr>
<td>9</td>
<td>Operation &amp; maintainance cost for one year</td>
<td>2,99,84,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Grand total</strong></td>
<td><strong>47,47,00,000.00</strong></td>
</tr>
</tbody>
</table>
REPORT OF WATER SUPPLY PROJECT AT YANAM
MAP SHOWING YANAM REGION AND DOWLESWARAM PUMP HOUSE SITE
MAP SHOWING LOCATION OF PUMP HOUSE AT DOWLESWARAM
MAP SHOWING YANAM REG
MAP SHOWING THE PUMP HOUSE SITE AND RIVER GODAVARI
MAP SHOWING THE PUMP HOUSE SITE AT DOWLESWARAM ON THE UPSTREAM SIDE OF BARRIAGE
NAME OF THE PROJECT

AUGMENTATION OF WATER SUPPLY SCHEME TO YANAM REGION FROM THE RESERVOIR OF SIR ARTHUR COTTON COTTON BARRAGE AT DOWLAIISWARA ANDHRA PRADESH
ESTIMATE AMOUNT
Rs. 49.844 CRORES
AGENCY

M/s ENGINEERING PROJECTS (INDIA) Ltd.
A Govt. of India Enterprises, Hyderabad

Agreement No: 113/ PW/ YD/ 2010-11
AGREEMENT AMOUNT
Rs. 46,28,63,246/-
Objectives of the Project:

Supply of un-interrupted drinking water to Yanam free of cost and free from impurities at the rate of 3 cusecs per day upto 2040
POPULATION CENSUS AND INCREASE

- AS PER 1991 CENSUS - 20,297
- AS PER 2001 CENSUS - 31,362
- AS PER 2011 CENSUS - 54,596
- INCREASE IN POPULATION - 54.50% (by 2001)
- INCREASE IN POPULATION - 74.08% (by 2011)
## PROJECT DEMAND ASSESSMENT

<table>
<thead>
<tr>
<th></th>
<th>Prospective Year 2025</th>
<th>Ultimate Year 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Population</strong></td>
<td>2,25,000</td>
<td>3,00,000</td>
</tr>
<tr>
<td><strong>Rate of supply (135+ 15% Wastages)</strong></td>
<td>159 LPCD</td>
<td>159 LPCD</td>
</tr>
<tr>
<td><strong>Requirement of Clear Water</strong></td>
<td>35.78 MLD</td>
<td>47.70 MLD</td>
</tr>
<tr>
<td><strong>Existing supply from all sources</strong></td>
<td>9.8 MLD</td>
<td>9.8 MLD</td>
</tr>
<tr>
<td><strong>Balance requirement of Clear Water</strong></td>
<td>25.98 MLD</td>
<td>37.90 MLD</td>
</tr>
<tr>
<td><strong>Requirement of Raw Water (including 10% extra)</strong></td>
<td>28.578 MLD</td>
<td>41.69 MLD</td>
</tr>
<tr>
<td><strong>Hours of pumping</strong></td>
<td>23.00 Hours</td>
<td>23.00 Hours</td>
</tr>
</tbody>
</table>
Components of the Project

- Construction of intake well with suitable screw gearing shutters
- Laying intake pipe line with 400mm dia DI pipe with suitable length in 3 rows
- Construction of Jackwell-cum-pump house with suitable circular RCC vent type intake for drawing water from River Godavari into intake well
- Laying of pressure main with 300mm dia DI pipe for a length of 65km
- Construction of delivery cistern
- Site leveling and barbed wire fencing around the site at pump house,
- Dowlaiswaram and Drinking water tank at Yanam
- 2 Rooms staff quarters of size 6.69 x 4.46 mts. in RCC framed structure
- Horticulture development at Dowlaiswaram and Yanam
- Supply and fixing of 3 Nos. vertical turbine pump sets of 75 HP each
- 33 KV and LT 6 pole structure with 2 Nos. of Transformers of suitable capacity
# UIDSSMT QUARTERLY PROGRESS REPORT FOR QUARTER ENDING MARCH 2012

## General Details

1. **Name of the ULB:** YANAM MUNICIPALITY
2. **Name of the Project:** Augmentation of Water Supply scheme for Yanam
3. **Project Cost Approved by SLSC:** Rs. 4431.00 Lakhs
4. **Date of SLSC:** 23.2.2009
5. **Name of Implementing Agency:** Public Works Department, Yanam
6. **Date of Signing of MOA:** 26.2.2009
7. **Date of Release of ACA 1st & 2nd Installment:** 28.5.2009 & 3.3.2010 & 7.12.2011
8. **Amount of ACA Released Including Incentives, if any:** Rs. 2378.00 Lakhs
   
   (Rs. 1263 + Rs. 304 Lakhs + Rs. 811 Lakhs)
9. **State Share:** Rs. 2222.27 Lakhs (Rs.386.42 Lakhs + Rs. 1835.85 Lakhs)
   
   *Loan availed by PWD from NABARD to meet the balance state share and cost escalation for the project.
11. **ULB Share (Along with Details of Source if not from Own):** Nil (ULB Share of 10% will be met in the State Budget along with the State Share)
12. **Date of Administrative and Financial Sanction from Competent Authority:** 18.9.2009
## Monitoring of Physical Progress

- **Date of Tendering Main Package:** 18.3.2010
- **Date of Work Order Issued:** 03.07.2010*
- **Duration of Project as Per DPR:** 18 Months
- **Date of Start of Project:** 13.07.2010
- **Date of Completion as Per DPR:** 12.04.2011
- **No. of Months Behind Schedule:** 15 months
- **Revised Date of Completion:** 31.07.2012
- **Implementing Agency:** Public Works Department, Yanam
- **Expected Population Benefitted:** 55000 (70000 by 2021)
- **Approximate Area Benefitted:** 30.00 Sq.Kms
PHYSICAL PROGRESS as on 6.6.2012

- **PIPE SUPPLY**: 65Km (as per Agreement)
  - 350MM DIA K9 DI PIPE SUPPLY COMPLETED

- **PIPE LAYING**: 65Km (as per Agreement)
  - 54.5Km Completed

**CIVIL WORKS**

- **Jack well**: Casting & Sinking completed
  - Plugging concrete in progress

- **Staff Quarters, Switch Yard**: Structure reached up to first slab & first slab to be laid

- **Foot path Bridge**: Centering work for deck slab in progress
## MONITORING OF FINANCIAL PROGRESS: (Rs. In Lakhs) as on 6.6.2012

<table>
<thead>
<tr>
<th>S. No.</th>
<th>SHARE</th>
<th>TOTAL AMOUNT RELEASED (IN LAKHS)</th>
<th>LAST DATE OF RELEASE</th>
<th>UTILIZATION TILL DATE (Rs. IN LAKHS)</th>
<th>% UTILIZATION</th>
<th>FUNDS TO BE RELEASED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>GOI SHARE TO ULB / IMPLEMENTING AGENCY</td>
<td>2378.00</td>
<td>7.12.2011</td>
<td>4011.11</td>
<td>96.92</td>
<td>756.40</td>
</tr>
<tr>
<td>2.</td>
<td>STATE SHARE TO ULB / IMPLEMENTING AGENCY</td>
<td>1760.49</td>
<td>----</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>ULB SHARE TO IMPLEMENTING AGENCY</td>
<td>Nil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Nil</td>
</tr>
<tr>
<td>4.</td>
<td>ANY OTHER SOURCE TO IMPLEMENTING AGENCY</td>
<td>Nil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Nil</td>
</tr>
<tr>
<td>5.</td>
<td>INCENTIVE RELEASED BY GOI AS PER PARA-9 OF UIDSSMT GUIDELINES</td>
<td>Nil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Nil</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4138.49</td>
<td>-</td>
<td>4011.11</td>
<td>96.92</td>
<td></td>
<td>756.40</td>
</tr>
</tbody>
</table>
LAYING OF PIPE
CHECKING OF TRENCH LEVEL
LAYING OF PIPE
REFILLING THE TRENCH
JOINTING OF PIPE MECHANICALLY
CHECKING OF SAND CUSHION ON LEVEL
LAYING OF PIPES AT JOINT
PIPE JOINTING ARRANGEMENTS
JOINTING OF PIPE
CHECKING OF LEVELS
INSPECTION OF PIPE TRENCH
EXCAVATION OF PIPE TRENCH MECHANICALLY
INPECTION OF PIPE LAYING SITE BY THE EXECUTIVE ENGINEER
DAIL GUAGE READING OF PRESSURE TEST
TRENCH CUTTING, SAND FILLING AND LAYING OF PIPE
LAYING OF PIPE AT ANOTHER LOCATION
FILLING OF SAND UNDER PIPE LINE
LIFTING OF PIPE FOR LAYING IN POSITION IN TRENCH
LIFTING OF PIPE FOR LAYING IN POSITION IN TRENCH
REFILLING THE TRENCH AFTER LAYING PIPE
PRESSURE TEST IN PROGRESS
PRESSURE RELEASE AFTER TEST
VISUALS OF PUMP HOUSE, STAFF QUARTERS AND JACKWELL
PLACING OF IRON KERB FOR JACK WELL
CENTERING WORK FOR JACK WELL BASE
CENTERING WORK FOR JACK WELL
BASE FOR FOUNDATION
REINFORCEMENT FOR JACK WELL WALL AT BASE
SCAFFOLDING WORK FOR JACK WELL FOUNDATION
REINFORCEMENT OF JACK WELL BEAM AT BASE
ARRANGEMENTS FOR CONCRETING THE JACK WELL
JACK WELL AFTER SINKING
MEN AT WORK FOR SINKING
JACK WELL
CASTING OF JACKWELL
CURING ARRANGEMENTS FOR JACK WELL WALL
CURING ARRANGEMENTS FOR JACK WELL WALL
CASTING OF COLUMNS ABOVE BRACING BEAM OF PUMP HOUSE
COLUMNS OF APPROACH BRIDGE AND PUMP HOUSE UP TO BRACERBEAM
EARTH WORK EXCAVATION INSIDE THE JACK WELL FOR SINKING WELL
INSPECTION OF CTP
VI SUALS OF I NSPECTI ON BY AUDI T PARTY
THANK YOU FOR ALL

SAVE THE EARTH BY PLANTING MORE TREES