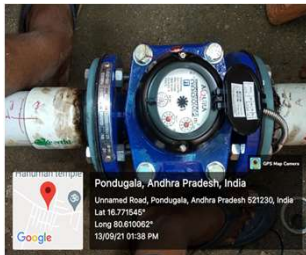




Sensor based IoT Smart Rural Water Supply Monitoring system Pondugala, Andhra Pradesh- *best practice!*



*Presentation by
State Water and Sanitation Mission, RWS&S department, GoAP
National Workshop on JJM, 9th & 10th June 2022, Bhubaneswar*

About Pondugala village

S.No	Details	Information
1	Mandal Name	MYLAVARAM
2	Village/GramPanchayat Name	PONDUGALA
3	Population as per census	4070
4	Present Population	4822
5	No of Households	1541
6	Lat&Long	16.677882, 80.9604836
7	Distance from Mylavaram(Block HQ)	5 Kms
8	Scheme PWS/CPWS/Others	PWS/Others
9	Water Source	Borewells (6nos)
10	Borewell Depth	200 ft
11	Submersible pump capacity	5 HP/ 3HP
12	Over Head Tank Capacity in Ltrs	90,000 litres
13	No of Public Stand Posts	190
14	No of FHTCs	503
15	Water Supply Timings(90 KL OHSR)	6:30 AM to 7:30 AM, 5:30 PM to 6:30 PM
16	Water Supply Timings(DPs)	6:00 AM to 9:00 AM, 5:30 PM to 7:30 PM
17	Water Purification Process	Chlorination will be done daily
18	Tank Cleaning Process	Tank cleaning will be done every 15 days



VWSC -Pondugula

S.No	Names of VWS Committee Members	Gender	Caste	Contact No
1	G.Kotamma	Female	ST	8074764636
2	M.D.Rafi	Male	BCD	9885941412
3	E.Prasanna Rani	Female	ST	6305425233
4	S.Venkatesh Kumar	Male	BC	8328474599
5	B.Vasantha	Female	SC	8688074036
6	P.Venkateswaramma	Female	BC	9908933893
7	M.Ramakrishna Rao	Male	OC	9573357332
8	S.Satyanarayana	Male	OC	9441143999
9	B.Raja Rao	Male	SC	9989532335
10	P.Srinivas Rao	Male	BC	7031256389
11	B.Tirupathamma	Female	ST	9441047836
12	A.Uma Rani	Female	OC	9491759120
13	G.Rambabu	Male	ST	8074764636
14	D.Chitamma	Female	BC	9010972235
15	B.Varalakshmi	Female	ST	9494838295

The Problem

- As population is increasing day by day, every individual, institution and also agricultural needs are increasing, resulting in huge shortage of fresh water for their daily needs.
- **Water wastage is one of the prime factors leading to water scarcity.**
- **Regular Chlorination is another challenge in water supply syetem**
- The reasons for water wastage could be overflows & also pipe leakages.
- There was a dire need to address the problem.

The Solution

- Making sure a person was dedicatedly watching the tank fill all the time felt like impossible.
- Moreover, we needed real- time data to monitor various aspects like chlorination, Pressure of the water, LPCD etc
- Vijayavahini Charitable Foundation – supported by TATA Trusts came forward to support technically as a pilot project.
- The **IoT** based Smart water supply & Monitoring project in Pondugula village of Andhra Pradesh state is unique in nature, as it involves auto chlorine dosing system. This means chlorine will be dozed in to pipeline in appropriate amounts based on the water yield from the source.

Technical Solution

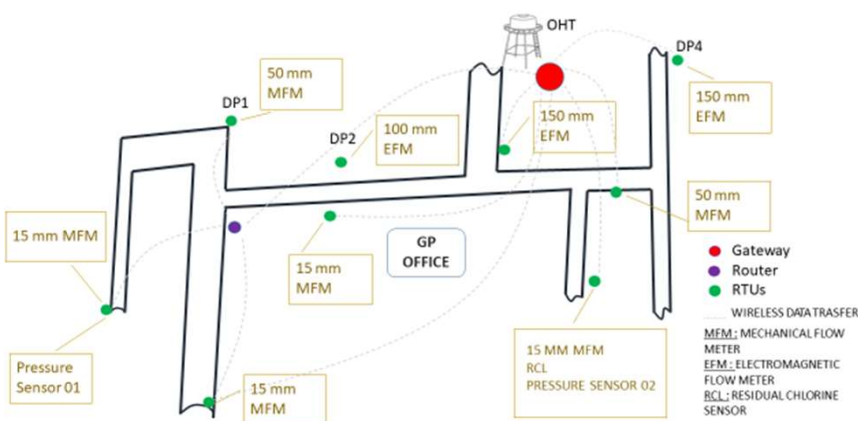
S.N.	IOT (Internet of Things)	Specification/Technology	Nos	Power	Use
1	Electromagnetic Flow Meter	150 mm	1	Grid supply	To measure the flow of Water through Electro Magnetic Waves
2	Electromagnetic Flow Meters	100 mm	2	Grid supply	
3	Mechanical Flow Meter (Woltmann)	50mm	2	Grid supply	To measure the flow of water
4	Multijet water flow meter with pulse outpur	15 mm	4	solar based	
5	Residual Chlorine Sensor	Probe type with RS485 output	1	Grid supply	To find the Chlorination at tail end point
6	Pressure sensor	1 to 25 bar	2	solar based	To find the pressure in the pipe
7	RTU (Radio Transmission unit)	Lora	12	Battery	To Transmit the data through Radio Waves to Gateway
8	Dosing Pump	6 LPH @ 3.5 kg/cm2, PP Liquid end with PVC fittings	1	Grid supply	Chlorination Point
9	Router	Lora	1	Grid supply	For Internet Provision
10	Main Gateway	Lora	1	Grid supply	Collecting the data from RTUs and transmit to web
11	Auto Sensor (OHT)	–	1	Grid supply	To ON & OFF submersible Pump
12	Monitor (GP Office)	–	1	Grid supply	Displaying E-JALASAKTHI DASH Board

Unique Features in IoT pilot Pondugula

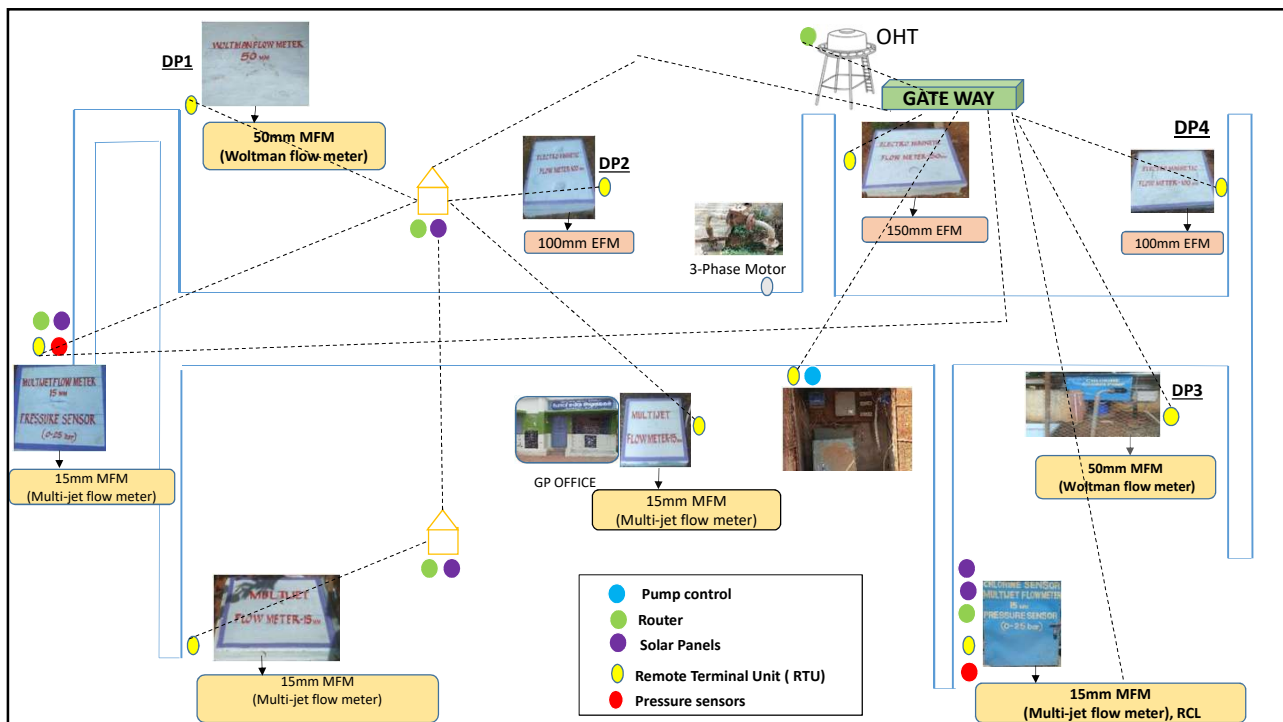
- Usage of Electromagnetic Bulk Flow Meters.
- Automation of Chlorine dosing system.
- No data loss in case of Electromagnetic, Woltmann Flow Meter in case of absence of power supply.



Schematic –IoT @Pondugula



The Rural Water Monitoring dashboard Pondugula, to access the dashboard click on the <https://ejalshakti.gov.in/jjmreport/IoTMonitoring.aspx>



The key objectives of the intervention

- To automate the water fill in overhead tank from water source.
- To check for last mile water delivery to Household in a street.
- To monitor household water consumption including overall people in Pondugula on daily basis in online dashboard.
- To automate the Chlorination process i.e. Chlorination at one water source.
- To monitor the water quality i.e. residual chlorine at household level in online dashboard.

The brigade

VWSC/Pani Samiti Members:

S.No	Names of VWSC Member	Designation	Gender
1	G.Kotamma	Chairperson	Female
2	M.D.Rafi	Member Secretary	Male

Operation and Maintenance Personnel :

S.No	Name	Designation	Gender
1	B BALAJI	Barefoot technician	Male
2	D VISHNUVARDHANA RAO	Pump Operator	Male
3	BANAVATHU KRISHNA	Pump Operator	Male

Andhra Pradesh Smart water supply management in villages
Success story of Pondugula, Krishna district

Vijayabhini Charitable Foundation (State PMU and ISA in 2 districts)

The Challenge
Access to safe drinking water is one of the major concerns. As per estimates, in 1951, per capita annual freshwater availability was 1,177 cu. m which came down to 1,545 cu. m in 2011. If present trend continues, in 2050, it is likely to go down to 1,293 cu. m in 2025 and further decline to 1,140 cu. m by 2050. In Andhra Pradesh, as of 2019, some of the Mandals of Krishna district are badly affected to a point where water tankers are required every alternate day.

Further, apart from existing geogenic contamination of groundwater, depletion in its levels also increases water quality issues. In addition, water wastage through overflows, pipe leakages, etc. contributes to the burden of water scarcity. Compared to urban areas, rural areas lack proper water infrastructure management in terms of sustenance of water resources, community ownership, water quality surveillance, water treatment, etc.

Announcement of JIM creating an institutional set-up to address these challenges
Vijayabhini Charitable Foundation (VCF), supported by Tata Trusts, has been engaged at the State level as Project Monitoring Unit as well as to play the role of an Implementation Support Agency in two districts of Andhra Pradesh, viz. Krishna and Vishakhapatnam districts, catering to a total of 107 villages. Apart from many initiatives to engage community in the planning, implementation,

management, operation & maintenance of in-village water supply systems, VCF has been moving forward to implement innovative technology like sensor-based IoT systems.

With the help of technical assistance from TATA Water Mission (TWM) and the water expert team from TATA Consultancy Services, pilot projects are being demonstrated as operational innovation in JIM to simplify water measurement and monitoring with reduced human intervention. A similar pilot has been demonstrated in Pondugula village of Mylavaram block of Krishna district.

Pondugula village has 1,000 families with an approx. population of 4,000. The tap water supply coverage was only at 27.13% as on 17th October, 2021. As a first step, JIM in partnership with Rural Water Supply and Sanitation (RWSS&S) Department, Andhra Pradesh has made provision of Single Village System (SVS) utilizing the groundwater source. A 90 KLD capacity overhead tank, four direct pumping sources, distribution lines, tap connections were installed to meet the water requirements of the village.

The village has formed a 15-membered Village Water & Sanitation Committee (VWSC) of which 50% are women, 25% are from weaker sections, and the remaining 25% are community leaders. The VWSC has been carrying out many behavioral change activities, especially for



సైబల్ ప్రాజెక్ట్ జిల్ జీవన్ మిషన్ టూటా ట్రస్ట్ వాచ్ ప్రోగ్రాం
ప్రారంభం, శీతా వాకి ప్రకటన

జీవన్ మిషన్ ప్రాజెక్ట్ వాచ్ ప్రోగ్రాం టూటా ట్రస్ట్ వాచ్ ప్రోగ్రాం ప్రారంభం. ప్రాజెక్ట్ వాచ్ ప్రోగ్రాం టూటా ట్రస్ట్ వాచ్ ప్రోగ్రాం ప్రారంభం. ప్రాజెక్ట్ వాచ్ ప్రోగ్రాం టూటా ట్రస్ట్ వాచ్ ప్రోగ్రాం ప్రారంభం.

Jal Jeevan Samvad | 17th Edition | February 2022

Article on IoT Pondugala in Jal Samvaad – Feb 2022 Edition

Impact of the Intervention

- This Smart Sensor(IoT) based rural water monitoring system has reduced human intervention of operating the submersible pump and resulted in restriction of water overflow.
- With the help of auto chlorine dosing system, the chlorine dosage is in appropriate amount in the water that is supplied to households, which resulted in removing the risk component for the operator to do manually.
- Further, we were able to track the water consumption for the whole village.
- Able to monitor Residual Chlorine Level at the household level ensuring safe water delivery.
- No water overflows.
- Reduction in Grey water.
- Saving in Electricity charges
- Trained community to take care of operations and safety aspects of flow meters, Chlorine sensors.
- The VWSC is overseeing the O & M of the entire system



Safe and regular drinking water has brought joy and prosperity to my home. I thank the Sarpanch, VCF-Tata Trusts and the RWS&S dept. for the work that they have done. said, [Modu Vasantha](#).

Some challenges

- At occasions we observed some fluctuations in the data on the dash board
- Synchronization of data is taking time
- Due to power fluctuations the adopter got burnt twice
- The residual pressure data is not reflected on the dash board for sometime

LET US WORK TOGETHER TO PROVIDE THE VERY BASIC NEED OF LIFE

**'WATER FOR ALL AND FOR ALWAYS'
SAFE, ASSURED, AFFORDABLE & RELIABLE: Sustainable !!**



THANK YOU !

