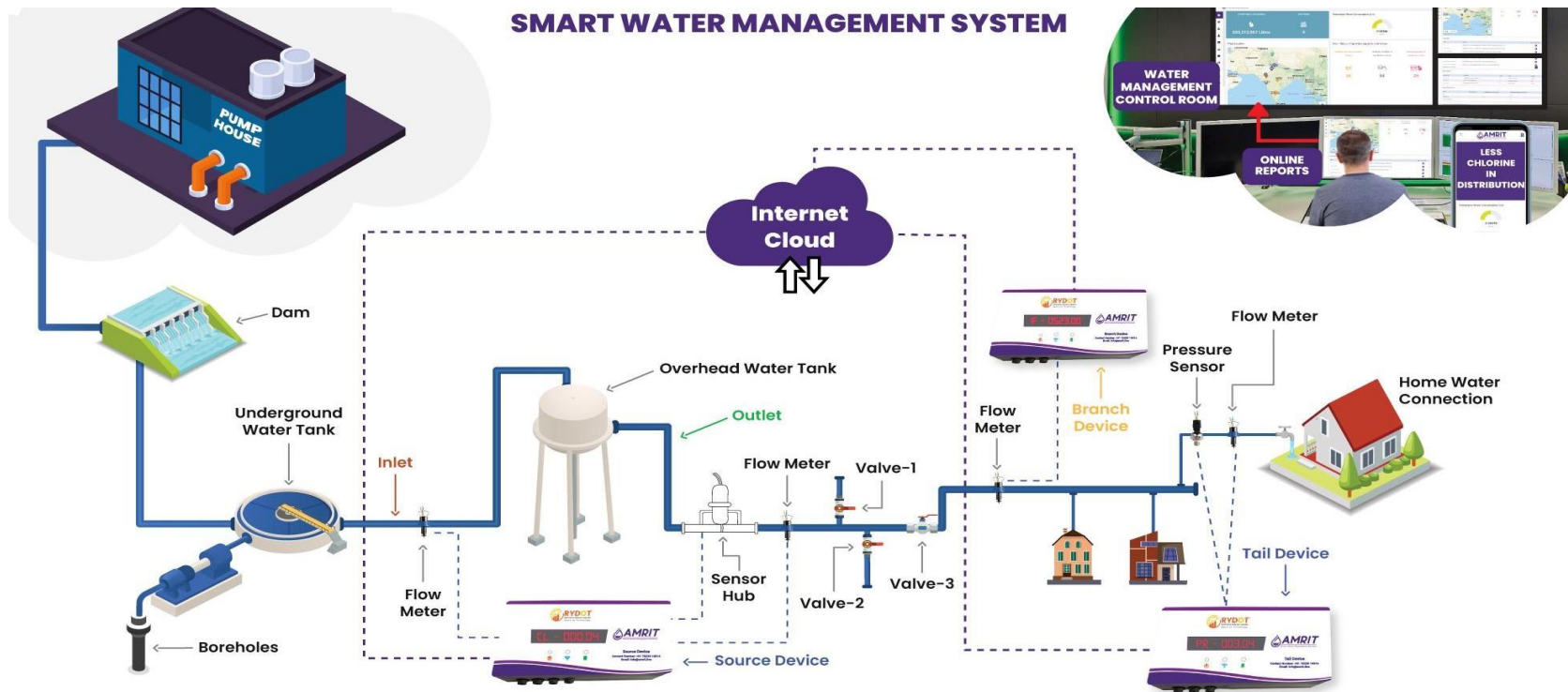


# Jal Jeevan Mission

## Taking the Digital Route: Deploying Sensor based IOT devices

### SMART WATER MANAGEMENT SYSTEM

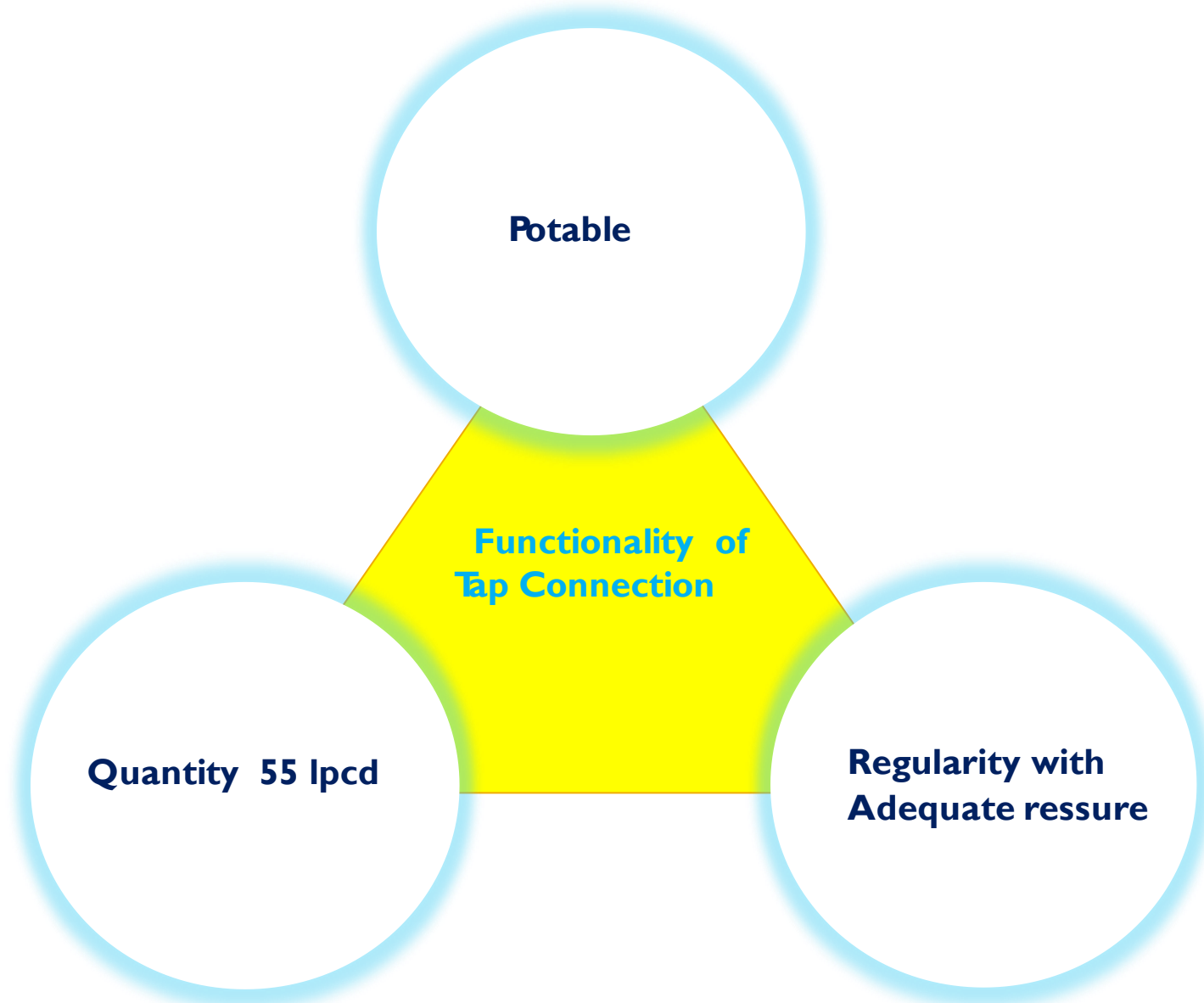


Er. Vishal Kumar  
Superintending Engineer Haldwani  
EX-HOD Civil Engineering Gov. Poly. Nainital

# Ultimate Goal



Har Ghar Jal  
Jal Jeevan Mission



**Potable**

**Functionality of  
Tap Connection**

**Quantity 55 lpcd**

**Regularity with  
Adequate ressure**

# Work Plan of JJM

Har Ghar Jal

**Test, commission and hand over – exit.  
Tender &  
Award of work**

**Data collection & Site Investigation**

- Baseline Study
- Topographical Survey
- Geotechnical and Hydrogeological Survey

**Alternative analysis of options based on project life cycle cost**

**From concept to commissioning**

**Population forecast  
Water demand assessment**

**Design Development**

- Concept planning
- Preliminary Design
- Detailed Design
- Technical specification
- Cost Estimate
- Tender document

**Selection of source**

- Quality
- Quantity
- Sustainability

**Study of existing infrastructure**

- Service level benchmarks
- GIS mapping of existing infrastructure
- Conditional assessment
- Gap analysis

## What is IoT?

The Internet of things (IoT) describes physical objects (or groups of such objects) with sensors, processing ability, software, and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks.





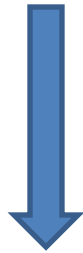
# WHY IOT

- कहते हैं— जो मापा नहीं जा सकता है, उस पर नियन्त्रण नहीं पाया जा सकता है।
- ❖ प्रभावी निगरानी तन्त्र से नल कनेक्शन की कार्यशीलता, अर्थात् नियमित आधार पर निर्धारित गुणवत्ता वाले पेयजल की पर्याप्त मात्रा में आपूर्ति सुनिश्चित होगी।

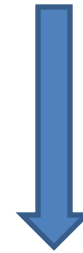


# Functionality of FHTC

## Smart Monitoring System

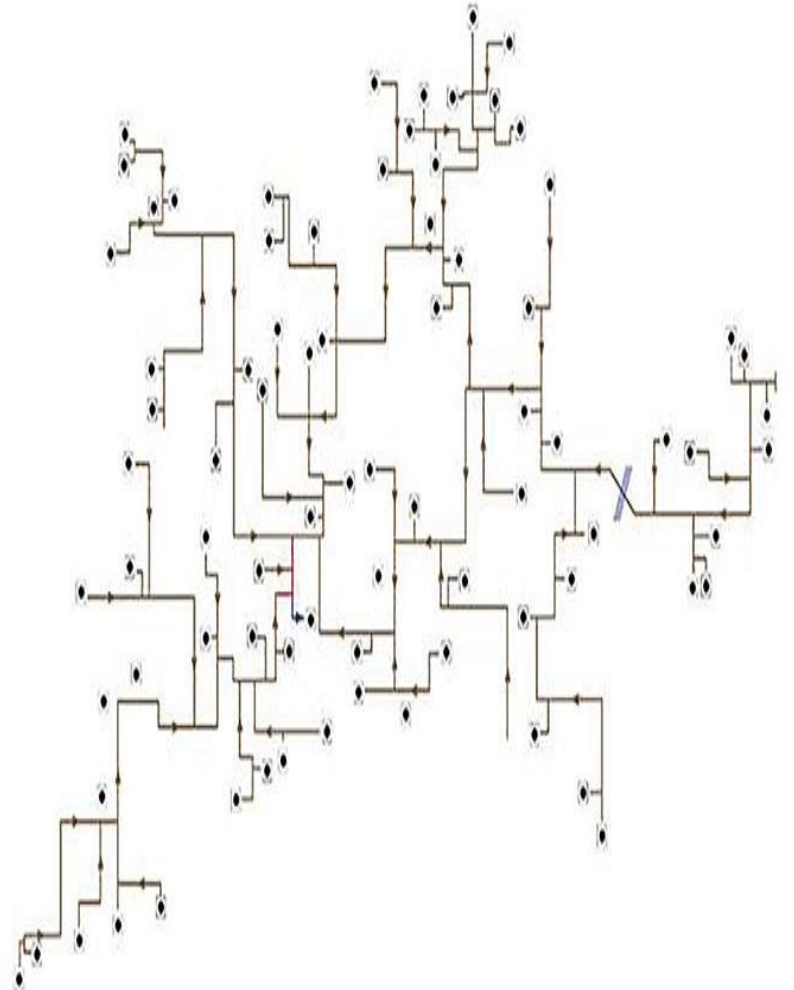


**SCADA**



**IOT Based Sensor**

# IOT Based Pipe line leak detection system



# IOT Sensor for Water Applications

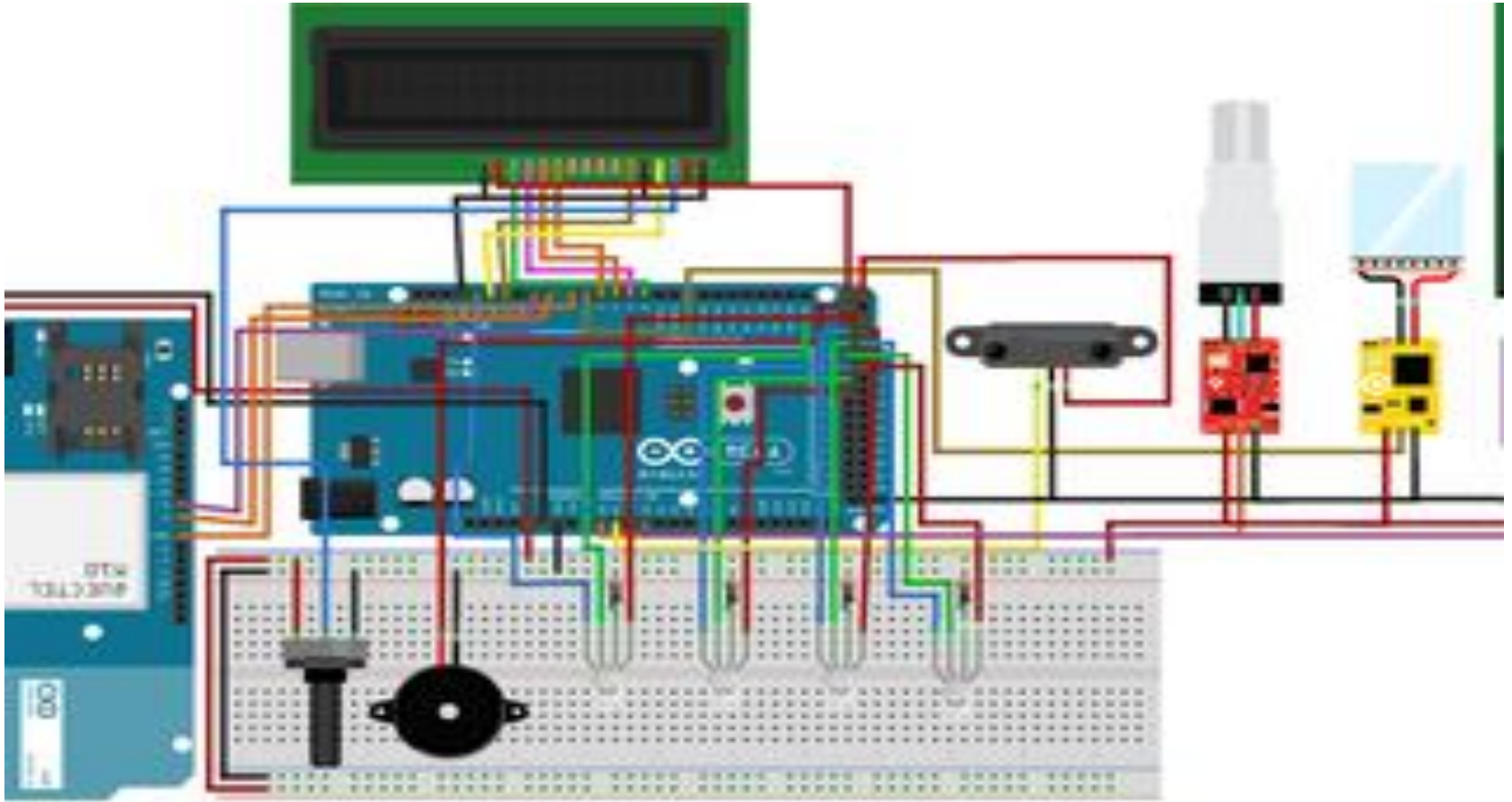


**Pressure Sensor**



**Water Flow Sensor**

# IOT Based Water Quality Monitoring System



# AMRIT Devices



RTU



Sensors



Mechanical Flow  
Sensor

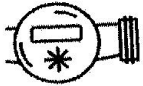


Valve



Pressure

## Device Functionality



### Bulk Flow Meter

Records volume of water flowing through the meter (100 mm) from main supply line in the form of pulses



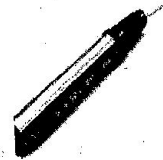
### Consumer Flow Meter

Records volume of water flowing through the meter (25 mm) in the form of pulses at the consumer end



### Pressure Sensor

Records the water pressure in the supply line at the consumer end in the form of digital output



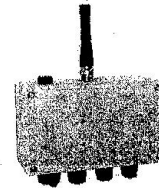
### Residual Chlorine Sensor

Records the free residual chlorine level in the supply line water at the consumer end in the form of digital output



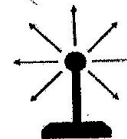
### Hydrostatic Level Sensor

Records the water column level in the borehole in the form of digital output



### Lora RTU (Remote Terminal Unit)

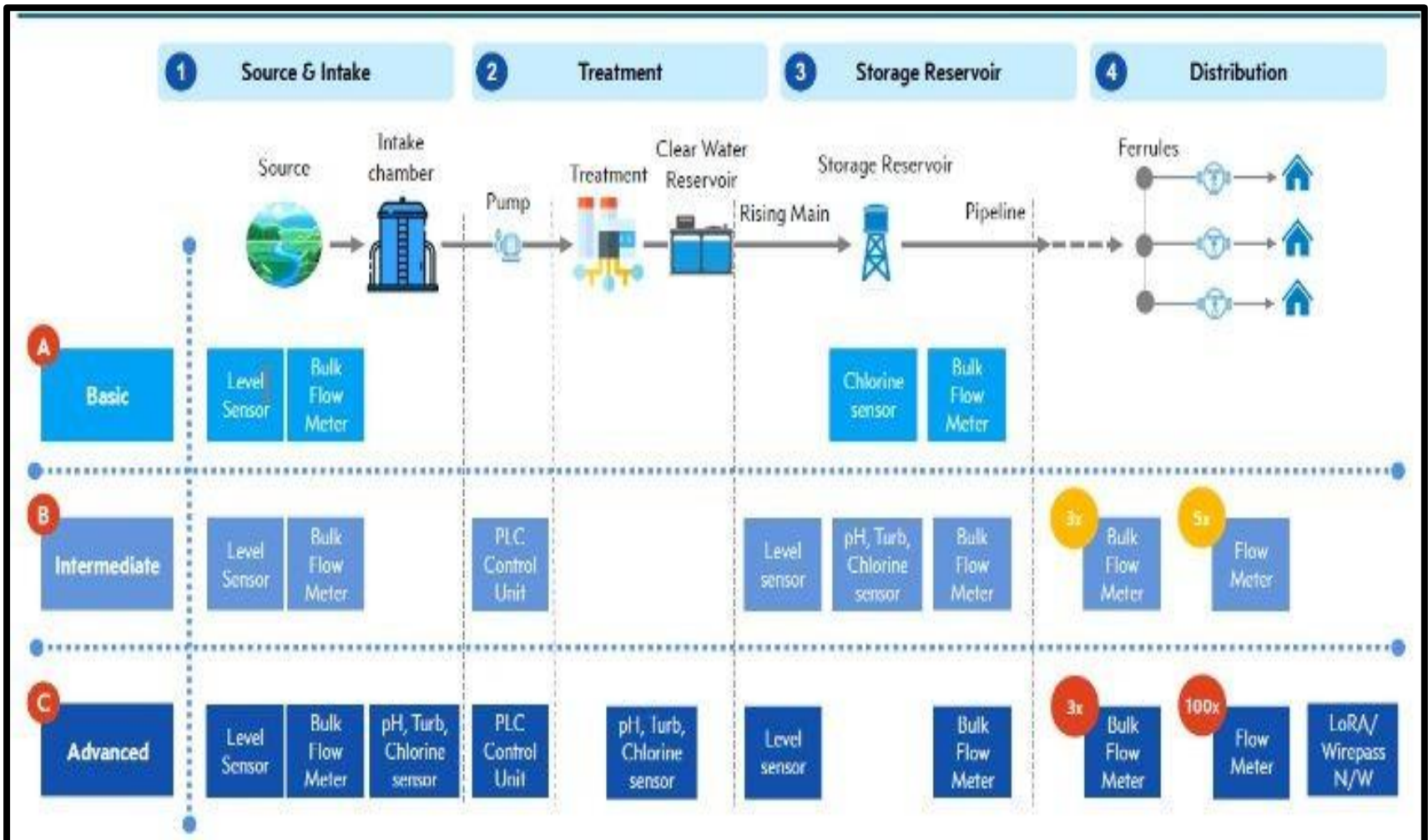
Collects the real-time analog, Digital and pulse output from the sensors/meters and converts into electrical signal. These electrical signals in the form frequency is transmitted to the gateway wirelessly using ISM free band 868 MHz Frequency



### Lora Gateway (Aggregator)

Receives the signals from all the RTU's within the range and converts back into the readable format. These decrypted sensor data is sent to the cloud server using cellular network. At the server the data is processed into useful analytics and graphical representation is displayed in the dashboard

# JJM Scheme



# Ground Installation



pH, TDS, Chlorine, Nitrate, Fluoride Sensor



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Jal Jeevan Mission

# Dashboard

## Plant Location



## Basic Information

Storage Name	Mushkapat Bawali - Jalpur
Population	6888
Serial Number	4507766040404
Address	3307248 Bhangung, Rajasthan, India
Latitude	26.7618020-82.74274427
Longitude	76.76326450000000
District Name	Jalpur District (Rajasthan)

## Today water supply (Ltr)

Today  
02 Aug 2022

**42,912 L**

## Average LPCD

Last 7 Days  
14 Aug 2022 - 20 Aug 2022

**14.59 L**

## Today LPCD

Today  
02 Aug 2022

**15.15 L**

## Daily water supply trend (Ltr LPCD)



## Daily Water Supplied



## Water Quality



# Health Data

## Health Readings



# Health Raw Report

## Health Raw Report

Plant Gateway Select a Date Range

Jaipur District (Rajashthan)

(S) Madhogarh Bassi - Jaipur

03/02/2022 - 03/02/2022

Generate Report

## Reports

Plant x Gateway x Battery Level x +12

Download

Show 100 entries

Plant	Gateway	Battery Level (%)	Network Level (%)	Tampered	Firmware Status	Power Status	Fluoride	In Flow	Nitrate	Residual Chlorine	TDS	p
Jaipur District (Rajashthan)	(S) Madhogarh Bassi - Jaipur	100%	77%	Not Tampered	OK	TRUE	1	1	1	1	1	1
Jaipur District (Rajashthan)	(S) Madhogarh Bassi - Jaipur	100%	77%	Not Tampered	OK	TRUE	1	1	1	1	1	1
Jaipur District (Rajashthan)	(S) Madhogarh Bassi - Jaipur	100%	70%	Not Tampered	OK	TRUE	1	1	1	1	1	1
Jaipur District (Rajashthan)	(S) Madhogarh Bassi - Jaipur	100%	77%	Not Tampered	OK	TRUE	1	1	1	1	1	1

# Sensor Raw Report

## Sensor Raw Report

Plant

Gateway

Select a Date Range

Jaipur District (Rajasthan)

(S) Madhogarh Bassi - Jaipur

08/01/2022 - 08/01/2022

Generate Report

## Reports

Plant x Gateway x +8

Download

Show Raw Data

Show 100 entries

Plant	Gateway	Fluoride (Milligram/Litre)	In Flow (Litre/Minute)	Nitrate (Milligram/Litre)	Residual Chlorine (ppm)	TDS (Milligram/Litre)	pH	Out Flow (Litre/
Jaipur District (Rajasthan)	(S) Madhogarh Bassi - Jaipur	1.27	0	15.76	0.01	507.94	7.43	360
Jaipur District (Rajasthan)	(S) Madhogarh Bassi - Jaipur	1.29	0	15.92	0.01	466.02	7.43	372
Jaipur District (Rajasthan)	(S) Madhogarh Bassi - Jaipur	1.31	0	16.46	0.01	522.62	7.43	444
Jaipur District (Rajasthan)	(S) Madhogarh Bassi - Jaipur	1.2	0	14.23	0.01	454.46	7.45	432

# GIS mapping of existing & proposed infrastructure

Tantraypora - Goom  
Ahmed Pora- Tanyeray  
Water Supply Scheme  
Under Jal Jeevan  
Mission

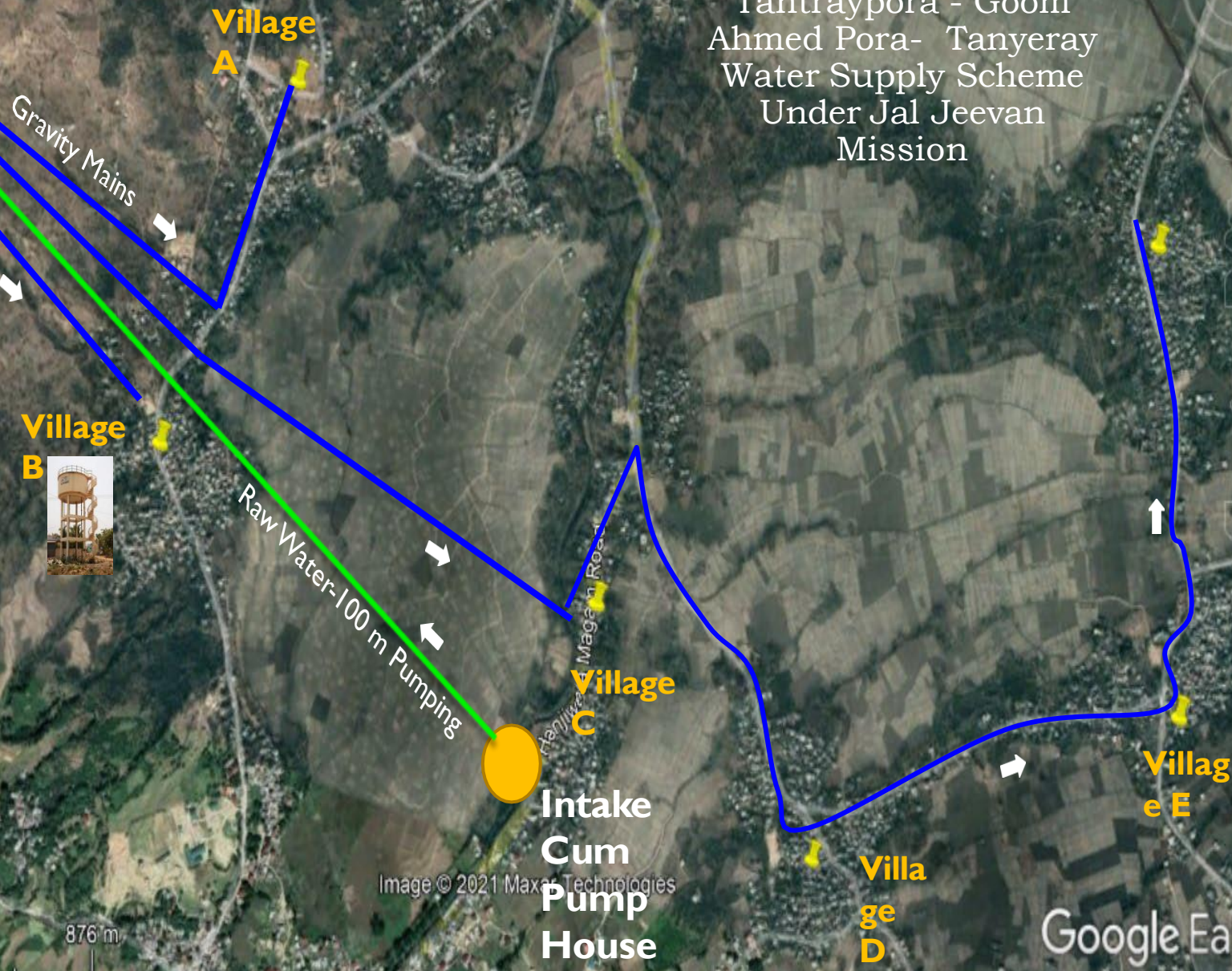


Image © 2021 Maxar Technologies

Google Earth



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# Intra Village GIS Mapping





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Water is the elixir of life

**THANKS**