Har Ghar Jal
Jal Jeevan Mission

# Digital initiatives under Jal Jeevan Mission for assured water service delivery

**National Jal Jeevan Mission,**
**Dept. of Drinking Water & Sanitation**
**Ministry of Jal Shakti**
**Government of India**

# Areas of ‘Digital Transformation’ under JJM

- Jal Jeevan Mission focuses on development of local public utility for water service delivery;
- Technology has been used as enabler to achieve core objectives of Jal Jeevan Mission;
- Community participation in planning, implementation, monitoring and O&M;

## 1 Planning

- Focuses on creation of adequate infrastructure;
- Prudent expenditure of public money;
- Planning to be done keeping in mind that ‘No one is left out’;

## 2 Implementation

- Participation of public in life changing mission through JJM Dashboard and citizen application, Rashtriya Jal Jeevan Kosh;
- Building partnerships through KRCs, sector and strategic partners;

## 3 Monitoring

- Transparency in the expenditure of funds;
- Monitoring of implementation
- Monitoring of service delivery;

## 4 Operation & Maintenance

- Development of local public utility;
- VWSC/ Paani samiti to take care of water supply systems for next 30-40 years;

# Statement of Digital Vision's Outcomes

1. Design of cost effective schemes
2. Continuous monitoring of progress
3. Improved transparency
4. Development of local water utility
5. Integration of databases

# Digital Initiatives Under JJM

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## Jal Jeevan Mission
### Har Ghar Jal

‘Building Partnerships
Changing Lives’

# Digital Platforms of Jal Jeevan Mission

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## 01 JJM IMIS

brings together all data, i.e tap connection provided at HHs, VAPs, DAPs, SAPs, VWSCs details, scheme completion data, scheme planning and expenditure data, financing and funding details, the progress of support activities, progress in priority areas etc.

## 02 JJM Dashboard

captures all essential monitoring parameters i.e., no. of FHTCs provided, changes after launch of mission, up to village level details, grievance redressal system, real time sensor based measurement and monitoring, availability of funding;

## 03 JJM WQMIS

all functional laboratory in the country are one click away from community so that anyone can identify the nearest water testing lab and can get their private water tested and get results digitally, so that trust can be built for the public water supply department ;

## 04 IoT Platform

to monitor Key Performance Indicators, and also ensure quick response, minimum service delivery outage, minimum water loss, optimise efficiency and monitor the quantity and quality on sustainable basis;

## 05 Mobile app

enables data collection for Paani Samiti/ VWSC, GPs and officials using mobile or laptop. The data will be regarding financial collection, progress of work, maintenance etc. of water pipes, water assets and other water related information at the village block level;

## 06 Analytical tool

to support data analysis, predictive analytics, monitoring and preparation of dashboards is needed. Analytical tool will identify and understand the features capabilities which are a must or are good to have and should generate dashboard;

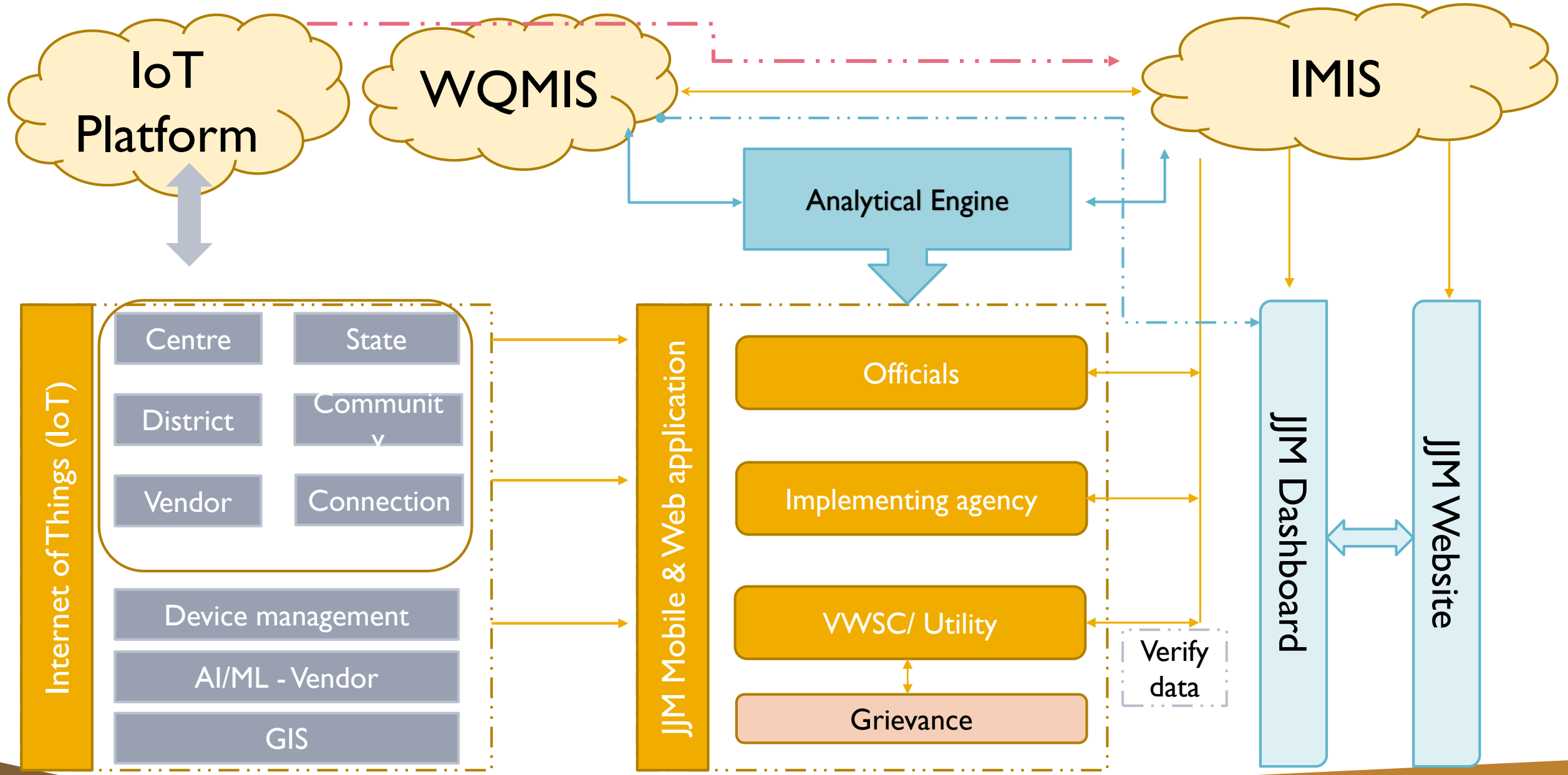
## 07 PFMS

Under JJM the online tracking of disbursement and expenditure being done through the use of the “Public Finance Management System (PFMS), which leads to transparency and prudent expenditure of public money;

## 08 JJM Website & RJJK Portal

Information about overall policy formulation, planning, financing and coordination for JJM. RJJK portal enables individuals/ organisations to donate/ contribute in making provision of clean drinking water in village of their choice

# Relation between Digital Platforms of Jal Jeevan Mission



# Integrated Management Information System (IMIS)

- JJM-IMIS keeps all program related data;
- JJM-IMIS stores the inventories of all the assets that will be needed to provide service i.e. water supply
- It also maintains database of beneficiaries;
- The database available on IMIS will be utilised by the JJM mobile and web application which enables PHED officials and VWSCs/ Paani Samities to keep track of the assets which will help in proper Operation & Maintenance during the outrage;
- JJM-Dashboard is powered by IMIS database;

# JJM Dashboard

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Tap water supply in households (HHs)

Tap water supply in Schools / AWCs

Tap water supply in districts

Sensor based IoT pilots

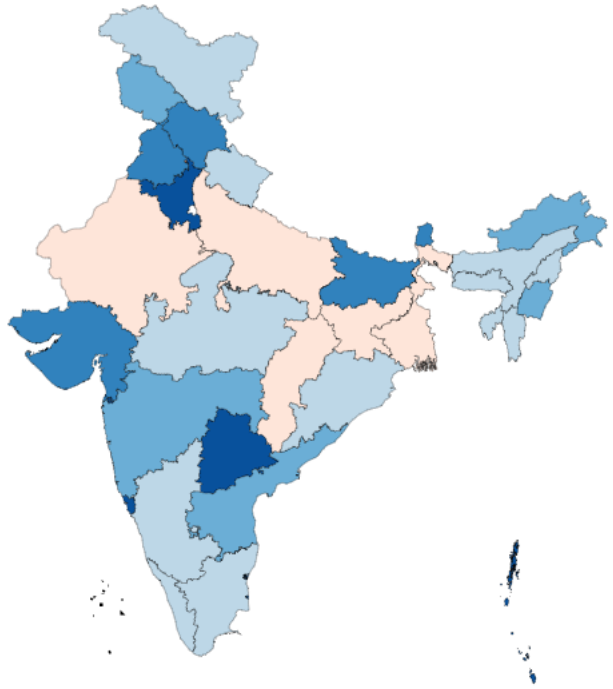
Water Quality

Search your village ...

## Tap water supply in households (HHs) | India

As on 09 Dec 2021

State view | District view



0%-10% | 11%-25% | 26%-50% | 51%-75% | 76%-<100% | 100%

## India | Status of tap water supply in rural homes

| Total number of households (HHs) | Households with tap water connections as on 15 Aug 2019 | Households with tap water connections as on date |
|---|---|---|
| | | +69,635 |
| 19,22,52,674 | 3,23,62,838 (16.83%) | 8,63,93,787 (44.94%) |

Households provided with tap water connection since launch of the Mission

**5,40,30,949** (28.10%)

## Har Ghar Jal [100 % HHs with tap water connections]

100% FHTC States/UTs

s, Puducherry, D&NH and D&D, Haryana

| 100% FHTC Districts | 100% FHTC Blocks | 100% FHTC Panchayats | 100% FHTC Villages |
|---|---|---|---|
| 83 | 1,007 | 62,204 | 1,27,266 |

## Progress: HHs provided with tap water supply

Yearly | Cumulative

## Status of households with tap water connection (as on date)

| State/ UT | Total households | Households with tap water supply | Households with tap water supply (%) |
|---|---|---|---|

# Highlights of JJM Dashboard

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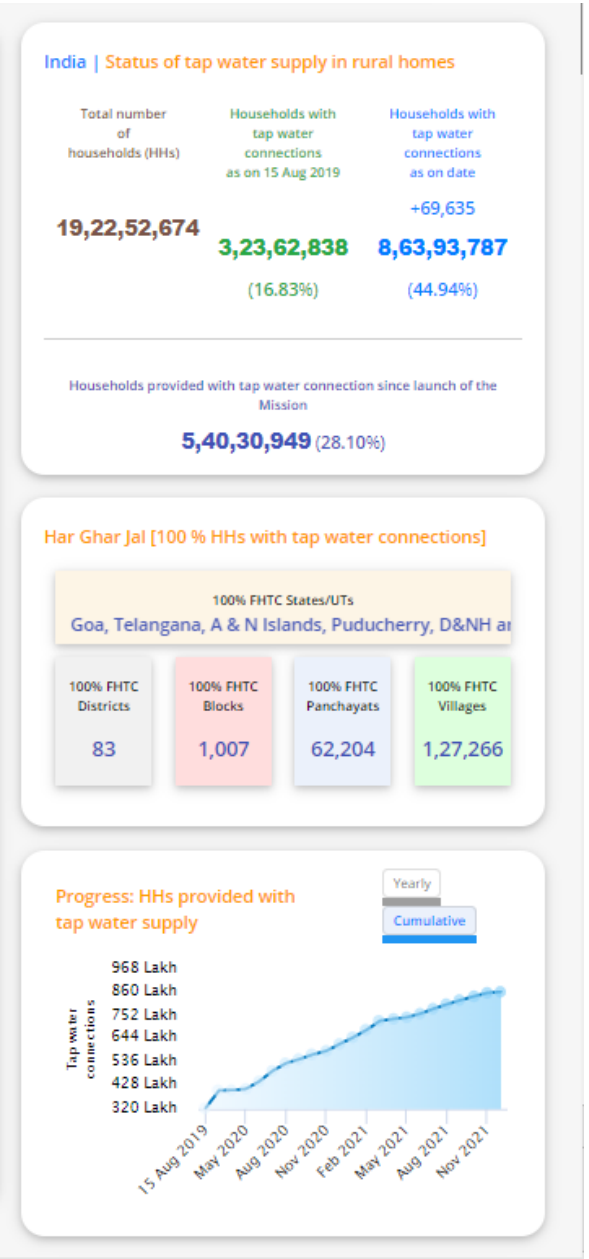
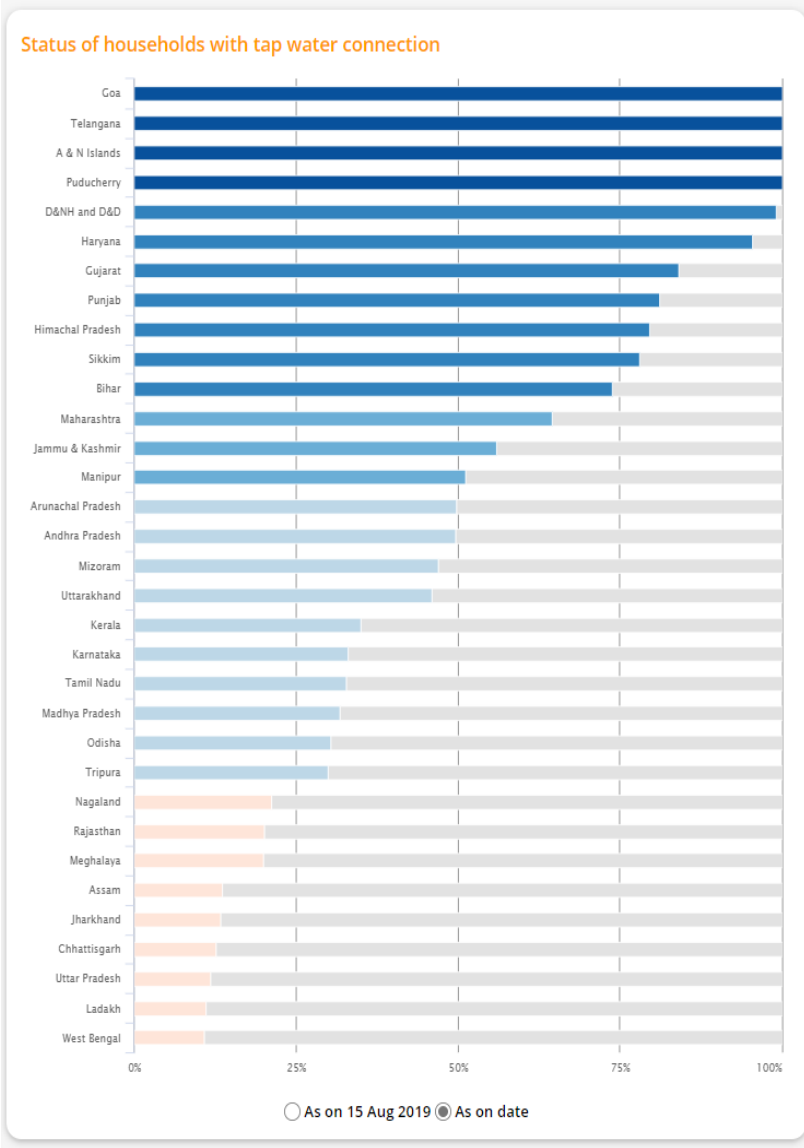



Reflects the progress made under mission;

Number of tap water connections provided on daily basis and since the launch of the mission at national and state level;

Status of states/UTs, Districts, Blocks, Panchayats and Villages which have achieved the 'Har Ghar Jal' status by providing 100% tap water connections;

State and district wise status of households with tap water connections as on 15th August 2019 and as on date, so that progress of each state/UT can be monitored;



# Features of JJM Dashboard

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## Financial progress

### Financial Progress

| 2019-2020 | 2020-2021 | 2021-2022 |
|---|---|---|

**Central Share (₹ In Crore)**

| | | |
|---|---|---|
| Opening balance: 226.42 | Allocation: 1,262.78 | Assured fund: 1,489.20 |
| Fund drawn: 947.09 | Available fund: 1,173.51 | Expenditure: 762.93 |

**State Share (₹ In Crore)**

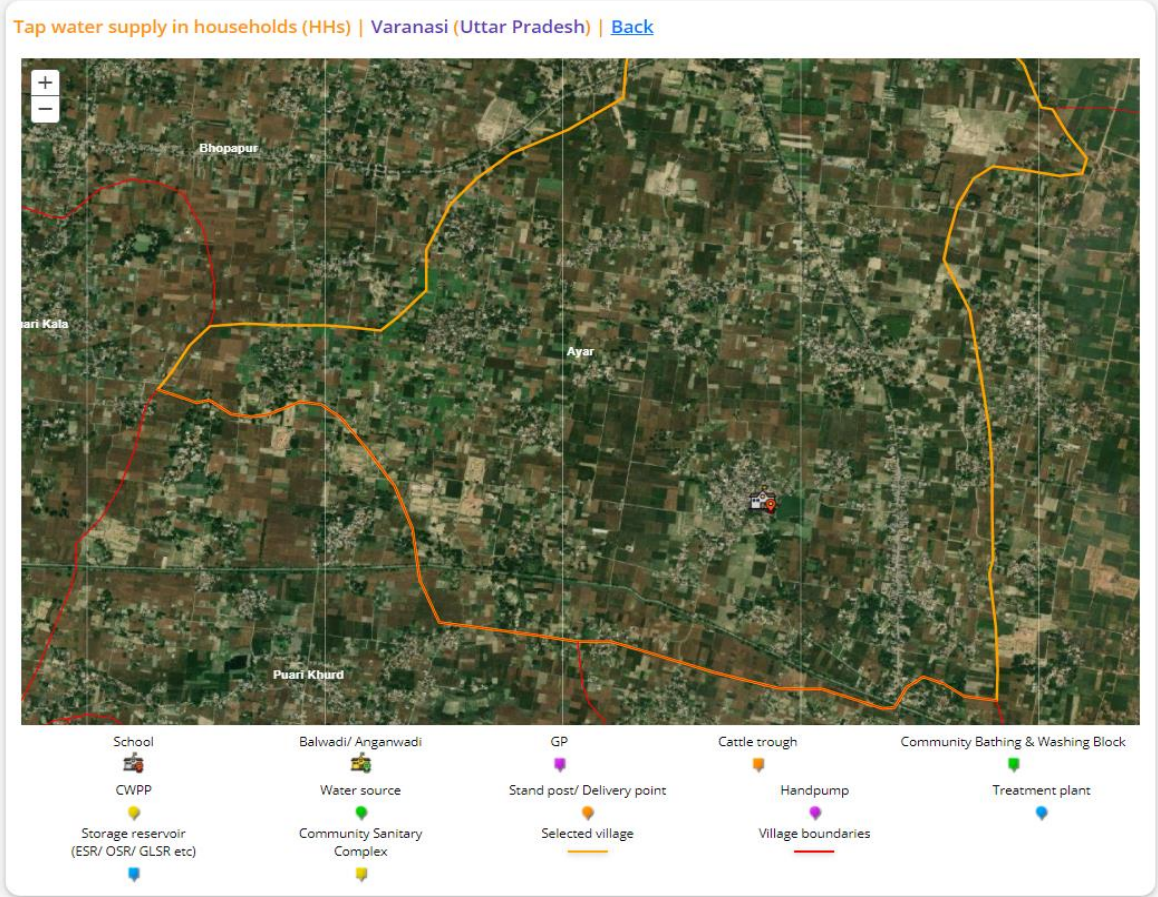
| | | |
|---|---|---|
| Current year [OB+Allocation]: 165.47 | Short fall in previous year: 0.00 | Assured fund: 165.47 |
| Available fund : - | Expenditure : 81.24 | |

**Total (₹ In Crore)**

| | | |
|---|---|---|
| Assured fund: 1,654.67 | Available fund: 1,173.51 | Expenditure: 844.17 |

* Funding pattern (90:10)

## Village boundary and in-village infrastructure




## Various details at village level

| Habitations | Beneficiary | Schemes | Water Sources | School | Balwadi/Anganwadi |
|---|---|---|---|---|---|
| 12 | 789 | 3 | 13 | 2 | 7 |

# JJM- WQMIS

1. Registration of water sample with location and date stamp
2. Public can locate nearest lab. Anyone can submit sample to lab through the portal.
3. Online uploading of lab results and communication
4. In case of contamination alerts are generated and remedial actions are taken
5. Online uploading of FTK test results and communication
6. Status of NABL accreditation/ recognition of labs

# Water Quality Management Information System (WQMIS)

Jal Jeevan Mission

Water Quality Management Information System

JJM-WQMIS

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Home | Locate labs near you | Know FTK users | Tutorials | Contact us | हिंदी

## Status of testing of drinking water samples in 2021-22 (as on date)

### Lab Testing Status

| Active laboratories | Samples tested in laboratories | Total Villages where test has been done | Contaminated samples found in laboratories |
|---|---|---|---|
| 2,013 | +16,393<br>20,00,037 | 2,61,895 | +2,181<br>1,78,063 |

### FTK Testing Status

| Users trained for testing water samples using Field Testing Kit (FTK) | Samples tested using FTK | Total Villages where FTK test done | Contaminated samples found using FTK |
|---|---|---|---|
| 7,39,362 | +13,884<br>12,75,787 | 53,784 | +1042<br>1,11,946 |

### Login as

- Public User
- Field Test Kit User
- Departmental Official
- Laboratory Official
- DWSM Member Secretary

Locate labs near you

### Status of drinking water samples tested in laboratories in 2021-22 (as on date)

| S. No. | State/ UT | Number of testing laboratories | Samples received | Samples tested | Samples found contaminated | Remedial action taken | Number of NABL accredited laboratories |
|---|---|---|---|---|---|---|---|
| 1. | Andaman & Nicobar Islands | 11 | +2<br>420 | +6<br>403 | 26 | 0 | 0 |
| 2. | Andhra Pradesh | 112 | +413<br>2,36,351 | +978<br>2,15,234 | +151<br>8,731 | 7,795 | 12 |
| 3. | Arunachal Pradesh | 33 | +88 | +61 | | 17 | 0 |

# JJM Mobile and Web Application

**6 Lac+ Villages Covered**

**Target Users**

**For implementation workforce : Field Engineers / VWSC Pani Samiti-** Village water utility

- Infrastructure details
- Beneficiary details
- Chemicals/ Stock information
- Financial details
- Add/delete tap water connections

**Videos and other content for capacity buiding**

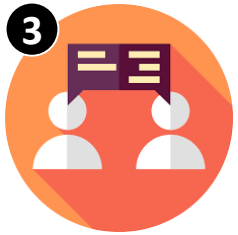
**Grievance redress system**

**DWSM/ SWSM/ NJJM**

- Remote monitoring of progress
- Timely identification of issues and potential risks

Data entry in Digital workflows

Progress Monitoring



Information and Capacity building

Development of local water utility

# JJM Mobile and Web Application: Local water utility

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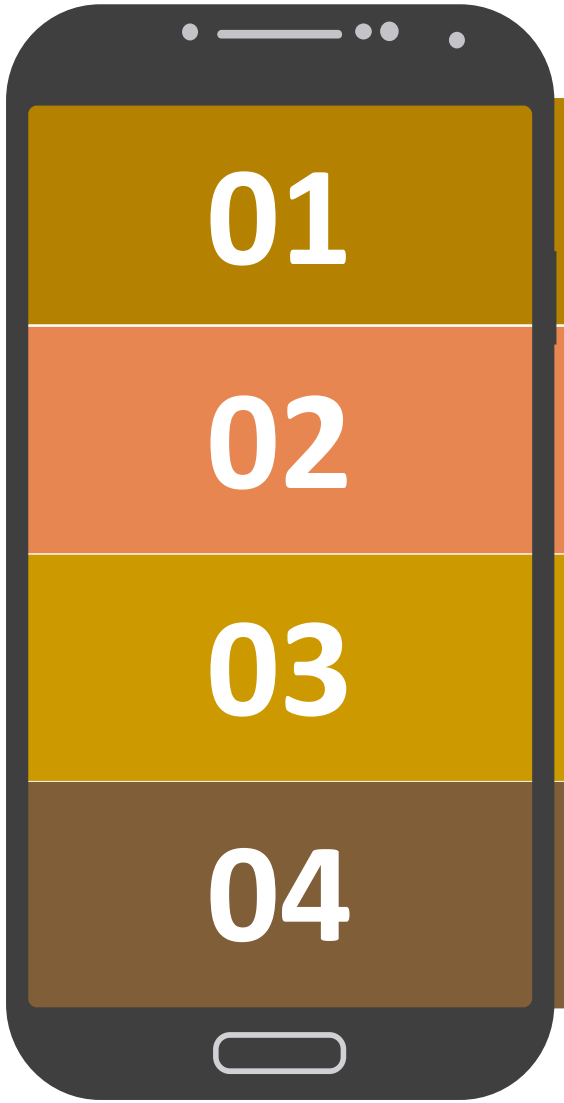

**01**

Har ghar Jal-certification
Tap connection details
Asset tagging
Capacity building videos

**02**

Pani Samiti: Supply, connection, finance and stock information

**03**

**Generation of reports/ alerts/ warnings**

**04**

**Grievance redressal**

# JJM Mobile and Web Application: Features

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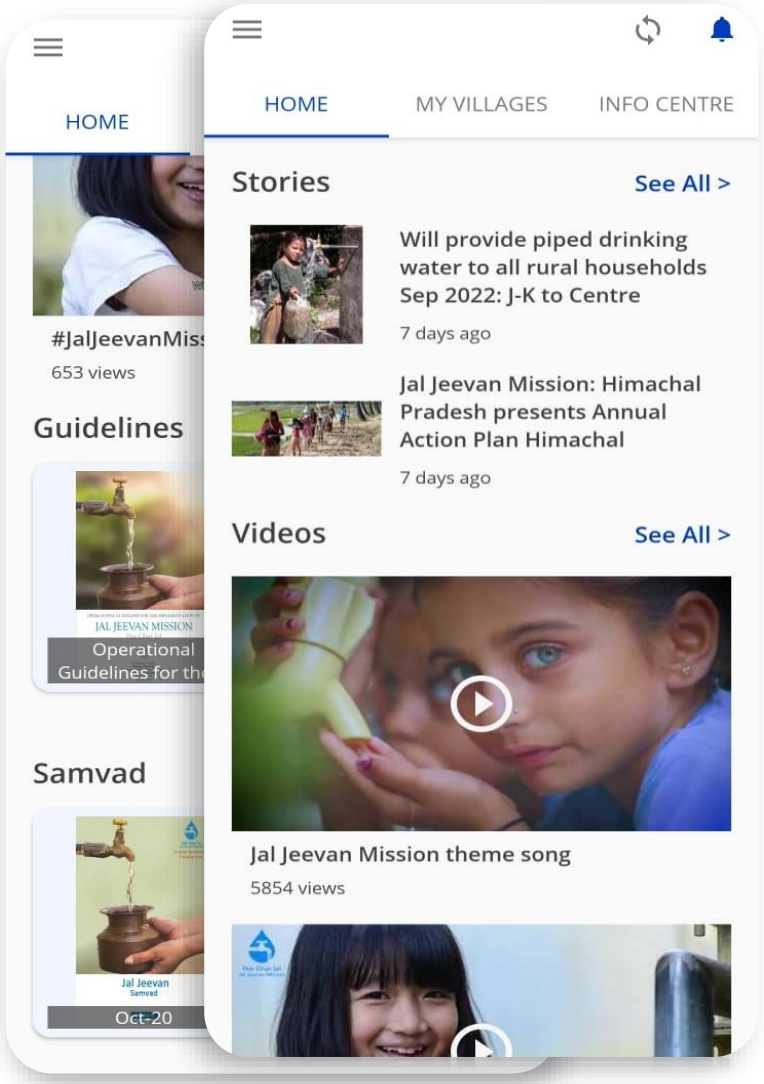
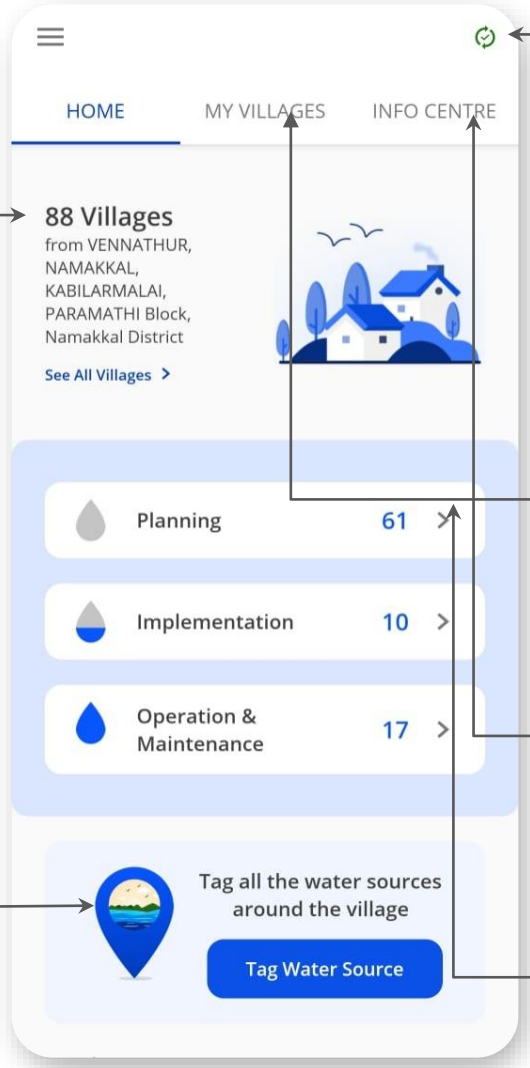



It shows the number of villages assigned from various blocks. By clicking "See all villages" you will reach the "My villages tab" where you can see the entire list




Use this button to sync the app with server:

- Download latest village information
- Upload form data

Orange Sync Button: Not Synced
Green Sync Button: Synced

Under "My Villages" tab all the villages assigned to you will appear

Under Info Centre, you can assess to the content related to JJM to help you learn, grow, and perform better at your job e.g., videos, FAQs, guidelines etc.

Villages are classified into different stages. You can click on these cards to view villages within that category

Shortcut button to tag water sources

# JJM IoT Platform: Technical committee report

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**Solution Design**

**Data to be captured, sensors to be used** (type & location) for different village archetypes in India; & **func. requirements**

**Hardware Specifications**

**Device requirements, accuracy, range,** operating conditions, standards (e.g., ISO:4064) & certifications (e.g., FCRI)

**Networking Protocols**

**Networking technologies** (e.g., LoRa, 2G/3G/4G/5G, NB-IoT) & **Comm. protocols** (e.g., MQTT, HTTPs, AMQP)

**Governance Framework**

**Roles and responsibilities** of GP / District / State / Center for execution & sustenance of IoT-based smart water mgt. + **Rollout plan**

**Standardized Data Format**

**Data elements, format** (device to cloud, state to central cloud), frequency of transmission; and interoperability (DLMS)

**Security Standards**

**Device, network, and application-level security standards** (AES; DTLS / SSL / TLS) for IoT implementation

## Technical Committee Report on Sensor-based Monitoring

View Report

# JJM IoT Platform: Implementation options

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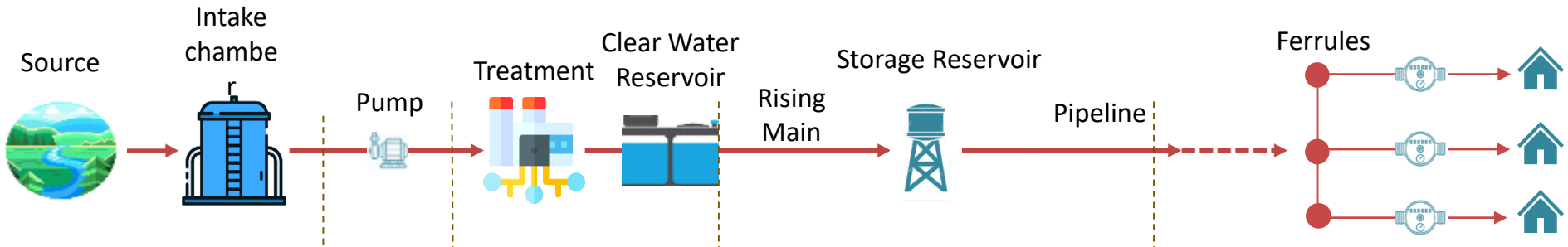


| | | 1 Source & Intake | 2 Treatment | 3 Storage Reservoir | 4 Distribution |
|---|---|---|---|---|---|
| A | Basic | GW Level Sensor; Bulk Flow Meter | | Chlorine sensor; Bulk Flow Meter | |
| B | Intermediate | GW Level Sensor; Bulk Flow Meter | PLC Control Unit | Level sensor; pH, Turb, Chlorine sensor; Bulk Flow Meter | 2-5 Bulk Flow Meter; 1 Tail-end house - Consumer Flow Meter + Pressure sensor |
| C | Advanced | GW Level Sensor; Bulk Flow Meter; pH, Turb, Chlorine sensor | PLC Control Unit; pH, Turb, Chlorine sensor | Level sensor; Bulk Flow Meter | 2-5 Bulk Flow Meter; 100x Flow Meter; LoRA/ Wirepas s N/W |

# JJM IoT Platforms: Sensor based water supply measurement & monitoring system

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Tap water supply in households (HHs)

Tap water supply in Schools / AWCs

Tap water supply in districts

Sensor based IoT pilots

Water Quality

## Jetpur Village in Mahesana District, Gujarat

pH | Pressure | Residual chlorine | Nitrate | Flow meter

## Basic Information

Back

| | |
|---|---|
| State : Gujarat | District : Mahesana |
| Block : Bechraji | Panchayat : Jetpur |
| Village : Jetpur | Nos. of habitations : 1 |
| Population served though schemes : 2,909 | |
| Agency : Greenvironment Innovation & Marketing India Pvt. Ltd. (Under ICT Grand Challenge) | |
| Location (Water Sources) : Near Water Wors | |
| Scheme : Jetpur-1 | |
| Year of commissioning : 2009-2010 | |

## Average water supply (LPCD)

Last 7 Days
02 Dec 2021-08 Dec 2021

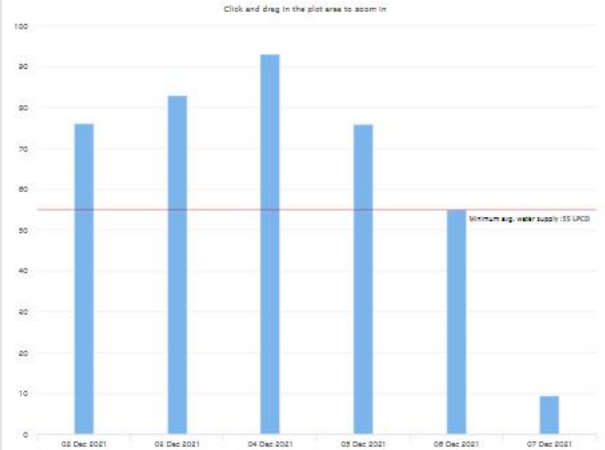
65.5 L

## Water Supplied

Yesterday
As on 8 Nov 2021

27,700 L

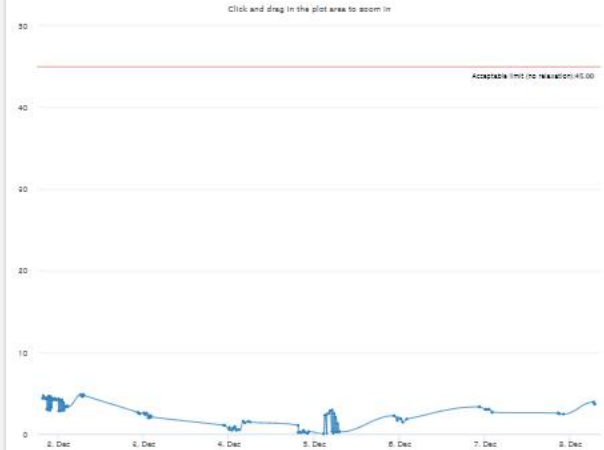
## Daily LPCD trend




## pH

## Pressure (meter)

## Nitrate (mg/l)




## VWSC/ Pani Samiti Member

| Name | Designation | Gender |
|---|---|---|
| Thakor Pravinsinh Balavantsinh | Chairperson | Male |
| Bhangi Kalabhai Manabhai | Member Secretary | Male |

## Operation & Maintenance Personnel

| Name | Designation | Gender |
|---|---|---|
| Prajapati Visatbhai Mohanbhai | Pump Operator | Male |

Data updated by respective States/ UTs and hosted by NJJM. Copyright © NJJM 2020

# JJM IoT Platform: National rollout through a centralized IoT platform (1/2)

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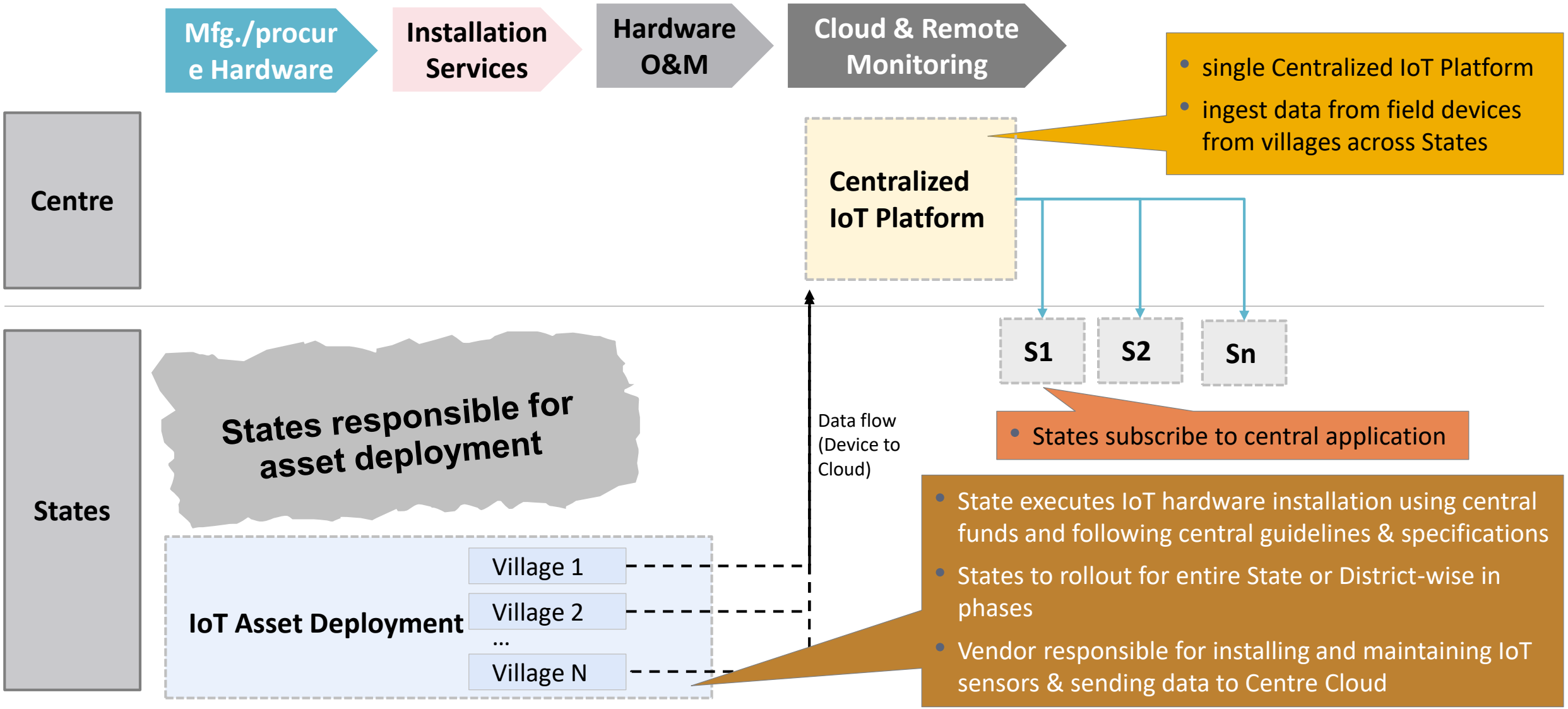

# JJM IoT Platform: National rollout through a centralized IoT platform (2/2)

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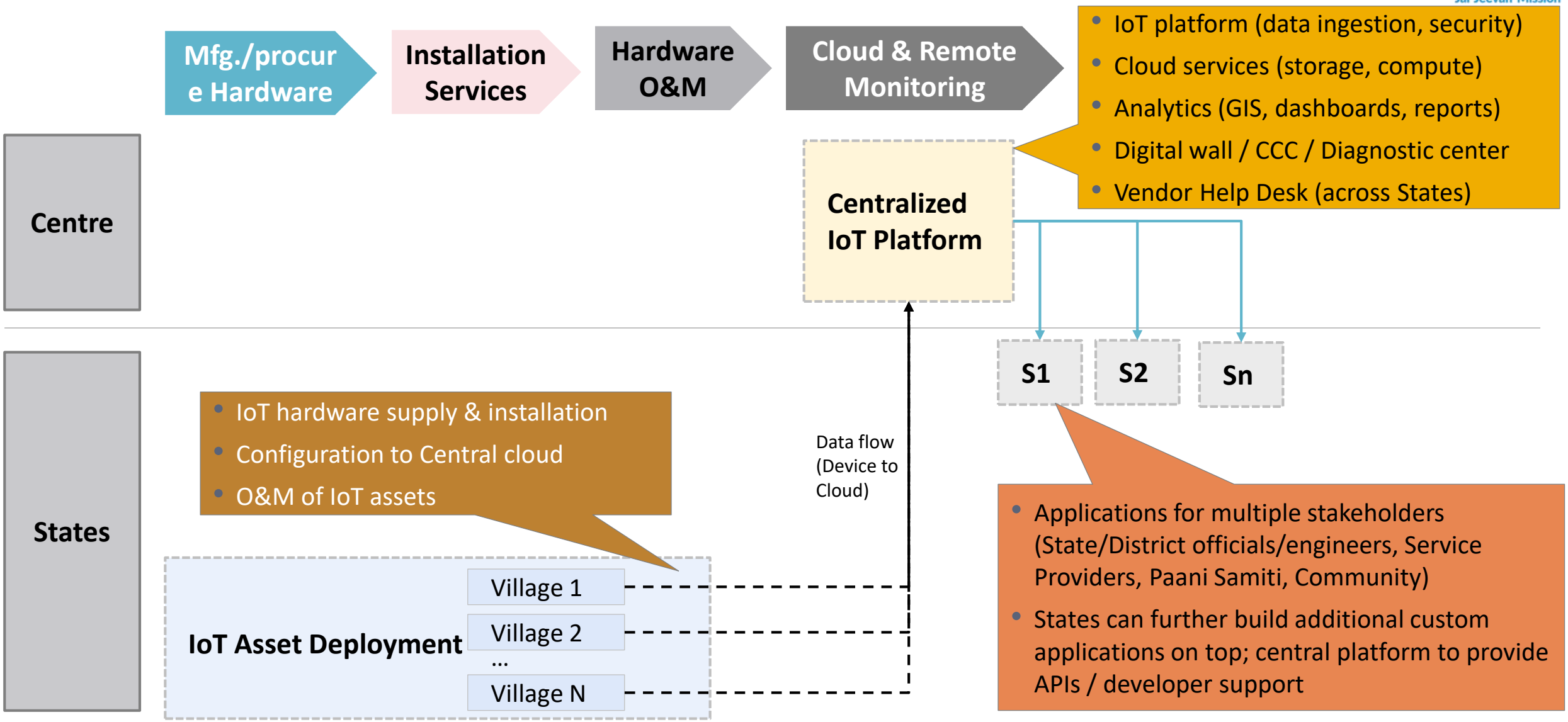

# Smart Water M&M System: Status of IoT roll-out in states

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| States | Concept | Planning & Approval | RFP | Rollout | Data Display |
|---|---|---|---|---|---|
| Goa | | | | | |
| Haryana | | | | | |
| Sikkim | | | | | |
| Gujarat | | | | Pilot | |
| Manipur | | | | | |
| Punjab | | | | | |
| Himachal | | | | | |
| Jammu & Kashmir | | | | | |
| A&N Islands | | | | | |
| Tripura | | | | | |
| Arunachal Pradesh | | | | | |
| Chhattisgarh | | | | | |

# Public Financial Management System (PFMS)

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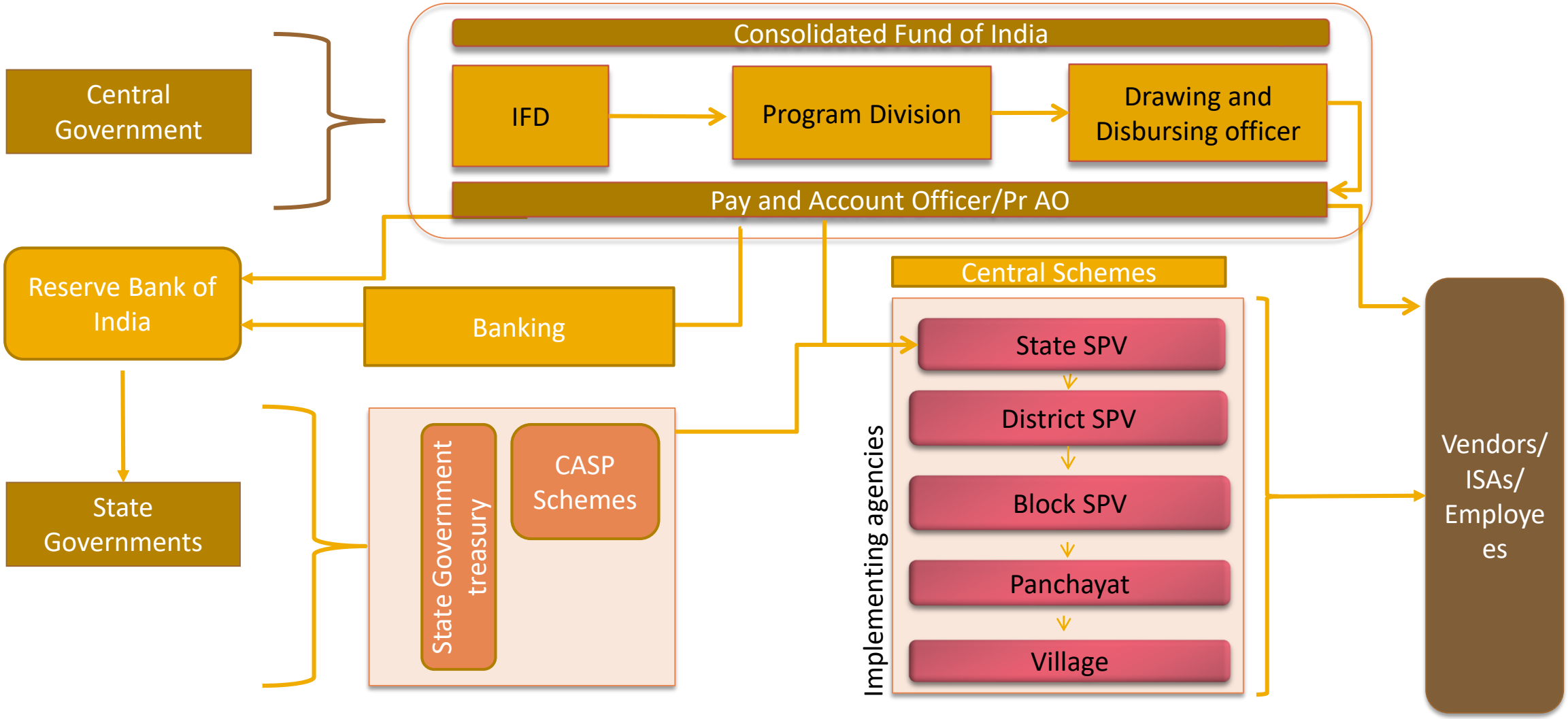
- **The Public Financial Management System (PFMS)** has been started with the objective of tracking funds released under all Plan schemes of Government of India, and real time reporting of expenditure at all levels of Programme implementation.
- It provides a robust system for ensuring 'Just in Time' releases in respect of **Central Sector (CS)** and **Centrally Sponsored Scheme (CSS).**
- **Efficient and effective tracking of fund flow** to the lowest level of implementation.
- To provide information across all schemes implementation agencies in the country on fund utilization leading to better monitoring review.
- **Decision support system to enhance public accountability**

# Public Financial Management System (PFMS) : Financial network



# Digital Platforms and Databases : Integration

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**JJM Database**

IMIS: assets, progress (physical & financial) etc.

WQMIS : Labs, tests, mitigation

JJM Digital Platforms & Databases

IMIS, WQMIS, IoT, Mobile app

**JJM Database**

IoT: measurement & monitoring.

**JJM Platforms**

Mobile & web app, analytical tool



NCDC: Integrated disease surveillance programme

Record of waterborne diseases

Water resources database

CGWB database

# Initiatives for outreach

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## Jal Jeevan Mission
### Har Ghar Jal

‘Building Partnerships
Changing Lives’

# Smart Water M&M System: Pilots

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**Advanced**

| # | Location | Source | Avg. LPCD (Last 7 Days) | LPCD Trend (Last 30 Days) | Click below |
|---|---|---|---|---|---|
| 1 | Gharat, Sirohi, Rajasthan | Groundwater | 49.1 L | | Gharat |
| 2 | Ghanahatti, Shimla, HP | Surface | 100.1 L | | Ghanahatti |
| 3 | Dudhli, Dehradun, Uttarakhand | Groundwater | 48.7 L | | Dudhli |
| 4 | Bettahalli, Bangalore, Karnataka | Surface | | | Bettahalli |

**Intermediate**

| | | | | | |
|---|---|---|---|---|---|
| 5 | Kitth, Tehri Garhwal, UK | Surface | 145 L | | Kitth |
| 6 | Janori, Nashik, Maharashtra | MVS | 54.6 L | | Janori |
| 7 | Churedar, Tehri Garhwal, UK | Surface | 36.6 L | | Churedar |
| 8 | Kot Kulogi, Tehri Garhwal, UK | Surface | | | Kot Kulogi |

**Basic**

| | | | | | |
|---|---|---|---|---|---|
| 9 | Bavka, Dahod, Gujarat | Groundwater | 39 L | | Bavka |
| 10 | Chilakota, Dahod, Gujarat | Groundwater | 45.9 L | | Chilakota |
| 11 | Jada Kheriya, Dahod, Gujarat | Groundwater | 38.8 L | | Jada Kheriya |
| 12 | Agara, Dahod, Gujarat | Groundwater | 40.2 L | | Agara |
| 13 | Changa, Leh Ladakh | Groundwater | 41.4 L | | Changa |

A collaborative initiative in support of Jal Jeevan Mission by TATA Community Initiatives Trust (TCIT) and TATA Trusts

Beta Version

# Status of ICT Grand Challenge roll-out in states

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**ICT Grand Challenge**

Pilot project has been started in 100 villages.
Deployment has been done in 60+ villages;

**ICT Grand Challenge**

04 finalists will implement IoT on pilot basis in 100 villages of 09 states;

| States | Site visited | BOQ & Order placed | Deployment start | Deployment Complete | Testing & Data projection |
|---|---|---|---|---|---|
| Andhra Pradesh (15) | | | | In 13 villages | In 13 villages |
| Gujarat (20) | | | | | In 20 villages |
| Haryana (13) | | | In11 villages | | |
| Karnataka (13) | | | | | In 13 villages |
| Ladakh (08) | | | | In 03 village | In 03 village |
| Maharashtra (05) | | | In 01 village | | |
| Manipur (01) | | | | | |
| Rajasthan (15) | | | In 09 villages | In 05 villages | In 05 villages |
| Uttar Pradesh (10) | | | | | In 10 villages |

# Water Quality Analysis – Traditional vs Advanced

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TRADITIONAL APPROACH

Static Water Testing Laboratory

CURRENT APPROACH

Portable Water Quality Analyzer

- Innovation Challenge to develop a portable device:
  - ✓ Ideation
  - ✓ POC development
  - ✓ Prototyping
  - ✓ Product development
  - ✓ Validation/testing
  - ✓ Commercialization

Preliminary evaluation:
*28 applicants shortlisted*

2nd level evaluation:
*20 applicants shortlisted*

EEC meeting: *10 finalists shortlisted*

# FEATURE COMPLIANCE

| S. No. | Features Incorporated |
|---|---|
| 1. | Designed as a portable device |
| 2. | Value of water quality parameters are in digital format output |
| 3. | Easy to carry and handle |
| 4. | Easy to calibrate |
| 5. | Equipped with an in-built power supply (if necessary) |
| 6. | Detects the Microbial Contamination level (If yes, Please give the separate sheet for details) |
| 7. | Low operation and maintenance |
| 8. | Accompanied by a detailed user manual for operating the portable device |
| 9. | Has a provision for data transfer |

# Portable devices: details of parameters can be tested

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| Pics of the portable device | Name of the Start-ups / Innovators | Parameters can be tested |
|---|---|---|
| | **EarthFace Annalyticals Pvt. Ltd** | pH, Turbidity, TDS, Hardness, Free residual chlorine, Fluoride, Nitrate, Total alkalinity, Ammonium chloride, ecoli |
| | **Elico Pvt. Ltd** | Testing ground water-based source near urban areas for parameters including Phosphate, Nitrate, Ammonia, Chromium and Turbidity |
| | **Digital Rural India Mission** | pH, Turbidity, TDS, Hardness, Free Residual Chlorine, Fluoride, iron, Nitrate, Potessium, Alkalinity, Calcium, Magnesium, Arsenic, Selenium, Zinc, Mercury, Lead, Chromium, |

# Portable devices: details of parameters can be tested

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| Pics of the portable device | Name of the Start-ups / Innovators | Parameters can be tested |
|---|---|---|
| | **EyeNet Aqua Solution Pvt. Ltd.** | pH, Turbidity, TDS, Free residual chlorine, Fluoride, Iron, Nitrate, Hardness, Alkalinity, Phosphate, Nitrate, Lead, Mercury, Copper, Ammonia, Sulphate |
| | **Padmaseetha Technologies Pvt. Ltd** | pH, Turbidity, TDS, Hardness, Chlorine, Fluoride, Iron, Nitrate, Zinc, Copper, Chromium, Manganese |
| | **Indriya Sensotech Pvt. Ltd** | pH, Turbidity, TDS, Hardness, Free residual chlorine, Nitrate |

# Portable devices: demonstration

EarthFace Analytics - Padma - Device Demo

Padma - On-spot, real time, cost effective, tamperproof, user friendly, digital smart device that requires no human interpretation and periodic calibration for results.

# Thank You

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‘Building Partnerships
Changing Lives’