Arghyam | JalSoochak

About the Organization

Arghyam is a nonprofit organization focused on safe, sustainable water for all, founded by Rohini Nilekani in 2001. Over the years, we have supported 200+ partners and 231 projects across 28 states. Our work is to enable drinking water security at population scale by partnering with governments and the ecosystem by leveraging digital technology.

We are the Digital Public Infrastructure (DPI) and AI lead partner for National Jal Jeevan Mission. We also manage the India Water Portal, a knowledge platform with more than a million readers every year.

Problem Statement (use case specific)

The government of India launched Jal Jeevan Mission to bring drinking water via taps to every household in all the villages of the country. While the physical infrastructure has reached 82% of the households, there is no reliable information on which villages are getting water. As per the 2024 functionality assessment survey of 19812 villages (declared functional), nearly one in four households do not have functional taps.

Manual reporting has errors and cannot be verified. IoT is expensive, costing upto Rs 1 lakh per scheme. Moreover, the official budget allocation for IoT covers only 38% of the 6 lakh villages of which very few are working. There is a need for a cost-effective and reliable solution leveraging AI and digital technology to cover all villages across contexts to enable drinking water supply.

AI Solution Description

JalSoochak is an AI-enabled monitoring platform for rural water supply. To record water supply data, pump operators submit photographs of bulk flowmeter readings daily via WhatsApp. An AI model converts the images into data, analyses them and feeds into dashboards and reports to frontline workers, panchayats, section officers, district and state officials. Daily nudges remind the pump operators to report regularly. Reliable data at a village-level helps to detect water supply disruptions and respond quickly and supply water to every village.

Tools and techniques Used

1. Custom-built Computer Vision and AI-based Image Recognition
2. Image Processing and Optical Character Recognition (OCR)
3. Machine Learning
4. Rule-based Validation and Anomaly Detection
5. Data Analytics and Decision Support for dashboards, alerts, reports
6. Cloud-native and Microservices Architecture
7. Whatsapp integration

Key Features of tech solution

- AI-based Image to data conversion with 92% accuracy
- Inclusive by design with whatsapp. No new app or training needed. Supports multi-lingual nudges and alerts.
- Scalable and interoperable with existing systems
- Free and Open-source Digital Public Good - available to all states.
- Anomaly detection & automated validation reduces errors
- Role-based Dashboards & alerts enable quick response
- Solution can be extended beyond bulk-flow meters to capture data from other sources like electricity meters, etc.

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Impact (Qualitative and Quantitative)

JalSoochak is deployed across all the 16,949 rural water supply schemes in Assam. The government is able to monitor daily water supply, identify service disruptions and respond quickly. Assam is the only state in India that knows reliably which villages were supplied water on a day-to-day basis in a cost-effective way.

Total users: 22,000+ since launch

Number of Active Users: ~ 18,000 report daily through the platform

Amount of water supplied: 37,600+ MLD

Number of images captured & processed: Over 27 lakh since launch

Beneficiaries: ~1.6 crore citizens

Plan for roll-out and sustainability

- Arghyam enters into partnership with states to support Jal Jeevan Mission through non-financial MoUs. We have partnerships with Assam, Rajasthan and are in discussions with Maharashtra, Jharkhand and Karnataka.
- **Pilot:** JalSoochak will be field tested to check the extent of localization required in terms of language and image detection fine-tuning.
- **Development**: The solution will be developed by the state with support from Arghyam in technology design and architecture.
- **Deployment**: Arghyam will support in training, capacity building and program management for smooth roll-out and continuity.
- **Sustainability**: Open-sourced tech removes vendor lock-in. Hosting the solution in the government's infra and facilitating the officials to use data to manage their water supply ensures sustainability of the solution. It costs less than Rs.500 per scheme per year to maintain the solution.

Cost of development and ongoing maintenance

- Development Cost: **Rs.1.4 crore** (HR: 1.2 cr, Tech: 15 Lakh, Others: 5Lakh)
- Estimated costs for maintenance: **Rs.72 Lakh per annum** (HR: Rs.60 Lakh, Infra: Rs.9 Lakh, Others: Rs.3 Lakh)
- Estimated cost for scaling - State onboarding & implementation costs:
  - **Small state** with ~10k schemes: **Rs.74 Lakh** (One-time implementation cost: Rs.13 Lakh, Annual infra, whatsapp, email/otp costs: Rs.61 Lakh)
  - **Medium sized state** with ~25k schemes: **Rs.1.52 Cr.** (One-time implementation cost: Rs.15 Lakh, Annual infra, whatsapp, email/otp costs: Rs.1.37 Cr.)
  - **Large sized state** with ~50k schemes: **Rs.2.82 Cr.** (One-time implementation cost: Rs.22 Lakh, Annual infra, whatsapp, email/otp costs: Rs.2.6 Cr.)
- Average cost per beneficiary: Approx. Re 1 per beneficiary
- Average cost per scheme: Less than Rs.500 per year

Additional documents

- **Application Presentation:** https://drive.google.com/file/d/19wgFjbnQ_qcVXn62u594UANMFrFH9gd1/view?usp=sharing
- **Solution Demo Video:** https://youtu.be/QjveuD3Zf44
- **User Testimonials:** https://youtu.be/QjveuD3Zf44
- **Website:** https://jalsoochak.in/#home