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Title: Implementation of Recommendation ITU-T Y.4218 “Internet of things and information and communication technology requirements for deployment of smart services in rural communities” [for development of a smart village](#) in India

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Abstract: This TD contains the information on implementation of Recommendation ITU-T Y.4218 “Internet of things and information and communication technology requirements for deployment of smart services in rural communities” in India.

Please find below and attached the presentation on the implementation of Recommendation ITU-T Y.4218 “Internet of things and information and communication technology requirements for deployment of smart services in rural communities” in India.

Development of India’s smart intelligent village at SATNAVARI and Role of ITU Standards

Presentation to ITU-T SG20RG-AP meeting (24-25 March 2026)

**Invited presenter: Rakesh Kumar Bhatnagar, Director General, VoICE and
Retired Advisor (Technology), DoT**

1. Background

Voice of Indian Communication Technology Enterprises (VoICE), a telecom industry society supporting domestic design led solution has successfully implemented the **Smart Intelligent Village** Pilot Project in the country at village Satnavari, District - Nagpur Rural, State - Maharashtra in India. This village was inaugurated by Honourable Chief Minister of Maharashtra, Shri Devendra Fadnavis on 24th Aug 2025. It is a first such initiative in country and possibly the first of its kind globally with 18 solutions integrated under one umbrella.

Smart Intelligent Village Project has been conceptualized after going through the ITU-T Recommendation Y.4218 on IoT and ICT Requirements for deployment of smart services in rural community

2. ITU Recommendation

2.1 ITU-T Y.4218 (05/ 2023)*

This is an important standard on "IoT and ICT requirements for the deployment of smart services in rural community". It is quite useful for countries like India in creating smart infrastructure in rural areas and further bridging the digital divide.

2.2 ITU-T Y.4218 implementation leads to transform rural communities to smart category by establishing the ICT and IoT requirements by deploying smart services like e-government, telehealth, tele-education, smart agriculture, surveillance, disaster management, smart lights, smart cattle health and more.

2.3 In last few years we were witnessing a progress towards smart cities only and rural areas were getting required support migration from rural to urban areas was getting accelerated but Smart Intelligent Villages have potential to reverse the process and how, will follow in subsequent paragraphs.

2.4 Now every most of household having access to a smartphone and the Internet have access to various smart services and can monitor all services on their devices and digital divide is practically getting addressed. See in subsequent use cases in the Pilot Project implementation by VoICE (Voice of Indian Communication Technology Enterprises), a consortium of domestic design led telecom initiative society.

2.5 **Bridge the digital divide** between urban "smart cities" and rural areas by providing a blueprint for sustainable smart infrastructure in village Satnavari .(~~expected to be developed in near future.~~

2.6 Recent economic survey released by Government of India has also recognised Smart Intelligent Village initiative of VoICE and Maharashtra Government. Para 13.33 of the Economic Survey <https://www.indiabudget.gov.in/economicsurvey> mentioned "Technologies can be leveraged holistically to support rural development, enhancing quality of life, strengthening local economies, and empowering communities. For example, in Satnavari Smart Village, Maharashtra, farmers receive AI powered alerts on Soil, crops and weather conditions. Smart irrigation operates on solar energy with predictive insights, while shared community drone spraying of fertilizers and dashboards ensure transparent governance. Students can learn from AI-driven modules and digital labs, and villagers can access instant telemedicine and e-health records."

2.7 In three States of India, three Smart Samridhi Grams (Intelligent Villages) are being implemented and many more will follow soon. The first one was inaugurated by Mr. Jyotiraditya M. Scindia, Hon'ble Union Minister of Communications, Government of India, Minister at village Umri -village, Guna, Madhya Pradesh, India on 15th March 2026.

2.8 Following Objectives of the Pilot Project in line with Recommendation ITU-T Y.4218 are visible:

- Sustainability: Transform of rural areas into economically, socially, and physically sustainable spaces is being possible.
- Equity: We have attempted through the pilot that one can ensure all citizens to have equal access to advanced telecommunications, regardless of their location.

* <https://www.itu.int/epublications/en/publication/itu-t-y-4218-2023-05-internet-of-things-and-information-and-communication-technology-requirements-for-deployment-of-smart-services-in-rural-communitie>

- **Reduced Migration:** Improving rural living conditions and technological access helps prevent the forced migration of youth to major cities, rather reverse has happened at least in Satnavari where first line of maintenance is managed with local expertise who migrated from urban areas.

3. Pilot Project and Use Cases

Following Use Cases have been deployed by 25 “Make-in-India” Companies under VoICE consortium in India’s first Smart Intelligent Village:

- i. **Smart Agriculture**
SmartKheti: An IOT based system to improve farm yield, save water by 35%, save labour by 50% and provide several value-added services through mobile application
- ii. **Health and Medicine**
 - Teleconsultation with Doctor through Video calls. Further consultation with specialist Doctor on call for expert advice. All records of health and treatment are stored in database.
 - Health POD for 123+ tests in few minutes and further teleconsultation by PHC or Specialist.
- iii. **Smart Education through Smart Class Room**
 - Digital Anganwadi: Indian Tech, Ai Tools & Experience
 - Smart School: Smart interactive panel for 360-degree learning
- iv. **Rural Drinking Water Supply & Quality Monitoring**
 - Real-time monitoring of water quantity—meeting the government’s mandate of 55 litres per capita per day (LPCD)—and continuously checks key quality parameters like TDS and pH
- v. **Smart Cattle Management:**
 - Continuous monitoring of vital parameters: body temperature, heart rate, movement, and activity patterns. Oestrus cycle prediction for timely artificial insemination and herd management
- vi. **Public Protection & Disaster Relief:**
 - Public Announcements and alerts in case of any emergency / awareness
- vii. **Climate Smart Agriculture**
 - For net zero agriculture and natural farming
- viii. **Security Surveillance**
 - Surveillance through intelligent cameras
- ix. **Smart Lights:**
 - Sensor-based smart lighting that automatically turns on when people or vehicles are

detected. This feature reduces electricity consumption and enhances safety.

- x. Drone Services:
 - Spraying fertilizers and pesticides
- xi. Smart Pond for fisheries:
 - To Regulate dissolved oxygen in Fishery ponds for improvement in productivity
- xii. Wi-Fi Hotspots:
 - 1Creating Network throughout the Village for connecting various devices and proliferating internet
- xiii. Mast with cabin:
 - Fast deployable static backbone solution that enables advanced technologies and provides fully equipped workspace
- xiv. Smart Kendra
 - For delivery of various Government services at village level
- xv. Smart Waste Bin
 - For monitoring waste collection and alerts
- xvi. Fire Safety
 - Fire diffusion using fire extinguishing balls. These small balls can be dropped using Drone.

4. Other Details

4.1 ANNEX 1

A Power Point Presentation on Use cases.
