

Rural Connectivity

Reaching Every Rural Mile

Bridging the Digital Divide in Rural India
with High-Speed, Secure Wi-Fi Access



Background

India, with its rich diversity, grapples with a pronounced urban-rural digital divide. Despite having the world's second-largest active Internet user base and leading in global wireless data consumption, approximately 50% of the population still lacks or experiences inadequate internet connectivity.

Acknowledging this disparity, the Indian Government introduced the PM-WANI Scheme, a visionary initiative designed to connect every corner of the nation by deploying millions of Wi-Fi hotspots. In addition to the PM-WANI Scheme, the Indian government has undertaken various other initiatives to address the digital divide and enhance internet connectivity across the nation. One notable effort is the BharatNet project, which aims to provide high-speed broadband connectivity to over 250,000 gram panchayats (village councils) in rural India. This project recognizes the importance of rural connectivity in fostering economic development, improving access to education and healthcare, and promoting e-governance. Despite these efforts, challenges persist, and a holistic approach involving collaboration between government, private sector entities, and civil society remains crucial.

- **India's internet penetration rate stood at 48.7 percent of the total population at the start of 2023.¹**
- **As on March 09, 2023, 1,47,764 Wi-Fi hotspots have been deployed in India under the PM-WANI scheme. There are above 600,000 Wi-Fi hotspots in India, which is a relatively low number for a population of more than 1.4 billion.²**

Overview

Since our inception, we have been carving out a high-performing, flexible wireless system that can further help in embracing infinite possibilities. IO by HFCL brings you a multifaceted Wi-Fi networking approach that helps you meet your short and long-term goals.

Bhuvnesh Sachdeva
VP-Product Development

The villages of Baslambi in Haryana and Baidebettu in Karnataka exemplified the challenges faced by remote communities, lacking internet infrastructure and reliable connectivity. These locations were digitally isolated, impacting residents' access to essential services and economic opportunities. Taking proactive steps to bridge this gap, IO by HFCL deployed India's first PM-WANI network in the small village of Baslambi in Haryana, Northern India, in March 2021. Covering the entire village area of 3.84 square meters, this initiative aimed to provide high-speed Wi-Fi Internet to 6,000 residents, marking a significant stride in connecting remote areas.

Building on the success of this model, we replicated the initiative in Baidebettu village in Karnataka, Southern India, by June 2021. The PM-WANI networks established in these villages now offer high-speed, affordable Wi-Fi Internet to thousands of previously unconnected residents, transforming their digital landscape.

These installations not only connect the residents to essential digital services but also serve as an inspiration for other Internet Service Providers (ISPs) and solution providers to collaborate and innovate. Addressing the critical challenges of rural connectivity—affordability and accessibility—these initiatives showcase the potential for technology to empower remote communities.

According to recent statistics, approximately 399 million individuals in rural India, representing 52% of the total population, are actively utilizing the internet.³

Between 2015 and 2021, internet penetration in rural parts of India experienced a remarkable 200% increase, surpassing the 158% growth recorded in urban areas during the same period.⁴

Challenge

The rural settings of Baslambi and Baidebettu presented significant challenges, including a lack of infrastructure, unreliable power supply, and limited access to digital services. Residents faced deprivation of essential resources such as healthcare, education, and economic opportunities due to the constraints of limited connectivity. The geographical remoteness of these areas compounded these challenges, underscoring the urgent need to tackle the digital divide.

Solution

The remote villages grappled with a formidable challenge of lacking 3G/4G connectivity. The initial obstacle was the establishment of bandwidth and connectivity, which was addressed by creating a Point-to-Point wireless link for backhaul connectivity. This involved setting up high-speed Point-to-Point and Point-to-Multipoint wireless links from the nearest ISP fiber Point of Presence (PoP) to distribute connectivity to the villages.

The team conducted a meticulous Wi-Fi coverage planning exercise, considering critical locations. Leveraging TIP OpenWi-Fi architecture and i2e1 core solutions, we installed Access Points, Point-to-Point, and Point-to-Multipoint Unlicensed Band Radios (UBR) to ensure 24x7 connectivity. Solar panels were strategically placed for a continuous power supply, enabling operation around the clock, even in the absence of grid power. The comprehensive offerings bundled hardware, software, infrastructure setup, deployment, and maintenance services, tailored to meet the requirements of the PM-WANI scheme. To withstand outdoor deployment and rugged weather conditions, IP67 rated UBRs and Access Points were selected, ensuring reliable performance in challenging environments.

Furthermore, local entrepreneurs took on the role of Public Data Offices (PDOs) through network disaggregation, thereby broadening the Wi-Fi market and engaging local suppliers in providing connectivity. An attractive Wi-Fi package was introduced, allowing users to access the internet for six hours on a single mobile device with no data download limits. This holistic approach aimed at not only addressing connectivity challenges but also fostering local entrepreneurship and providing affordable and accessible internet services to the community.

Outdoor Wi-Fi



ion4e Wi-Fi 5 2x2

High capacity outdoor Access Points

P2MP UBR



ion4In & ion4I1_BTS

IO 5 GHz 700 Mbps UBR with Integrated Antenna

Result

- 01** Data usage in Baslambi and Baidebettu villages has undergone an exponential surge, skyrocketing from a mere 2GB per day initially to an impressive average of over 200GB per day within a span of five months.
- 02** The broadband services have gained widespread acceptance, with more than 1200 unique users benefiting from the services daily.
- 03** These once digitally isolated villages have experienced a transformative leap, now enjoying up to 500 Mbps bandwidth. This advancement has facilitated access to essential services such as telemedicine, education, banking, and government services. Residents no longer need to travel to cities for internet access, fostering local entrepreneurial opportunities and minimizing the carbon footprint.
- 04** The availability of high-speed internet has particularly enhanced healthcare access through telemedicine services, allowing doctors to provide remote consultations to villagers. Additionally, residents now enjoy a diverse range of entertainment options, including Netflix, Hotstar, YouTube, and other streaming apps, significantly enriching family entertainment choices in these communities.

Conclusion

Through collaborative efforts with service partners and the successful implementation of the PM-WANI scheme, HFCL effectively eradicated the digital divide in Baslambi and Baidebettu villages. This initiative not only expanded internet access but also empowered the community with enhanced educational and healthcare opportunities. Looking ahead, HFCL aims to broaden coverage by deploying additional Access Points and replicate this successful model in various regions across India, underscoring its unwavering commitment to ensuring inclusive connectivity for all.





The PM-Wani WiFi implementation in Baidebettu village really enabled the local population to go digital for learning, banking, entertainment and e-governance. Without the PM-Wani scheme, the entire village was disconnected from the world of the internet. HFCL's initiative to provide WiFi connectivity at this remote village is a testimony to their ability and willingness to connect the unconnected. To enable uninterrupted service, the use of Solar Powered WiFi system was a fantastic approach as Baidebettu faces regular power disruptions due to its topography and climatic conditions. We, the local population of Baidebettu, really thank and appreciate HFCL for its commitment to social responsibility. Wishing more success!

Devadas Pai

CEO - NanoCell Networks

References

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