

### **White space broadband – A solution for rural connectivity in India**

- 67% of India's population lives in rural areas
- BharatNet, a GoI initiative is the world's largest connectivity program
- 100 per cent FDI in telecom sector
- Entrepreneurs, companies and investors must put resources into building rural connectivity



Nearly two-thirds of India's 1.35 billion people live in the country's vast rural hinterland comprising approximately 640, 867 villages according to a World Bank survey. Many of these are in forests, mountainous terrains and other remote areas. Bringing this huge population under the mainstream umbrella, giving them a quality of life that is similar to their urban counterparts - including health, water, education, sanitation, housing, livelihood, infrastructure and disaster relief has been the focus of successive governments at the Centre and State.

Several state and central government organisations, cooperatives, NGOs, corporates and start-ups have been making huge strides in mainstreaming rural India. Several applications have been developed to enable this, including applications for energy and water, agriculture, manufacturing, sanitation, health,

transportation, communication, environmental conservation, rural employment and communication.

One of the key components of delivering all of the above and mainstreaming rural India is internet connectivity. There is no doubt that anytime, anywhere access to connectivity can change the plot of rural India's growth story.

### **Promising more growth**

With better, faster and more reliable internet access, more rural communities would have access to information that could improve their livelihoods. Initiatives such as the now famous e-Choupal that are meant to empower small and marginal farmers could be more successful. India could minimise its digital divide if similar models were replicated across other sectors in rural areas - cottage industries, fisheries, to name a few.

High-speed internet could make rural BPOs a viable option, offering attractive employment opportunities to village youth. This would increase income and decrease the current migration rates of rural population to urban areas.

### **The untapped opportunity for TVWS in rural India**

In the next few years, TV gateways, rural broadband technologies and satellite communications will be the main contributors to business in India's rural hinterland. However, the drastic increase in demand for these technologies has put pressure on the supply side of resources.

Challenges lie in the fact that deployment of optical fibres is an expensive proposition and cellular service providers are facing diminishing average revenue per user. In addition, they have to pay high licensing fees and steep infrastructure costs. The infrastructure cost for cellular and Wi-Fi-based broadband solutions in rural areas is also expected to be very high.

The solution is to utilise a mesh-based, last-mile or middle-mile network that is capable of providing coverage within a desired radius.

### **TV White Space (TVWS)**

TV White Space (TVWS) is one such untapped band within the Sub-GHz spectrum which is 'available for a radio communication application, at a given time, in a given geographical area, on a non-interfering/non-protected basis'. In other words, White Space Spectrum refers to the gaps or empty spaces that are unused in an otherwise heavily-occupied broadcasting spectrum band.

According to a study by the Indian Institute of Technology-Bombay, Doordarshan, India's only terrestrial TV service provider has 12 (80%) out of 15 channels of 8Mhz in the "TV-UHF band-IV" available as TVWS. The unused band, deployed effectively can assist in the provision of broadband connectivity to rural areas; a key goal of Digital India.

TVWS can be used for affordable backhaul to connect Wi-Fi clusters, and can feed into the urban-suburban or village gram panchayat National Optical Fibre Network node. Its USP lies in the fact that it can also be used to provide connectivity in remote locations, difficult terrains and scenarios where it is not possible to deploy fiber. TVWS can also be used to provide backhaul to unlicensed Wi-Fi operations in villages or Panchayats.

### **Successful test-run**

Microsoft conducted a pilot study at Harisal in Maharashtra to test the possibilities of using TVWS to provide rural connectivity. Google's Project Loon, an IIT-Bombay project wherein students developed a proof-of-concept network that relied on TV white space for transferring information, and a joint IIT-Madras and Nokia partnership that aimed to use white space spectrum to offer cheap broadband connectivity in remote rural areas are other examples of the effectiveness of this solution.

Several start-ups have commenced working on providing solutions, so that they may hit the road running, as soon as the Indian government gives a green signal to TVWS technology, to encourage the internet to connect more people and more things than ever before.

In the absence of a regulatory framework, DoT and other stakeholders continue to draw upon best practices of countries like South Africa, Singapore, the United States of America and the United Kingdom where white space has already been deployed.