THE HINDU CENTRE
for
Politics and Public Policy

A Reality Check on India's Search for Digital Utopia

PREETI MUDLIAR

With no electricity, a boy charges his mobile using solar power to attend his online class in Bormarjong village in Assam on June 11, 2020. Photo: Ritu Raj Konwar

The Covid-19 pandemic has highlighted the persistent digital divide afflicting rural India owing to poor and insufficient internet connectivity. With the Prime Minister's Independence Day speech acknowledging the need 'to complete' internet connectivity to villages, there is a renewed vigour and interest in the National Optic Fibre Network (NOFN)/BharatNet project. An important question to pose when translating policy to project is: when should a project considered to be "complete" – in this case a technology infrastructure project such as Bharat Net? This question gains importance against the backdrop of India's attempts to bridge the several urban-rural divides in access to technology. Restrictions on physical contact during the COVID-19 pandemic also mean that there is a greater reliance on internet-based solutions for a range of services. This situation can also be the time to fast-track India to a digital society.

In this article, Preeti Mudliar, Assistant Professor, IIIT-Bangalore (The International Institute of Information Technology - Bangalore), points out that there is a lot to learn and unpack from the failures of the early NOFN-connected villages as well as previous infrastructure policy initiatives such as the ill-fated Aakash tablet. For intent to be translated to effective policy implementation, she says, it is important to go beyond a number-chase and ensure that realistic markers of progress are set and financial, technical, and personnel resources are provided to sustain and upgrade the infrastructure created.

As parents, children, and teachers across India scramble to cope with the deficiencies in internet infrastructure and devices that would allow for a reasonable transition to online teaching during the ongoing COVID-19 pandemic, the ways in which rural India remains a laggard in the absence of reliable internet connectivity makes for particularly poignant testimonies. These diverse experiences across India's spectrum, rural-urban, rich-poor, literate and non-literate (both functional and digital), are important indicators from the ground that should guide policy makers in their efforts to chart a realistic course to fulfil the long-held aspiration to usher in a digital India.

On India's 74th Independence Day, Prime Minister Narendra Modi unveiled an ambitious plan: to "complete the work of connecting over six lakh villages with optical fibre."[1] This announcement has once again brought into focus earlier

telecom policy moves with similar ambitions to connect rural India to the internet. Among other factors, the PM's announcement was motivated by the pandemic that had already thrown into sharp relief the chronic digital chasm that separated rural India from its urban centres in matters of internet accessibility and use.

Although recent usage figures released by the Internet and Mobile Association of India (IAMAI) and Nielsen show that the availability of cheap data has spurred an increase in rural internet users, surpassing their urban counterparts, it cannot be assumed that the higher connectivity figures also translate to stable internet signals.[2] Moreover, usage figures are based on metrics such as people who use the internet at least once a month, which cannot be considered to be a realistic indicator to assess activities such as online education. News reports[3] consistently note that while increase in internet connections show a rise in basic telecommunication facilities, they cannot be taken as a meaningful indication of presence and use of services such as online learning.[4] In the absence of quality internet, reports chronicle that teachers in rural India are, instead, falling back on innovations such loudspeakers to disseminate their classroom lessons while maintaining social distancing regulations. Could rural India have been spared its challenges owing to poor connectivity?

Although recent figures show that cheap data has spurred an increase in rural internet users, it cannot be assumed that these translate to stable signals.

India is no stranger to grand schemes that aspire to take the internet to the rural resident. As such, the PM's 1,000-day declaration has little novelty, notwithstanding good intent. Policy announcements by themselves, however, mean very little unless they translate into robust outcomes on the ground. If the history of India's telecom policy pronouncements on connecting rural India are anything to go by, then, ideally,

Policy announcements by themselves, however, mean very little unless they translate into robust outcomes on the ground.

rural India would have been adequately equipped with the requisite internet infrastructure well before the pandemic upturned familiar routines.

An ambition from the past

After all, the 1,000-day-plan finds its origins in policy initiatives that go as far back as 2004 when the then United Progressive Alliance (UPA) government formulated a Broadband Policy to improve the broadband, internet, and computer penetration rates that in 2003 were at 0.02 per cent, 0.4 per cent, and 0.8 per cent, respectively. The Broadband Policy, 2004, sought to improve these figures and achieve a target of 20 million broadband subscribers by the year 2010. It aimed to boost internet access through various infrastructure, such as optical fibre technologies, digital subscriber lines, cable TV networks, and satellite media.[5]

As noted in a report I authored as part of The Hindu Centre for Politics and Public Policy Fellowship in 2016, the 2004-Broadband Policy was followed by a White Paper issued in August 2010 by the office of the Adviser to the Prime Minister on Public Information Infrastructure and Innovation headed by Sam Pitroda, which sought to squarely focus on connecting gram panchayats (GPs). It envisioned the building of infrastructure and administrative capacities of the panchayats, the most elementary unit of governance in India, through the provision of broadband connections that could be leveraged to create a public information infrastructure at the grassroots. The plan was to create infrastructure capabilities and enable access and delivery of government services, health, education, and other services. On October 25, 2011, the government approved a Cabinet Note for the creation of a National Optical Fibre Network (NOFN) to provide broadband connectivity to panchayats. The project would be funded through the Universal Service Obligation Fund (USOF) and executed by a special purpose vehicle (SPV) called the Bharat Broadband Network Limited (BBNL), incorporated under the Companies Act, 1956, and would include personnel from BSNL, RailTel, the telecom concern of the Indian Railways, and the Power Grid Corporation of India

Limited (PGCIL). This was to be the biggest rural broadband connectivity project in the world.[6]

By the time the NDA came to power in 2014, the NOFN was stumbling through missed deadlines and organisational challenges that hampered its functioning.[7] The NDA was quick to announce a name change, from NOFN to BharatNet, but the re-labelling meant little in terms of bettering rural India's prospects of being connected to high speed broadband internet. When the NOFN was unveiled as official policy under the aegis of the BBNL in 2011, the proposed timeline for completion was two years during which incremental optical fibre covering 5,00,000 route km would be laid. Since then, the timeline has undergone multiple revisions with the latest deadline now pushed to August 2021 as per the PM's Independence Day announcement.

> **"If you see, prior to 2014, only 5 dozen panchayats had the optical fiber network. However in the last 5 years, 1.5 lakh panchayats are connected with the optical fiber network which is helping us today, immensely. We are working on the goal of taking it to every panchayat and this work is in progress in the remaining one lakh panchayats. In these changing times it is essential that Rural India is also brought under the ambit of Digital India. There is a surge in the demand of online facilities among the rural population. Keeping this in view, we had earlier proposed the extension of connectivity to every panchayat and today I would like to assure you that we have decided that we will connect all our six lakh villages, with the optical fiber network. As the requirements have changed, so have our priorities. In over six lakh villages, thousands and lakhs of kilometers of optical fiber would be laid down. We have decided that within 1,000 days, we will complete the work of connecting over six lakhs villages with optical fiber."**[8]

When is a project 'complete'?

If such ambitious, albeit well-meaning, projects are to truly be of benefit to people, it is important to redefine the marker of "project-completeness". Even while the discussions and calls to action around BharatNet focus on the completion of the project, usually determined by the indicator of connecting the GP office with a functional broadband that would function in the range of 100 mbps, it would also be instructive to examine what happens once the broadband reaches the GP. Does it mean that all will then be well once an office on the premises of the GP gets broadband connectivity and rural India, in its entirety, can be considered internet enabled? A closer examination of the GPs that have already received internet connectivity through NOFN/BharatNet reveals that this is far from true.

The 2015-committee constituted by the government to evaluate the implementation and progress of NOFN/BharatNet found numerous issues plaguing the implementation and use of the infrastructure. While the report made sharp comments on the poor co-ordination and lack of accountability by the executing agencies that impeded the swift meeting of targets, it also observed that the presence of the broadband infrastructure by itself was insufficient to ensure a fully functional internet that would be of use to the general public. States were found to be indifferent instead of actively collaborating, which, in turn, led to delays and slow progress in the implementation. At sites where NOFN had been completed, repair and maintenance issues were exacerbated by a lack of skilled staff. Unreliable electricity and inadequate space to house and secure equipment and assets made it even more difficult to provide internet connectivity to rural residents even if the village was, by definition, "connected". This resulted in poor utlisation. A point highlighted by the NOFN/BharatNet evaluation committee.

On Page 90 of its report, the Committee noted:

> **"The lessons of the pilot project implemented under NOFN indicate that there was almost no utilization of bandwidth by three prominent service providers – the telecom service providers, the cable T.V providers and Internet service providers. The cited reasons ranged from poor return on investment for rural service provision, lack of market volumes and lack of assured service levels. Service provision in the pilot projects had to be sustained entirely by Government expenditure which makes the entire investment case uneconomic when scaled up across the country."**

Building on the Committee's report, Srinivasan and Ilavarsan[9] offered additional suggestions, such as the need to develop the absorptive capacity of government, citizen, and businesses to understand, learn, and utilise the advantages of broadband without which the benefits of rolling out a massive internet connectivity project would not be realised. Additionally, they called for the removing barriers to access and improve affordability of internet for use by common citizens by putting in place equitable service level agreements that would allow for greater participation from the private players and invigorate investment and innovation in services and utilities delivered using the internet.

Similarly, the study conducted by this author in 2016 to evaluate the state of the NOFN infrastructure four years after it was first rolled out to pilot sites in Panisagar in Tripura; Parwarda (Andhra Pradesh) and Arain (Rajasthan), found that the reach of the NOFN infrastructure was limited to the offices of the GP.[10] From there, horizontal connectivity was extended via Broadband Wireless Terminal (BBWT) devices to other institutions of importance in the villages such as schools, primary health care centres, veterinary sub centres, and land records office, of which not all connections were even functional.

As I note in the report,

> **"The infrastructure saw regular disruptions owing to breakdown of the BBWT devices, which were seldom repaired as it was unclear who was responsible for paying for their maintenance. The citizen communities of these villages themselves were largely unaware of the presence of NOFN infrastructure as an internet service in their villages and what it meant for them in terms of internet access and use. Interviews revealed that the mandate with the executing agencies i.e. BSNL, RailTel and PGCIL, was solely to provide for connectivity up to the GP level and its allied institutions and did not include making these connections available for use or retail purchase by private citizens."**

Rural India's unquenched thirst for the internet

When the pandemic hit, I received calls from the villagers of the Bilthai panchayat in Panisagar, seeking my assistance in drafting petitions to private service providers for better internet connectivity. When asked about the NOFN infrastructure that had been provided to them, they said that optical fibre cables (OFCs) were lying in a state of disuse by the roadside and although they had informed the district administration several times, no solution was forthcoming.

The digital divide is further gendered with women unable to use the free WiFi the way the menfolk of the village do owing to social taboos.

Much like their urban counterparts, rural India too thirsts for good internet connectivity to accomplish a wide range of activities ranging from leisure to work. So acute is their need for good internet that inevitably WiFi passwords of GPs that manage to hold on to some remnants of the NOFN internet begin circulating among villagers who throng the perimeter of the buildings hoping to catch a stable WiFi stream as free riders. This was a common story at almost every site that I visited during fieldwork. At such times, panchayat officials opt to

switch off the WiFi, paradoxically, to avoid 'disruption' to their official work by the crowds that gather near their offices.

In Arain, Rajasthan, where the password of the NOFN WiFi remained unchanged, I could also observe how the digital divide is further gendered with women unable to use the free GP WiFi the way the menfolk of the village do, owing to social taboos and restrictions on women's mobility. Moreover, even trials by private WiFi service operators using the NOFN infrastructure ignored women as potential users, assuming erroneously that they would not have any need for the internet in the first place.[11]

It is not clear if the renewed focus on completing the connectivity process under BharatNet will also remove the obstacle of gendered digital access, which is crucial for digital inclusion, or resolve the critical issues relating to maintenance and responsibility, which are essential for the stable functioning of the infrastructure. During fieldwork, I found site after site that had received NOFN infrastructure struggling with malfunctioning devices and fickle internet connectivity strength along with long power cuts. In addition to GP offices themselves finding their work frequently challenged by lack of NOFN internet leading them to precarious dependencies on weak mobile internet signals, allied institutions of governance, such as primary health care centres and MGNREGA personnel, ran from pillar to post trying to find either stable internet signals on their mobile phones or prepaid USB data packs to comply with the digitisation requirements of their work.

Uninterrupted functioning of the infrastructure created requires unfailing attention to continuous maintenance and well-defined roles of responsibility to ensure the same. This will facilitate ways to allow the common citizen to access internet services. Mere connectivity figures matter for little when these

Mere connectivity figures matter for little when these cannot translate into scenarios of widespread stable use.

cannot translate into scenarios of widespread stable use that will meaningfully fulfil citizens' need for the internet.

A caution from the past

The NOFN/BharatNet initiative is not the only digital infrastructure-related policy to have failed its remit and made its absence felt during the pandemic. Even as scores of news stories detail how the option of online education is unviable because of the lack of access to devices, such as laptops and smartphones owing to unaffordability, one must also examine the reasons why the UPA government's attempt to provide affordable tablets, which were to serve as personal computing devices for students and other citizens, failed. As one of the pet projects of the UPA-II's HRD minister, Kapil Sibal, the Aakash tablet made global headlines for being priced for as low as $35.

According to archival documents accessed in 2013, the UPA's National Mission on Education Through Information and Communication Technology (NME-ICT), the genesis of the Aakash tablet was motivated by the need for a computing device with a low cost but rich in features. The NME-ICT wanted to utilise ICTs in "providing high-quality, personalised and interactive knowledge modules over the internet in an any-time-any-where mode".[12] Among other things, the Aakash tablet was meant to showcase India's technological supremacy and talent for 'frugal innovation'. Nowhere was it more evident than its unveiling at the United Nations headquarters when India assumed rotating presidency of UN Security Council. On that occasion, the then UN Secretary General, Ban Ki Moon praised India for "being a super-power on the information highway".[13]

However, the grand announcements and nationalistic fervour that accompanied the Aakash discourse never really converted into a national infrastructure resource of lasting value. The pandemic only makes more acute the thought of the chance that India lost with the Aakash project. Announced in the high pitched sentiment of positioning it to be the "world's cheapest tablet", the now-abandoned Aakash project is a cautionary tale for grand policy intents that fail to

buttress their announcement with clearly defined objectives and the means to secure a project's continued utility and success. With the Aakash tablet, conflicts between IIT Jodhpur and Datawind over the test specifications of the tablet led to serious difference of opinions, culminating in the government transferring stewardship of the project to IIT Bombay.[14] Nonetheless, the saga of missed deadlines and devices failing to meet acceptable standards continued during the UPA government's tenure and when the NDA government assumed power in 2014, it unceremoniously dropped the "world's cheapest tablet" project.

The pandemic only makes more acute the thought of the chance that India lost with the abandoned Aakash project, the "world's cheapest tablet".

Hardware issues were not the only misguided part about the Aakash project. Even while work on Aakash was underway, educationists and critics pointed to the futility of promoting Aakash as a technology-fix to the complex problem of quality education by arguing that investment in computer-aided learning cannot be a substitute for investing more in the human elements of the education system.[15] Notwithstanding the partial and incomplete thrust on technology for education, if India had managed to get at least the hardware component of Aakash right, it would have meant an easy and affordable device for the poor who are the have-nots in the digital divide. Consequently, they now find themselves marooned on digitally forsaken islands and their children are deprived of online lessons owing to their inability to afford smartphones and mobile internet.

A meaningful way ahead

The point in recollecting the failure of the early phases of NOFN/BharatNet and the Aakash tablet is not to indulge in unproductive hand-wringing over the projects being little better than non-starter initiatives. Rather, it is an attempt to salvage what is left of the ambitions driving the BharatNet rural connectivity

project. If the government is serious about getting rural India on to the internet, it cannot cite figures of completed connections as a measure of any success.

Even while the NOFN/BharatNet project struggles to keep up with its deadline of laying OFCs and providing villages with functional internet connectivity, the policy governing the project would do well to recognise that the laying of cables can hardly be the only measure of the completeness of the project. Academic literature recognises that infrastructures by their very nature can never be declared as complete because their functionality and continuity needs to be maintained.

If the government is serious about getting rural India online, it cannot cite figures of completed connections as a measure of success.

It is essential to understand the very character of infrastructures as inherently dynamic systems requiring constant maintenance and supervision to deliver on their capabilities.[16] The NOFN/BharatNet project centres around hardware such as OFC, GPON (Gigabit Passive Optical Fibre Networks), OLT (Optical Fibre Network) and BBWT devices. Together, they comprise the core of how the internet is being delivered to the panchayats under the aegis of the NOFN. Breakdowns and disruptions in these devices require immediate remedial intervention with specialised technical skills that are not easily available in rural India.

Thus, while the devices work together to ensure the functioning of the internet, they are not self-correcting objects that can recognise and repair the faults in their functioning. With no provisions to ensure continuity of devices and, hence, internet services, NOFN/BharatNet can never be completely functional without constant work on the parts that contribute to its status as an infrastructure.

In terms of a policy move, it will be very useful for the NOFN/BharatNet project to rethink the attributes on which it can be declared as a completed project. With scant or no attention paid to recognise the nature of infrastructure, a project that is considered 'complete' actually remains neglected and in a state of disuse owing to a lack of clear directives on responsibility, maintenance, budget, and personnel. In this regard, the NOFN/BharatNet project is thus no different from other infrastructure systems, such as roadways, railways, electricity, all of which require constant maintenance and attention to faults and repairs to ensure that they keep running with minimal disruption. A redefinition of 'completeness' will thus ensure that the Prime Minister's 1,000-day plan to complete the task of internet connectivity to India's 638,365 villages[17] is not rendered meaningless. This will also be a game-changer in getting rural India online.

BharatNet is no different from other infrastructure systems such as roadways, railways, electricity, all of which require constant maintenance.

[**Note:** This article is partly based on, and elaborates upon, a Policy Report, *Rural India on the National Optic Fibre Network: What Happens Next?* by the author when she was Public Policy Scholar at The Hindu Centre for Politics and Public Policy.]

[**Preeti Mudliar's** research interests broadly centre around gender, infrastructure, digital media, and news media processes that she studies using qualitative and ethnographic methodologies. Her work has been published in Human Computer Interaction (HCI) venues such as ACM CHI and ACM CSCW. Some of her work also finds expression in speculative writing that has been a part of anthologies published by the Digital Asia Hub, Hong Kong, and the Alexander von Humboldt Institute Fur Internet and Gesellschaft (HIIG), Berlin, Germany. She is currently an Assistant Professor in IIIT-Bangalore.]

References:

[*All URLs are last accessed on August 26, 2020*]

1. **PM India. 2020**. PM's address to the Nation from the ramparts of the Red Fort, August 15. [https://www.pmindia.gov.in/en/news_updates/pms-address-to-the-nation-from-the-ramparts-of-the-red-fort/?comment=disable].

2. **Mishra, D and Chanchani, M. 2020.** For the first time, India has more rural net users than urban, *The Times of India,* May 5. [https://timesofindia.indiatimes.com/business/india-business/for-the-first-time-india-has-more-rural-net-users-than-urban/articleshow/75566025.cms].

3. **Athar, U and Sharma, G. 2020.** Parents, Teachers Scramble for Access to e-learning in Rural India, *The Mint,* July 5. [https://www.livemint.com/news/india/parents-teachers-scramble-for-access-to-e-learning-in-rural-india-11593948421008.html].

4. **Pandey, K. 2020.** Covid-19 Lockdown highlights India's great digital divide, *Down to Earth,* July 30. [https://www.downtoearth.org.in/news/governance/covid-19-lockdown-highlights-india-s-great-digital-divide-72514].

5. **Department of Telecommunications. 2004**. Broadband policy, 2004, Ministry of Communications and Information Technology, Government of India. [https://dot.gov.in/broadband-policy-2004].

6. **Mudliar, P. 2016**. Rural India on the National Optic Fibre Network: What Happens Next?, Policy Report No. 19, The Hindu Centre for Politics and Public Policy, December 21. [https://www.thehinducentre.com/migration_catalog/article22982842.ece/BINARY/Policy%20Report%20No.19].

7. **Government of India. 2015**. Report of the Committee on National Optical Fibre Network (NOFN), SMARTNET, Ministry of Housing and Urban Affairs, March 31. [https://bit.ly/3gCDcSm].

8. **PM India. 2020.** Op. Cit.

9. **Srinivasan, N and Ilavarasan, P.V. 2015.** White Elephant or a Game Changer?, *Economic & Political Weekly*, October 17, Vol. 50, Issue No. 42, pp.59. [https://www.epw.in/journal/2015/42/special-articles/white-elephant-or-game-changer.html].

10. **Mudliar, P. 2016.** Op. Cit.

11. **Mudliar, P. 2018.** Public WiFi is for Men and Mobile Internet is for Womenn: Interrogating Politics of Space and Gender around WiFi Hotspots, *Proceedings of the 21st ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW'18)*, Jersey City, New York, New York. November 3-7. [https://dl.acm.org/doi/10.1145/3274395].

12. **National Mission on Education in ICT. 2011.** *FAQs for the Aakash tablet.* [http:// www.sakshat.ac.in/pdf/Final_FAQ_Aakash.pdf]. [This archival link that was last accessed in 2014 and is no longer available online].

13. **Press Trust of India. 2012.** Aakash tablet unveiled at UN, *The Hindu*, November 29. [https://www.thehindu.com/sci-tech/technology/gadgets/Aakash-tablet-unveiled-at-U.N./article15616996.ece].

14. **Mudliar, P and Pal, J. 2015.** ICTD in the Popular Press: Media Discourse around Aakash, the "World's Cheapest Tablet", *Information Technologies & International Development,* ICTD'13 Special Issue, vol 11, Issue 1. [https://www.itidjournal.org/index.php/itid/article/view/1361].

15. **Ibid.**

16. **Graham, S and Thrift, N. 2007.** 'Out of order understanding repair and maintenance', *Theory, Culture & Society,* May 1, 24(3), pp.1-25.

17. **Office of the Registrar General & Census Commissioner, India. 2011.** Number of villages by States and Union Territories (in 2001 and 2011 census), *Census of India, 2011.* Ministry of Home Affairs, Government of India.