

MAPPING DIGITAL MEDIA: INDIA



Mapping Digital Media: India

A REPORT BY THE OPEN SOCIETY FOUNDATIONS

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5. Digital Media and Technology

5.1 Broadcasting Spectrum

5.1.1 Spectrum Allocation Policy

The Supreme Court of India ruled in 1995 that airwaves are public property, and a scarce resource that must be used for the public good and managed by the government on behalf of the public, in their interest.²⁵⁶ The implementation of this principle is carried out jointly by several government agencies depending on which part of the spectrum is allocated.

First, the Department of Telecommunications (DoT), under the Union Ministry of Communications and Information Technology (MCIT), manages all spectrum-related issues, including allocation, ownership, and usage. Second, the DoT issues a National Frequency Allocation Plan (NFAP), a practice established in 1981, which is revised and updated every two years.²⁵⁷ The NFAP lays down the frequency management plan to suit the national frequency requirements as per the ITU guidelines²⁵⁸ (see *Annex 1*), and therefore all new decisions on assignment of spectrum to service providers get reflected in the revised NFAP. Third, the Standing Advisory Committee on Radio Frequency Allocation (SACFA), a section of the Wireless Planning and Coordination (WPC) wing of the DoT under the MCIT, is responsible for making recommendations on major frequency allocation issues and formulating the NFAP. Due to increasing demand on spectrum in the late 1990s, the Spectrum Management Committee (SMC) was set up in 1998 as a steering group of the WPC and the TRAI, the telecoms regulator established in 1997 to oversee spectrum allocation, pricing, and efficiency of use.²⁵⁹

However, incremental liberalization and deregulation in communications over the last decade have increased pressure on the spectrum management process. The DoT allocates spectrum for a broad range of services,

256. Paragraph 81, *The Secretary, Ministry of Information and Broadcasting v. Cricket Association of Bengal* (1995), 2 SCC 161.

257. Since there was little demand for spectrum until the mid-1990s, this was not revised regularly.

258. See <http://www.wpc.dot.gov.in/faq.asp#1> (accessed 28 September 2012).

259. Telecommunications, "Opportunity Costs Affecting Spectrum Utilisation," Report of Spectrum Management Committee, New Delhi, 24 December 1998, at <http://indiaimage.nic.in/pm-councils/got/report/chap5.htm> (accessed 28 September 2012).

which includes telecoms and broadcasting (television and radio).²⁶⁰ In the past, the government has not only given preference to certain players in each sector but has also laid special emphasis on certain sectors with respect to spectrum allocation. For instance, the process of application for community radio (CR) and the granting of spectrum for CR is mired in red tape.²⁶¹ In contrast, the telecoms industry has a more structured procedure for allocation of spectrum, and not only because it needs more spectrum. As demands on spectrum have increased, some users such as telecoms operators, particularly Unified Access Service License (UASL)²⁶² holders, have been given priority in spectrum assignment since the government saw them as potentially bringing in higher revenues to the exchequer.

The first phase of licensing saw private mobile telephony operators (the 1990s) and private FM radio operators (2001) receive spectrum via auctions. As it was gradually realized that operators faced difficulties in paying the high entry fees, government sought to bail them out by altering the spectrum charging procedures. In the second phase of licensing cum spectrum assignment for private FM operators, a system of one-time entry fee (OTEF) coupled with a 4 percent revenue share was designed; but the second phase 2G telephony moved to a first-come, first-served (FCFS) system (between 2003 and 2008) at 2001 rates (see section 7.2.3). While the revenue share for radio was revised regularly, the telecoms players continued to pay the 2001 upfront entry rates for spectrum, thus benefitting from lower one-time entry costs. The 2012 telecoms policy reverted to auctions after a Supreme Court judgment in February 2012, following the 2G licensing scam, as detailed below (section 5.1.2).

Despite initiatives to allow private enterprise in television and telecoms, public enterprises enjoy favored access or terms of access in spectrum allocation. For example, spectrum for terrestrial television in the 470–806 MHz range is solely assigned to the state broadcaster, DD. Although TRAI recommended the deregulation of terrestrial television in analog and digital modes in 2005 to promote community and private stations in these modes,²⁶³ there has been no follow-up; DD remains the sole terrestrial broadcaster. In late 2007, the WPC proposed that DD vacate 32 MHz in the 470–806 MHz band to enable the deregulation of this segment to private broadcasters,²⁶⁴ but so far no action has been taken by Prasar Bharati, or by the MIB.

In telecoms it is often pointed out that spectrum allocation has imparted advantages to public enterprises. According to Shyam Ponappa, telecoms policy specialist: “Public sector telecom providers—BSNL and

260. Government of India (Allocation of Business) Rules, 1961, at <http://www.dot.gov.in/objective.htm> (accessed 2 December 2012).

261. K.S. Hari Krishnan, “Red Tape Mutes Community Radio in India,” at <http://www.ipsnews.net/2012/03/red-tape-mutes-community-radio-in-india/> (accessed 13 January 2013).

262. Throughout the 1990s, telecoms operators had to seek separate licenses for each kind of service they wished to provide in their respective service area. In 2003, the government commenced the Unified Access Service License (UASL) regime, which allowed licensees to provide any kind of service through any kind of technology within their service area: TRAI, “Consultation Paper on Unified Licensing Regime,” Consultation Paper No. 6/2004, New Delhi, 13 March 2004, at <http://www.trai.gov.in/trai/upload/ConsultationPapers/25/NewConsultationpaper%2013TH%20MARCH%202004.pdf> (accessed 28 September 2012).

263. TRAI, “Consultation Paper on Issues Relating to Private Terrestrial TV Broadcast Service,” TRAI, New Delhi, February 2005.

264. “DoT urges DD to vacate spectrum for pvt players,” *Business Line*, 30 June 2007, at <http://www.thehindubusinessline.com/todays-paper/article1662442.ece?ref=archive> (accessed 16 April 2012).

MTNL²⁶⁵—have been given spectrum before private-sector companies, e.g., 20 MHz of BWA spectrum was awarded on a countrywide basis some time before that for private operators.”²⁶⁶ In other words, these enterprises were not given any price preference, but were only guaranteed allocations at the price paid by private operators.²⁶⁷ However, public enterprises ended up getting an inferior chunk of spectrum for Broadband Wireless Access (BWA) that could not be converted into a business opportunity.

Within the telecoms sector, bias in spectrum allocation is also evident in the mandating of technologies. Dr Mahesh Uppal, an independent telecoms policy commentator, candidly recalls:

Historically the rules for GSM and CDMA favored GSM once it was chosen as the sole standard for mobile services—but later, in 2003, seemed to favor CDMA. The decision to allow dual technology licenses hurt pure GSM players because it reduced spectrum available for GSM. The rules for license fees also separate GSM and CDMA streams, which has allowed those using dual technology (i.e., GSM & CDMA) players to benefit at the expense of pure play GSM players, since for the same total amount of spectrum pure GSM players could end up paying more in fees (because combining their spectrum holding means that they reach new slabs for fees earlier).²⁶⁸

As to the actual amount of spectrum allocated, the CDMA trade association has maintained that the pre-2007 policy (before CDMA operators were allowed to enter the GSM segment) was biased. In response, the GSM trade association argued that since CDMA technology claimed itself to be between five and eight times more efficient than GSM, the spectrum allocation in a ratio of 1:2 (1 MHz for CDMA and 2 MHz for GSM) was biased in CDMA’s favor. Satyen Gupta, formerly with TRAI, clarifies, “The only reason CDMA was given less spectrum as compared to GSM was because it was believed by the DoT that the CDMA networks are more spectrum efficient. It was believed that 2.5 MHz in the CDMA technology could support subscribers more than that by 5 MHz in GSM.”²⁶⁹

Moreover, the process followed by the DoT while allowing CDMA players to enter the GSM arena in 2007 lacked fairness, as equal opportunity was denied to some operators. For instance, the leading CDMA operator Reliance Communications was allocated start-up GSM spectrum in January 2008, way ahead of other CDMA operators who had applied at the same time. The luckier ones received their due spectrum later in 2008, as was the case for operators in the Rajasthan and Punjab circles, but the case of Delhi circle was

265. BSNL, or Bharat Sanchar Nigam Limited, is wholly owned by the government and provides telecoms services for the entire country, except for the two largest cities, Mumbai and New Delhi, that are catered for by MTNL, or Mahanagar Telephone Nigam Limited, which is majority-owned by the government.

266. Interview with Shyam Ponappa, consultant, columnist, and Distinguished Fellow at the Centre for Internet and Society, Bangalore, New Delhi, April 2012.

267. It must also be pointed out that BSNL tends to have more stringently audited rural roll-out obligations compared with private telecoms operators.

268. Interview with Dr Mahesh Uppal, telecoms policy specialist and director, Com First (India) Pvt. Ltd, New Delhi, March 2012.

269. Interview with Satyen Gupta, Secretary General, NGN Forum India and formerly Principal Advisor, TRAI, New Delhi, December 2012.

extreme: in the national capital five smaller companies and Tata Tele—the leading competitor of Reliance in the CDMA segment—were not allocated GSM spectrum until September 2010.²⁷⁰

Even within the GSM segment, discrepancy exists: while older operators, who got their licenses in the 1990s, were allocated more efficient spectrum in the 900 MHz range, the later ones were allocated spectrum in the 1,800 MHz band. As older licenses come up for renewal in 2014–2015, after the licensing period of 20 years lapses, the government’s re-farming protocols are coming under scrutiny. In November 2012, a so-called Empowered Group of Ministers (EGoM) on telecoms said that the older operators could retain only 2.5 MHz of the 900 MHz band, and the rest would be auctioned to others; those who gave up the 900 MHz spectrum would be allocated additional spectrum in the 1,800 MHz band, for which they will have to cough up high capital investments in infrastructure and additional towers.²⁷¹

In crying foul against the entire telecoms sector, Internet Service Providers (ISPs) have pointed out the unfairness in licensing protocols of BWA frequencies, which required that the lowest price of BWA be at least 25 percent of the base price of the 3G frequencies auctioned.²⁷² Mahesh Uppal reiterates this: “The rules for 3G and BWA spectrum had anomalies in favor of BWA since the latter came with more spectrum and the reserve price for BWA was lower.”²⁷³ The rationale for the linking up of these frequencies is unclear and has invited criticism from the industry, especially by ISPs already allotted some BWA frequencies but asked to surrender them and rebid for them in the 3G and BWA auctions held in mid-2010. The ISPs sued the DoT for not following TRAI’s recommendations, but TDSAT ruled in favor of the DoT.²⁷⁴

After consultation in 2007 on commencing mobile television via broadcast networks, TRAI made some recommendations in 2008 on associated aspects of technology, allocation of spectrum, and licensing. Since no specific band is allocated for broadcast of mobile television in India,²⁷⁵ TRAI recommended allocating UHF Band V (585–806 MHz) for mobile television and allotting licenses via a closed tender system on an OTEF basis, with licenses bundled with 8 MHz of spectrum.²⁷⁶ In May 2010, TRAI recommended the 585–698 MHz band be earmarked for digital broadcasting services, including mobile television, and 698–806 MHz only for International Mobile Telecommunication (IMT);²⁷⁷ the EGoM decided to put this band up for auction for 4G.²⁷⁸ Mr Gupta summed it up as follows:

270. CAG Report, p. 47, at http://www.cag.gov.in/html/reports/civil/2010-11_19PA/chap4.pdf (accessed 23 May 2012).

271. “EGoM allows Operators to hold 2.5 MHz spectrum in 900 MHz,” *Telecomindiaonline.com*, 2 November 2012, at <http://www.telecomindiaonline.com/egom-allows-operators-to-hold-2-5-mhz-spectrum-in-900-mhz.html> (accessed 8 December 2012).

272. See <http://www.dot.gov.in/as/Auction%20of%20Spectrum%20for3G%20&%20BWA/3g.pdf> (accessed 18 April 2012).

273. Interview with Dr Mahesh Uppal, telecoms policy specialist and director, Com First (India) Pvt. Ltd, New Delhi, March 2012.

274. See <http://www.iltb.net/2010/02/yet-another-spectrum-issue...-justice-denied-to-isp/> (accessed 21 April 2012).

275. The MIB had initially planned to use around 90 or 96 MHz for mobile TV, but had not got around to specific allocation.

276. See <http://traai.gov.in/WriteReadData/Recommendation/Documents/57.pdf> (accessed 16 April 2012).

277. TRAI, “Recommendations on Spectrum,” May 2010 (Section 1.6.1), at <http://traai.gov.in/WriteReadData/Recommendation/Documents/FINALRECOMENDATIONS.pdf> (accessed 16 April 2012).

278. See <http://www.thehindubusinessline.com/industry-and-economy/article2964446.ece?css=print> (accessed 17 April 2012).

As per the regulator's recommendations, the allocation of 700 MHz band will be discussed from 2014 onwards. On implementation of DTT, half of the bandwidth or approximately 100 MHz, will be the digital dividend; the upper half (i.e. 698 MHz–806 MHz) will be used for BWA and 4G and will be allocated among potential operators for Service-Agnostic usage i.e. operators will be free to use the spectrum with the technology and for the purpose of their choice.²⁷⁹

TRAI laid down reasonable technical arguments in favor of the allocation of the digital dividend for last-mile delivery of mobile and wireless broadband services.²⁸⁰ However, vacating analog terrestrial frequencies enabling basic, free-to-air television for the lowest income groups raises issues of inequity. While these groups will be unable to access DTT in the absence of subsidies for expensive STBs (see section 7.1.1.2), the principal beneficiaries of the vacated spectrum would be operators of 4G frequencies (698–806 MHz), whose services will benefit, at least in the initial years, higher-income groups (see section 7.4).

5.1.2 Transparency

The first sector-specific policy document on spectrum, the New Telecom Policy 1999 (NTP-99), was significant not only because it mentioned the availability of affordable and effective telecoms as its prime objective,²⁸¹ but equally because it stated “the need for a transparent process of spectrum allocation.”²⁸² Thereafter, since spectrum was bundled along with the license in most cases, or was allocated only after a license was granted, it is basically the licensing policies (see section 7.2.3) that indicate the nature and levels of transparency in spectrum awards.

The rationale for allocating spectrum for private radio operators seems to be solely based on technical constraints, i.e. the maximum number of frequencies that can be made available, which restricts the number of players. Even with community radio, WPC decides quite arbitrarily the number of frequencies to make available in a given circle.²⁸³ For private FM radio broadcasters, the license and spectrum allocation process migrated from an auction regime (with license fees and few guidelines) to a tender-based process (with revenue-sharing agreements), which has clear eligibility requirements and guidelines. However, in the latter case, the bids per region are opened in the presence of bidders, but without any outsiders—thus the process is

279. Interview with Satyen Gupta, Secretary General, NGN Forum India and formerly principal advisor, TRAI, New Delhi, December 2012.

280. Paragraph 2.8: “The 700 MHz (698–806 MHz) spectrum band is considered the most important band for broadband deployment. It is suitable from the point of both capacity and coverage. The digital dividend spectrum in the UHF range has very good propagation characteristics and is highly suitable for the roll-out of mobile broadband in rural and other difficult-to-reach areas. Allocating this spectrum to mobile will mean that network operators require fewer base stations, meaning less capital investment is needed to bring broadband to all areas. Following the recommendations of the ITU's World Radio communication Conference (WRC) in 2007, Governments across the globe have actively pursued policies to facilitate use of this spectrum for mobile broadband as soon as possible.” TRAI, “Consultation Paper on IMT—Advanced Mobile Wireless Broadband Services,” 19 August 2011, at <http://www.trai.gov.in/WriteReaddata/ConsultationPaper/Document/IMT-Adv11.pdf> (accessed 13 December 2012).

281. See http://www.trai.gov.in/TelecomPolicy_ntp99.asp, Section 2, “Objectives and targets of the new telecom policy 1999” (first point) (accessed 20 April 2012).

282. See http://www.trai.gov.in/TelecomPolicy_ntp99.asp, Section 5, “Spectrum management” (first paragraph) (accessed 20 April 2012).

283. The number of frequencies per circle was first set at six and later changed to three. But frequency allocation can also be prone to influence, Bangalore being a prime example, where about four CR frequencies have been allocated.

only partially transparent.²⁸⁴ In the case of community radio, the granting of licenses (and spectrum thereof) is restricted to four operators per service area.²⁸⁵ Since the government decides licenses and the allocation of frequencies to prospective applicants on a case-by-case basis, in many instances there are inordinate delays. Sajan Veniyoor, former General Secretary of the Community Radio Forum, says that although the process of granting a license is supposed to take eight or nine months, some NGOs either have had to wait for years to get a license, or have had their applications rejected.²⁸⁶

A typical reason for delay would be if an application is from a coastal area, so-called red-corridor or Maoist areas, and naval areas, border areas. There is no explanation, but Ministry of Home Affairs will take their time to clear the file. In many cases, it has been rejected without reason. I know that 12 applications from Jharkhand have been rejected by MHA, as far as I know—no reason given. Sometimes, rural and small applicants from remote areas might give geo-coordinates which are not exact. This causes long delays—up to five months sometimes. The form for filling in your application for frequency allocation (SACFA) is very complicated, and many NGOs can't figure it out.²⁸⁷

Interestingly, in a rare admission, the MIB itself drew attention to the dependence on inter-ministerial clearances for community radio applications as causing delays in awarding them permission/spectrum.²⁸⁸

The telecoms sector has seen several turnarounds vis-a-vis modalities of spectrum award. Between the early 1990s and 2001, when mobile licenses and spectrum were allocated to private players, auction was the only route followed. However, since 2003, the licenses for mobile telecoms, bundled with minimum initial spectrum, were doled out on a FCFS basis. In 2007, under the dual technology change, CDMA operators were allowed to offer GSM services and were given licenses/spectrum under the FCFS policy. But in January 2008, the FCFS policy for GSM was manipulated to give 122 licenses; some applicants were leaked information about the issue of the date for the Letter of Intent, allowing them to make arrangements beforehand.²⁸⁹ Thus, along with opaque procedures, bias in the licensing system in telecoms was alleged to hinge on access to government officials to receive licenses without delay. Furthermore, a CAG report estimated that unfair licensing procedures and undue advantages to select service providers cost the exchequer about Rs 1,760,000 million²⁹⁰ (around US\$ 32,000 million) and precipitated the 2G spectrum scam.²⁹¹ Following this, in early

284. See documents relating to the policy on expansion of FM radio broadcasting services—Phase 2, at <http://www.mib.nic.in/ShowContent.aspx?uid1=0&uid2=51&uid3=125&uid4=0&uid5=0&uid6=0&uid7=0> (accessed 25 April 2012).

285. Though CR does not have to pay permission fees, the cost of application is Rs2,500, and they may be asked to furnish a bank guarantee of Rs25,000 and annual spectrum fees of Rs19,700.

286. Interview with Sajan Veniyoor, former General Secretary of Community Radio Forum, New Delhi, January 2011.

287. Interview with Ramnath Bhatt, co-founder of Maraa, a media and arts collective in Bangalore, February 2011.

288. Ministry of Information and Broadcasting (MIB), *Strategic Plan, 2011–17*, MIB, Government of India, New Delhi, 2010, p.14, at <http://mib.nic.in/ShowPDFContent.aspx> (accessed 23 April 2011) (hereafter, MIB, *Strategic Plan*).

289. CAG Report, p. 30, at http://www.cag.gov.in/html/reports/civil/2010-11_19PA/chap4.pdf (accessed 23 May 2012).

290. CAG Report, at http://www.cag.gov.in/html/reports/civil/2010-11_19PA/chap4.pdf (accessed 23 May 2012).

291. For a detailed account, see Jyoti Thottam, "War of Words Escalates in India's Telecom Scandal," *Time Magazine*, 14 December 2010, at <http://www.time.com/time/world/article/0,8599,2036867,00.html> (accessed March 2012).

2012, the Supreme Court cancelled all 122 licenses and concluded that spectrum was sold too cheaply at the 2001 auction rates, well below market price. Mahesh Uppal sums up:

The spectrum award has been subject to several considerations. The bundling of spectrum with mobile licenses was clearly unorthodox. The bundling and amount of spectrum (e.g., 4.4 MHz for GSM licenses) were decided without adequate analysis or justification. The rules for allocating the additional 2.2 MHz were similarly ad hoc. Later, the move to allocate spectrum based on number of subscribers benefited those who overstated subscriber numbers or those who acquired subscribers without consideration for actual usage of the connection. The 122 licenses of 2008 are de facto spectrum allocation. These too have been found by the Supreme Court to lack due process.²⁹²

In 2010, even as the FCFS policy was applicable for 2G spectrum allocation, the government resorted to e-auctions to sell and allocate 3G and BWA spectrum. This was a more transparent system, though not without subsequent controversies, with the process being clearly communicated upfront²⁹³ and details of the auction being published on the DoT website. After the 2012 Supreme Court judgment on 2G licenses, the government announced a new telecoms policy which: delinked spectrum from “all future licenses” and allocated spectrum separately “at a price determined through market related processes (auction/tender/bid);” provided “flexibility to operators to operate any or all segment of services;” and permitted spectrum pooling, sharing, and trading.²⁹⁴ In light of the new policy, and as per the orders of the Supreme Court, the government auctioned spectrum vacated because of the cancellation of 122 2G licenses in October 2012. However, the auction turned out to be a flop, largely because of a high floor price; the floor price was subsequently reduced in December 2012 by 30 percent to enable a re-auction by March 2013.

In the internet sector, issues of transparency in spectrum award first emerged with the Qualcomm case. According to Mr Ponappa: “Qualcomm India Pvt Ltd had won BWA spectrum in four circles, but DoT obstructed the actual award of spectrum using what appears to be frivolous arguments aimed at harassing Qualcomm. The motivation for this can only be guessed at.”²⁹⁵

Moreover, one of the winners in the BWA auction in 2010, which raked in an estimated Rs28 billion (far exceeding government estimates), was a relatively unknown company called Infotel Broadband Services Ltd—the only bidder to win the license/spectrum for services in all 22 circles of the country.²⁹⁶ Infotel paid US\$2.7 billion for the spectrum and the pan-India license. When the winners of the BWA auction were announced, Reliance Industries Ltd, hitherto having no broadband interests, said it would acquire 95 percent

292. Interview with Dr Mahesh Uppal, telecoms policy specialist and director, Com First (India) Pvt. Ltd, New Delhi, March 2012.

293. See http://www.dot.gov.in/as/Auction%20of%20Spectrum%20for3G%20&%20BWA/3G%20BWA%20presentation_for%20ITS_Dec%2012_final.pdf (accessed 26 May 2012).

294. Department of Telecommunication, “National Telecom Policy—6 June 2012,” 2012, at <http://www.dot.gov.in/ntp/NTP-06.06.2012-final.pdf> (accessed 8 December 2012).

295. Interview with Shyam Ponappa, consultant, columnist, and Distinguished Fellow at the Center for Internet and Society (Bangalore), New Delhi, April 2012. Finally, when Qualcomm got the spectrum almost two years after the auction, it sold a substantial stake in the BWA entities to Bharti Airtel, India’s leading private telecoms operator.

296. See <http://www.business-standard.com/india/news/infotel-secures-pan-india-bwa-spectrum-licence/397941> (accessed 26 May 2012).

of Infotel for just over US\$1 billion. A member of the family that owned Infotel, Anand Nahata, said to a television news channel: “When the bid prices started becoming high, we realized that we needed to talk to a strategic partner. So we were talking to Reliance somewhere in between the auction. So it’s not something which has happened in a day.”²⁹⁷

5.1.3 Competition for Spectrum

Outright hoarding of spectrum has been evident in the telecoms sector. In December 2010, after the CAG’s scathing report on the 2G scam, Tata Tele and Reliance Communications—CDMA licensees who received GSM licenses in 2007 after the government approved the dual technology regime—accused the older GSM operators of spectrum hoarding, a charge that the latter vehemently denied.²⁹⁸ However, the 2010 CAG report stated that certain mobile operators were allocated “excess” spectrum, over and above what should have been given them under the licensing policy.²⁹⁹ In November 2012, the Supreme Court directed the Central Bureau of Investigation (CBI) to go ahead and file a charge against companies that had allegedly been allocated excess 2G spectrum.³⁰⁰

A totally different mechanism of spectrum hoarding emerged when licensees did not roll out their services on time. Mr Ponappa explains this:

Another example of spectrum hoarding arose in the case of many license holders who were awarded spectrum along with their licenses in 2008—and never built any networks, and therefore never used any of the spectrum awarded to them. In effect, this resulted in depriving spectrum to other operators, who were entitled to it by virtue of holding a license (such as Tata Tele in Delhi), because there wasn’t sufficient spectrum to go around.³⁰¹

In some cases, when dual technology was allowed, certain CDMA operators were given GSM licenses (and, hence, spectrum) later than other favored ones. Apar Gupta, a media lawyer and partner in a New Delhi law firm, adds, “Going beyond mere opinion, even the 2G license judgment points that existing telecom incumbents took fresh licenses (in 2008) through dummy shell companies in order to gain more spectrum.”³⁰²

Data released by TRAI have consistently shown that telecoms operators overstate their total subscriber bases. In early 2011, for instance, while India’s mobile population was almost 800 million, only about 550 million were active subscribers—i.e. almost 30 percent of declared subscribers did not use their mobiles.³⁰³

297. See <http://www.reuters.com/article/2010/06/11/us-infotel-reliance-idUSTRE65A20Y20100611> (accessed 26 May 2012).

298. See <http://www.indiatoday.intoday.in/site/Story/121643/business/tata-rcom-protest-spectrum-hoarding.html> (accessed 26 May 2012); <http://www.financialexpress.com/news/vodafone-india-ceo-hits-back-at-tata-on-spectrum-hoarding/723281> (accessed 26 May 2012).

299. CAG Report, at http://www.cag.gov.in/html/reports/civil/2010-11_19PA/chap4.pdf (accessed 23 May 2012).

300. PTI, “2G: firms to face CBI charges for excess spectrum,” Livemint.com, 30 November 2012, at <http://www.livemint.com/Industry/95aWn3xDgF8qlxsVnPWsol/SC-clears-chargesheet-against-telcos-for-excess-spectrum-dur.html?facet=print> (accessed 10 December 2012).

301. Interview with Shyam Ponappa, consultant, columnist, and Distinguished Fellow at the Center for Internet and Society (Bangalore), New Delhi, April 2012.

302. Interview with Apar Gupta, lawyer and partner, Advani & Co., New Delhi, April 2012.

303. See <http://www.trak.in/tags/business/2011/03/08/indian-telecom-subscriber-growth-january-2011> (accessed 28 February 2012).

A subsequent GSMA study³⁰⁴ found mobile teledensity in India to be a mere 25 percent compared with TRAI's figures. This indicated spectrum hoarding—since spectrum over and above the minimum that is bundled with the licenses is allocated on the basis of subscriber base linked criteria defined by the DoT in March 2006.³⁰⁵ So, if an operator exaggerates its subscriber base, it can get more spectrum.

By September 2012, it was clear that India had a large number of inactive mobile users; while Reliance Communications shaved off 20.5 million people from its subscribers' list, three other operators—Bharti Airtel, Vodafone, and Idea!—collectively reduced their overall numbers by 5 million. TRAI tried to remedy the situation earlier when it stipulated that all mobile numbers unused for a specified period be sold to new consumers.³⁰⁶ Mr Gupta explains: “[With] the new TRAI stipulations, that SIMs that are inactive for more than six months will be subtracted from the current number of subscribers, the estimated drop in the number of mobile subscribers is expected to be in the tune of 200 million.”³⁰⁷

Like the 2G scam, there have been other instances of unfair spectrum allocation to favored private parties. One such case, now being probed by government auditors, is the ISRO scam, where the Indian Space Research Organization allegedly granted a multimedia company unlimited usage of the 70 MHz S-band spectrum for 20 years.³⁰⁸ The Union Minister of Communications and Information Technology, Andimuthu Raja, was subsequently charged and forced to resign.³⁰⁹

On the whole, we find unevenness in spectrum allocation that tends to be skewed toward the telecoms sector due to the rents it generates. However, in the telecoms sector, the policy has been tweaked to allow new operators (CDMA in 2003 and additional GSM ones in 2008) to get spectrum and also to provide excess spectrum to some existing players.

5.2 Digital Gatekeeping

5.2.1 Technical Standards

The adoption of technical standards for the various forms of transmission and compression involved in digital broadcasting and distribution has not been uniform. TRAI's Consultation Paper on Digitization of Cable TV in 2005 discussed the benefits of digitization, along with the timeframe, license, carriage and network

304. See <http://www.gsma.com/newsroom/wp-content/uploads/2012/12/Anne-Bouverot-India-Telecom-2012.pdf> (accessed 15 December 2012).

305. “Spectrum panel wants new allocation norms, auction,” *Times News Service*, 20 December 2007, at http://www.articles.economictimes.india-times.com/2007-12-20/news/28477712_1_allocation-norms-spectrum-allocation-mhz (accessed 26 May 2012). See also “Report of Committee to recommend revised subscriber-based criterion for allocation of spectrum,” 18 December 2007, at <http://www.hindu.com/nic/spectrum.pdf> (accessed 26 May 2012).

306. Arlene Chang, “Why falling mobile subscriber base is good for Indian telcos,” *Firstpost.com*, 17 September 2012, at <http://www.firstpost.com/business/why-falling-mobile-subscriber-base-is-good-for-indian-telcos-458726.html> (accessed 10 December 2012).

307. Interview with Satyen Gupta, Secretary General, NGN Forum India and formerly Principal Advisor, TRAI, New Delhi, December 2012.

308. See <http://www.hindustantimes.com/Another-scam-Auditor-probes-ISRO-s-S-Band-spectrum-deal/Article1-659631.aspx> (accessed 27 May 2012). In 2005, ISRO's commercial arm, Antrix Corporation, and a private firm, Devas Multimedia, signed an agreement allowing the latter unbridled use of 70 MHz of the scarce S-band spectrum for 20 years to launch its two satellites.

309. See http://www.rajeev.in/rajeev_writes/Telecom_Minister_A_Raja_hoarding_Spectrum_ISPs/july292010.pdf (accessed 27 May 2012).

upgrading, and other technical issues. Although TRAI recommended promoting the digitization of cable distribution, it left the option of Conditional Access System (CAS) digitization with the cable operators, since CAS can be implemented via analog or digital transmission, and costs involved for small networks could be very high.³¹⁰ This approach led to a lack of standardization in the push toward digitization, since Multiple System Operators (MSOs) and cable operators pursued different, potentially incompatible technologies.³¹¹

The lack of technical standards has been a big issue for DTH services and a subject of tremendous debate while being addressed by TRAI and the MIB. The DTH License Agreement of 2003 required STBs to be of open architecture (non-proprietary) to ensure technical compatibility and effective interoperability among different service providers.

In August 2010, TRAI issued a consultation paper after the implications of different compression, broadcasting, and encryption standards were realized. Currently, there is discussion as to whether the requirement of technical compatibility and effective interoperability among different DTH service providers needs to be continued, modified, or dispensed with entirely.

Table 26.
Technical standards of DTH services/networks

DTH service (promoter; commencement)	Transmission standard	Compression standard	Conditional access services (encryption)
Dish TV (Zee Group; 2003)	DVB-S	MPEG-2	Conax
DD Direct Plus (Doordarshan; 2004)	DVB-S	MPEG-2	No encryption
Tata Sky (Hathway-Tata-Star; 2006)	DVB-S	MPEG-2	NDS
Sun Direct TV (Kal Cables/SUN; 2007)	DVB-S	MPEG-4	Irdeeto
Reliance Digital TV (Reliance ADA Group; 2007)	DVB-S	MPEG-4	Nagravision
Airtel Digital TV (Bharti Telemedia; 2008)	DVB-S2	MPEG-4	NDS
Videocon d2h (Bharat Business Channel; 2008)	DVB-S2	MPEG-4	Irdeeto

Source: TRAI, “Technical Interoperability of DTH Set top Boxes,” 2010, Consultation Paper No. 11/2010, New Delhi, 20 August, p. 13.

In mobile television, although TRAI in 2007 debated technologies like Digital Video Broadcasting–Handheld (DVB-H) and Media Forward Link Only (Media FLO), standards were again left to mobile operators’ discretion,³¹² with a rider that the technology chosen be digital, proven to work,³¹³ and conform to standards issued by ITU, Telecom Engineering Center of India (TEC) or another body recognized by the government.

310. For advantages of analog CAS, see Richard Chamberlain, “Conditional Access: The Digital vs Analogue Debate—The analogue viewpoint,” *Indiantelevision.com*’s CAS Update, 18 December 2002, at <http://www.indiantelevision.com/headlines/y2k2/dec/dec95.htm> (accessed 12 May 2012).

311. See <http://www.icra.in/Files/ticker/Cable-TV-Dist-Ind-14022011.pdf> (accessed 5 June 2012).

312. TRAI opted in favor of technology-neutral regulation, in order to enable operators to keep abreast with the latest technological developments and not shut out any new potentially better technology. For TRAI recommendations on issues in mobile TV, see <http://www.trai.gov.in/WriteReadData/trai/upload/Recommendations/80/recom23jan08.pdf> (accessed 16 April 2012).

313. Proven means that the technology should have been in continuous use for over a year for a global customer base of over 50,000 and be permissible for use regardless of versions.

5.2.2 Gatekeepers

Issues that might be classed as gatekeeping problems include inconsistent functioning of the Electronic Programming Guide (EPG) across different DTH operators, the nonconformity to Unicode standards for display of Indian languages, and the selective bundling of channels by distributors of digital multiplexes (MUX) and CAS. There is presently no comprehensive and up-to-date EPG available that works equally well across all operators. Problems have been reported with EPG not being displayed for DD channels on DTH providers like Dish TV and Sun Direct.³¹⁴ Not conforming to Unicode12, available in all Indic languages, also plagues the broadcasting industry. However, technology experts and some broadcasters indicate that the adoption of technological standards per se is not difficult since they are well developed.³¹⁵

Digital multiplexes, MSOs, CAS, and DTH providers can select or bundle channels such as news and regional language channels,³¹⁶ or provide separate language feeds for one channel³¹⁷ and/or separate channels in one genre, for example, sports channels, or a bouquet of channels, usually from one broadcaster or network that cannot be separately subscribed to or downloaded. Bundling of channels has been typically based on several factors like channel popularity,³¹⁸ carriage fees paid by less popular channels to cable operators, type of programming, and bandwidth taken by the channel (channels with a higher bandwidth may be bundled with channels with a lower bandwidth).³¹⁹ Until à la carte pricing³²⁰ was made mandatory through a TRAI tariff order in July 2010, it was only possible to view certain news channels by subscribing to the entire range provided by that broadcaster. Though à la carte pricing has now become mandatory, allowing subscribers to choose specific channels, implementation has been delayed. Cable operators did not make prices for individual news channels available until the TRAI order, and DTH operators also made their à la carte pricing plans effective from February 2011.³²¹

To ensure a level playing field among service providers, TRAI brought out the Telecommunication (Broadcasting and Cable Services) Interconnection Regulation in 2004. This sought to ensure all private service providers treated one another in a non-discriminatory fashion with respect to carrying and providing television signals. However, this regulation only specifies non-discriminatory carriage of signals, and does not

314. Sun Direct and Dish TV allegedly beam DD channels directly from DD Direct+, which does not provide EPG. Other DTH providers use their own satellites to beam DD channels and provide EPG as well. See discussions in IndianDTHforum.com, at <http://www.saveondish.com/forum/e-p-g-on-dd-channels-t-25425.html> (accessed 5 June 2012).

315. Interview with Prof. Ashok Jhunjhunwala, Director of TeNet, IIT-Chennai, Chennai, January 2011; interview with K. Aravamudhan, Senior Manager–Regulatory Affairs, Star India, New Delhi, January 2011; interview with Appa Kuttie, Former Technical in Charge, Chennai Live, Chennai, January 2011.

316. For example, Tata Sky's Tamil Regional Pack in January 2011.

317. For example, Disney Channel is available in Tamil/Hindi/English/Telugu feeds, and users have the option to switch feeds.

318. Clubbing high-popularity channels with less popular channels.

319. Interview with K. Aravamudhan, Senior Manager–Regulatory Affairs, Star India, New Delhi, January 2011.

320. The viewer is given the price of every channel and has the option of choosing the channels that he/she wants to view instead of taking a whole package.

321. See <http://www.dth.co/342/tra-orders-dth/>; <http://www.dth.co/448/tata-sky-channel-pricing/>; <http://www.dth.co/437/videocon-d2h-channel-pricing> (accessed 5 June 2012).

have a must-carry clause—for instance, distributors are not mandated to carry any specific channels (besides specified public broadcasters’ channels) as long as they treat channels from all sources equally.

5.2.3 Transmission Networks

Unlike broadcasting and telecoms, where the government has a presence via public-sector companies, it has historically not operated cable networks, leaving it largely to private operators. In the only exception, the Tamil Nadu government started a cable distribution company, Tamil Nadu Arasu Cable TV Corporation Ltd (hereafter Arasu Cable), in 2007 to weaken Sumangali Cable Vision (SCV), the leading Tamil Nadu cable company, as the Chief Minister of the ruling Dravida Munnetra Kazhagam party (Dravidian Progress Federation, DMK) had fallen out with the SCV proprietors—his relatives.³²² However, their relations improved, and the state-owned Arasu Cable was allowed to go defunct, which adversely hit many operators and consumers who had switched to it.³²³ When DMK’s political opponent, the All India Anna Dravida Munnetra Kazhagam (All India Anna Dravidian Progress Federation, AIADMK) came to power in the state in 2011, it re-launched Arasu Cable in a bid to hit back at SCV, which was owned by senior DMK leaders.

5.3 Telecommunications and Cable Operators

Intense competition in this sector has resulted in more options being available to viewers as rival cable and DTH companies compete to offer packages and channels. Despite possible conflicts of interest between distributors and rival television networks, news availability has by and large not been interfered with by major MSOs and DTH operators. But not so with local cable operators (LCOs), especially those relaying their own mix of live and prerecorded programming—often termed “ground-based channels.” Common across India, many pipe out news as well, which gains further significance when these entities are politically aligned: while the old city of Hyderabad has 4TV and Ruby TV,³²⁴ a radical variant is NaMo TV in Gujarat, entailing numerous LCOs aligned with the ruling regime relaying similar content across many cities.

5.3.1 Telecoms and Media Content

The role of telecoms companies in the broadcasting and distribution of media, especially television, content is expanding. Some, such as RCom and Airtel, have made major forays into the DTH segment distribution through subsidiaries. There is also the case where parent companies of telecoms operators—for instance the the Tata Group which owns two telecoms companies—co-own a DTH service, Tata Sky.

322. See http://www.twocircles.net/2007aug09/tamil_nadu_government_own_cable_tv_distribution_unit.html (accessed 5 June 2012).

323. See <http://www.livemint.com/2009/07/22230103/A-year-on-Tamil-Nadu-govtrun.html> (accessed 15 April 2012).

324. Most notable are channels like 4TV and Ruby TV oriented toward one religious community, and Jai Sri Ram oriented toward another—all run by local politicians. Interview with Dr Padmaja Shaw, Professor, Department of Communication and Journalism, Osmania University, Hyderabad, April 2012.

Table 27.

Sister concerns of telecoms operators involved in content distribution

Group entity	Telecoms (mobile 2G/3G)	Broadcasting (C&S)	TV distribution (DTH)	TV distribution (IPTV)
Reliance	✓	✓	✓	✓
Airtel	✓	—	✓	✓
Tata	✓	—	✓	—
Central government	✓	✓	✓	✓

Source: TRAI (various)

One can argue that because parent companies of mobile/DTH operators have minority stakes in news broadcasters (such as Aditya Birla Group’s Idea Cellular Ltd in the TV Today Network, and Reliance ADA Group’s RCom in Bloomberg India—see section 6.3.1) and because mobile firms have emerged as one of the leading television advertisers, they have an additional impact on the distribution of media content.

5.3.2 Pressure from Cable and Telecom Operators on News Providers

With the increased vertical integration among companies involved in cable television distribution and MSOs and the comparatively fragmented last-mile operations, TRAI’s Interconnection Regulations (2004) served as a mechanism to ensure private operators did not indulge in anti-competitive behavior by trying to influence prices, content exclusivity, or carriage of channels of rival entities.

Increased competition among cable and telecoms operators has been beneficial for viewers in terms of how they can receive news channels. But some cable operators have unfairly blocked channels that carried programming not in the interests of their owners. For example, cable operators in Telangana threatened to black out Andhra channels that carried stories against a campaign for a separate state of Telangana to be carved out from the existing state of Andhra Pradesh.³²⁵ Except for Raj News and HMTV, all other news channels including such reports were blacked out.³²⁶ In 2006, cable operators in Kashmir stopped beaming all satellite channels under pressure from militants, who claimed the programs were “indecent.”³²⁷

Kanwar Sandhu, head of the Day and Night News channel in Punjab, confirmed that whenever their channel telecast something detrimental to the ruling political party it faced pressures—such as blocking of its relays, blackouts, faulty transmission, or muting of volume—from Fastway Transmissions Pvt Ltd, the leading MSO in Punjab.³²⁸ Fastway Transmission Ltd, whose ownership structure is unclear but is believed to be controlled

325. A campaign for creating a separate state for the Telangana region by breaking away from the southern state of Andhra Pradesh, at <http://www.greatandhra.com/viewnews.php?id=27138&cat=15&scat=16> (accessed 15 April 2012).

326. See http://articles.timesofindia.indiatimes.com/2011-02-22/hyderabad/28625047_1_cable-operators-news-channels-gemini-news (accessed 15 April 2012).

327. Militant outfits claimed that the channels promoted obscenity and vulgarity in Kashmiri society, and were indecent from the point of view of conservative Islam, at http://articles.timesofindia.indiatimes.com/2006-05-14/india/27805162_1_cable-operators-entertainment-channels-militant-outfits (accessed 15 April 2012).

328. Interview with Kanwar Sandhu, CEO of Day and Night News, Chandigarh, January–February 2011.

by Punjab's ruling regime through proxy stakes, has over the years marginalized rival cable distributors in that state, including major national MSOs like Hathway and Zee Group's WWIL.

Sun TV Network's subsidiary Sumangali Cable Vision (SCV) has a virtual monopoly over cable distribution in Tamil Nadu, ensuring some control over news shown there. An instance where this effective monopoly worked against a rival is the case of Zee Group's attempt to launch a Tamil channel in 2001. Zee TV claimed it faced many hurdles in reaching consumer homes as the cable distribution was controlled by SCV, an affiliate of its potential rival Sun TV. Zee TV was more successful in 2008 when it had more distribution options.

5.4 Assessments

India is perhaps the only large, lucrative, and growing communication market where administrative ministries have full powers to discard any recommendations of a regulator like TRAI (see section 7.2.2). However, after the Supreme Court cancelled 122 2G mobile licenses, there is growing pressure on ministries to adhere to TRAI's recommendations. Since the institutional design of the regulator empowers it to only make recommendations on spectrum, as with other decisions, it is WPC's SACFA that allocates spectrum on advice from the DoT and its other committees. Such an institutional framework creates conditions for politicization and favoritism in spectrum allocation.

The regulator does follow a system to get input from all sections of society and integrate this into the policymaking process. However, its recommendations are sometimes accepted only in a piecemeal fashion by the government, the 122 2G mobile licenses in 2008 being a case in point. In other cases, the regulator shied away from giving concrete recommendations, as in TRAI's Interconnection Regulation of 2004 that mandated a non-discriminatory—and not a must-carry—clause for distributors of television signals. Finally, the executive sometimes puts pressure on the regulator to change its recommendations.

Nevertheless, policymakers, regulators, and courts have generally equated maximization of either subscribers or government revenues as tantamount to public interest. The maximization of subscribers approach encouraged the overstating of subscriber numbers and the hoarding of spectrum—the latter also aided by a nexus of politicians, bureaucrats, and businesses. The attempt to maximize government revenues led to high tariffs and lower subscriber bases in the first decade of commencing mobile services; prices crashed when the initial auction regime was done away with and more operators entered the market in the mid-2000s. But after moving back to an auction regime in 2012, there are concerns that prices will slowly start creeping upwards.

At the moment, spectrum regulation is not under pressure to even engage with the public interest. For instance, the first step of defining the objectives of telecoms, private radio, terrestrial television, and community radio policies is always articulated in terms of access to the general public, particularly in rural areas.³²⁹

329. For instance, all licensing and other policies use terminologies of citizens as well as consumers, while community radio policy talks about benefits to communities. The NTP-99 mentions, "Availability" of affordable and effective communications for the citizens is at the core of the vision and goal of the telecom policy.

However, the next step, that of spectrum allocation, disregards these principles: no allocation considerations articulate concerns specifically related to the public interest. Government communiqués on spectrum allocation, especially in the context of internet/telecoms, deal mostly with factors like pricing logic and commercial potential. Unless inquiries such as those by the CAG get attention, information on the granting of licenses and spectrum is difficult to access in full detail, and hence is unavailable to consumer groups and experts for questioning and analysis.

On the face of it, telecoms spectrum regulation seems to reflect positive indicators, such as a widening diversity of licensees, growing size of companies, increasing numbers of subscribers/viewers, and periodic checks on tariffs. But several issues still need to be addressed.

First, the belief that spectrum must be allocated for exclusive use to each telecoms operator, leading to fragmented spectrum in narrow bands (mean spectrum holding is 5.5 MHz per operator compared with international trends of nearly 22 MHz),³³⁰ runs contrary to the approach of shared spectrum. Second, the belief that more competition is better has resulted in 12 or more licensees of spectrum (i.e. telecoms operators) in some mobile telecoms circles in India, compared with international trends of three or four operators per territory. This is seen as detrimental to the competitive milieu and wider welfare, as some estimates suggest maximum welfare at three or four operators, and diminishing thereafter.³³¹ A large number of licensees have resulted in spectrum allocated per operator in India being on average less than a quarter of that held by operators elsewhere, which reduces the capacity of their networks to carry more data.³³² Third, the problem lies in applying a criterion used only in India of maximizing traffic per MHz of spectrum per unit area—rather than maximizing traffic between all users with the available spectrum in a given area, or for all users covered by an operator (i.e. providing a sufficiently large band of spectrum so networks will have fewer transmission towers while carrying more traffic).

The combination of these three factors has made spectrum allocation inappropriate, since it has resulted in telecoms operators competing to corner spectrum for its own sake, with ineffective traffic carrying capacity, because of fragmented bands and too many operators. But it must also be borne in mind that when there were limited numbers of mobile spectrum holders, before licenses got unconventionally dished out in 2008, there were several instances of cartel-like behavior evident in pricing services like SMS.³³³

Two principal initiatives in the spectrum regime address widening access and narrowing the digital divide. One is the Universal Service Obligation Fund (USOF), created with a portion of private operators' fees, to

330. David Lewin, Val Jervis, Chris Davis, and Ken Pearson, "An assessment of spectrum management policy in India," Plum Consulting, London, December 2008, at http://www.plumconsulting.co.uk/pdfs/Plum_Dec08_Spectrum_management_policy_India.pdf (accessed 15 April 2012) (hereafter Lewin et al., "An assessment of spectrum management policy").

331. Lewin et al., "An assessment of spectrum management policy."

332. Marten Pieters, CEO of Vodafone in India, remarked that while 1 MHz of spectrum is used to serve 45,000 customers in London, it serves 350,000 in New Delhi: Surajeet Das Gupta, "India has too many players—Q&A: Marten Pieters, CEO, Vodafone Essar," *Business Standard*, 16 February 2011, at <http://www.business-standard.com/india/news/qa-marten-pieters-ceo-vodafone-essar/425316> (accessed 15 April 2012).

333. For example, the cost of an SMS for an operator is 5 paise, but every operator was charging Rs1, "This is not a scam. It's a crime. Punish the guilty. Get back the money," *Tehelka*, 7(48), 4 December 2010, at http://www.tehelka.com/story_main48.asp?filename=Ne041210Coverstory II.asp (accessed 25 May 2012).

fund expansion of infrastructure in rural areas and often commercially non-viable areas—a process whose burden is carried by public-sector telecoms operators. The second is the roll-out obligation, whereby spectrum assignees are to provide services in a time-bound manner in their territories, especially in smaller towns and district headquarters, as an integral part of their award of spectrum and license. However, such initiatives are by no means consistent and the government has full discretionary powers to withdraw, modify, or distort them.

Public interest has played a limited or little role in the allocation and regulation of white spaces; neither is there mention of white spaces in the NFAP 2011, nor have civil society organizations addressed this question, though some academics have started engaging with it.³³⁴

Of the digital dividend comprising around 100 MHz in the 700 MHz band, half is currently used by DD for terrestrial broadcast and half by defense and other government agencies. Since digitization of terrestrial transmission of DD entails a period of simulcast in the public interest (see sections 2.1.2 and 7.1.1), the broadcaster can release its spectrum only at the end of its switch-over, around 2017. The release of defense spectrum is dependent upon BSNL building an optic-fiber cable (OFC) network as a substitute for the spectrum released. Despite this, the DoT has been pushing for the quick release of the digital dividend; though details and mechanisms of allocation are still unspecified, all indications are that the DoT will use it, or at least part of it, for commercial deployment of 4G services in a service-agnostic manner—to maximize its price and charges—and hence presumably will go along with the Supreme Court's suggestions on the auction route. Trade bodies argue that because a future broadband network (LTE, or Long Term Evolution, marketed as 4G) ideally needs 2x20 MHz bands of spectrum, some of the digital dividend should be allocated to wireless broadband in the public interest—especially to aid rural access where such an approach will prove advantageous to a cost-effective network roll-out.³³⁵

But elsewhere, rural beneficiaries do not have such high-profile advocates. In community radio (CR), where the process of spectrum regulation is complicated, the number of radio stations is low and the number of frequencies per license area (100 km) is low (three frequencies).³³⁶ When the MIB released its Community Radio Policy in 2006, it stated that there was potential for more than 5,000 stations. As the number of private, commercial FM stations increases and expands into smaller towns—cumulatively bringing higher rents for government through revenue share with these stations—the number of frequencies available to CR stations may find themselves in conflict, unless SACFA gives due emphasis to the public interest scope of the latter. Activists feel that there is much scope for improvement in promoting CR through increased spectrum allocation, thereby enabling additional licenses for each service area, or a reduction in the size of service areas because of the limited reach of CRs.³³⁷

334. See http://www.ee.iitb.ac.in/~karandi/pubs_dir/Technical%20Briefs/IITB_proposal_TV_White_Space.pdf (accessed 10 December 2012).

335. "2.6 GHz Band Vital for the Growth of LTE According to GSMA Backed Research," 13 January 2010, at <http://www.mobilebusinessbriefing.com/articles/2-6-ghz-band-vital-for-the-growth-of-lte-according-to-gsma-backed-research/11126/> (accessed 28 September 2012).

336. Interview with Ramnath Bhatt, co-founder of Maraa, a media and arts collective in Bangalore, February 2012.

337. Interview with Sajan Venniyoor, former General Secretary, Community Radio Forum, New Delhi, January 2011; interview with Ramnath Bhatt, Bangalore, March 2011.