

Draft for comments and corrections by participants

## **Report on Expert Forum: Broadband Policy and Regulation Conducive to Access by the Poor**

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## Introduction

LIRNE*asia* is undertaking a multi-phase, research- and documentation-based regional initiative funded by the Ford Foundation to inform and engage decision makers and stakeholders in India (Telecom Regulatory Authority of India, the Department of Telecommunications, Ministry of Information and Broadcasting, senior executives from operators, senior academics and civil-society leaders) about good practices in policy and regulatory issues affecting broadband access. The intention is to promote learning among governments and other stakeholders and the facilitation of a policy discourse that takes into account the interests of the poor. The project will be carried out by a series of short courses and structured conversations whereby Indian policy makers and stakeholders are assisted to evolve solutions to problems keeping broadband from the many, influenced by learnings from similarly situated countries.

The Expert Forum on Broadband Policy and Regulation Conducive to Access by the Poor was organized by LIRNE*asia* as a first step in launching the Ford Foundation funded project. This was a small interactive event to gain insights from experts including regulators and policy makers from India, Hong Kong, South Africa and Bhutan. The topics covered included regional specificities of broadband development, contributions that could be made to an improved investment environment by licensing policies, the opportunities presented by the “digital dividend” repurposing of frequencies for broadband development and metrics to assess efficacy of broadband policies.

One of the main purposes of initiating this project with an Expert Forum was to lay out the foundation by engaging and consulting decision makers and stakeholders about what they deem to be regulatory priorities and critical challenges in taking Broadband to the poor. Subsequently the project would focus on these critical issues in order to ensure that the capacity building courses and research are conducted with the priorities of the regulators in mind.

This document summarizes the presentations and discussions of each session and presents the conclusions and recommendations of the Expert Forum. Further information, such as the agenda, the presentation slides and contributing documents are attached as an annex.

### **The participants of the Expert Forum were:**

Dr Rahul Khullar (Chairman, Telecom Regulatory Authority of India (TRAI))

Sudhir Gupta (Senior Advisor, Telecom Regulatory Authority of India (TRAI))

William Stucke (Councillor, Independent Communication Authority of South Africa (ICASA))

Danny Lau (Director of Regulatory Affairs, Office of the Communications Authority (OFCA), Hong Kong)

Lakshuman Chhetri (Chief Information and Media Officer, Bhutan Info Comm and Media Authority (BICMA))

Ugyen Tshewang (Finance Officer, Bhutan Info Comm and Media Authority (BICMA))

Aslam Hayat (Centre Director, Pacific ICT Regulatory Resource Centre, Fiji)

Dr Alison Gillwald (Executive Director, Research ICT Africa, South Africa)

Dimitri Ypsilanti (Previously Head of the Telecommunication and Information Policy Section, OECD)

Shyam Ponnappa (Distinguished Fellow, Centre for Internet and Society, India)

Satyen Gupta (Secretary General, NGN Forum, India)

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Roshanthi Lucas Gunaratne (Senior Researcher, LIRNEasia)

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## Session 1: Regional Specificities of Broadband development

Dr. Rohan Samarajiva set the stage for the Expert Forum in the opening session by giving an introduction to Broadband business models and requirements for its development. He discussed the success of mobile telephony in connecting the poor and how it has enabled millions of poor people to engage in tasks normally associated with the Internet such as information retrieval, payments, and remote computing. The summary of his presentation and discussion follows:

It is important to understand the business model that enabled impressive gains in voice connectivity, as widespread broadband access among the poor is likely to be achieved by extending this model. It would also be the basis of coherent and effective policy and regulatory responses.

Voice connectivity was achieved for a majority of the world's people, including substantial numbers of the poor, because governments removed or lowered barriers to participation in the supply of telecom services and created conditions conducive to competition, even if that competition was less than perfect. Where multiple suppliers existed, intense competition occurred—the critical step in implementing the budget telecom network (BTN) model. For example in 2011 India had an HHI<sup>1</sup> of 0.1381, Pakistan an HHI of 0.2233 and Bangladesh an HHI of 0.3009. Another condition which influenced the development of the BTN model was the rapid growth of the Indian and Chinese voice markets that led to lower network equipment and handset costs.

The radically lower prices attracted more minutes of use, which, in turn, made further reductions possible. Operators were able to load their networks with high volumes of revenue-yielding minutes because they had succeeded in reducing the transaction costs of dealing with large numbers of customers who generate small amounts of revenue. Prepaid, which reduces transaction costs and also accommodates the needs of those with irregular earning patterns, was a critical element. Due to this Budget Telecom Network (BTN) Model, the total cost of mobile use has drastically declined in developing countries compared with developed countries.

If we try to learn from the success of voice telephony, Broadband Success will depend on extending the BTN model. But broadband also requires adequate investment, applications that people find useful (including entertainment), easier-to-use interfaces and improved literacy skills. In order to extend the BTN model to broadband, International backhaul prices must come down and pricing flexibility is essential.

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<sup>1</sup> The Herfindahl–Hirschman Index is a measure of the size of firms in relation to the industry and an indicator of the amount of competition among them. According to US DoJ Horizontal Merger Guidelines HHI of 0.1500-0.2500 indicates moderate concentration

One negative aspect of the BTN model is fluctuating quality due to congestion. Therefore it is necessary to monitor QoSE and ensure truth in advertising. But hard regulation should not be used, as this might cause marginal customers to be deemed not profitable.

The other requirement for broadband penetration is demand-side stimulation. Governments can stimulate demand by encouraging entrepreneurship and innovation in the m-applications space, freeing up government data for application developers, support for local languages, and introducing targeted literacy programs.

### **Discussion:**

The discussion commenced with the possibilities of innovative business models which can be used in implementing FTTx<sup>2</sup> in order to ensure that high quality broadband can be accessed by the poor. It was noted that India is planning on laying out fiber at the village level, using their Universal Service Funds. India is only planning on FTTB for big buildings in cities, as fiber to individual homes is not feasible currently. But it was also noted that in some regions of Africa, Fiber to the home (FTTH) does exist. In Africa by using fiber and digital subscriber line access multiplexers (DSLAM) that are already existing for commercial purposes, the incremental cost of providing 10Mbps has become inexpensive enough to make it feasible. This could possibly be a model that can be considered by India. A hybrid solution was also discussed where fiber will be taken to a main exchange in the city/village and then copper would be used from the exchange to the home. In order to reduce the cable installation costs, it was suggested to take advantage of construction of sewers, pipelines, roads and lay fiber at the same time.

The necessity for such high speed links as provided by FTTH was also discussed. In Rome and Ireland there had been a lack of demand for FTTH links of 100Mbps. Therefore the consumer needs and requirements should be taken into consideration before network roll-out. While the demand for high speed data may not be currently high in India, it may grow with the proliferation of smart phones, therefore it is necessary to provide scalable infrastructure.

It was noted that in Office of the Communications Authority (OFCA) Hong Kong, does not over-regulate the broadband sector. They let the commercial players decide. Soft forms of regulation or self regulation is practiced, and they believe that it has enabled high broadband penetration in Hong Kong.

In some countries like Pakistan in order to improve broadband access, availability of electricity has to be taken into account. Therefore, Pakistan used USF to fund alternative energy sources to power Base Transceiver Stations (BTS). In this case the problems of theft of energy sources and the need for community buy-in were discussed in order to ensure that the equipment is protected.

The importance of security issues related to telecommunication services was mentioned in the concluding remarks of this session. Current practice of copying identification cards/ passports etc to purchase SIMs can lead to identity theft. For example a Pakistani person who bought two SIMs later found out that he owned 82 SIMs. The retailer had used his identity card to issue 80 other SIMs. Currently identification requirements are for security and to avoid terrorism, but in some cases, can cause identity theft. Considering its importance it was noted that if the telecommunications sector

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<sup>2</sup> A generic term for any broadband network architecture using optical fiber to replace all or part of the usual metal local loop used for last-mile telecommunications. The term is a generalization for several configurations of fiber deployment. For example, FTTN (fiber to the node), FTTB (fiber to the building), FTTC (fiber to the curb), FTTH (fiber to the home) etc.

ignore security concerns, some other unrelated department may take over it, and that there was a necessity to look at evidence and find more efficient methods of doing it.

The group suggested that we should also study net neutrality and include a section in the paper.

## **Session 2: Licensing to support the growth of Broadband**

The second session was on licensing policies supportive of broadband rollout, and was presented by Aslam Hayat. Effective policy and regulation in licensing is critical to the promotion of the interests of the poor and their participation in the digital world through the Internet.

Aslam commenced his presentation by explaining the different types of licensing available, such as technology specific licensing, service specific licensing and more recently introduced unified licensing which is both technology and service neutral. India has unified only access licenses, whereas Nigeria has unified all types of licenses. He also described the different licensing models, such as vertical/ horizontal, national/ regional, individual/ class etc. The main message was that the nature of the license does not matter, if the objective is to provide modern telecommunication services at affordable prices and there are no biased exclusions, any structure will do as long as people's necessities and country's specifics are taken into account. A summary of his presentation follows:

In the ICT sector there is a growing consensus that in the absence of demand for scarce resources, freedom to entry should be unrestricted and the market should be allowed to decide the number of players. However, in case of scarce resources the number of players should be limited only by the availability of the resource and in the case where demand exceeds supply, market methods should be adopted to allocate the resource. The regulator and government should also consider the market in order to decide the optimal number of players. For example in case of mobile licenses many countries are of the opinion that four is an optimal number both in terms of healthy competition and viability of business. In Pakistan and Bangladesh fifth and sixth operators remain struggling. It is a similar situation in both India and Indonesia as well.

The main licensing principles to follow are neutrality, simplification, flexibility, non-discrimination, adoption open market entry policies, detachment of spectrum from operating license, permitting spectrum trading, permitting vertical separation, and encouragement of infrastructure sharing.

The importance of exit regulations was highlighted as it would give confidence to new entrants, keep telecom sector's growth and viability and ensure that inefficient players are allowed to vacate space for efficient players.

Shock and awe policies are counter-productive for businesses especially where sunk costs are involved. It is extremely important for both new entrants and existing operators to be able to predict how the regulatory regime will grow or evolve in the next few years. The operators need assurance that the terms and conditions of their licenses will not be adversely changed without their consent.

There are two schools of thought on extending coverage of broadband: one believes that no roll-out obligation is necessary as demand and competition will take care of it, the other

believes in order for universal coverage, roll-out obligations are necessary. In Bangladesh, in the absence of roll-out obligations mobile phone penetration reached 98% in 15 years, whereas in Pakistan, a country five times larger than Bangladesh reached 85% penetration in less than three years with roll out obligations. Therefore, it seems that rollout obligations accelerates the process. Country's priorities would determine the path it would follow out of the two options but one fact remains, in the first option, uneconomical areas may be left un-served forever but may be served in the second option.

World over, broadband service providers advertise broadband speed that is often higher than actually experienced by the user. A report from the UK's Ofcom found that only 20 percent of customers live close enough to a telephone exchange (3.2 kilometers) to receive 8 Mbit/s from an advertised 8 Mbit/s connection. This issue has emerged and some governments have begun to respond. The Czech government has asked that service providers offer actual achieved speed that is, over the long term, not less than 80 percent of the advertised speed<sup>3</sup>. In its recommendations to member countries, the OECD advises<sup>4</sup>, that Governments should discourage harmful business conduct and practices such as misleading advertising.

Regulators need to create awareness about broadband services and packages. Transparency in the billing needs to be ensured and licensees should be bound to have honest advertisements or at least it should not be misleading.

#### **Discussion:**

The discussion was led by Danny Lau from Office of the Communications Authority (OFCA) Hong Kong. He started by giving an introduction into the licensing practices of Hong Kong. He said that OFCA practices pro-competition and pro-consumer, light-handed and market-driven licensing policies. He mentioned that they had no regulatory barriers for market entry and exit (market entry and exit are considered as pure commercial decisions of operators). The only condition at exit is that the operator must ensure that all customers have been migrated to other operators before exit.

Their licensing is technology neutral, with no foreign ownership restrictions, and there are no pre-set limit on the number of licenses to be issued unless there is a constraint, e.g. radio spectrum, no minimum requirement on investment, no deadline for licence application, and applicants are required to submit only minimum necessary information for licence application. Spectrum is acquired via an auction, and it cannot be resold, unless the company is sold along with the resources.

Currently, Hong Kong has 6 active retail service providers (voice + data). There is no significant market player (SMP).

Hong Kong requests the operators to voluntarily publish their standards of broadband / QOS every quarter. It is requested to publish the actual results vs target. (at least service standards like time to answer phone, time to respond etc.)

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<sup>3</sup> Building broadband: Strategies and policies for the Developing World by Yongsoo Kim, Tim Kelly, and Siddhartha Raja

<sup>4</sup> Broadband Growth and Policies in OECD Countries, 2008

## Session 3: Opportunities presented by the 'Digital Dividend' for Broadband development: Lessons from South Africa

The digital switchover, whereby spectrum previously allocated to broadcasting is reallocated in the context of gradual transition to digital TV broadcasting, is a critical element of any contemporary spectrum management plan. The opportunities afforded by the digital switchover were presented by Dr. Alison Gillwald, taking the South African experience as a case study. Alison commenced her presentation by giving an overview of the Digital Terrestrial Television (DTT) transition. A brief overview of the specific frequencies that will be released, technologies and organizations involved in the digital transition in South Africa was then presented along with the roadmap of the South African Development Community (SADC) for digital switchover which has set a deadline for the region as Dec 2013, even though the deadline set by ITU is 2015. The summary of her presentation follows.

The prime spectrum around 700MHz and 800MHz bands are particularly suitable for the deployment of high-speed wireless broadband services using technologies such as LTE and 4G. This is also the spectrum currently used by Analog Television. If the digital dividend is realized it would bring about many opportunities for broadband growth including the spurring of new competition in the broadband market. It will drive down prices and improve market penetration.

Demand for additional spectrum in sub-Saharan Africa is likely to be even greater than in high-income countries in the short term owing to the phenomenal mobile growth in Africa. Wireless and mobile broadband only supplements wireline broadband in developed countries, whereas it is the primary means of access to the Internet in developing countries including Africa.

The GE-06 Plan was defined by ITU for Europe and Africa for the digital transition. The basis of the DTT standard should be based on the GE-06 Plan in order to ensure equitable access to spectrum in all the countries in the region, and efficient use of spectrum.

Even though the Ministerial Digital Broadcasting Task Team was established in 2000, there were many delays including ICASA issuing an invitation to apply for 2.6 and 3.5 GHz spectrum in 2009/2010 where they mentioned that the granting method would follow an auction approach but timelines and details of the process were excluded from the Invitation to Apply. ICASA was criticized for this unorganized process, due to which the entire auction process was withdrawn, and there is still no movement in 2012.

Other than delays in the issuing of spectrum the issuing of government-subsidized set-top-boxes is also a long process. The tender for set-top-boxes closed on the 14<sup>th</sup> September 2012, and now it needs to be evaluated and awarded. Contracts with successful companies must be negotiated after which the manufacturing of the 5 million government-subsidized STBs would commence. All this would take around 6–9 months. Then the government-subsidized STBs need to be distributed to the South African Post Office, from where they can be bought. At the same time it is required to design and implement the means based subsidy programme to determine which people receive subsidized STBs and conduct media campaigns to educate the public about the benefits of digital television.

Overall the main lessons gained from the South African DTT transition experience are:

- The need to view migration from convergence perspective

- Importance of weighing efficiency of spectrum as basis for allocation against the public interests and ease of television access.
- Commit resources to necessary institutions in order to ensure capacity to manage commercial process
- Try to limit unintended consequences by creating an enabling, flexible rather than controlling environment
- The digital dividend can only be realized at the end of the period when both digital and analog televisions are simultaneously transmitted (simulcast).

The main take away from this session was the requirement of a coordinated and integrated approach between all stakeholders including the regulatory authorities, operators and government is necessary for a successful DTT transition.

**Discussion:**

The discussion was led by Shyam Ponnappa who started the discussion by highlighting the importance of spectrum sharing, and how the importance was only realized after the proliferation of smart phones which created the data Tsunami. 700 MHz has been the automatic band for spectrum sharing because it's been freed up due to the digital dividend; he also mentioned the possibility of sharing other bands.

The purpose of the DTT is to free up spectrum but government's are losing focus and are trying to support local manufactures in the process which is creating other complications and dependencies, as in the case of South Africa where they are trying to export set top boxes in order to use the revenue to subsidize the set top boxes provided to the people. For costs of equipment to come down there needs to be a lot of uptake, India and China need to get on board, similar to the way costs came down in the mobile sector.

Singapore has announced their first test beds, previously it has only been UK and US, so countries do not have much experience in this area.

One of the drivers and benefits of digital television is the availability of interactive functions, and the possibility of having additional channels. In Hong Kong there's no demand for the interactive functions via the set top box due to the high penetration of Internet and the public using the Internet to replace the television. On the other hand, some countries access the Internet through the television. For example Belgium has the highest access of Internet through the television.

The possibility of using the return channel for Internet access was also discussed for India, since most people already have a television, but then the problem is who will pay for it. Release of a further 500MHz of spectrum by 2017 is also an element of the draft National Telecommunications Policy being currently discussed in India.<sup>5</sup>

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<sup>5</sup> <http://convergence.in/blog/2012/03/08/tra-ai-on-national-telecom-policy-supports-voip-sharing-active-passive-infra-mvno/>

## Session 4: Indicators - Measuring the performance of ICT/ Telecom policies

Roshanthi Lucas Gunaratne presented the paper on indicators. Her talk was on the current ITU method of estimating the number of Internet Users in a country, its weaknesses, and an evidence based method of estimating the number of Internet users. She also touched on existing indicator definitions and the importance of demand side measurement. A summary of the presentation and discussion is as follows:

The ITU relies on National Statistics Organizations (NSOs) and National Regulatory Authorities (NRAs) to provide data in response to questionnaires. The data collection itself poses shortcomings due to the various methodologies used to collect the same indicator and often the lack of reliable data sources.

The presentation focused on improving the measurement of 'proportion of individuals using the Internet'. This indicator was chosen, partly due to the challenges of arriving at accurate and realistic estimates in the absence of up-to-date, representative survey data from countries. It is also a base indicator that is used in composite indices such as the IDI (ICT Development Index), NRI (Network Readiness Index), Digital Economy Index (previously e-readiness Index) and KEI (Knowledge Economy Index). Errors in such base indicators ripple through the system causing significant errors in composite indicators, and should be minimized.

There are significant shortcomings in the current method of estimating the proportion of Internet users in countries where demand-side data are unavailable. In the absence of demand-side surveys, governments calculate the proportion of Internet users based on the number of subscriptions and a multiplier, which leads to unrealistic values as exemplified by the anomalous position of Afghanistan being credited with 1,000,000 Internet users, despite having only 2,000 fixed Internet subscriptions. The reported number of subscriptions is also often inaccurate.

A new method was proposed, which uses the readily available income and education components of the Human Development Index (HDI) to define a new index that will provide a more accurate estimate of the proportion of individuals using the Internet. A regression analysis of Internet users per 100 and the new index for countries where demand-side surveys had been conducted showed a strong correlation between the two. Using these data, a model was derived which enables the estimation of the proportion of individuals using the Internet given the income and education level. This evidence based estimation method can be used in the absence of demand side surveys instead of arbitrary multipliers provided by country administrations. If national circumstances justify higher numbers, that should be supported by a demand-side survey.

This method operationalizes the principle that demand-side data is first best and therefore suggests including representative survey results from regional research organizations such as RIA, even if they are not identical to the results provided by the country administrations. It also removes the most egregious uses of high multipliers and the problems of accurately estimating the total subscriptions in a country. It is based on income and education levels which have been considered by many researchers as the main drivers of Internet use.

**Discussion:**

The discussion was led by Dmitri Ypsilanti and Satyen Gupta. Dmitri started off the discussion by giving an overview of supply-side data and their use in the OECD. He then went on to discuss the fact that while survey data was currently the best way to estimate the number of Internet users, it too can be problematic. Some of the issues with survey data are:

1. It covers only households, and the definition of a household is not consistent and can vary from country to country.
2. Surveys are conducted at different times of the year/ different years therefore are not comparable. They too need to be manipulated in order to ensure that the data is for a specific year. This is especially problematic as surveys are very costly and are infrequent. For example in Hong Kong surveys are done every 10 years and in the years a survey is not conducted a specific growth rate is used, which is currently 1.4.
3. The results depend on how they are conducted (face-to-face, over the phone etc) and how the respondent understands/ answers the question.

Dmitri also mentioned the importance of using supply side data such as number of subscriptions and how that can be politically sensitive as many broadband plans define subscription targets to be reached as way of measuring the achievement of the plan. It was mentioned that the supply-side data may be more useful from a regulatory and policy point of view while demand-side data maybe more useful from a socio-economic/ marketing point of view, therefore that both types of data are important for different reasons.

The question was raised – Why is this indicator useful? The group finally agreed that this indicator was useful not only due to the fact that ITU used it to measure IDI and other indices, but for developmental purposes due to the fact that the Internet can enable many underprivileged people to learn about the world, for example Khan Academy enables a little child who cannot afford classes to understand new subjects. The number of Internet users is also important for businesses, especially when it comes to marketing, for telecom operators to understand whether there is space for a new entrant, for e-development initiatives and for the government to understand whether making services available online would be useful.

Satyen gave an overview of the structure of Indian regulatory bodies, and the stakeholders. India has many agencies that estimate and report on the number of Internet users, even though the exact methodology used is unclear. All of them (e.g. TRAI, the Planning Commission) report on and quote the figures provided by the operators. Internet and Mobile Association of India (IAMAI) counts Internet enabled SIMs used at least once a year (approx 100 million users). Indian Government reports the number of subscribers and not users. To derive users they use 4.5 as the multiplier because it is the average size of an Indian family.

The discussion was closed with suggestions of relevant indicators to measure for India, in order to assess the growth of broadband penetration.

1. Number of laptops and computers
2. Number of dongles
3. Number of fixed Broadband connections
4. Number of data enabled SIMs + data packages
5. Number of subscriptions to data services
6. Data enabled SIMs with only occasional Internet use (?)

7. How many Mbits go out of the country
8. Facebook users
9. How much data is being carried by the data network

## **Concluding Session: Broadband Regulatory Priorities**

The Expert Forum on Broadband Policy and Regulation Conducive to Access by the Poor was concluded by the panel session on Broadband Regulatory Priorities which was chaired by William Stucke. He gave an overview of ICASA and South African regulatory priorities.

He described ICASA performance metrics including the 5 year plan with targets and objectives. India's performance management system was discussed and it was noted that According to NTP 2012 broadband should be a right for Indians but there is no target date by when this should occur.

Countries comparable to India were discussed. TRAI uses Brazil and South Africa as benchmarks as they are geographically large countries with high populations. South Africa currently benchmarks against Malaysia and Korea. 20 years ago Korea and South Africa were similar in income and telecom penetration. So South Africa is studying the Korean transition. China was also considered as an appropriate comparator for India, due to similarities in population.

The expert forum concluded with a summary of the takeaways from the presentations as follows:

It is necessary to reinvent the broadband business model in a similar way to mobile so that the overall cost is lower and it is appropriate for people with uneven earning patterns, rather than the 'all you can eat' model currently used for broadband.

The importance of FTTx in order to ensure high quality, high speed broadband access was also discussed. Since the cost of fiber is significant, it is important to implement a system to coordinate infrastructure changes and have all operators share the cost and include all their fibers.

Appropriate licensing policies are critical to ensure high penetration of broadband, and some of the areas that regulators should focus on are to give confidence to new entrants by introducing exit regulations; encourage cost-oriented infrastructure sharing, regulate wholesale tariffs and introduce regulations with adequate safeguards to ensure that valuable resources are fully utilized and that operators are not 'sitting' on valuable spectrum.

By studying the South African experience in transition to digital television, and the delays caused, it can be seen that a coordinated and integrated approach between all stakeholders including the regulatory authorities, operators and government is necessary for a successful DTT transition. It is also important to note that only at the point of digital switch over can the digital dividend be realized.

Discussion on the new method of estimating number of Internet users was lively and interesting. It was concluded with the agreement that the section on broadband discourse should be much broader including, indicators on quality and speed.