

**Research, capacity-building, advocacy and dissemination by LIRNEasia**  
**Advancing evidence-based policymaking and regulation in the emerging Asia-Pacific to  
ensure greater participation in ICTs (Phase II)**

**Final technical report**

**19 July 2010**

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\*LIRNEasia is a regional ICT policy and regulation think tank active across the Asia Pacific. It is incorporated as a non-profit company under Sri Lankan law. It is currently primarily funded by the International Development Research Centre of Canada ([www.idrc.ca](http://www.idrc.ca)) and the UK Department for International Development (DFID). Additional information is available at [www.lirneasia.net](http://www.lirneasia.net)

IDRC project number: 104918-001

IDRC Project Title: *Research, capacity-building, advocacy and dissemination by LIRNEasia: Advancing evidence-based policymaking and regulation in the emerging Asia-Pacific to ensure greater participation in ICTs (Phase II)*

Countries: Afghanistan, Bangladesh, Bhutan,<sup>1</sup> India, Indonesia, Malaysia,<sup>2</sup> Maldives, Mongolia<sup>3</sup>, Nepal,<sup>4</sup> Pakistan, Philippines, Singapore,<sup>5</sup> Sri Lanka, Thailand.

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<sup>1</sup> Benchmark research only

<sup>2</sup> Benchmark research only

<sup>3</sup> TRE study only

<sup>4</sup> Benchmark research only

<sup>5</sup> Benchmark research only

## Abstract

LIRNEasia is a regional ICT policy and regulation think tank active across the Asia Pacific. Its mission is to *improve the lives of the people of the emerging Asia-Pacific by facilitating their use of ICTs and related infrastructures; by catalyzing the reform of laws, policies and regulations to enable those uses through the conduct of policy-relevant research, training and advocacy with emphasis on building in-situ expertise.*

The research, capacity-building, advocacy and dissemination programs carried out by LIRNEasia over the 2008-10 period built on previous WDR [World Dialogue on Regulation for Network Economies] and LIRNEasia research and capacity-building initiatives between 2006 and 2008<sup>6</sup> and is described in this Final Technical Report.

The activities supported under the project comprised of four inter-related **research** modules, five **capacity-building** modules, and three **advocacy and dissemination** modules. Capacity building and advocacy/dissemination draw from research; research is assisted by the relationships established through capacity building.

Much of LIRNEasia's research in this cycle was based on the idea that the mobile will be the primary device through which the "bottom of the pyramid" (BOP) in emerging markets (such as the ones that LIRNEasia works in) engages with the Internet, or the tasks normally associated with the Internet such as information retrieval, payments and remote computing. The research, specifically the Teleuse@BOP3 and Mobile2.0@BOP studies have allowed LIRNEasia to contribute hard evidence to support this idea, which many appear to be simultaneously subscribing to. The Teleuse@BOP3 research showed considerable advancements in connectivity at the BOP, with mobile service becoming a "necessity" in these markets. The Mobile2.0@BOP studies of mobile use beyond voice indicated that there is much scope for the delivery of other services through the mobile such as pension payments, mobile commerce, etc to BOP markets but certain cross-cutting challenges for policymakers and regulators (spectrum, mobile payment guidelines, etc as well as operators (ensuring services are relevant and affordably priced) lie ahead. Key recommendations made based on this research appear to be resounding with industry, though it is too early to see concrete results as yet.

The Indicators research (continued from the 2006-2008 research cycle) has generated mechanisms for generating better indicators of ICT sector and regulatory performance important underscoring the importance of evidence-based policy making. The second telecom regulatory environment (TRE) assessments (based on perception) appear to be successfully reflecting reality, and have gotten the attention of regulators in countries with high as well as low TRE scores. The survey of National regulatory agency (NRA) websites has similarly caught the attention of NRAs, even leading one NRA to redesign its website based on the scoring mechanism. The objective benchmarking activities (mobile price, international voice, international roaming, broadband price and quality) have led to successful policy interventions as well as adoption of LIRNEasia's basket methodology for price comparisons by the ITU and the changing of misleading advertisement campaigns by broadband providers.

The Capacity building program has continued to generate good results, with the successful hosting of the CPRsouth3 and CPRsouth4 conferences and associated young scholar tutorials, with each conference yielding higher quality papers than the previous year, according to survey responses of paper reviewers. Knowledge mapping activities indicate that participants are active in either the academic or policy sphere, suggesting that the conference is succeeding in its goal of developing in-situ policy intellectuals within the region.

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<sup>6</sup> See <http://www.lirneasia.net/about/annual-reports/> as well as previously-submitted technical reports.

In addition to CPR*south*, the program included capacity building among NRA, national statistical-organization (NSO) staff and non-governmental, non-private sector actors who can influence the policy reform process in countries. This effort has already yielded results (e.g. an article from a (previous non-expert) journalist trained at a training courses being able to influencing his country's regulator to investigate licensing decisions through his writing). .

In addition to increased coordination between units, collaborations among the three south-based units of LIRNE.NET (LIRNEasia, RIA!<sup>7</sup> and DIRSI)<sup>8</sup> have facilitated cross-regional knowledge transfer through teaching activities, conference/workshop participation, as well as a DIRSI researcher interning at LIRNEasia for six months and the successful launch of the now annual CPR*afrika* conference.

The advocacy and dissemination component comprised three modules, the first being continuation of the successful rapid response program, where six interventions were made over the period, and recommendations being adopted in at least two of them. The second module, a general dissemination module include direct communication with the primary audiences of policy makers, regulators, senior managers of relevant companies, and opinion leaders and communication with them through the changing of their symbolic environment constituted by the media. LIRNEasia research has been disseminated at over 75 events, and received significant media coverage on its research and activities in the countries it works in. The third module was a summative conference, attended by over 180 international and local participants, including regulators, policymakers, industry, civil society, media and other stakeholders, which brought together the activities and achievements of LIRNEasia's first five years.

*Keywords: Asia, evidence-based policymaking, ICTs, capacity building, policy research, regulation.*

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<sup>7</sup> <http://www.researchictafrica.net>

<sup>8</sup> <http://dirsi.net/en>

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## 1.0 Research Problem

The Asia-Pacific is one of the most dynamic regions of the world economy. Yet, South Asia, an important sub-region within the Asia-Pacific, is home to the world's largest concentration of poor people and includes many countries that rank very low in ICT sector performance. Throughout the region there are many countries that offer high-priced and low-quality ICT services to their people and have within them extremely weak or inept policy and regulatory systems. Basic reforms, such as allowing multiple suppliers to participate in markets that government-owned monopolists have manifestly failed to serve, have been done slowly and partially, if at all.

The relationship between ICTs, growth and poverty alleviation is a complex one that has been discussed in LIRNEasia's first book, in addition to work by recent writers.<sup>9</sup> The purpose of the research conducted under this project not being that of advancing knowledge in this domain, further discussion of these writings is not undertaken. The purpose of this project was the advancement of evidence-based policy making and regulation through an integrated program of research, capacity building and advocacy. The research was of an applied nature. It rested on the conclusion, supported by the above literature, that the contribution of ICTs to economic growth and poverty alleviation is a positive one. The overall research program aimed to contribute to, and advance, knowledge in applied areas such as the trajectory of the mobile as a mode by which those at the Asian BOP will enter the Information Society. Even apparently non-research activities such as capacity building through the vehicle of CPRsouth were implemented as research projects seeking to advance knowledge in how knowledge work is done and scholarly networks sustained under less-than-ideal conditions.

Throwing technology by itself, ICT or otherwise, at the problems faced by those at the Asian BOP within these countries is ineffective. Improvements in institutional structures, policy making, and regulation are needed for technologies and new services to be useful and sustainable.<sup>10</sup> LIRNEasia seeks to address these improvements through research, training and advocacy, focusing its efforts on a number of countries in the emerging<sup>11</sup> Asia-Pacific. By the end of this project, LIRNEasia had broadened its research to the entirety of South Asia (eight countries), the nations of the original ASEAN (five countries) as well as Mongolia.<sup>12</sup> The core set that LIRNEasia works in<sup>13</sup>, contains some of the fastest growing telecom markets in the world, among the most populous and containing the largest numbers of the unconnected (see Figure 1). It also includes the world's largest concentration of poor people.<sup>14</sup> All of the Asia-Pacific comes within the scope of its capacity-building activities, and indeed some capacity-building and dissemination activities serve those outside the Asia-Pacific as well.

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<sup>9</sup> Samarajiva, R. & A. Zainudeen (eds.) (2008), *ICT infrastructure in emerging Asia: Policy and regulatory roadblocks*, New Delhi & Ottawa: Sage and IDRC, Introduction; and recent writing such as Waverman, L., M. Meschi, and M. Fuss (2005). "The impact of telecoms on economic growth in developing countries," paper presented at TPRC. <http://web.si.umich.edu/tprc/papers/2005/450/L%20Waverman-%20Telecoms%20Growth%20in%20Dev.%20Countries.pdf>

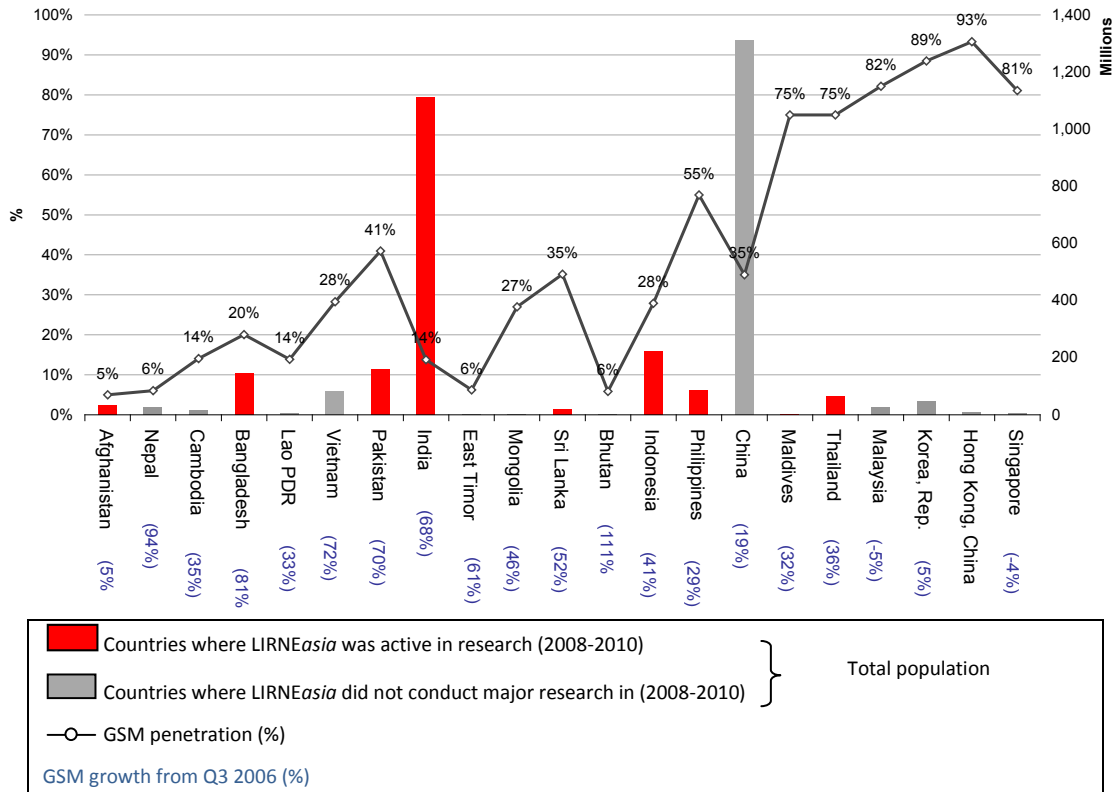
<sup>10</sup> For a comprehensive discussion see, Samarajiva, R. & A. Zainudeen (eds.) (2008), *ICT infrastructure in emerging Asia: Policy and regulatory roadblocks*, New Delhi & Ottawa: Sage and IDRC, Introduction.

<sup>11</sup> The term "emerging Asia Pacific" is defined pragmatically as countries in the region with per-capita GDPs below Malaysia.

<sup>12</sup> Although the research in two of these five countries is limited to secondary data collection under the mobile and broadband benchmarks areas of work.

<sup>13</sup> I.e., conducts the larger research components in.

<sup>14</sup> China and Vietnam are not included because of the difficulties of fully engaging with these countries which are outside the legal and administrative cultures and the relationship networks of the present group of researchers at LIRNEasia and because we have not yet identified high-quality



**Figure 1: Population, GSM penetration and GSM growth since end September 2006 for selected Asian countries (2007)**

Sources: Informa Telecoms and Media (2008); World Bank (2008)

LIRNEasia’s mission is “to improve the lives of the people of the emerging Asia-Pacific by facilitating their use of ICTs and related infrastructures; by catalyzing the reform of laws, policies and regulations to enable those uses through the conduct of policy-relevant research, training and advocacy with emphasis on building in-situ expertise.”

For the past five and a half years, LIRNEasia has engaged in a concerted and focused program to achieve its mission, bootstrapping itself into a credible player in the ICT policy and regulation space in the Asia-Pacific region, extending beyond its comfort zone of India and Sri Lanka to the totality of the newly expanded membership of the South Asian Association for Regional Cooperation (SAARC) that now included Afghanistan and three large and influential founding members of the Association of South East Asian Nations (ASEAN). It has extended its research coverage from five countries (in 2005) to 11 by the start of this project in 2008, to 14 by the end of the project in 2010,<sup>15</sup> with a much broader coverage being achieved in capacity-building actions.

The core mission of LIRNEasia can be restated in terms of advancing evidence-based policy making and regulation in the ICT sector. Our work which includes short-term and opportunistic advocacy actions as well as long-term capacity-building actions that build on a foundation of timely and relevant research conducted across multiple countries intends to both improve sector and regulatory performance and

<sup>15</sup> Although the research in some of the countries is limited to secondary data collection under the mobile and broadband benchmarks areas of work.

create an exemplar of good governance for other sectors. Our research problematizes each of these terms and will in fact help advance understanding of each of them.

Among the essential infrastructure sectors, ICT infrastructure is the one where barriers to participation have been reduced the most. Partially as a result, it is also the sector where improvements in performance are most visible, in terms of wider access, lower prices, improved quality and greater choice. The resulting improvements in many economic value chains in society and the effects, generally positive, on the polity and society of improvements in ICT performance justify weight being given to improving evidence-based policymaking and regulation and, thereby, further improving sector performance.

The activities supported under this project comprised four inter-related **research** modules, five **capacity-building** modules, and three **advocacy and dissemination** modules. Capacity building drew from research; research was assisted by the relationships established through capacity building. Advocacy and dissemination drew from research as shown in Figure 2. The research modules were organically integrated: Mobile 2.0@BOP drew from both the results of Teleuse@BOP3 on “more-than-voice” teleuse at the BOP and from supply- and demand-side data generated by the Indicators module. The emphasis placed on fixed and mobile broadband quality of service derived from the greater importance that attaches to quality of service as people try to use the mobile phone for more-than-voice applications.

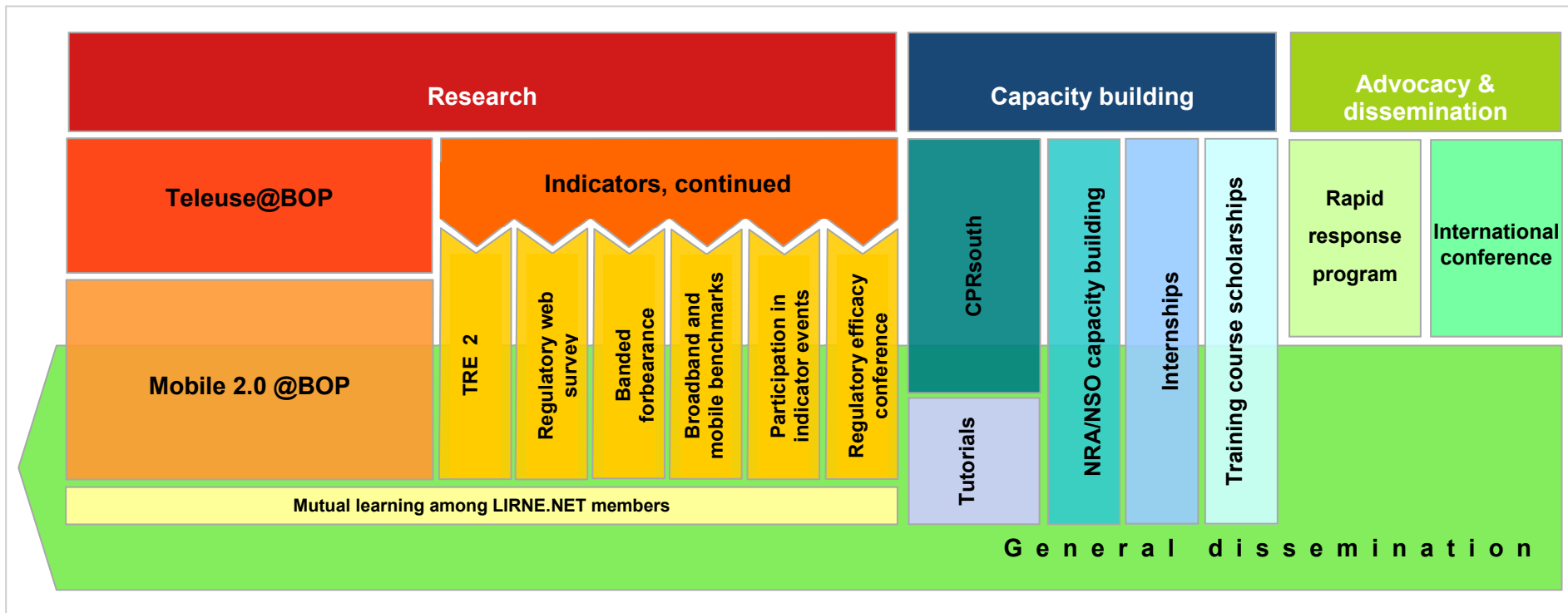


Figure 2: Advancing evidence-based policymaking and regulation in the emerging Asia Pacific to ensure greater participation in ICTs: Research, capacity building and advocacy by LIRNEasia

## 2.0 Objectives

The overall objective of this project was the advancement of evidence-based policymaking and regulation in the emerging Asia-Pacific to ensure greater participation in ICTs in the context of a more integrated world economy. The objectives of the three components were as follows:

1. To conduct a research program that comprised four inter-related modules that would lay a foundation for advancing evidence-based ICT policy and regulation, including creating greater awareness of BOP-friendly policy actions by government, regulators and operators (Research Component)
2. To establish the conditions to facilitate the creation and sustenance of in-situ policy intellectuals (Capacity-building Component) ; and
3. To disseminate the output of all activities in multiple ways to different audiences capable of influencing reform, including carefully targeted rapid-response interventions and new-media presence (Advocacy and Dissemination Component).

The objectives of the sub-components are given below, with an assessment of the fulfillment of these objectives (For specific outputs, please refer Section 5.0). The degree of fulfillment of objectives in relation to the outcome map for the project are also provided in Table 1 which follows. The outcome mapping for this cycle was done in early 2008, when monitoring and evaluation capacity within the organization was minimal. With a better understanding of the evaluation process, outcome mapping and LIRNEasia's mandate we now see some gaps in our earlier thinking. Given an opportunity we could have done a more accurate outcome map but decided not to for consistency reasons. One obvious improvement we could have done is to emphasize that LIRNEasia expects policy and not implementation outcomes. Nevertheless, the outcome map (along with an assessment of the fulfillment of objectives is provided as Table 1.

### 2.1 Teleuse@BOP3

1. Conduct of household survey on teleuse among the BOP, with focus on Mobile2.0 usage and teleuse by expatriate workers, in five countries previously studied, including the implementation of the diary-based study and focus groups (lagged) as with Teleuse@BOP2.
  - 1.1. Six country study of ICT use among BOP men and women (new country added: Bangladesh) among 11, 090 BOP teleusers. Study explored trends since 2006, Mobile2.0 uses and teleuse among expatriate workers. Quantitative module included household survey with 1 week diary placement to capture usage patterns. Qualitative module conducted to further investigate findings from the quantitative module. See Annexes 1-5 for research papers based on the data collected; Annex 6 for qualitative component report; Annexes 10-12 for survey questionnaires and discussion guides and Annex 104 for methodology details.
  - 1.2. Findings have been disseminated at events held in India, Sri Lanka (see Annex 15 for participant list) and Bangladesh, as well as through multiple interviews (See Annex 99 for media coverage), press releases (Annex 16 and 17), articles and papers (See Annexes 1-5).

### 2.2 Mobile2.0@BOP

1. Explore how the bottom of the pyramid population in emerging Asia are starting to use mobile 2.0 services and what policy changes would facilitate these applications, through eight "vertical" studies (focusing on applications and services) and five "horizontal" studies (focusing on the policy and regulatory conditions necessary). The specific studied identified were:
  - 1.1. The issuance of licenses for service provision and frequencies (horizontal)
    - 1.1.1. Completed (See Annex 60)
  - 1.2. Interface between telecom and banking regulation(horizontal)
    - 1.2.1. Completed (See Annex 57)
  - 1.3. Mobile Number Portability(horizontal)

- 1.3.1. Completed (See Annex 64)
- 1.4. **Spectrum refarming process (horizontal)**
  - 1.4.1. This was not done because the researcher requested for a change of the scope to study a more relevant Mobile 2.0 application and the change was agreed after internal discussion; instead, a study into the potential use of mobile payments in the public transport system (vertical) was done (See Annex 59).
- 1.5. **New conception of frequency use (horizontal)**
  - 1.5.1. This was not done because there were concerns regarding the scope and the relevance of the study to emerging Asia; after extensive internal discussion, a study on the challenges of operationalizing the real-time Biosurveillance Program's m-Health Survey (vertical) was done in its place using input from the Biosurveillance project (separate IDRC-funded project); this study was only partially funded under the Mobile2.0@BOP project funds; remaining funds came from the Biosurveillance project funds (See Annex 65).
- 1.6. **The growth, forms and regulatory problems of domestic and international mobile payments: Philippines (vertical).**
  - 1.6.1. Completed (See Annex 63).
- 1.7. **Freedom of expression issues pertaining to dissemination of customer-requested SMS. Indonesia, Pakistan or Thailand (vertical).**
  - 1.7.1. Completed (See Annex 61)
- 1.8. **Business models for delivering mobile value-added services: Buzz City, India and Thailand (vertical).**
  - 1.8.1. Completed (See Annex 55).
- 1.9. **Identifying conditions for delivery of successful m-government services to the BOP: India (vertical).**
  - 1.9.1. Completed (See Annex 62).
- 1.10. **The interplay of information over mobiles, payments and logistics: Bangladesh (vertical).**
  - 1.10.1. Completed (See Annex 54).
- 1.11. **Identifying the conditions for use of mobiles for disaster warning in a public-warning model: Maldives (vertical).**
  - 1.11.1. Completed (See Annex 56).
- 1.12. **Mobile 2.0 agricultural applications appropriate for farmer needs, building on work done in 2006-07: India and Sri Lanka (vertical).**
  - 1.12.1. Completed (See Annex 58), however, the scope was slightly changed; please refer Section 4.2.1 for full explanation.
  - 1.12.2. Findings have been disseminated through events held in Pakistan (see Annex 81 for meeting report), India and Sri Lanka (See Annex 83), as well as multiple media interactions and news releases (see Annexes 74-79 for news releases and Annex 99 for media coverage).

## 2.3 Indicators continued

- 1. To use the TRE (Telecom Regulatory Environment) assessment tool as method of benchmarking regulatory performance across countries, to benchmark broadband prices and mobile prices (voice/SMS, international calling, international roaming) across countries, and to use all these benchmarks/data as an input into research and as an input into policy interventions.
  - 1.1. TRE studies were done in 10 countries, 8 reports were published with the last two currently in draft format (See Annexes 18-25 for the 8 final reports; and Annex 26 for the penultimate draft of the 9<sup>th</sup> (Afghanistan) paper; the 10<sup>th</sup> (Mongolia) paper is not submitted at this point as it is undergoing review). Findings disseminated to regulators, policy makers and media



through events in Thailand, Philippines and India and received wide media coverage (see Annexes 41-43 for participant lists and Annex 99 for media coverage); results used extensively in various other public forums and in capacity building activities; A cross-country synthesis paper written on the methodology and presented at international academic conferences (see Annex 30). The TRE Manual (which gives detailed instructions to researchers on how to conduct a TRE survey) developed, updated and shared with sister researcher network RIA (and used in their 2009/2010 work).

- 1.2. Broadband and mobile price benchmark reports published every six months (twice a year, in February and September). Reports circulated to NRAs prior to publishing each time. Significant price movements reported to media or discussed on the online blog; International price benchmarks used in policy interventions (e.g. to get the South Asian Regulators to call for reducing intra-region calling prices; see section 7.3.2.2).
- 1.3. An Asian Indicator Database developed and populated with 10 years of indicator data (See Annex 36); However attempts to get NRAs to populate and use the database has not been successful so far and this will be abandoned in future work.
2. To organize an conference to advance knowledge in reliable methods of assessing regulatory performance with hopefully beneficial effects on the further development of the TRE instrument.
  - 2.1. Conference organized for 35 invited scholars and practitioners was held from 26-27 February 2009, in Hong Kong, in collaboration with the University of Hong Kong (See Annex 41 for participant list and Annex 41a for conference agenda).
3. To compare and benchmark websites of regulatory agencies so that they begin to view the websites as a tool in good regulation.
  - 3.1. A survey of 31 NRA websites in the Asia Pacific region was done using an updated methodology (Annex 35)
  - 3.2. Findings were disseminated via media (print and online) as well as various policy forums. including the 2008 June Expert Forum on ICT Indicators in Singapore where 8 SAARC regulators responded to the methodology and findings (See Annex 37).
4. To use indicator data to develop new methodology for tariff regulation in the mobile sector so that day-to-day regulatory activities can be done differently.
  - 4.1. A new research methodology (called "Banded Forbearance") was developed; Method has been published in a peer reviewed journal (see Annex 29)
5. Develop a software application to measure fixed broadband quality, build a website that hosts a database of broadband quality data input by the voluntary testers and bring together leading technology/solutions providers, operators and researchers to develop a robust methodology and identify specific indicators to measure mobile-broadband QoSE.
  - 5.1. A fixed broadband test tool (AT-Tester) was developed; it can be downloaded from [www.broadbandasia.info](http://www.broadbandasia.info) along with its source. The same site hosts the quality information database which a volunteer tester can input data. A user can generate customized reports to obtain a snapshot of the quality of the widely used broadband packages in the cities/countries that have been included in system. Mobile broadband test tools for four mobile operating systems were developed.
  - 5.2. In addition, the methodology was modified to measure mobile broadband quality. The first version of software that can test broadband quality was developed and a first round of (beta) testing was conducted. Further work to be carried out in the next research cycle, given high level of interest and opportunity for impact.
  - 5.3. Results of the fixed broadband testing used in 2 policy interventions (one in India, one in Bangladesh; see section 4.5.1).
6. To hold a conference on

## 2.4 Capacity building

1. Conduct two CPRsouth conferences, in December 2008 and December 2009; cultivate university relations in terms of hosting the conferences; hold board meetings as part of each conference.
  - 1.1. CPRsouth3 Conference held in Beijing, China in December 2008 (See Annex 84), including young scholar tutorials (See Annex 91) and Board meeting (See Annex 94).
  - 1.2. CPRsouth4 Conference held in Negombo, Sri Lanka in 2009 (See Annex 85), including young scholar tutorials (See Annex 92) and Board meeting (see Annex 95).
2. Identify researchers and teaching staff as well to track the academic and policy activities of the past conference participants through knowledge mapping exercises.
  - 2.1. Survey of participants and young scholars from the first three CPRsouth conferences as well as the related tutorials was conducted to investigate the post conference academic and policy activities of the conference and tutorial participants. See Annex 89 for the outcome survey findings and Annex 88 for draft evaluation report.
3. To train young scholars on the policy process and on how to bring research into the policy process through the provision of up to 30 scholarships in each CPRsouth conference (15 young scholars from the country/region where CPRsouth conference is being held and up to 15 young scholars from outside the host country)
  - 3.1. Twenty nine scholarships were awarded to young scholars to attend CPRsouth3: 15 young scholars were from China and 14 were international (a fifteenth international young scholar was selected, but was unable to attend). See Annex 91 for scholarship holder details.
  - 3.2. Twenty seven scholarships were awarded to young scholars to attend CPRsouth3: 14 young scholars were from Sri Lanka and 13 were international (further 2 selected but were unable to attend due to logistical and personal reasons). See Annex 92 for scholarship holder details.
  - 3.3. After discussions with IDRC January 2010, thirteen scholarships were awarded to young scholars from the Asia Pacific to attend tutorials in research methods, basics of infrastructure economics and communication strategies held alongside the International Communication Association 2010 conference, Singapore in June 2010. See Annex 96 for scholarship holder details.
4. Provision of internships amounting to 10 intern-months per year, for two years.
  - 4.1. A total of 5 internships were awarded for the period, amounting to 20 intern-months in total: Aileen Aguero (6 months), Priyanwada Herath (6 months), Pratiche Joshi (5 months), Il-haam Petersen (2 months) and Haymar Win Tun (1 month).
5. To increase the capacity of national regulatory authorities (NRAs) and national statistical organizations (NSOs) so that they may improve their data collection methods and be inclined to use benchmarked data in their decision making or policy formulations.
  - 5.1. A 1.5 day workshop on ICT sector indicators and benchmark regulation for NRAs and NSOs held in Singapore in June 2008 (see Annex 37 for meeting report and Annex40 for participant list). All of LIRNEasia's indicator work presented and discussed at the meeting.
  - 5.2. A five day training program (Measuring ICT Access and Use by households and individual) co-organized by LIRNEasia and the ITU was held in Bangkok in 2009. Program was attended by over 25 representatives of NRAs, 16 of whom were sponsored by LIRNEasia and come from countries we work in. Demand-side data collection was the topic See Annex 38 for meeting report).
  - 5.3. Helani Galpaya invited to represent Asian indicator data at the ITU's annual ICT Indicator Meeting in Cairo in 2009 (this is ITU's flagship even on indicators, attended by senior regulators from across the world, including the countries LIRNEasia works in).
  - 5.4. Rohan Samarajiva held discussions with the Chairman of the Telecom Regulatory Authority of India about the need to improve indicator data collection in the sector
6. Scholarships to support participants to attend two LIRNE.NET training courses.

- 6.1. 17 scholarships were provided to applicants from academic and research institutes, media and civil society organizations for the 12<sup>th</sup> Executive Training Course “Connectivity and Convergence” held in Singapore in June 2008 (see Annex 90 for scholarship holder details).
- 6.2. 13 Scholarships were provided to journalists and mid and senior level staff of regulatory agencies, civil societies and NGOs for the Executive Training Course “Connectivity and Convergence: Alternative Regulatory Strategies” held in South Africa in April 2010 (see Annex 93 for scholarship holder details).

## 2.5 Advocacy and dissemination

1. **Training LIRNEasia researchers to communicate in ways that will be effective with media**
  - 1.1. Training session on communicating research effectively through the media held for researchers in May 2008.
2. **Conduct of media interactions (facilitated by professional communication consultants where applicable) to disseminate LIRNEasia research**
  - 2.1. LIRNEasia has had significant interactions with the media (print as well as electronic) over the period. Eleven press releases were issued over the period, dissemination events were held where media were invited, in addition to numerous interviews with print and electronic media being given (See Annex 99 for media coverage). Articles and advertisements showing research findings have also been strategically placed in local newspapers to reach target audiences. See Annex 99 for full media coverage.
  - 2.2. Given the significance of India, as well as the difficulties in navigating the Indian media, a communication consultant was commissioned to facilitate interactions with Indian media. More than 50 media stories carried in Indian media over the period. Similar assistance was retained in Bangladesh since this was the first time LIRNEasia was reaching out to media in that country in a large scale. As a result, significant media coverage (in print and television) was received on our research and the dissemination even held in Dhaka. See Annex 99 for full media coverage.
3. **Actively engage in getting our research findings into Wikipedia in at least ten subject headings and comments in at least five active and relevant blogs.**
  - 3.1. Minimal activity completed at the time of reporting.<sup>16</sup> Activity not completed due to time constraints among researchers. The task of creating Wiki pages for LIRNEasia’s projects, activities, and research areas has been assigned to a research fellow in May 2010. The assignment is ongoing.
  - 3.2. LIRNEasia’s research papers have also been uploaded to the SSRN [Social Science Research Network] portal to improve visibility of its research (e.g., LIRNEasia papers make up 9 of the 19 search results for the search terms “telecom” and “Asia”<sup>17</sup>). Paper download statistics are contained in Annex 98.
  - 3.3. The LIRNEasia blog is regularly updated with research outputs in all forms (papers, presentations, colloquia discussions) in draft as well as final form. See Section 6.3.6.4 for usage statistics on our blog.
4. **The making of a documentary video to document T@BOP3 research results and to more effectively communicate them**
  - 4.1. Instead of a single documentary video, 7 mini-teleuser profiles (less than 3 minutes each) were made, reflecting different aspects of teleuse by the BOP in several countries. It was thought that this would be more useful as they can be used as a part of a presentation,

<sup>16</sup> [http://en.wikipedia.org/wiki/Quality\\_of\\_service\\_experience](http://en.wikipedia.org/wiki/Quality_of_service_experience)

<sup>17</sup> <http://papers.ssrn.com/sol3/results.cfm?RequestTimeout=5000000>, 30 June 2010.

rather than in place of a presentation (which would be the case if one single longer documentary was made as in Teleuse@BOP2). See <http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/>

5. The commissioning of a documentary photographer to document the the use of Mobile 2.0 services by the BOP
  - 5.1. An exhibition of photographs reflecting mobile use at the BOP was displayed at LIRNEasia's 5<sup>th</sup> anniversary conference. Instead of commissioning a photographer, existing photographs from the Internet (with necessary fees paid and permissions obtained, though most were free of charge) was used (See Annex 104). The collection is now on permanent display at LIRNEasia's office premises as well as online: <http://www.flickr.com/photos/lirneasia/galleries/72157623224575717/>
6. Participation in international and regional conferences, workshops and dialogues that will serve to broadly disseminate LIRNEasia research.
  - 6.1. LIRNEasia has presented its research at over 75 events over the grant period. See Annex 100 for a full list of event participation by LIRNEasia.
7. Continuation of Rapid response program
  - 7.1. Six rapid response interventions were made over the period. See Section 4.5.1 for details.
8. International conference to consolidate the learnings of the first five years of LIRNEasia research and the dissemination thereof among influential peer organizations, partners and key consumers of LIRNEasia research.
  - 8.1. The 5<sup>th</sup> year anniversary conference was organized and hosted in Colombo in December 2009, with participation of over 160 persons (policy makers, regulators, industry representatives, researchers, academics, media among others). Eighteen (18) presentations of LIRNEasia research were made. See Annex 103 for full conference report. For five year review see Annex 102.

## 2.6 Mutual learning among LIRNE.NET members

1. A meeting be organized to explore opportunities of mutual learning and collaboration among the constituent entities of LIRNE.NET; a follow-up meeting involving a greater number of researchers with minimum of five researchers to also be organized
  - 1.1. Meeting between the LIRNE.NET members (LIRNEasia, RIA! and DIRSI) held in Ottawa (organized by IDRC) in June 2008, following double panel of LIRNE.NET member researchers at ITS 2008 conference (leading to a DIRSI researcher joining LIRNEasia for a six month internship, see 1.2).
  - 1.2. Follow up meeting between LIRNE.NET members held in April 2009 following 13<sup>th</sup> LIRNE.NET training course in South Africa.
  - 1.3. DIRSI researcher Aileen Aguero completed a six month internship at LIRNEasia; in addition to two research papers being written by the researcher (including replication of econometric model used for DIRSI findings), , benchmarking methodologies were compared between the two regions.
  - 1.4. Quantitative assistance was provided by RIA researcher Christoph Stork for Teleuse@BOP3, leading to several statistical models being developed (including replication of statistical model used for RIA findings).
  - 1.5. Senior researchers from DIRSI (Antonio Botelho) and RIA (Christoph Stork) participated at LIRNEasia's T@BOP3 analysis workshop in November 2008.
  - 1.6. LIRNEasia senior research staff taught modules at LIRNE.NET training courses organized by RIA as well as young scholar training modules at CPRAfrica.
  - 1.7. LIRNEasia CEO delivered opening lecture at ACORN-REDECOM conference.
  - 1.8. Assistance to RIA with CPRAfrica design and planning.

- 1.9. Joint funding proposal (tri-regional) for capacity building submitted to IDRC for consideration.

## 2.7 Evaluation

1. Systems to be created to regularly collect data on performance on the inter-related components of the proposal and to conduct a running evaluation of the project. By the time the project commences, LIRNEasia will have three persons trained in outcome mapping.
  - 1.1. Data on media coverage and event participation by LIRNEasia researchers are regularly collected and categorized for further analysis and evaluation. These are key indicators of LIRNEasia's success capturing dissemination of research through different channels, to different audiences in different countries. These indicators are regularly reported in technical reports (biannually) as well as annual reports. In addition, all media coverage and event participation are captured on the LIRNEasia blog for further dissemination. See Annex 99 for media coverage, and Annex 100 for event participation over the period, both categorized by project component.
  - 1.2. Senior Research Manager, Chanuka Wattegama was trained in outcome mapping at the International Program for Development Evaluation Training (IPDET), Building Skills to Evaluate Development Interventions, in June-July 2009. Lead Scientist Sujata Gamage and researcher, Nilusha Kapugama was trained in outcome mapping through a training session (first day only) by Raj Verma organized by LIRNEasia's 3R project in January 2009.
  - 1.3. An external evaluation of LIRNEasia's policy influence success was commissioned by IDRC. The LIRNEasia team participated in this activity, and also provided assistance to the external evaluator in obtaining feedback from external stakeholders.

Table 1: LIRNEasia's Project Outcome Map 2008-10

Objectives	Expected results	Results LIRNEasia would like to see	Results LIRNEasia would love to see	Indicator(s)	Fulfillment of objectives
<b>1. Research</b>					
<b>1.1 Teleuse @BOP</b>					
To continue the research of teleuse at BOP extending the previous year's work both horizontally (more countries added if private sector funding mobilized) and vertically (questionnaire to include modules linking to Mobile 2.0); comparison of the results with the earlier.	A better understanding of how the use of ICTs is changing at the BOP, what the demand is and how they use it ICTs; what barriers stand in the way of greater use	Policy makers, operators and opinion leaders are aware of research findings.	Policies are changed to facilitate use by BOP; operators created services tailored to BOP. Civil society and donor thinking on sustainable ICTs changed.	Please see section 3 for general dissemination indicators.  A documentary video	<ul style="list-style-type: none"> <li>• Six country study of ICT use among BOP men and women. New country added (Bangladesh); exploration of Mobile2.0 usage among BOP teleusers included; similar areas to Teleuse@BOP2 also included, allowing for trend analysis. Qualitative module also included. Booster sample of migrant teleusers also included.</li> <li>• Instead of a single documentary video, 7 mini-teleuser profiles produced.</li> </ul>
<b>1.2 Mobile 2.0@BOP</b>					
To analyze the different modes of mobile 'phone' use at the Asia Pacific BOP for more-than-voice purposes (including payments, agricultural applications, e-gov applications, entertainment services, content, SMS based voting, early disaster warning etc) and thereby make policy proposals; challenge the	A better general understanding of how the BOP use non-voice mobile services, the demand, specific strategies they employ and any differences of use between men and women	Policy makers, operators and opinion leaders are aware of research findings.	Policies are changed to promote use of more-than-voice mobile services at BOP; operators create products/services tailored to BOP mobile 2.0 usage	Please see section 3 for general dissemination indicators.  Summative report on Mobile 2.0 @ BOP	<ul style="list-style-type: none"> <li>• 9 peer-reviewed studies on the "vertical" aspects of Mobile2.0 usage completed, providing an understanding of some of the different Mobile2.0 (or non-voice) applications aimed at the BOP in several emerging Asian countries. Specifically, the use of mobiles for e-gov services was looked at, in addition to payments, commerce, entertainment services etc..</li> <li>• Gender differences in the use of these applications was not particularly addressed because none of the study components showed any key differences in mobile 2.0</li> </ul>
	Specifically, a more accurate picture of implications of using mobile phones for payments/ local and international remittances have on financial regulations	Regulators aware of the research findings	Decision makers change policies based on the findings so that BOP will be empowered and experience less barriers in making mobile transactions	A photo documentary that will be displayed at an exhibition and online.	
	Understanding the mechanisms and advantages/disadvantages of using mobile 2.0 aspects to	Government policy makers and operators are aware of research findings.	E-gov applications are tailored for delivery via mobiles to BOPs rather than		

computer-centric narrative of how people will use ICTs; to research the specific regulatory and innovative conditions that necessary to realize Mobile 2.0	deliver e-gov services to BOP particularly versus the more traditional telecenter model		relying on telecenters/ information kiosks; government agencies introducing more innovative e-gov solutions delivered via mobiles; both men and women access e-gov services		<p>services used by men and women, possibly due to the relatively low usage of these still. However, some understanding of the gender differences in non-voice applications was gained from the Teleuse@BOP module.</p> <ul style="list-style-type: none"> <li>• Policy recommendations were summarized in policy briefs based on 6 of the studies, which were submitted to policymakers at Expert forum Meeting in Pakistan.</li> <li>• Study findings were disseminated through events and interviews to policymakers, operators and media. Research findings received wide coverage in Bangladesh, India, Pakistan, Sri Lanka and Thailand.</li> <li>• A photo documentary exhibition was held at the LIRNEasia@5 conference in December 2009</li> <li>• Summative report could not be done as some of the components were <i>done</i> late and more time was spent in dissemination activities, which were thought to be more important with greater potential for policy influence. Papers on all vertical and horizontal components were individually published online.</li> </ul>
	Improved demand for timely and accurate agricultural price information; a better understanding of the ability of ICTs to reduce transaction costs in agricultural markets.	Policy makers and stakeholders aware about the research findings	Appropriate policies for reducing transaction costs in value chains adopted		<ul style="list-style-type: none"> <li>• Research on the provision of agriculture value added services through mobiles was conducted, looking at existing applications. Findings and recommendations were presented to policymakers at Expert forum Meeting in Pakistan.</li> </ul>

	Further understanding of the use of ICTs in disaster risk reduction through public and community based early warning systems.	Policy makers and stakeholders including disaster management practitioners aware about the research findings	Appropriate policies adopted in public warning systems and in community-based warning systems		<ul style="list-style-type: none"> <li>• A comprehensive study was carried out in Maldives and the report has been made available to regulators and operators. In addition, the findings of the study have been presented at multiple events.</li> </ul>
	A comprehensive knowledge of system and frequency licensing issues, spectrum reframing, mobile number portability, new business models etc that would have an impact on the Mobile 2.0 model	Policymakers and operators are aware of research findings.	Regulatory environment is modified to remove the barriers to realization of full potential of mobile 2.0 model to give access to BOP; mindsets changed	Please see section 3 for general dissemination indicators.  Rapid-response interventions	<ul style="list-style-type: none"> <li>• 3 peer-reviewed studies on the “horizontal” issues of Mobile2.0 usage completed, providing an understanding of some of the implications of Mobile2.0 (or non-voice) applications for BOP on regulation in several emerging Asian countries including: mobile number portability; licensing and spectrum issues and regulations for mobile payments.</li> <li>• Study findings were disseminated through events and interviews to policymakers, operators and media in 2 countries</li> </ul>
<b>1.3 Indicators continued</b>					
To continue the work on improving telecom regulatory environment by developing inter-country benchmarks for the regulatory environments of each - adding three new countries and quality of service as a dimension; to collect indicator data to help explain difference in	More accurate picture of telecom sector and regulatory environment in these countries obtained through the TRE survey.	Regulators are aware of the research findings.	Regulators modify behaviour based on the findings.	Country study reports on TRE.  TRE findings used for Rapid-response interventions  Journal articles and research publications  Research findings disseminated at workshops	<ul style="list-style-type: none"> <li>• TRE studies in 10 countries conducted (including four new countries: Maldives, Afghanistan, Bangladesh and Mongolia), providing a picture of the telecom regulatory and policy environment.</li> <li>• Findings were disseminated to policymakers and regulators in India, Thailand and the Philippines through events that had senior level regulatory, policy and private sector participation. Wide media coverage was received in these and other countries, reaching a wider audience</li> </ul>



regulatory performance					(see Annex 99). <ul style="list-style-type: none"> <li>• A cross-country paper analyzing results and discussing the methodology was written and disseminated in academic settings.</li> </ul>
	A better understanding of how NRA use web site as an interactive window with their stakeholders.	Regulators aware of the research results.	Regulators use the research findings in improving their present sites; NRAs without web sites use the research findings as a guide to build new sites.	Journal articles and research publications  Research findings disseminated at workshops	<ul style="list-style-type: none"> <li>• A survey of websites of NRAs in 31 countries was conducted to rate their effectiveness.</li> <li>• Findings were disseminated via various media sources, as well as mailed directly to the regulators. A panel of SAARC regulators responded to research findings at an event held in Singapore in June 2008.</li> </ul>
	Development of a new regulatory instrument “banded forbearance” that has the potential to simplify telecom regulation aimed for countries with limited capacity, for example micro states	Regulators aware of the research results.	Regulators modify behaviour based on the findings.	Journal articles and research publications  Research findings disseminated at workshops to the focused audience	<ul style="list-style-type: none"> <li>• New regulatory instrument was developed. Method has been published in a peer-reviewed journal, as well as presented to regulators of SAARC region.</li> <li>• Methodology has been used in training regulators, policy makers and other actors from Asia and Africa.</li> </ul>
	A telecom indicator database for the countries under study; preferably populated by national data collectors.	Governments and regulators are aware of the research findings;	Endorsement of online indicators database by the national governments and regulators.	Indicator database	<ul style="list-style-type: none"> <li>• Database was developed, and populated with 10 years’ data; NRAs were made aware of the database and trained in its use, however formal endorsement could not be obtained from NRAs, and thus the initiative was terminated.</li> </ul>
	Collection, and presentation of demand side mobile and broadband quality indicator data for initiating operators to offer Service Level Agreements (SLAs) to their customers	Regulators, operators and telecom users aware about the research findings; wide publicity received by media	Regulators and operators modify behaviour based on the findings.	Journal articles and research publications  Research findings disseminated at workshops	<ul style="list-style-type: none"> <li>• This project component has developed into something wider than what was envisioned initially. In reality we achieved more than planned. For example, instead of initiating operators to offer Service</li> </ul>

	ensuring the quality of service they promise; presentation of a methodology consumers can easily use to determine the QoS of a broadband connection			Rapid-response interventions using research findings	Level Agreements (SLAs) to their customers we were successful (in some countries) to have regulators specify standards to operators which has a more effective impact. Though we did not plan to see it happen so fast, we also see an improvement in broadband quality in some of the places we have been doing testing. Another plus point was the Federal Communication Commission of USA implementing a broadband quality testing model along the same lines of LIRNEasia, though independently. (Please refer Section 4.3.4 for a detailed account of activities, outputs and outcomes.)
<b>2. Capacity Building</b>					
To continue the development of an Asia-Pacific scholarly network on ICT policy and regulation supported by LIRNEasia; with lessons being drawn for developing effective knowledge networks; build capacity in the area of telecom policy research	<b>CPRsouth</b> Asia-Pacific based scholars brought together as a ICT policy and regulation scholarly network that has its own organizational structure	The scholarly network attracts the attention of ICT policy and regulation scholars throughout the South	The indicators of connectivity within the scholarly network improve significantly and members' institutions support the network	Conference in Beijing in Nov-Dec 2008  Conference in location TBD in 2009  Participation of researchers from 15 countries, based on knowledge mapping  Maintenance and improvement of CPRsouth website	<ul style="list-style-type: none"> <li>• 19 paper presenters from 15 countries were selected through a competitive process to participate at CPRsouth3 in Beijing. The paper presenters for were mentored through for a period of 6 weeks by senior scholars about the content of their papers and the presentation of their research findings.</li> <li>• 20 paper presenters from 14 countries were selected through a competitive process to participate at CPRsouth4 in Negombo. The paper presenters for were mentored through for a period of 6 weeks by senior scholars about the content of their papers and the presentation of their research findings.</li> </ul>

					<ul style="list-style-type: none"> <li>• An annual survey was conducted to inquire into the academic and policy activities of the CPRsouth paper presenters post CPRsouth. The survey showed that of the 35% of paper presenters (from CPRsouth1, 2 and 3) have been active in the academic and policy spheres. Furthermore, survey data showed that approximately 90% of the respondents have been in touch with other conference participants.</li> <li>• The survey also shows the participants and willingness to bar part of the cost of attending.</li> <li>• The CPRsouth website contains the conference papers and the tutorial materials. The website has been upgraded to make it more user-friendly and thereby make the above material more accessible. The papers are hosted on Social Science Research Network (SSRN) thereby making the papers more widely distributed. The statistics show that the least downloaded paper has been downloaded 4 times while the most downloaded paper has been downloaded 121 times. The average number of downloads for the papers is 22.</li> </ul>
	<b>Tutorials for Young Scholars</b>				
	Have substantial representation of young scholars (Asia-Pacific based or with Asia-Pacific interest) for the tutorials	A keen interest shown by the young scholars to attend tutorials shown by the increasing demand	Universities and regional entities commit resources to support LIRNEasia's programs for young scholars	Tutorials offered for young scholars  Increased number of local and	<ul style="list-style-type: none"> <li>• For CPRsouth3 29 scholarships were awarded to young scholars (15 from China, 15 from other countries). The young scholars received training in Research methods, basics of</li> </ul>

				international scholarships	<p>Infrastructure economics and Communication Strategies.</p> <ul style="list-style-type: none"> <li>• For CPRsouth4 27 scholarships were awarded to young scholars (14 from Sri Lanka and India and 13 from other countries). The young scholars received training in Research methods, basics of Infrastructure economics and Communication Strategies.</li> <li>• The survey showed that 24% young scholars from CPRsouth1, 2 and 3 were involved in the academic and policy process. A survey was also conducted on the supervisors of the selected young scholars. The response rate was low however, those who responded considered CPRsouth to be beneficial to their mentees/supervisees. The average amount their institutions were willing to commit to CPRsouth was USD 200-300.</li> <li>• 13 selected young scholars attended a tutorial that was co-organized by Department of Communication and New Media of National University of Singapore. Subsequent to the tutorials, the young scholars were given the opportunity to attend the International Communication Association (ICA) conference.</li> </ul>
	<b>Internships</b>				
	Six months internships offered at LIRNEasia	Interns are trained to have expert knowledge in telecom policy research within the six month period	Interns use the knowledge they gained in external spheres	Number of internships offered with mentorship	<ul style="list-style-type: none"> <li>• 5 internships were awarded for the 2008-2010 research cycle. The interns engaged in writing research papers and extensive research</li> </ul>

					activities. The internships resulted in two cross-regional research papers. The longest internship was for a period of 6 months, the shortest was for 6 weeks.
	<b>NRA/NSO capacity building</b>				
	Capacity building workshops for National Regulatory Agencies (NRAs) and National Statistical Offices (NSOs) on telecom indicators offered	Training course attracts significant participation both from NRAs and NSOs	Participants use the knowledge for the process of building the telecom indicators at national level and populating the indicator database	Indicators workshop in 2008  Training workshops  4 interventions in NRA/NSO events	<ul style="list-style-type: none"> <li>• ITU and LIRNEasia co-sponsored 5-day training for NSOs in Bangkok, Thailand attended NSOs from 12 countries that LIRNEasia focuses on (others).</li> <li>• Helani Galpaya was invited to and attended the International Telecommunication Union (ITU) annual ICT indicator meeting, held in Cairo 2008 and Internet Governance Forum (IGF) (Hyderabad). Presented LIRNEasia data and highlighted importance of supply and demand side data collection at each event.</li> <li>• Rohan Samarajiva held discussions with the Chairman of the Telecom Regulatory Authority of India (TRAI) about the need to improving the indicators in the telecom sector.</li> </ul>
	<b>Scholarships for the training course</b>				
	Training course on 'Telecom Regulatory aspects' with broad participation offered for the staff of National Regulatory Agencies (NRAs) and key operators in the region; opportunities are provided for those who cannot finance themselves	Training course attracts significant participation both from NRAs and operators	Change of attitudes and behavior of the participants through the knowledge they gain from the course	14 scholarships to the course	<ul style="list-style-type: none"> <li>• 13 Scholarships were given to journalists and mid and senior level staff of regulatory agencies, civil societies and NGOs for the Executive Training Course "Connectivity and Convergence: Alternative Regulatory Strategies" held in South Africa in April 2010.</li> </ul>
<b>3. Advocacy and</b>					

dissemination					
<p>To disseminate the output of all three activities in multiple ways to different audiences capable of influencing reform, including carefully targeted rapid-response interventions, including the development of an alternative model of influencing policy</p>	<p>Research findings disseminated to the multi stakeholders using multiple tools</p>	<p>Awareness of LIRNEasia's research by policy makers, regulators, operators, civil society, researchers and public</p>	<p>Demonstrable effects on policy and regulatory changes from LIRNEasia research</p>	<p>Journal articles and research publications</p> <p>Rapid response interventions</p> <p>Conferences and workshops: Participation in 15 such events (other than the ones organized by LIRNEasia)</p> <p>Number of researchers trained to communicate in ways that will be effective with media</p> <p>Five year anniversary international conference</p> <p>Media interactions: multi clusters of media interaction activities</p> <p>Video: A video depicting research findings of T@BOP, will be distributed to media, stakeholders and also available in the net at YouTube</p>	<p>LIRNEasia's research has been widely disseminated to policymakers, industry, regulators, civil society, researchers and the public. This is through various actions:</p> <ul style="list-style-type: none"> <li>• Publication of peer-reviewed journal articles</li> <li>• Development of mini-documentaries on Teleuse@BOP [posted online, screened at various presentations]</li> <li>• Participation in conferences and workshops [more than 75 over the period]</li> <li>• Issue of news releases and policy briefs</li> <li>• Provision of media interviews (print and electronic)</li> <li>• Strategic placement of articles and advertisements in local newspapers</li> <li>• Maintenance of its blog, where research findings, reports, presentations, news releases, policy briefs are posted (for webstats see Section 6.3.6.4).</li> <li>• It successfully organized and hosted its 5th year anniversary conference in December 2009, where 18 presentations of LIRNEasia research were made to an audience of over 160 participants.</li> <li>• It has continued its rapid response program, making various interventions in policy</li> </ul>

				<p>Strategically placed newspaper articles and news stories/ news stories / appearances in electronic media</p> <p>Maintenance of a widely read and frequently updated LIRNEasia blog site; online versions of all the deliverables will be made available through the web site</p> <p>Active engagement of getting our research findings into Wikipedia and comments in active and relevant blogs.</p>	<p>processes over the project period.</p>
<b>4. Mutual learning among LIRNE.NET members</b>					
To improve mutual learning and collaboration among the constituent entities of LIRNE.NET	Cooperation between LIRNEasia and at least one other regional unit of LIRNE.NET for mutual learning and information sharing	Information sharing at regional level	Inter-regional replication of research models	A meeting coinciding with the International Telecom Society biennial conference and a follow up meeting	<ul style="list-style-type: none"> <li>• Meetings between the members were held alongside other events in Ottawa (alongside ITS conference) and Johannesburg.</li> <li>• A double panel of LIRNE.NET member researchers was held at ITS 2008 conference</li> <li>• A DIRSI researcher completed a six month internship at LIRNEasia; in addition to two research papers being written by the researcher,</li> </ul>

					<p>benchmarking methodologies were compared between the two regions</p> <ul style="list-style-type: none"> <li>• Quantitative assistance was provided by RIA researcher for T@BOP3, leading to several statistical models being developed</li> <li>• Senior researchers from DIRSI and RIA (one each) participated at LIRNEasia's T@BOP3 analysis workshop</li> <li>• LIRNEasia senior research staff taught modules at LIRNE.NET training courses organized by RIA as well as Young Scholar training modules at CPRafrica</li> <li>• LIRNEasia CEO delivered opening lecture at ACORN-REDECOM conference</li> <li>• Assistance to RIA with CPRafrica design and planning</li> <li>• Joint proposal (tri-regional) for capacity building submitted for consideration</li> </ul>



### 3.0 Methodology

*Please refer Section 4.0 where detailed research methodology is discussed along with project activities*

## 4.0 Project activities

### 4.1 Teleuse@BOP3

Teleuse@BOP3 is a multi-country study of how people at the Bottom of the Pyramid (BOP) use ICTs that builds on two previous studies. It constitutes a quantitative survey conducted between September and November 2008, with additional qualitative studies conducted between February and March 2009. In addition to understanding, through longitudinal analysis, the dynamics of how hitherto excluded people join the (electronically) connected world, Teleuse@BOP3 was seeking to understand how people at the BOP are beginning to use the mobile for “more than voice” services, if at all. It also included a module which looks at the teleuse experience and remittance patterns of (domestic and international) migrant workers.

A one and a half day workshop was held in Negombo, Sri Lanka on 11-12 May 2008, on “Knowledge sharing workshop on methods for ICT user research in emerging markets.” The workshop brought together LIRNEasia researchers and international experts from private sector and research organizations to exchange knowledge, experiences and learnings with respect to conducting similar demand-side/user research across emerging markets, with a special focus on the methodological aspects of conducting this kind of research. Significant input was obtained on improving the Teleuse@BOP methodology as well as the survey questionnaire, through group-work sessions. The workshop report is contained in Annex 13.

#### 4.1.1 Quantitative component

The quantitative study constituted a representative survey of telecom users among 9,540 BOP respondents aged 15-60 (in total) across Pakistan, India, Sri Lanka, the Philippines and Thailand, as well as a sixth country (Bangladesh) which has been enabled through private sector funding secured by LIRNEasia. BOP was defined as socio-economic classification<sup>18</sup> (SEC) groups D and E, except in the Philippines, where only SEC group E was considered because SEC D and E groups constituted close to 90 percent of the population. Conflict and tribal areas of the countries under study were excluded (See Annex 105 for details on methodology).

A diary was placed with 50 percent of the sample to record phone usage patterns over a one week period. Where the respondent was illiterate, another person in the household was instructed on how to fill in the diary. In addition, booster samples constituting BOP migrant workers (native to the countries under study) totaling 1,550 across the six countries were surveyed on their teleuse experiences, and issues pertaining to remittances. In Pakistan and Bangladesh, where female migrant workers are rare, the sample was adjusted to reflect this. Additionally, in Pakistan migrant workers coming from SEC C households were also interviewed, due to difficulties in locating sufficient SEC D and E migrants. Often the money that migrants send home is used for renovating the house. In Pakistan household structure characteristics are included in determining the SEC of a household; therefore such renovations often move the household into the SEC C group. More detail on the research methodology can be found in Annex 104. The survey questionnaires can be found in Annexes 10 and 11.

**Table 2: Teleuse@BOP3 quantitative sample**

	Bangladesh	Pakistan	India	Sri Lanka	Philippines	Thailand	Total

<sup>18</sup> A market research classification of households taking into account the education and occupation of the chief wage earner of the house, among other factors. See Annex

BOP teleusers	2,050	1,814	3,152	924	800	800	9,540
Margin of error @ 95% CL (%)	± 3%	± 2%	± 2%	± 3%	± 4%	± 4%	
Diary placement	1,025	900	1,600	450	400	400	4,775
Migrant workers	350	300	400	200	200	100	1,550

Notes: Excludes the following: FANA/FATA regions of Pakistan ; North and East provinces of Sri Lanka; SEC D group of Philippines; and SEC D and E population of Bangkok.

The process for the selection of a suitable research agent to conduct the quantitative component was initiated in April 2008 through a call for expressions of interest (EOIs) (Annex 7). Six EOIs were received from: The Nielsen Company (Sri Lanka), TNS (Sri Lanka), Indicus Analytics (in collaboration with Gallop Consulting) (India), Hansa Research (India), CKS Consulting (India) and Datamation Foundation (India). The Nielsen Company, Indicus Consulting and Hansa Research were shortlisted after evaluation, and technical as well as financial proposals were thereafter requested (the full request for proposals is contained in Annex 8). Full proposals were received by 9 June 2008. Evaluations were conducted by a panel constituting Harsha de Silva (Lead Economist), Chanuka Wattagama (Senior Research Manager Development), Luxman Siriwardena (Board Director), Ayesha Zainudeen (Research Manager) and Dimuthu Ratnadiwakara (Researcher), based on the proposals as well as presentations by the candidates also. In June 2008, the Nielsen Company was selected to carry out the quantitative component of the study through a competitive bidding process.

The questionnaires (Annex 10 and Annex 11) were developed largely by LIRNEasia, and were translated into 15 local languages; to the extent possible given the capabilities of LIRNEasia's researchers, some local language versions have been double-checked to ensure that nuances are not missed in the translations.

The survey was conducted among telecom users (those who have used a phone in the last three months) from the BOP in the six countries. Unlike Teleuse@BOP2 where small non-BOP samples were also surveyed, Teleuse@BOP3 did include a sample of non-BOP users. Reasons were budgetary considerations and the fact that the non-BOP samples would not be representative in any case.

Sample design, data collection (fieldwork), data entry and cleaning were conducted by Nielsen, including quality control procedures<sup>19</sup>. Fieldwork was completed between September and November 2008.

The preliminary findings were presented to LIRNEasia at an analysis workshop on 28-29 November 2008 (See Annex 14 for workshop report) in order to obtain feedback to inform the analysis, to allow the researchers to make use of relevant findings in their research, and to scope out the issues that would need to be explored at the qualitative stage. The workshop was attended by LIRNEasia's researchers (including those working on the Mobile2.0 studies) as well as participants from research partner organizations, DIRSI and RIA, and representatives from three companies that had been short-listed for selection to conduct the qualitative component of the study.

#### 4.1.2 Qualitative component

The qualitative component of this study was initiated after the quantitative component had yielded initial findings. Unlike in T@BOP2 where both were simultaneous and one didn't enlighten the other, this enabled LIRNEasia to first see the overall patterns from the quantitative data and see where further investigation was needed (e.g., the quantitative component showed a significant amount of multi-SIM ownership; the qualitative component being conducted after the quantitative findings

<sup>19</sup> Nielsen uses specific quality control systems, including "WatchBuilder Measurement Science Standards," an internal quality control measure which guides the research team in sample design and execution of the project. This ensures compliance to the set norms and standards and also ensures consistency and mitigates non sampling errors. In addition, Nielsen has stringent quality control procedures: Across the countries, random field checks were conducted in accordance with Watchbuilder norms to ensure that the questionnaire is properly administered and respondents are recruited in an accurate manner.

were available allowed us to investigate the reasons for BOP teleusers to own more than one SIM card).

A request for proposals was issued on 5 November 2009 to eight potential candidates across Asia. Proposals were received from five on 18 November 2009: CKS Consulting (India), Hansa Research (India), Gallop Consulting (India), The Nielsen Company (Sri Lanka), and Synovate (India). Evaluations of proposals were conducted by a panel constituting Harsha de Silva (Lead Economist), Chanuka Wategama (Senior Research Manager) and Ayesha Zainudeen (Research Manager). Three applicants were short-listed on 24 November 2009 (CKS Consulting, Hansa Research and the Nielsen Company), and invited to attend and observe the quantitative analysis workshop (28-29 November 2008). The idea was to familiarize them as much as possible with the issues which arose from the quantitative findings which would need to be explored at the qualitative level. Following the workshop on 2 December the three candidates were invited to make presentations of their final proposals (duly revised and fine-tuned after attending the workshop). The presentations were evaluated by Harsha de Silva (Lead Economist), Chanuka Wategama (Senior Research Manager), Rohan Samarajiva (CEO) and Ayesha Zainudeen (Research Manager). Following the presentations, CKS Consulting was unanimously selected to conduct the qualitative study.

About 200 subjects were studied in total, through three types of qualitative research methods:

- *Focused group discussions*: constituting 8 respondents per session<sup>20</sup>
- *Home visits with media mapping*: depth interviews conducted in at the home of either migrant workers or their families to understand and document the media and social networks of the migrant workers and their families in their actual contexts
- *User mini-ethnographies*: An observational research method to understand the context of the users from their own perspective over a period of three hours during their daily activities

**Table 3: Teleuse@BOP3 Qualitative sample**

Country	Location	Focused group discussions	Home visits with media mapping	User mini-ethnographies
India	Urban	2	0	2
	Peri-urban	0	4	4
	Rural	4	2	2
Bangladesh	Urban	2	2	2
	Rural	1	2	1
Pakistan	Urban	2	2	2
	Rural	1	2	1
Sri Lanka	Urban	2	2	2
	Rural	1	2	1
Philippines	Urban	1	1	1
	Rural	1	1	1
Thailand	Urban	1	1	1
	Rural	1	1	1
<b>Total</b>		<b>19</b>	<b>22</b>	<b>21</b>

A kick-off workshop was held on 15 January 2009 to revisit the quantitative findings in depth and provide direction on the research tools (Annex 12) and samples which were been developed by CKS in consultation with LIRNEasia.

<sup>20</sup> In certain locations, some focused group discussions were replaced with two mini-group discussions (4 respondents each) to ensure representation of the different kinds of respondents that needed to be studied

Fieldwork was conducted by CKS in the six countries between February and March 2009. LIRNEasia's own researchers made field visits during this period (observing at a minimum three field protocols per country) to ensure the quality of the research, but also to allow them to engage in the fieldwork and with the respondents face-to-face. LIRNEasia was invited to attend an internal data analysis session held by CKS on 8-9 March 2009 in Bangalore, to allow LIRNEasia to provide feedback and ideas on the analysis (bringing in additional insights from the quantitative analysis) and to allow LIRNEasia to engage with the data from the protocols which were not observed directly by LIRNEasia on the field. The final report (including details on methodology) is available in Annex 6.

Dissemination events for operators, policymakers and media were held in three countries. See Section 6.3.1 for details.

A series of working papers has been initiated based on the quantitative and qualitative findings of the study; some papers are still being finalized, however, current drafts (at the time of writing) are given in Annexes 1-5, as well as available on the Teleuse@BOP3 project webpage (<http://lirneasia.net/projects/2008-2010/bop-teleuse-3/papers/>).

## 4.2 Mobile2.0@BOP

Mobile 2.0 is a term used to describe the use of mobiles for “more-than-voice”. Mobiles are increasingly becoming payment devices which can also send/process/receive voice, text and images; it is envisaged that in the next few years, they will also be capable of information-retrieval and publishing functions normally associated with the internet.

With the significantly high cost of using Internet facilities and other barriers (PC illiteracy, PC maintenance issues etc.) it is likely that the BOP in much of emerging Asia will choose mobile handset as the device to obtain the same services their counterparts in the west get through the Internet. This study focused on such trends and the policy changes to be made to build an enabling environment.

The Mobile 2.0 @ BOP project included of twelve studies, researched in terms of ‘horizontal’ issues and ‘vertical’ applications. The horizontal studies explored various competitive, regulatory and policy conditions that affect the emergence of Mobile 2.0@BOP. The vertical studies analyzed and explained how a particular applications (such as micro-payments and remittances, agriculture applications, voting applications, e-government services etc) is taking shape in specific countries. Three horizontal and nine vertical studies were conducted.

With the exception of one vertical study<sup>21</sup> the Mobile2.0 studies commenced after the November 2008 planning meeting. The starting point was a planning meeting that was held on 29-30 November 2008, in Negombo, Sri Lanka. The meeting brought together researchers to share knowledge on their respective research components/topics, and how each fit into the bigger picture of “more-than-voice” research, as well as to discuss and agree on project timelines, research communication and dissemination strategies (see Mobile 2.0 workshop report contained in Annex 82).

First drafts of reports were received between April and July 2009, which were sent for peer review by pre-selected experts in the relevant areas of research. Each researchers conducted a colloquium based on the first draft of each paper and obtain further feedback from other researchers prior to completing the final versions of the papers. Final versions of all twelve papers (listed in Table 4) have been received and are contained in Annexes 54-65.

**Table 4: Lead researchers and peer reviewers of Mobile2.0@BOP studies**

	Mobile2.0 study	Lead researcher	Peer reviewer
Horizontal studies	An Evaluation of Different Models for the Issuance of Licenses for Service Provision and Frequencies	Payal Malik	Zhong Liu, PhD, (Southwest University of Finance and Economics, China)
	Mobile number portability in emerging	Tahani Iqbal	Payal Malik (University of

<sup>21</sup> The study on the possible use of cell broadcasting was started earlier because: (a) There was a request from regulator to have this done quickly; and (b) It was convenient for the researcher to conclude it early.

	South Asia		Delhi, India)
	Mobile banking, mobile money and telecommunication regulations	Erwin Alampay, PhD	W. A. Wijewardene (Independent Consultant; former Deputy Governor of the Central Bank of Sri Lanka)
Vertical studies	M-money for the BOP in the Philippines	Erwin Alampay, PhD	Christoph Stork, Ph.D. (Research ICT Africa (RIA), South Africa)
	Freedom of expression in mobile content: Pakistan	Hina Sarfaraz	Yuli Liu, Ph.D. (National Chengchi University, Taiwan)
	Exploring conditions for delivery of successful m-government services to the bottom of the pyramid (BOP) in India	Subhash Bhatnagar, PhD.	Helani Galpaya (LIRNEasia, Sri Lanka)
	Mobile cell broadcasting for commercial use and public warning in the Maldives	Natasha Udu-gama	Rohan Samarajiva, PhD (LIRNEasia, Sri Lanka)
	Business models for delivering mobile value-added services: Thailand	Puree Sirasontorn, PhD	Christoph Stork, PhD (Research ICT Africa (RIA), South Africa)
	CellBazaar, a mobile-based e marketplace: Success factors and potential for expansion	Ayesha Zainudeen	Robin Mansell, PhD (London School, of Economics, University of London, UK)
	Leveraging Mobile 2.0 in India for Agricultural Market Access	Harsha De Silva, PhD	Alexander Flor, PhD (Faculty of Information and Communication Studies, University of the Philippines Open University)
	Use of mobile payments in public transport system	Harsha De Silva, PhD	W. A. Wijewardene (Independent Consultant; former Deputy Governor of the Central Bank of Sri Lanka)
	Challenges of operationalizing the real-time Biosurveillance Program's m-Health Survey	Nuwan Waidyanatha	Zhong Liu, PhD (Southwest University of Finance and Economics, China)

Several dissemination activities were completed. See Section 6.3.2 for details

#### 4.2.1 Changes in project scope

There were some changes in the scope of the Mobile2.0 component over the course of the project.

- The planned spectrum refarming study (a horizontal study) was replaced with a vertical one in order to study an emerging innovative mobile application in Sri Lanka. Private bus operators are planning to introduce re-load fare passes to commuters. These e-reload passes will be readable by existing GPRS-enabled ticket machines. The current plan is for the passes to constitute physical re-load cards or mobile phone-enabled mechanisms. If mobile-phone enabled, then a whole new window of opportunity will emerge for transactions; this could become the most widely used full "mobile2.0" (transaction-capable) application. The study therefore examined the possibilities and policy challenges in introducing this solution.
- The planned horizontal study on the new frequency uses was not done as its direct relevance to Mobile 2.0 in the emerging Asian context was not clear. A new component to study the use of mobile phone in bio surveillance systems was introduced in its place.
- The planned vertical study on agriculture<sup>22</sup> was re-conceptualized due to delays in the revival of Govi Gnana Seva (GGS) project in Sri Lanka as well as delays in implementing the

<sup>22</sup> Originally envisaged to quantify changes in producer surplus and reduction in wastage in agricultural value chains through research in India and Sri Lanka after the implementation of two ICT-based agricultural price applications (GGS in Sri Lanka and a similar application developed by IIT-Madras in India); the Indian research

information dissemination system (market price, weather, crop advise using local language voice recognition technology) at the Rural Technology and Business Incubator (RTBI) at the Indian Institute of Technology (IIT) Madras made it impractical to do either the Sri Lanka or the Indian component of the study as envisaged in the original proposal. Hence the scope was changed to articulate the lessons from an operational pilot in Kadi in the state of Gujarat in India, where farmers are able to avail of commodity backed financing. In particular this case study seeks to understand the extent to which systems and processes are important in linking farmers to markets, and specifically understand the kind of actors required to make such an activity sustainable. This rationale is borne from cognizance of the fact that livelihood impacts are dependent on the external structures and processes (external actors, laws and access to credit and insurance, etc.) that are required to more effectively impact farmer livelihoods. In addition this study sought to shed light on the challenges for the adoption of such services by those from the BOP.

### 4.3 Indicators continued

#### 4.3.1 Second Telecom Regulatory Environment (TRE 2) assessment

This component of the study is the Telecom Regulatory Environment (TRE) assessment which is a perception-based survey of the regulatory and policy environment in countries.

The research started with a one-day TRE research planning meeting, conducted in Sri Lanka in May 2008. All researchers who were tasked with conducting a TRE study participated the meeting. Detailed discussions on the methodology were conducted. It was agreed to add a new sector (Broadband) and new dimension (Quality of Service) to the survey in this cycle given the importance of both to emerging Asia. This year for the first time, the option of conducting the survey through a web-based questionnaire was made available. Training was provided on using the online survey tool.

The TRE evaluation was done across seven dimensions (market entry, allocation of scarce resources, interconnection, regulation of anti-competitive practices, tariff regulation, universal service obligation, and quality of service) for three sub-sectors mobile, fixed and broadband..

TRE research was originally conducted in nine countries, India, Indonesia, Pakistan, the Philippines, Sri Lanka, Thailand Afghanistan, Bangladesh and Maldives. Due to logistical difficulties in physically travelling to Afghanistan and the difficulty in establishing relationships in the new/emerging telecom sector there, significant delays were experienced in completing the survey and the final report for Afghanistan. However at the time of writing this report, the penultimate draft report of the Afghanistan TRE has been completed and is contained in Annex 26 (Annexes 18-25 contain TRE studies for the first eight countries).

Further, the CEO and COO were invited and contracted to conduct a training workshop for IDRC grant recipients in Mongolia (DREAM-IT project) in the 4<sup>th</sup> quarter of 2009. The two day workshop was not related to TRE, but based on relationships developed during that workshop, and based in significant interest from the Mongolian audience, it was decided to conduct a TRE survey in Mongolia. It was also of interest to LIRNEasia, since up until then the only other micro-state that was subject of a TRE survey was the Maldives. It was thought that having a Mongolian TRE would enable us to not only compare the results to at least one other micro-state (since micro-state results aren't really comparable with other (larger) country results), but also enable us to judge the feasibility of conducting micro-state studies (because the Maldivian experience showed that survey results in micro-states/micro-markets are unreliable due to respondents being thoroughly interconnected and being unwilling to express honest opinions even in response to an anonymous survey). The work in Mongolia started in the first quarter of 2010 – through a local (Mongolian) researcher who expressed interest in carrying out the work. At the time of writing this final report, the TRE survey has been completed in Mongolia and the first draft of the paper analyzing the results has been written. However the final version incorporating reviewer's comments is currently being worked on, and will

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would compare welfare with the situation before implementation (as GGS has been in operation since 2003); the project would be done with additional funds from other sources.

not be attached to this report (however it will be made available via the LIRNEasia website, immediately after completion. Please visit <http://lirneasia.net/projects/2008-2010/indicators-continued/telecom-regulatory-environment/>).

The studies 10 TRE studies were conducted by the following researchers:

- Afghanistan: Sriganesh Lokanathan (Senior Research Manager, LIRNEasia)
- Bangladesh: Miraj Khaled (Graduate student, Simon Fraser University, Canada; Researcher, LIRNEasia)
- India: Payal Malik (Senior Lecturer in Economics, Delhi University, India; Senior Research Fellow, LIRNEasia)
- Indonesia: Chanuka Wattegama (Senior Research Manager and Broadband Specialist, LIRNEasia)
- Maldives: Helani Galpaya (Chief Operating Officer and Indicator Specialist, LIRNEasia)
- Mongolia: Lhlanaran Lhagva, Editor-in-chief, BILEG ICT Magazine, Mongolia
- Pakistan: Joseph Wilson (Assistant Professor of Law & Policy, Lahore University of Management Sciences, Pakistan and former Research Fellow, LIRNEasia)
- Philippines: Erwin Alampay (Assistant Professor, National College of Public Administration and Governance (NCPAG), University of the Philippines; Senior Research Fellow, LIRNEasia)
- Sri Lanka: Malathy Knight-John (Research Fellow/ Head of Public Enterprise Reform, Competition Policy and Regulation Unit, Institute of Policy Studies, Sri Lanka; Senior Research Fellow, LIRNEasia)
- Thailand: Deunden Nikomborirak (Research Director, Competition Policy and Consumer Protection Program, Thailand Development Research Institute Foundation, Thailand; Senior Research Fellow, LIRNEasia)

The researchers conducted the TRE assessment in the eight countries using common methodology to assess regulatory performance. A panel of telecom experts in the respective countries, representing different stakeholder groups was sent a TRE questionnaire along with a letter of introduction (depending on the country, this is done using combination of regular mail, internet, fax or in person). The stakeholders belonged to three categories:

- **Category 1:** Stakeholders directly affected by telecom sector regulation : e.g. operators, industry associations, equipment suppliers, Investors
- **Category 2:** Stakeholders who analyze the sector with broader interest: e.g. financial institutions, telecom consultants, law firms
- **Category 3:** Stakeholders with an interest in improving the sector to help the public: e.g. academics, research organizations, journalists, telecom user groups, civil society, former members of regulatory and other government agencies, donors

Tight security and privacy policies are enforced to ensure that respondents cannot be individually identified, and to ensure that no one other than the country researcher and one other designated person at LIRNEasia (who has the task of ensuring quality) has access to individual responses to the survey. Nine research colloquia were conducted<sup>23</sup> to present the results and obtain feedback on the draft country studies. Several methodological issues were raised and discussed in detail. Final country reports for all countries except for Afghanistan and Mongolia (as per the above discussion) have been submitted (See Annexes 18-25) and are also available online at the LIRNEasia website. The penultimate draft of the Afghanistan report is contained in Annex 26.

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<sup>23</sup> See: <http://lirneasia.net/2008/10/colloquium-tre-pakistan-study-2008/>; <http://lirneasia.net/2008/09/colloquium-bangladesh-tre-study-2008/>; <http://lirneasia.net/2008/09/colloquium-telecom-regulatory-environment-study-india-2008/>; <http://lirneasia.net/2008/09/telecom-regulatory-and-policy-environment-in-sri-lanka-results-and-analysis-of-the-2008-survey/>; <http://lirneasia.net/2008/09/colloquium-telecom-regulatory-environment-study-thailand/>; <http://lirneasia.net/2008/09/colloquium-tre-philippines-study/>; <http://lirneasia.net/2008/09/colloquium-maldive-tre-study-2008/>; <http://lirneasia.net/2008/09/colloquium-indonesia-tre-study-2008/>; and <http://lirneasia.net/2010/05/colloquium-tre-afghanistan/>

Three research dissemination events were held, with representatives from the respective national regulatory agencies, industry and media among others present in each event (in panel discussions as well as in the audience at these events). See Section 6.2.3 for details.

In 2007, LIRNEasia drafted a TRE Manual as requested by (and partially funded through) Amy Mahan of Communica/DIRSI. The intent was to have a comprehensive set of instructions and Excel Templates (that automatically calculate final TRE scores etc) for any researcher who is conducting a TRE study in any country. This manual and calculation templates were updated by LIRNEasia in late 2008, based on the research meeting referred to above and they now reflect the addition of a new dimension (quality of service) and new sub-sector (broadband). The manual also contains instructions on using the website to conduct the survey online. Both are freely available online via the LIRNEasia website. Both were shared with our sister research network in Africa (Research ICT Africa) in February 2009, and has been used by them in their SPR (Sector Performance Review) Studies conducted recently (and SPR incorporates a TRE survey and analysis, but is more comprehensive in that it covers the broader ICT sector, not just telecom).

### 4.3.2 Regulatory website survey

In June 2008, LIRNEasia conducted a systematic assessment of regulatory websites in the Asia Pacific region. Building on similar work conducted by LIRNEasia in 2004-05,<sup>24</sup> this study benchmarked the way National Regulatory Authorities (NRAs) use their websites to improve their regulatory functions. The survey evaluated how well NRAs achieve this objective in regard to their stakeholders. Each website is awarded marks for the availability of information and features that are useful to these stakeholders. The hope is that the survey will encourage NRAs to improve their websites so as to serve their stakeholders in a more effective and transparent manner. (See Annex 35 for final report).

A total of 32 websites were evaluated from the 62 Asia Pacific economies. The selection of economies was based on a minimal criterion to ensure the maximum number of NRA websites within the Asia-Pacific region could be included. The criteria included that the economy be a member of the ITU, have a functioning regulatory website and that it was available in English (for practical purposes). Under the above criteria a total of 32 economies were selected out of 62.

The methodology was largely guided by previous studies such as those conducted by the United Nations in collaboration with the American society for Public Administration<sup>25</sup>, DIRSI<sup>26</sup> and the previous (2005-06) LIRNEasia study<sup>27</sup>. However, these studies focused on mainly the e-government angle while LIRNEasia 2008 study places more emphasis on the regulatory functions of an NRA such as transparency and accountability.

LIRNEasia's previous study clustered countries based on the e-readiness levels. Clustering of countries was important as it wasn't fair to benchmark the effectiveness of regulatory web sites ignoring other

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<sup>24</sup> <http://lirneasia.net/projects/2004-05/regulatory-web-survey>

<sup>25</sup> Ronaghan, S.A, (2001), 'Benchmarking E-government: A Global Perspective - Assessing the Progress of the UN Member States', United Nations Division for Public Economics and Public Administration (UNDPEPA) and American Society for Public Administration (ASPA), available at: [http://egov.dubai.ae/opt/CMSContent/Active/EGOV/ar/Documents/Benchmarking\\_EGovernment\\_A\\_Global\\_Perspective.pdf](http://egov.dubai.ae/opt/CMSContent/Active/EGOV/ar/Documents/Benchmarking_EGovernment_A_Global_Perspective.pdf) online on; 20/06/08.

<sup>26</sup> Mahan, A, (2004), 'Benchmarking African NRA Websites, Stimulating Investment in Network Development: Roles for Regulators, WDR Project, LIRNE.NET, Denmark.

<sup>27</sup> Wategama, C. (2005), Benchmarking National Telecom Regulatory Authority websites of Asia-Pacific Region. <http://www.lirneasia.net/wpcontent/uploads/2006/02/Wategama%202005%20Benchmarking%20NRAs.pdf>



criteria. The idea of clustering was to group the countries with ‘peers’. This allowed NRAs to find not only where they stand in absolute terms but with respect to a group of countries with similar conditions as well.

However, in the current study, there was a change of focus, with e-readiness no longer being an appropriate measure. Therefore the clustering was done based on the total number of access paths (mobile and fixed telephone connections) per 100 inhabitants, as it was assessed as a good indicator to measure the advancement of the telecom sector in a given country.

The methodology focused on four key areas of importance: factual information and news, business information, general and customer information. Each category was awarded a weight of the final score and marks were awarded based on the availability of information.

Further building on the website survey, additional research was conducted based on the data collected for the survey. Some of the data, namely information about public hearings and consultation papers, was used to measure the level of transparency of the regulators. The data was compared with three existing indices from the World Bank governance indicators: Regulatory Quality, Government Effectiveness and Voice and Accountability.<sup>28</sup> The data followed the same trend as the Regulatory Quality indicator and the Government Effectiveness indicator to a certain extent (i.e. the countries with “better” websites as per our methodology also did well better in the Regulatory Quality and Government Effectiveness indicators of the World Bank).

### 4.3.3 Banded forbearance

LIRNEasia has developed a new regulatory instrument called “banded forbearance” that has the potential to simplify telecom regulation to a level that can be implemented effectively by countries with limited regulatory capacity, for example micro states. Specifically, it’s a tool that provides a simpler way (than the traditional methods) for regulators to engage in tariff regulation so that regulatory resources can be concentrated on other areas and industry can get more predictability on tariff approvals. Banded forbearance requires the identification of a peer group of countries, benchmarking prices in defined services, and the setting of upper and lower bands around the specified benchmark. Operators, including incumbent operators, would be exempted from tariff regulation as long as they stay within the defined band. The criteria of the investigation into prices that fall outside the band would be clearly specified. Banded forbearance differs from asymmetric regulation, because the latter applies only to dominant operators (i.e. operators with significant market power) while the former applies to all operators. It requires the availability of reliable, accurate and timely data using common definitions on matters such as leased-line prices and tariffs charges to consumers so that the appropriate benchmarks can be developed, from which the regulators can define the bands.

Desk research was conducted over the period, resulting in the presentation of a paper at the CPR*south3* conference. Initial research on the area was presented at the Expert Workshop on ICT Sector Indicators and Benchmarks Regulation for SAARC Regulatory Authorities, held for SAARC Regulatory Authorities on 14-15 June 2008 in Singapore, to obtain feedback on the concept (Annex 37 and 40). An updated version of the research paper has since been published in the *International Journal of Regulation and Governance* (See Annex 29). The methodology (how to practically adopt Banded Forbearance as a method of tariff regulation) has been taught to participants of regulatory training courses in Singapore (2008) and South Africa (2009 and 2010).

### 4.3.4 Benchmarks

Based on the sector performance measurement that LIRNEasia has been involved in between 2006 and 2008, three new areas of benchmarking (mobile prices, broadband prices and broadband quality of service) have been developed making use of the opportunity presented by a lack of such existing

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<sup>28</sup> <http://info.worldbank.org/governance/wgi/index.asp>

benchmarks as well as an apparent demand. These areas have all been developed through an ‘open source’ approach and have gone through a number iterations, taking into account stakeholder feedback to arrive at the current measures. For example, the mobile basket methodology was based on the OECD price baskets, but then modified in several rounds based on feedback from SAARC regulators, OECD and others. They have been published on the web as well as in print and distributed to various industry groups, the media, etc. LIRNEasia publishes these indicators on a bi-annual basis, widely disseminating them to regulators, service providers as well as the general public through the media.<sup>29</sup>

#### 4.3.4.1 *Mobile benchmarks*

LIRNEasia has been making use of the OECD basket methodology for mobile cost comparisons since early 2006. The OECD uses basket methodology which takes pricing information from the Teligen Master Tariff Database, and creates comparable user baskets based on actual user profiles, including in the baskets connection charges and monthly subscription, call, SMS as well as MMS use, taxes and free airtime and SMSs.<sup>30</sup> The OECD methodology provides a comprehensive tariff indicator as opposed to other methodologies, and has been periodically recalibrated and improved. LIRNEasia has taken this a step further, and adapted this ‘T-basket’ for the South and Southeast Asian region – the reason for the customization was because the usage characteristics in Asia were found to be significantly different to those of the OECD (e.g. much higher minutes of use per month in Asia than in the OECD countries).

The South and Southeast Asian baskets that LIRNEasia has developed are calculated for low, medium and high users separately and account for the connection charges (where applicable) depreciated over three years, any applicable monthly charges, the usage profile (including airtime and SMSs), free airtime and SMSs, and applicable taxes. In the most recent round of basket calculations, conducted in February 2010, it was decided to include MMS and voicemail charges as well (which is part of the OECD methodology). The usage profile of minutes of use (MOUs) and SMS was also tweaked for the calculations conducted in February 2010. Previously, the usage profile consisted of MoUs and SMS data, calculated separately for prepaid and postpaid users, as reported by the mobile operator with the largest market share and/or national averages, where available; where a breakdown of usage data by prepaid and postpaid use is not available, data was apportioned by prepaid and postpaid use, according to the given operators’ relative share of prepaid and postpaid subscribers, and the weighted average ratio of prepaid to postpaid MOU and SMS data using operator data where such breakdowns are available.

However, in the last round of calculations conducted in February 2010, it was decided to construct the basket using the volume of MOUs, SMS and MMS as given in OECD methodology, such that the basket values would be comparable with those constructed in other regions using similar OECD methodologies. Around early 2009, the ITU finally abandoned the per-three-minute-call price reporting, and switched to calculating an “ICT Price Basket”, partly based on OECD methodology. The basket measures and compares ICT prices across countries, combining the average cost of fixed telephone, mobile cellular, and Internet broadband.<sup>31</sup> Given ITU’s move towards baskets loosely based on minutes of use and SMS reported by the OECD, it was decided to revise LIRNEasia’s basket methodology from using MOUs and SMS reported by mobile operators in the Asian region, to that reported by the OECD. Furthermore, in future, LIRNEasia will consider not calculating mobile price baskets since the ITU calculates a similar basket, from which we can obtain relevant data (although information is often outdated by the time it is published).

In the absence of data on call and SMS distributions by destination, time of day and duration, the latest OECD weights have been utilized to calculate the price baskets. While the OECD weights may not reflect Asian usage patterns accurately, they were loosely verified using LIRNEasia’s Teleuse@BOP

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<sup>29</sup> See <http://www.lirneasia.net/projects/benchmarks> for the price and quality benchmark reports published every 6 months.

<sup>30</sup> See [http://www.teligen.com/t\\_basket.asp](http://www.teligen.com/t_basket.asp)

<sup>31</sup> [http://www.itu.int/newsroom/press\\_releases/2009/07.html](http://www.itu.int/newsroom/press_releases/2009/07.html)

findings and were deemed applicable for use (See Annex 31 for Mobile Benchmarks publications over the period).

#### 4.3.4.2 *Broadband benchmarks – broadband price*

Broadband growth in emerging Asia is characterized by:

- Growth in connections led by mobile broadband technologies (as opposed to xDSL or other fixed or wire-line based broadband growth);
- Growth in connections with limited download/upload allowances per time period (as opposed to “all you can eat”/unlimited download/upload packages that were common in the develop markets); and
- A wide range of speeds offered as broadband (starting with the 256kbps download speed packages which barely count as “broadband” in some countries, to the 2Mbps or 4Mbps domestic broadband packages that are now common and increasingly affordable in others)

The LIRNEasia methodology therefore benchmarks prices across a range of packages that take into account the above factors. In addition, domestic and international leased line costs have an important impact on retail broadband prices in developing countries (lack of access to international cables or control of domestic leased-lines by the incumbent often drive up these costs to new entrants; this is exacerbated by the fact that most of the content accessed by users is hosted in the US or Europe). Therefore the LIRNEasia methodology includes two measures of domestic leased line prices. Obtaining international leased-circuit prices has proven to be time consuming (therefore hasn't been done consistently so far) but is being added starting with the 2<sup>nd</sup> half of 2010.

Data is collected every 6 months (in February and September), and published on <http://lirneasia.net/projects/2008-2010/indicators-continued/benchmarks/>. In addition, when significant changes in prices have been visible, reasons have been investigated and news releases have been sent to media outlets (See Annexes 48-51).

While initially the prices of the South Asia were collected and reported, since October 2008, coverage has expanded to include three countries from Southeast Asia as well, namely Indonesia, Thailand and Philippines because LIRNEasia has been working in these countries extensively (See Annex 32 for Broadband Benchmarks publications [price and QOSE] over the period).

Finally, repeated discussions amongst researchers and regulators at various forums hinted at the difficulty consumers have in selecting a broadband package that cost effective and fits their needs. Interactions with Prof. Johannes Bauer (Professor, Telecommunication, Information at the at the University of Michigan; member of the International Advisory Board of LIRNEasia) alerted us to a new(er) methodology titled the Least Cost Frontier<sup>32</sup> which enables comparison of various mobile or broadband packages or baskets. The starting point of the LCF method is a basket. However, at the time LIRNEasia first started benchmarking mobile broadband prices, a defined basket was not commonly available (unlike the case of mobile voice, where the OECD basket was well defined and widely used). Therefore LIRNEasia was simply benchmarking the price per Giga Byte of download via a mobile broadband network across countries. However in Q3 2009, Nokia developed and published the first mobile broadband data basket and benchmarked prices using that methodology.<sup>33</sup> A modified version of this basket was adopted by LIRNEasia. Then, Professor Bauer's team was contracted to develop a software tool that automated the calculation of a mobile data basket using

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<sup>33</sup> See <http://comm.psu.edu/about/centers/institute-for-information-policy/06Bauer-Kim.pdf>

<sup>33</sup> See [http://www.nokia.com/NOKIA\\_COM\\_1/Corporate\\_Responsibility/Society\\_/Expanding\\_Horizons/Expanding\\_Horizons\\_NEW/pdf/Expanding\\_Horizons\\_Q3\\_2009.pdf](http://www.nokia.com/NOKIA_COM_1/Corporate_Responsibility/Society_/Expanding_Horizons/Expanding_Horizons_NEW/pdf/Expanding_Horizons_Q3_2009.pdf). Initially LIRNEasia was approached by Nokia to develop a methodology for them, though LIRNEasia was unable to take up this work due to various reasons.

the LCF methodology. The tool enables any consumer in the countries LIRNEasia works in to enter his/her requirements for broadband use (e.g. user specifies the speed, expected usage level etc) and obtain the “best” broadband packages commercially available to the user. In recommending a package, the software takes into account the equipment cost (e.g. a mobile modem or mobile phone) as well as usage costs. At the time of writing, the software has been completed and tested. It is available freely on a website. However, further work needs to be done in publicizing its existence (after all users need to know such a tool is available before they will use it). Further work is also planned in obtaining the buy-in of operators and regulators in the countries LIRNEasia works in, so that the data entry (on the latest packages offered by the operators in each country) can be done directly by them (instead of a LIRNEasia researcher obtaining this information via various websites, and populating the LCF database). This newly adopted methodology is a significant improvement on our previous method of benchmarking mobile broadband data. The LCF tool itself is a significant step in enabling consumers to make informed choices on broadband packages.

#### 4.3.4.3 Broadband benchmarks – broadband quality

Quality of Service Experience (QoSE) is integrally connected to price: an increase in quality is an invisible decrease in price and vice versa. Broadband quality can be evaluated through speed tests. Test sites provide a variety of information about the speed of a link. Careful design and implementation of tests can shed light on the exact segment where inadequate capacity constrains speed. Carefully implemented tests can also be the basis for Service Level Agreements (SLAs) between operators and users and for regulatory action.

Broadband Quality is about more than upload speed and download speed (throughput), through these are certainly the most common measures. The LIRNEasia method tests for these, as well as other indicators of quality such as Latency, jitter, packet loss and round-trip time (See Table 5 ).

**Table 5: Dimensions of broadband quality that are measured by LIRNEasia**

<b>Throughput (kbps)</b>	<p>Referred to as the “actual amount of useful data sent on a transmission”<sup>34</sup>. <b>Defined by the ITU as “an amount of user information transferred in a period of time” (ITU-T X.641 (97), 6.3.3.16)</b>, more commonly referred to as download or upload speeds.</p> <p>A key advertised metric in broadband services is the download speed. It defines how much information a user can receive from a local or international server. Upload speed defines the speed at which the user can send information to local or international servers. It plays a significant role in responsiveness and real-time applications like VoIP (Voice over Internet Protocol).</p> <p>Throughput, or download and upload speeds, varies depending on the location of the server that holds the content. If the location is local, such as an ISP server, the throughput may be higher than it would be if the location is international.</p> <p>Therefore the testing has included throughput for both local (ISP) and international (yahoo.com) servers.</p>
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<sup>34</sup> Dodd, A. (2005), “The Essential Guide to Telecommunication” Fourth Edition, Pearson Education, p. 14

<b>Latency (ms)</b>	<p>Referred to as “delays when voice packets transverse the network”<sup>35</sup>. It is measured in milliseconds by using the Round Trip Time (RTT). This is significant in systems that require two-way interactive communication, such as voice telephony, or ACK/NAK [acknowledge/not acknowledge] data systems where the round-trip time directly affects the throughput rate, such as the Transmission Control Protocol (TCP).</p> <p><b>The ITU definition states that “Latency means transmission delay for FEC (Forwarding Equivalence Class) encoding, decoding, interleaving and de-interleaving” (ITU-T G.972 (04), 3025).</b></p>
<b>Jitter (ms)</b>	<p>Referred to as “uneven latency and packet loss”<sup>36</sup>. It is the variation of end-to-end delay from one packet to the next within the same packet stream/connection/flow. Jitter is more relevant for real-time traffic like VoIP. Ideally the figure should be low.</p> <p>E.g. Radio quality voice requires less than 1 ms Jitter, toll-quality voice requires less than 20 ms jitter and normal VoIP requires jitter to be less than 30 ms. Beyond 30 ms, the performance of VoIP will degrade.<sup>37</sup></p> <p><b>Also defined by ITU as “Short-term non-cumulative variations of the significant instants of a digital signal from their ideal positions in time” (ITU-T G.701 (93), 2024).</b></p>
<b>Packet Loss (%)</b>	<p>Referred to as the number of packets (as a percentage) that does not reach the destination. Degradation can result in noticeable performance loss with streaming technologies, VoIP and video conferencing. <b>ITU states that “in general, IP-based networks do not guarantee delivery of packets. Packets will be dropped under peak loads and during periods of congestion. NOTE – in case of multimedia services, when a late packet finally arrives, it will be considered lost” (ITU-T H.360 (04), 5.3.2.2).</b></p>

Broadband quality can vary depending on time of day due to network load. Therefore multiple readings are taken throughout the day. Broadband quality can vary depending on the location (e.g. in the case of xDSL the distance from exchange impacts performance; depending on how the network is dimensioned, urban vs. rural location of the user may impact performance). Therefore the reported quality measures are not for a particular country, but for a particular city within a country. Broadband quality is influenced by the location of the data/server being accessed – accessing data hosted overseas may yield different download times from accessing data hosted within a country on the ISPs own servers, and so on. Therefore three different locations (within own-ISP, within country [but at a different ISP] and international server) are tested for each indicator. The results may be influenced by factors other than actual network quality if only one user is entrusted with the testing (e.g. a virus on the testers computer may slow throughput measures significantly). Therefore, a large number of testers (some volunteers, some paid) are enlisted to do the testing. The testing software is automated (and freely available to all). Results are automatically uploaded to public website [www.broadbandasia.info](http://www.broadbandasia.info). Detailed testing plan is available at <http://www.lirneasia.net/wp-content/uploads/2008/03/broadband-quality-test-plan1.pdf>.

The methodology was developed in partnership with IIT-Madras. Initial testing was done manually in March 2008. Then a team from IIT Madras led by Timothy Gonsalves (PhD) was contracted to develop a software to automate the testing process. Since October 2008, this software has been used by various paid testers and unpaid volunteers to test quality of their broadband connections. The software has been available free of charge from the site [www.broadbandasia.info](http://www.broadbandasia.info) for any user to test a broadband package. The difference between this and other commonly available other tools (e.g., speedtest.net and speedtest.org) is unlike those, this it will do a segment analysis on traffic for user to ISP, user to a national server and user to an international server. It can also do a comprehensive

<sup>35</sup> Dodd, A. (2005), “The Essential Guide to Telecommunication” Fourth Edition, Pearson Education, p. 60

<sup>36</sup> Dodd, A. (2005), “The Essential Guide to Telecommunication” Fourth Edition, Pearson Education, p. 60

<sup>37</sup> Connection Magazine, <http://www.connectionsmagazine.com/articles/5/049.html>, CISCO Press Article

testing across six parameters, instead of the download and upload speeds – the most commonly tested ones.

During this research cycle LIRNEasia used the concept of ‘Volunteer Computing’ to tap a significant resource base to conduct testing (See Annex 27). In return the volunteers will be able to find out performance of their own packages – with the information readily available through a website. Prospective users might be able to make more intelligent choices when purchasing a new package.

Another focus of this cycle was expansion of the test process to cover rural areas, which had not done in previous cycles. Two workshops have been conducted to train telecenter operators in Sri Lanka and engineering students in Tamil Nadu, India. They were given the exposure to the AT-Tester. Information from these volunteers is being received and uploaded to the above-mentioned website.

LIRNEasia together with the Institution of Engineers Sri Lanka (IESL) organized its annual dissemination event in Colombo to present the March 2009 data to operators, users and media in Sri Lanka. Out of the five Sri Lankan telecom operators invited, two attended and responded to the findings. This is the second time we have held public hearings on the topic in partnership with IESL and indications are that this can become a regular event.

During this cycle, we also made significant inroads into testing quality of mobile broadband connections - previous testing as discussed above applied to broadband connections on a fixed network, or broadband connections on a 3G mobile network tested for quality while being stationary, (so “fixed” usage, in a sense. Here we mean truly mobile usage, in that the user is actually moving around while using a broadband connection over a mobile network. Unlike fixed broadband QoSE testing, this was more a virgin area and input from different stakeholders was sought to build the foundation for the development of the mobile version of the AT-Tester and test methodology. A workshop on mobile broadband quality of service experience (QoSE) measuring approaches was held on 30 April, 2009. This was the starting point of LIRNEasia’s mobile broadband QoSE testing research. This was attended by 30 participants representing regulators, telecom operators, users and also LIRNEasia’s partners in the broadband QoSE testing/benchmarking research. Annex 39 contains the workshop report including a participant list.

The key questions the workshop intended to find answers, through discussion with participants, to were:

1. From a quality perspective, is mobile broadband different from fixed broadband? If so how?
2. Should we focus on the same quality parameters as in the case of fixed broadband (throughput, latency and packet loss) or should we use a different set? For example, should we test throughput on the move and/or changing from one cell to another? Should such parameters specifically defined with related to mobile broadband? (e.g. RTT vs. mobile RTT)
3. Is mobile broadband quality technology-dependent to the extent that testing cannot be technology neutral?
4. In mobile broadband, what should be tested – link from handset to operator or (as in case of fixed broadband) link to the cloud, or both?
5. Should testing be done using a handset? Can PC simulation be used?
6. Does the type of handset significantly affect the quality? (In fixed broadband testing we treat PCs as equivalent) If, so how do we take this factor into account? (NB: This point is different from 3)
7. Do we have any tools for mobile broadband testing? If yes, do they cover all aspects discussed above? If no, will it be feasible to develop a single universal tool?
8. How should regulators ensure quality delivery? Should the process be different from that for fixed broadband?
9. Will users play the same vital role in mobile broadband testing, as in fixed broadband?
10. Should the advertising standards in mobile broadband differ from those in fixed broadband?

Input from this workshop was used in developing the mobile version of AT-Tester and the mobile broadband testing methodology. Based on this, proposals for the development of web and mobile versions of AT-Tester were called for in May 2009 by newspaper advertisements and through LIRNEasia’s website. Three firms made bids for selected components. The low response level might be attributed to both the lack of interest of this specific subject area and relatively low contract value.

After technical and financial evaluation by LIRNEasia and an external technical consultant, Zamzana Lanka PLC ([www.zamsana.com](http://www.zamsana.com)) and Nilgiri Networks were awarded the contracts for the development of mobile and web versions of AT-Tester.

Nilgiri Networks upgraded the AT-Tester software to work with any Windows platform (previously it was compatible only with Windows NT) and also developed a cut down web version for users who can spare limited amount of time. Although Linux and Mac versions of AT-Tester were planned, they were not developed as the costs were not justifiable given the limited number of Linux and Mac users in South Asia.

Zamsana Lanka PLC developed mobile AT-Tester versions for four widely used mobile handset operating systems: Windows CE, Symbian, Apple iPhone and Android. These along with source codes can be downloaded from <http://www.mobilebroadbandasia.info>. The mobile versions were soft launched at a meeting attended by Sri Lankan bloggers, a community of broadband power users in February 2010. This was the first step towards using bloggers for mobile broadband testing activities in Sri Lanka.

The degree of complication of testing mobile broadband quality (compared to testing fixed broadband quality) was higher for the following reasons.

1. Absence of a standard hardware and software platforms (use of different handsets against PCs; the hardware of a PC is not a critical determinate of broadband quality where that of a mobile handset is).
2. Testing from a fixed location vs. testing 'on the move;' this introduced additional questions such as what are the best locations? What modes we should test? Should it be stationary or moving? If moving at what speed? Etc.
3. Variable parameters like the number of simultaneous users connected to a mobile tower vs. environmental conditions (these have an impact over fixed broadband quality too but it is not significant).

Though far from perfection, LIRNEasia's mobile broadband quality test methodology addressed some of these questions. Modifications are being done with each round of testing.

The first two rounds of testing March and April 2010 in Colombo were failures; though the applications worked perfect in laboratory conditions, they gave spurious results when used in the field. This called for cancellations of test rounds and debugging of the application. The last two rounds in May 2010 presented acceptable results.

The tests were conducted while the testers used public transport (i.e. travelling in busses) to simulate the mobile broadband usage by BOP as much as possible.

LIRNEasia also continued its regular test rounds (of fixed broadband). An innovation introduced in the 2009 Q3 round of testing was a comparison of broadband quality offered by South Asian operators against few selected counterparts from developed markets. Four broadband packages were tested, two each from Canada (Ottawa) and USA (Buffalo and Denver). For the first time the price factor was introduced, presenting value for money. The findings are available in Annex 27 and were presented by Nilusha Kapugama at "Experts Workshop; Beyond Broadband Access: A data based information policy for a new administration," 22-24 September 2009, Washington DC, organized by the New America Foundation.

#### 4.3.4.4 *International Voice benchmarks*

The benchmarking of international calling rates was done in time for the annual SAARC (South Asian Association for Regional Corporation) summit that took place in Sri Lanka in August 2008. The lowest published rate for a one minute call from the eight SAARC countries to a list of countries was collected, using data available online. The research was carried for both fixed and mobile telephony services. The rates quoted by the largest operators in each sector (fixed and mobile) were used. This report is now published every six months, and is available at <http://lirneasia.net/projects/2008-2010/indicators-continued/benchmarks/>. From October 2009 onwards, rates for making an international call using Skype credit were compared against SAARC country for traditional telephony rates.

The benchmarking of international roaming rates was first done and presented at the GSM-Asia Pacific Conference September 2008, where all member countries of the GSM Association's Asia Pacific chapter were in attendance. The report gives prices for the SAARC countries. The published rates for the largest operator in each country were used. Most of the rates were available on operator websites; where not available, personal communication with customer service representatives was needed to obtain the information. Prices for sending an SMS, prices for receiving a one-minute call while roaming, prices for making a one-minute local call (in the roaming country) and the price to make a one-minute call home (back to the home country) were used. The report covered rates for roaming in over 40 countries for SAARC region users. The report is published every six months.

See Annex 33 for reports on International Voice and Annex 34 for International Roaming benchmarks published during this project cycle.

#### **4.3.5 International conference on regulatory efficacy**

The TRE is a parsimonious and effective instrument for measuring regulatory efficacy. It has been well received in academic settings<sup>38</sup> and by regulators and media.<sup>39</sup> The commissioning of a regulatory performance study by the GSM Association in 2008 testifies to the need for reliable methods of assessing regulatory performance.

An international conference on regulatory efficacy, entitled *Infrastructure Regulation: What Works, Why, and How do we know?* was held from 26-27 February 2009, in Hong Kong, in collaboration with the University of Hong Kong. The conference intended to address essential issues in regulations through conceptual and empirical studies (See Annex 41 for participant list and Annex 41a for conference agenda).

The conference was initially intended to take place in October 2008, in Singapore in partnership with the Lee Kuan Yee School of Public Policy at the National University of Singapore (LKY School). However, the relocation of Prof. M Ramesh (who was leading the initiative at the LKY School) to the University of Hong Kong in meant that the conference had to be postponed. Since Prof. Ramesh was the driving force of the conference at LKY School, it was decided to relocate the conference to the University of Hong Kong.

The two-day conference was attended by researchers, policy makers and academics working in the field of regulatory efficacy, from 15 countries ranging from Argentina to South Korea (See Annex 44 for participant list). It was decided that the papers presented at the conference will be compiled into a publication. A writing workshop was held in October 2009 in Negombo, Sri Lanka with the attendance of 14 paper presenters and discussants of the Conference on regulatory efficacy held in Hong Kong. A team of editors from University of Hong Kong and the National University of Singapore are currently working on the manuscript that will have chapters on the regulation of water, electricity and telecommunications.

## **4.4 Capacity building program**

Capacity building has been a focus of LIRNEasia since its inception. Enlightened regulators and policy makers are more likely to develop sensible policies. They are more likely to be receptive to evidence in the policy making process. Therefore engaging in capacity building of regulators and policy makers is directly linked to, and an essential part of, LIRNEasia's mission (and its advocacy program). This has been primarily carried out through the annual Executive Course on Telecom Regulation that was organized and taught by LIRNEasia previously (since 2008 it has been organized by our sister research network RIA, with participation of LIRNEasia as faculty members), through target trainings provided to NRAs and NSOs on topics relevant to their jobs and LIRNEasia's mission, and through on-demand training courses (upon the request of a specific organization, be it a NRA or a civil society organization).

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<sup>38</sup> <http://www.lirneasia.net/2007/08/lirneasia-researchers-to-present-at-tprc/>

<sup>39</sup> <http://www.lirneasia.net/2007/06/lirneasia-presents-its-research-in-pakistan/>



LIRNEasia also believes that researchers situated and grounded developing country contexts are more likely to develop appropriate policies and regulation (as opposed to adopting models adopted elsewhere which may be wholly unsuitable in our countries). Therefore, developing the capacities of researchers that work on issues relevant to our countries, and developing networks of such researchers has also been a focus of our Capacity Building Program. The primary vehicle for this has been the Communications Policy Research South (CPR*south*) series of conferences and the internships.

#### **4.4.1 CPR*south* conferences and tutorials for young scholars**

During the previous cycle of funding LIRNEasia initiated the establishment of a capacity building initiative known as CPR*south*, centered around an annual research conference that will provide a focus for intra-Asian (and intra-South) connections among scholars engaged in ICT policy and regulation research.

##### *4.4.1.1 CPR*south*3*

The third CPR*south* conference took place from 5-7 December 2008 and the tutorials for young scholars were held on 8-9 December 2008, in Beijing, China. The conference was held in collaboration with the School of Economics and Management of the Beijing University of Post and Telecommunication (SEM-BUPT), and was themed “Transformation Strategies for Telecom Operators.”

The call for abstracts was sent out in April 2008 to a mailing list of about 2,000 email addresses. A total of 85 abstracts and 60 young scholar applications were received by the deadline. Of this, 37 abstracts were shortlisted and 30 complete papers were received by the deadline. Nineteen papers were presented at the conference. While the paper presenters were predominantly from the Asia Pacific region, there was representation from Latin America, Africa and Europe (See Annex 86 for participant list). Twenty nine young scholars attended the conference and the tutorials (see Annex 91 for list of young scholars). Of these, 15 from China and 13 from 12 other Asia Pacific countries (including Samoa and Bhutan) were provided with funding while one participant from Africa attended as a self-funded participant. Of the selected participants, 53 percent of paper presenters and 60 percent of young scholars were female. The CPR*south*3 participants mainly consisted of those from universities.

Telecommunication Policy Research Conference (TPRC) and European Communication Policy Research (EuroCPR) were represented at CPR*south*3.<sup>40</sup> TPRC was represented by Prabir Neogi and Prof. Jonathan Aronson while EuroCPR was represented by Jean Paul Simon. They took part in a special session to discuss future collaborations with CPR*south*. CPR*south* was initially conceptualized based on these two organizations.

In addition to the conference and the tutorials, CPR*south*3 held a communications training session for the paper presenters and young scholars. A session on “Research to Policy” was another new feature at the conference. The guest speaker of CPR*south*3 was Prof. William Melody while the keynote speech was delivered by Liu Cai, Vice President and Secretary General of China Institute of Communication, Director of Policies, Laws and Regulations Department of Ministry of Information Industry, China. The conference report is contained in Annex 84.

The 3<sup>rd</sup> CPR*south* Board meeting was held on 6 December 2008 in Beijing, China. The Board meeting report is attached as Annex 94.

##### *4.4.1.2 CPR*south*4*

The fourth CPR*south* conference took place from 7-8 December 2009, with tutorials for young scholars taking place from 5-6 December 2009, in Negombo, Sri Lanka (See Annex 85 for the meeting report). The conference theme was “Speaking Truth to Power.”

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<sup>40</sup> TPRC and EuroCPR are large communication research conferences held annually in the USA and Europe respective. In its inception, CPR*south* was modeled on these two conferences.

The call for abstracts and call for applications for young scholars was sent out in April 2009 to a mailing list of about 2,750 email addresses. Seventy six abstracts and 34 young scholar applications were received by the deadline. Of the received abstracts, 40 were short-listed. The full papers of 32 of the short-listed abstracts were received by 15 September 2009 of that, 21 were selected to be presented at the conference. The papers presented were predominantly from the Asia Pacific. However, there was representation from Africa and Europe (see Annex 87 for participant list). Thirteen young scholars were selected from the 34 applicants. In addition 15 young scholars from India and Sri Lanka were selected through a nomination process. A total of 28 young scholars attended the tutorials. CPRsouth4 participants mainly consisted of those from universities. Of the selected paper presenters, 52 percent were female.

EuroCPR was represented at CPRsouth4 by Dr. Anders Henten and Dr. Jean Paul Simon.

In addition to the paper sessions, the young scholars and paper presenters were given an insight into how research is “consumed” in the policy process, through an interview with three practitioners representing the government, private and civil society organizations. The dinner speaker for the conference was Dr. Alison Gillwald (RIA) while the keynote was delivered by Dr. Lalithasiri Gunaruwan, General Manager, Sri Lanka Railways and senior lecturer of Economics at the University of Colombo. (see Annex 92 for list of young scholars)..

The 4<sup>th</sup> CPRsouth Board meeting was held on 8 December 2008 in Negombo, Sri Lanka. The Board meeting report is contained in Annex 95.

#### 4.4.1.3 *CPRsouth tutorials in Singapore*

Thirteen young scholars (selected from 80 applicants) from the Asia Pacific were selected to attend tutorials held on 21 June 2010 at the National University of Singapore (NUS). The event was co-organized by the Department of Communications and New Media of NUS. A majority of the young scholars were from Universities with a few from regulatory agencies and operators. Of the participants, 39 percent were female (see Annex 96 for details of scholarship holders).

#### 4.4.1.4 *CPRsouth website*

The CPRsouth website ([www.cprsouth.org](http://www.cprsouth.org)) underwent upgrades in April 2008 and February 2010. The website is now more streamlined and user friendly. In addition, submission of abstracts is now done through a webform on the CPRsouth website (instead of via email as was previously the case).

#### 4.4.1.1 *Knowledge mapping*

A survey of participants and young scholars from the first three CPRsouth conferences as well as the related tutorials was conducted to investigate the post conference academic and policy activities of the conference and tutorial participants.

In June 2009 Researcher, Nilusha Kapugama took part in the IDRC evaluation Capacity Building programme DECI (Developing Evaluation Capacity for ICT4D). The program trained her in evaluation methodology, “Utilization Focused Evaluation,” which she is using to perform an evaluation of the CPRsouth project.

Knowledge mapping exercises were conducted as a part of analyzing the outcome survey and evaluation findings. Network visualization tools were also utilized to analyze some of the data. See Annex 89 for the outcome survey findings and Annex 88 for draft evaluation report.

### 4.4.2 **NRA/NSO capacity building**

The Expert Workshop on ICT Sector Indicators and Benchmarks Regulation for SAARC Regulatory Authorities was held from 14-15 June 2008 at the Changi Village Hotel, Singapore.

Fourteen representatives from all eight National Regulatory Authorities (NRAs) within the SAARC region, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Sri Lanka and Pakistan, participated at the forum. The aim of this event was to present current research on ICT Indicators and Benchmarks and to obtain their feedback.

In addition, the participants attending the 12th Executive Course on Telecom Reform, held in the days prior to the event at the same venue also participated. Overall, participants from 17 countries attended (the full participant list is available in Annex 40).

The problems and importance of collecting comparable telecom sector and ICT indicators was discussed. The results of the LIRNEasia NRA website rankings were presented. Each senior representative from each NRA made a presentation in response to the survey methodology and rankings. Hands-on training on using the Asian ICT Indicator Database (developed by LIRNEasia in the previous research cycle, See Annex 36) was conducted (See Annex 37 for workshop report).

#### **4.4.1 Training course on measuring ICT access and use by households and individuals**

LIRNEasia and the International Telecommunications Union (ITU) organized and conducted a five day training program on conducting demand-side surveys on ICT use. The Ministry of ICT, Thailand acted as local hosts. More than 25 senior level representatives from National Statistical Offices (NSOs) in the Asia Pacific participated in the event. LIRNEasia selected and funded the South and Southeast Asian participants (in total funding 16 NRA staff members from 12 countries). ITU funded the trainer and provided the major components of the curriculum (which had been purpose-developed by the ITU). Rohan Samarajiva, Payal Malik and Helani Galpaya of LIRNEasia spoke at the event (Rohan Samarajiva made the opening speech; Payal Malik gave an overview of the Indian NSO's initiatives to measure ICT exports and imports; Helani Galpaya spoke of practical importance of standardizing indicator methodologies and data collection). The final report on the training program is available on the ITU website, and is included in Annex 38.

#### **4.4.2 Internships**

LIRNEasia had five interns for the 2008-2010 research cycle. .

- Aileen Agüero – Aileen is a research assistant at the IEP (Instituto de Estudios Peruanos – Institute of Peruvian Studies), working with Roxana Barrantes (DIRSI) on research projects (rural telephony, convergence and universalisation of telecommunications services, substitution and complementarities in telecom services use) and in consultancies for the Peruvian telecommunications regulator (OSIPTEL) and the Ministry of Transport and Communications. She joined LIRNEasia in May 2009, and completed her internship in December 2009. During her time she worked on two research papers based on the T@BOP3 data (Annexes 2 and 4), compared DIRSI vs. LIRNEasia benchmarking methodology making recommendations for comparability, and assisted with other research.
- Pratichi Joshi – Pratichi previously worked as a teaching and research assistant at the Communication and New Media Program, National University of Singapore (NUS), where she completed her Master's degree in Communications and New Media studies in 2008. She was involved in research assistance in examining the Global Patterns of Creative Commons License Use and Pan Localization Project on building local-language computing capacity in Asia. She joined LIRNEasia in August 2009, and completed her internship in December 2009. Pratichi worked on the background research for knowledge based economies project LIRNEasia was developing.
- Haymar Win Tun – Haymar was a Masters Student at the Lee Kwan Yew School of Public Policy at the National University of Singapore. She had previously worked with the United Nations Development Programme as an intern. Her internship at LIRNEasia began in December 2009 and completed in January 2010. Haymar did background research on the knowledge based economy during her internship at LIRNEasia.
- Il-haam Petersen – Il-haam previously worked as a research intern at the Human Sciences Research Council (HSRC) in South Africa where she was involved in various research projects exploring indicators of Science, Technology and Innovation potential in sub-Saharan Africa and the role of universities in developing countries. Her work at LIRNEasia involved looking at the importance of the role played by universities in the production or synthesis, and dissemination of knowledge in the developing world.

- Priyanwada Herath – Priyanwada was a Economics graduate from the University of Colombo. During her six month internship at LIRNEasia, she worked on a report on the Sri Lanka-India Comprehensive Economic Partnership Agreement. She worked on the project with Chair and CEO Rohan Samarajiva. Subsequently she was hired on a separate LIRNEasia project on the use of mobiles in consumption smoothing in Sri Lanka.

#### **4.4.3 Training course scholarships**

Scholarships were provided for 15 persons to attend the 12th Executive Course on Telecom Reform: Strategies to achieve connectivity and convergence held on 10-14, June 2008 at Changi Village Hotel, Singapore. The list of scholars and their details is provided in Annex 90.

From the beginnings of LIRNE.NET in Europe, we believed that there was a need for training and capacity building at regulatory agencies. We also believed that the regulatory agencies should commit resources for this purpose, even when scholarships were offered. As the evidence began to pile up that they were not willing to do so, we have begun to deemphasize training for staff of national regulatory agencies, despite continuing to believe that they needed training. One explanation for the lack of paying customers from regulatory agencies is that our courses do not meet their demands. Another is that the market has been spoiled by the ITU's fellowships for regulatory agency staff: we are asking the agencies to pay for training when the ITU is giving it to them for free. Thus, after the 2008 course, it was decided to pull out of the regulatory training business, at least in Asia, and instead support RIA's efforts in Africa instead. In this light, LIRNEasia supported scholarships for 13 persons to attend the 14th Executive course on Telecom Reform by RIA (via the University of Cape Town's Graduate School of Business's Programme in Infrastructure Reform and Regulation) in Cape Town on 12-16 April 2010, Cape Town. The list of scholars and their details is provided in Annex 93.

#### **4.4.4 Proposed training for Afghanistan Telecom Regulatory Authority**

Based on discussions and new relationships with the Afghanistan Telecom Regulatory Authority (ATRA), developed carrying out the TRE study fieldwork, it was decided to provide a short training course for ATRA before the end of the project. This was of course subject to the logistical arrangements (travel approvals, visas, etc) being made. However, due to scheduling conflicts, this could not be arranged prior to project completion and therefore did not take place.

#### **4.4.5 Training on communication for policy influence**

In addition, a module on Communication for policy influence was taught by Rohan Samarajiva, Helani Galpaya and Nilusha Kapugama at the DRC PAN-ALL conference in Penang (June 2009). The module was based on material developed through LIRNEasia's own experience of communicating for policy influence.

## **4.5 Advocacy and dissemination program**

### **4.5.1 Rapid response**

By definition, Rapid Response is a reactive, opportunistic activity. The following Rapid Response activities were undertaken over the project period:

1. In October 2007 LIRNEasia initiated discussion on a so-called environmental levy on mobiles proposed by the Environmental Ministry. It assisted Parliamentarians to remove the most noxious provisions at the consultative committee level, though the actual parliamentary debate did not place before the bill became law. In August 2008 the first regulations imposing the levy on mobile use (not handsets) and towers (retrospective) were issued. LIRNEasia led the evidence-based criticism of this abuse of market-based environmental

- instruments, using it as an opportunity to educate decision makers and the public. In late September the Supreme Court issued an injunction on the levy.<sup>41</sup>
2. Based on the ongoing Broadband QoS research, LIRNEasia made two interventions related to broadband in Bangladesh and Sri Lanka. The former was a response to a consultation paper on the issuance of wireless broadband licenses. The RFP that was subsequently issued included significant elements from the LIRNEasia intervention including for example a requirement that QoS be guaranteed to first point of landing in the Internet cloud, not just within the local network.<sup>42</sup> The Sri Lanka intervention was a response to a consultation paper on a state-funded national broadband network. We are yet to hear of the response.
  3. In July 2008, the Government of Sri Lanka announced procedures that required all mobile users to prove that they owned the phones they carried. In a series of media interventions LIRNEasia pointed out the extent of sharing at the BOP. The procedures were not withdrawn but are being implemented in modified form by the government.
  4. A third intervention related to broadband was made based on the ongoing Broadband QoS research. The intervention was made by Chanuka Wattegama of LIRNEasia with Timothy Gonsalves Ph.D. and R. Tirumurthy of TeNet Group, IIT Madras. A response was made to the Telecommunication Regulatory Authority of India (TRAI) consultation paper 'Bandwidth required for ISPs for better connectivity and improved quality of service' in February 2009. The use of contention ratios between 1:20 and 1:50 was recommended for broadband quality testing, complementing it with user-end testing. The LIRNEasia-TeNet methodology and test application, the AT-Tester, were also introduced. The recommendations were largely based on LIRNEasia-TeNet research in broadband Quality of Service Experience testing. In March 2009, TRAI issued quality of service recommendations, adopting the following LIRNEasia-TeNet recommendations:
    - Contention ratios should be between 1:20 to 1:50; TRAI adopted a range of 1:30 to 1:50.
    - Regulator/operators should promote user education/awareness
  5. LIRNEasia facilitated the publication of an article in one of Sri Lanka's leading English newspapers by Muhammed Aslam Hayat on regional experiences and concerns with mobile payments.<sup>43</sup> Hayat is a legal expert currently based in Bangladesh but with extensive regional experience. The article was aimed at raising interest around mobile payments, in light of the Central Bank of Sri Lanka's indication at the start of 2009 that it will be making policies for mobile payments. Not having seen much activity on this front, LIRNEasia facilitated a contribution from Hayat, which was published in the Financial Times, 12 July 2009.
  6. In July 2009, Helani Galpaya of LIRNEasia with Alison Gillwald of RIA, South Africa, responded to the Bangladesh Telecommunication Regulatory Commission (BTRC) on the public consultation paper on proposed Significant Market Power (SMP) regulation. Using the recent experience of South Africa in using SMP (Significant Market Power) determinations in regulation. Contrasting with Namibia and Botswana (which do not use SMP), it was pointed out that implementing complicated market definitions or SMP determinations was often difficult, even within the sophisticated and progressive structures found in developed countries. Furthermore, implementing them in South Asia, given the levels of development, would be (at best) complicated and (at worst) unfeasible. Hence, it was recommended that BTRC view with caution solutions that are taken "as-is" from developed countries and recommended without recognizing the ground-level realities of Bangladesh.<sup>44</sup>

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<sup>41</sup> See <http://lirneasia.net/2008/12/sri-lanka-supreme-court-suspends-three-environmental-levies/> for full set of related blog posts

<sup>42</sup> <http://lirneasia.net/2008/08/lirneasia%e2%80%99s-rapid-response-reinforces-quality-in-bangladesh-broadband>

<sup>43</sup> <http://lirneasia.net/2009/07/first-instalment-of-lirneasias-contribution-to-lanka-central-banks-policy-making-on-mobile-money/>

<sup>44</sup> <http://lirneasia.net/2009/07/lirneasia-with-help-from-ria-responds-to-bangladesh-public-consultation-on-smp/>

#### 4.5.2 General dissemination

Media is one of LIRNEasia's key means of reaching its target audiences (policymakers, regulators and industry). LIRNEasia has had significant interactions with the media (print as well as electronic) over the period. 16 press releases were issued over the period (See section 6.1, several dissemination events were held with participation of various categories of stakeholders (policymakers, regulators, operators, media, civil society), in addition to numerous interviews with print and electronic media being given. Articles and advertisements showing research findings have also been strategically placed in local newspapers to reach target audiences (e.g. Figure 6). Annex 99 contains media coverage received over the period.

Given the significance of India, as well as the difficulties in navigating the Indian media, a communication consultant was commissioned to facilitate interactions with Indian media. More than 50 media stories carried in Indian media over the period. Similar assistance was retained in Bangladesh since this was the first time LIRNEasia was reaching out to media in that country in a large scale. As a result, significant media coverage (in print and television) was received on our research and the dissemination even held in Dhaka. See Annex 99 for full media coverage.

A short training session for researchers on communicating research effectively to the media was held in May 2008, where dissemination plans for the main research projects were initiated.

*Section 6.3.6 contains a detailed description of work completed under this component.*

#### 4.5.3 Fifth year anniversary conference

To mark its fifth year in operation, LIRNEasia successfully organized and hosted a conference in Colombo from 9-11 December 2009. The three day conference was attended by over 180 international and local participants, including regulators, policymakers, industry, civil society, media and other stakeholders. The conference was opened with a session on "Evidence-based policymaking in Asia: the Indian path or the Chinese path?" which was chaired and moderated by Milinda Moragoda, M.P., Minister of Justice and Law Reforms, Sri Lanka, with Pratap Bhanu Mehta (Center for Policy Research, India) and Xue Lan (Professor and Dean of the School of Public Policy and Management at Tsinghua, China, via web conference). The conference report including a list of participants and agenda is contained in Annex 103.

A five-year review book was published, detailing LIRNEasia's work over the five years of its existence, looking at its growth and impacts over the period. The conference was blogged in real time. The five year review is contained in Annex 102.<sup>45</sup>

#### 4.5.4 Engaging with Wikipedia and relevant blogs.

Attempts were made to get an Intern to get LIRNEasia research wired/included in Wikipedia pages, however time constraints resulted in minimal activity in this regard.<sup>46</sup> The task of creating Wiki pages for LIRNEasia's projects, activities, and research areas was then given to a research fellow in May 2010. The assignment is ongoing.. There has also been some activity in terms of researchers engaging with other relevant widely read blogs. Though success/impact of this activity is not always easy to track, efforts in this regard will continue. A successful activity in with the same objective (i.e., gaining

<sup>45</sup> Alternatively it can be viewed at: <http://lirneasia.net/about/annual-reports/five-years-in-review/>

<sup>46</sup> [http://en.wikipedia.org/wiki/Quality\\_of\\_service\\_experience](http://en.wikipedia.org/wiki/Quality_of_service_experience)

LIRNEasia research higher visibility) has been the upload of LIRNEasia's research papers to the SSRN [Social Science Research Network] portal. For example LIRNEasia papers make up 9 of the 19 search results for the search terms "telecom" and "Asia."<sup>47</sup> Paper download statistics are contained in Annex 98.

The LIRNEasia blog is regularly updated with research findings (at draft as well as final stages), presentations, live feed from colloquia, as well as other discussions being posted regularly. See Section 6.3.6.4 for webstats.

#### **4.5.5 Documentary video to document T@BOP3 findings**

Like in the previous cycle, a short documentary video was to be developed to illustrate the findings of the Teleuse@BOP3 study. The Teleuse@BOP2 documentary (from the previous cycle) was a 12 minute documentary which tried to provide an overview of the Teleuse@BOP2 findings. While it served as a very useful input for the GK3 conference Teleuse@BOP quiz session, a limitation is that due to its length it takes up almost an entire presentation slot (most presentation slots are about 15 minutes).

Therefore, instead of a single documentary video, seven mini-teleuser profiles (less than three minutes each) were made, reflecting different aspects of teleuse by the BOP in several countries. Each mini-profile therefore emphasized particular findings and issues (e.g., use of mobiles for entertainment VAS; how BOP teleusers make remittances, etc) and can be easily within a 15 presentation slot to more effectively communicate particular aspects of the findings.

TVE Asia Pacific (TVEAP) was commissioned to develop the mini-profiles; the seven mini-profiles are based on teleusers from India (two), Philippines (three), Sri Lanka and Thailand. The mini profiles have been posted on LIRNEasia's website (<http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/>) as well as IDRC's, as well as the TVEAP YouTube channel.

#### **4.5.6 Photo exhibition at fifth year anniversary conference**

A photo exhibition of photographs reflecting mobile use at the BOP was displayed at LIRNEasia's 5<sup>th</sup> anniversary conference. Instead of commissioning a photographer, existing photographs from the Internet (with necessary fees and permissions, though most were free of charge) (See Annex 104). The collection is now on permanent display at LIRNEasia's office premises as well as online: <http://www.flickr.com/photos/lirneasia/galleries/72157623224575717/>

## **4.6 Mutual Learning among LIRNE.NET members**

In conjunction with a double session at the International Telecom Society biennial conference held in June 2008 in Montreal, a meeting was held among the constituent entities of LIRNE.NET. This was preceded by interactions with Canadian government and other organizations in Ottawa, coordinated by IDRC.

Both at the Ottawa meeting (<http://lirne.net/2008/07/lirne-idrc-meeting/>) and at the three-hour double session at the International Telecom Society's biennial conference (<http://lirneasia.net/2008/07/lirneasia-researchers-present-at-its-2008-montreal-canada/>), there was considerable exchange of ideas among the researchers from the three regional units (LIRNEasia, Research ICT Africa and DIRSI). There is serendipity to the percolation of research ideas. They do not happen only in highly structured environments. The multiple interactions around the sessions included exchanges on Teleuse@BOP and Indicators Continued projects. One result was Christoph

<sup>47</sup> <http://papers.ssrn.com/sol3/results.cfm?RequestTimeout=5000000>, 30 June 2010.

Stork (RIA) and Antonio Botelho's (DIRSI) participation at the Teleuse@BOP3 analysis workshop in November 2008 in Sri Lanka. In addition, Christoph Stork continued to assist in the analysis of the data, in developing econometric models to analyze the data and test various research hypotheses, as well as providing feedback on papers and analyses.

The 13th Executive Course on Telecom Reform was offered by RIA (through the Institute and the University of Cape Town Business School in Cape Town) on 14-17 April 2009, with the participation Rohan Samarajiva and Helani Galpaya of LIRNEasia on the course faculty. In addition, a meeting of LIRNE.NET centers took place to discuss current and future research collaborations. All senior research staff from LIRNEasia participated in this meeting, which was held in Johannesburg, at the RIA office.

Further continuing the cross-regional collaborations, LIRNEasia welcomed Aileen Aguero, a researcher from DIRSI for a six month internship at LIRNEasia. Aileen arrived in Sri Lanka in May 2009. She worked on comparing the indicators used by LIRNEasia and DIRSI and recommended ones that should be a focus for both networks. Together with Harsha de Silva of LIRNEasia, Aileen worked on a paper on income elasticity of demand for telecom services, applying a model developed for Peru (using the Mobile Opportunities dataset) to LIRNEasia's Teleuse@BOP3 dataset for the six Asian countries studied (Annex 2). Together with Nirmali Sivapragasam of LIRNEasia she also worked on a paper on awareness of mobile payment services among BOP migrant workers (Annex 4).

The 14<sup>th</sup> Executive Course on Telecom Reform was offered by RIA (through the University of Cape Town Business School) in April 2010. LIRNEasia offered 13 scholarships to regulators, policy makers, media personnel and non-governmental ICT activists from South and Southeast Asia to attend this training program (See Annex 93 for scholarship holder details). Rohan Samarajiva (CEO, LIRNEasia) and Helani Galpaya (COO, LIRNEasia) once again participated as faculty members of this course.

Our sister network RIA inaugurated the CPR*frica* conference in April 2010 in Cape Town (CPR*frica* the equivalent of CPR*south*, which has been managed by LIRNEasia for the past five years). LIRNEasia had been continuously assisting RIA in the design and planning of CPR*frica* (starting with initial meetings between LIRNEasia finance manager and RIA finance/admin team in April 2009 to discuss the funding, budgeting and logistics needed for the conference). Budgets, templates and even emails (related to CPR conference logistics) were shared with the RIA team during 2009 – 2010 so that the RIA team could benefit from LIRNEasia's experience and not re-invent the wheel. Rohan Samarajiva (CEO, LIRNEasia), Helani Galpaya (COO, LIRNEasia) and Sriganesh Lokanathan (Senior Research Manager, LIRNEasia) served as faculty members during the young scholar tutorials at the inaugural CPR*frica* conference in April 2010.

In May 2010, Rohan Samarajiva attended a Training Seminar on New Technologies and their Challenges for Telecommunications Regulation in Latin America where he delivered the opening lecture on "State of the art in telecom regulation around the world". The seminar was organized by DIRSI and ACORN-REDECOM (Americas Communication Research Network / Red Americana de Investigación en Información y Comunicación) and was held immediately prior to ACORN-REDECOM's 4th annual conference in Brasilia, Brazil (ACORN-REDECOM's annual conference is DIRSI's equivalent of the CPR*south* and CPR*frica* conferences) .

Responding to a request from IDRC, the three members of LIRNE.NET (LIRNEasia, RIA and DIRSI) worked on a joint proposal for the funding of CPR conferences (CPR*south* for Asia, CPR*frica* and ACORN-REDECOM for the Americas). It is currently under consideration by IDRC.

## 4.7 Evaluation

Data on media coverage and event participation by LIRNEasia researchers are regularly collected and categorized for further analysis and evaluation (See Annexes 99 and 100). These are key indicators of LIRNEasia's success capturing dissemination of research through different channels, to different audiences in different countries. These indicators are regularly reported in technical reports (biannually) as well as annual reports. In addition, all media coverage and event participation are



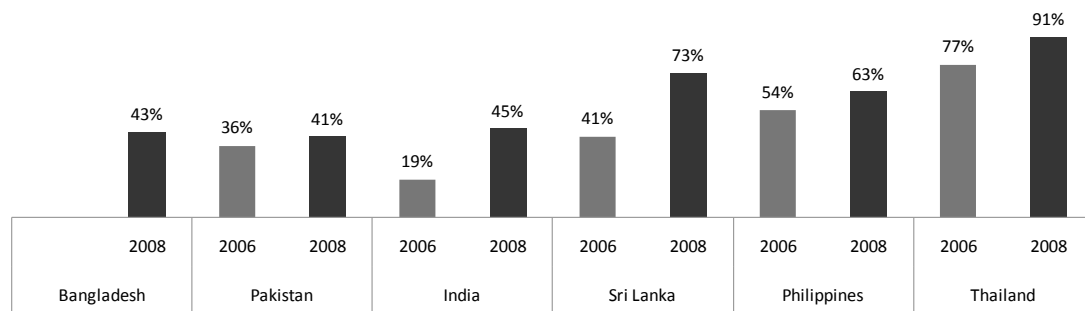
captured on the LIRNEasia blog for further dissemination. See Annex 99 for media coverage and Annex 100 for event participation over the period, both categorized by project component.

Senior Research Manager, Chanuka Wattagama was trained in outcome mapping at the International Program for Development Evaluation Training (IPDET), Building Skills to Evaluate Development Interventions, in June-July 2009. Lead Scientist Sujata Gamage and researcher, Nilusha Kapugama was trained in outcome mapping through a training session (first day only) by Raj Verma organized by LIRNEasia's 3R project in January 2009. An external evaluation of LIRNEasia's policy influence success was commissioned by IDRC. The LIRNEasia team participated in this activity, and also provided assistance to the external evaluator in obtaining feedback from external stakeholders.

## 5.0 Research findings

### 5.1 Teleuse@BOP3

The study shows great progress in telecom access and ownership across countries since 2006, particularly mobile ownership (except for Sri Lanka). Growth in phone (mobile + household fixed) ownership was seen in India, with more than doubling of BOP phone ownership, and Sri Lanka with 78% growth since 2006 (Figure 3). Growth in multiple-SIM use was also seen across all countries.



**Figure 3: Growth in total (fixed + mobile) phone ownership at BOP (% of BOP teleusers)**

**Notes:**

1. 2006 data from Teleuse@BOP2 study
2. Bangladesh not studied in 2006
3. 'BOP' defined at socio-economic classification (SEC) groups D and E, except in the Philippines, where only SEC E is considered

Consequently the use of public phones is in decline, for instance in India, in 2008, just 33% of BOP teleusers relied on public phones, down from 71% of the BOP in 2006. While much of the existing research suggests that mobile phones are increasingly serving as substitutes to traditional public phones, we find that public phones still serve a complement role to personal phones (Annex 3). For various reasons (e.g., when prepaid mobile credit is exhausted, or for greater privacy), public phones still serve an important role for BOP teleusers.

In addition, the urban-rural gap in BOP phone ownership was seen to narrow, approaching 1:1. Similarly, few urban-rural differences in other aspects of telecom use were seen; this could be for several reasons, including the possibility that there are not many differences between the urban and rural BOP (not overall population), or that there are definitional issues with how 'urban' and 'rural' are defined in the six countries.

Mobiles are mostly used for voice, SMS, missed calls, and in some cases, playing games (on the handset) and listening to the radio or stored music. In Sri Lanka (the only country with significant fixed phone ownership), "fixed" phones (mostly wireless or CDMA) are used in a similar manner to mobiles (voice, SMS and missed calls).

Awareness and use of 'Mobile2.0' services (e.g. mobile payments, m-gov applications, market information, voting/competition participation, etc) in Bangladesh, Pakistan and India is very poor. While awareness of such services is high in Sri Lanka, the Philippines and Thailand (between 10 and 60% of BOP mobile owners), usage is very poor. Most either feel that such services are not applicable to them, or they just don't know how to use them. In addition, many feel that the pricing of these services is too high; most of their prepaid credit is eaten up when trying to access these services. Those that are aware of these services report that they do not use these services as the same content can be obtained through cheaper alternatives (e.g., news or weather updates via TV or even word of mouth). Some also believe that certain skills and knowledge (which they do not possess) are needed in order to access these services too (See Annex 6).

A logistic model for mobile adoption has been completed (See Annex 1), finding evidence for the importance of social influence in mobile adoption in two modes: one that exerts pressure on individuals to adopt; and another that helps generate benefits via social networks that are tied in with economic and business networks. This is considered a significant addition to the current literature on the subject.

An analysis<sup>48</sup> of the expenditure patterns (as a share of personal income) of BOP mobile owners indicates that the income elasticity of demand (IED) for mobile services in the six study countries ranges from 0.1782 for Philippines to 0.2640 for India (Annex 2). This indicates that the services possess the characteristics of a necessity in the said countries: the higher the income, the lower relative importance of mobile phone service in the individual's budget, in other words, expenditure in this service is not very sensitive to changes in disposable income. This contrasts with similar estimations for Colombia (mobile services) and Peru (fixed and mobile phone as well as Internet services) by DIRSI researchers using the Mobile Opportunities survey data have indicated that mobile phone services have the characteristics of a luxury good, with IEDs greater than one.

An analysis of the factors affecting whether usage is responsive to a price fall (using willingness to pay data collected from the sample) indicated that demographic criteria, including income, are not significant in explaining whether usage is responsive to price fall (although they were important factors in determining mobile adoption). Instead, subscription to multiple service providers has an important association with the price responsiveness of use: Those with multiple SIM cards are likely to increase use when price falls whereas those who report that they would not switch service providers are unlikely to do so. The study further finds that consumption would increase among those with a more diversified use of mobile services (to vote and participate in competitions) and among more 'limited' users (those who attach a greater importance to the emergency uses of the phone). Overall the findings suggest that a small decline in the current per-minute price of mobile use would tap latent demand among mobile owners in low income markets. However, given the relatively low profit margins in these markets and the ability of users to switch quickly between providers, competing on price could threaten the long term survival of firms. Non-price strategies would therefore be important for sustainable service delivery (see Annex 5).

The analysis of the migrant survey component (non-representative sample; see Section 4.1.1 and Annex 104 for methodology details) has been completed. The findings reveal:

- The most popular way of communicating home among overseas and domestic migrants surveyed was through phone calls, though SMS was used by a significant number in the Philippines, Pakistan (overseas migrants) and Sri Lanka (domestic migrants). Internet calls and chatting was popular among a considerable number of overseas Bangladeshi migrants also. Most used their own phone to make calls (mostly mobiles), however some South Asian migrants tended to use public phones to make calls.
- Some migrants spent large amounts on communicating with home, with Bangladeshi and Pakistani overseas migrants spending USD48 and USD 36 per month (respectively) on average on communicating home. Domestic migrants, as expected spent much lower amounts, ranging from USD3 – 10 per month

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<sup>48</sup> Analysis led by DIRSI intern, Aileen Aguero.

- Migration almost always results in mobile adoption, either the migrant purchases the handset and gives it to her family, or she passes down her handset and buys a new one for herself. The primary need for communication was to keep in touch with loved ones at home. Depending on the type of job (e.g., client-driven, delivery-based, etc.) some need to communicate with local contacts in their destination country/location.
- The use of mobile payments for remittances among BOP migrants surveyed is almost non-existent, even in the Philippines. Among overseas migrants, the most commonly used way of sending money home (if not hand carrying it themselves) was through banks – either directly as deposits or through transfers; this method was seen as cheaper and convenient. In general, existing methods seemed to provide sufficient reliability, are convenient and are affordable. BOP migrant workers are not willing to pay large service charges/commissions to transfer remittances. Domestic migrants relied more on hand-carrying of cash, either by themselves when they go home, or through other known parties.
- An analysis of the socioeconomic factors affecting the awareness and use of mobiles for remitting money among migrant workers *surveyed* showed that those aware are more likely to be already banked and possess relatively higher incomes, suggesting a contradiction to or ineffective marketing in positioning the product as a financial solution for the unbanked masses, the very market that can serve to benefit the most from such services (see Annex 4). **However, caution should be taken when interpreting and extrapolating these findings, as the migrant worker sample was not representative.**
- An interesting phenomenon was seen among Bangladeshi domestic migrants, who appeared to be making the most use of mobiles to send money home. A small but significant number of domestic migrants surveyed in Bangladesh were found to be sending money home “through mobiles,” despite the lack of a formal mobile payment system in the country. It appears that many are making use of systems like the “flexi-load” system to transfer money home. Often migrants keep good relations with the village flexi-load seller who encashes load transfers from the migrant to his family (sometimes even for a fee as high as 20 percent) (see Annex 6).
- Besides using the mobile for actual transactions, mobiles are heavily used to coordinate remittances, with transaction codes and confirmations of receipt being sent over SMS, or sometimes through calls.
- BOP migrant workers are, however open to learning about new services, some are even willing to try mobile payment systems (if affordable); however, their main concern with such new services is their trustworthiness; they would be more comfortable if banks are involved in such services.

## 5.2 Mobile 2.0@BOP

The findings on this component of the project indicate that the BOP (and therefore, the majority of people in the developing world) are likely to enter the world of knowledge and convenience promised by the Internet through the path opened by the rapid evolution of the mobile, rather than an evolutionary path centered on a fat pipe connecting houses.

The study also confirmed the potential for Mobile 2.0 at the BOP, but didn’t explain why it hasn’t still taken off a big way. Data from Teleuse@BOP3 found less than 1 percent of the BOP teleusers that are aware of Mobile 2.0 services use them regularly while occasional use is a little higher. The Mobile2.0 study revealed similar trends in most places where the phenomenon was analyzed. For example, the apparent high trust in mobile transactions among BOP mobile users in Bangladesh (evidenced by the 96 percent that reload prepaid credit electronically) has not led them to exploit the Mobile 2.0 phenomenon to their advantage.

The findings of the studies are summarized below:

- CellBazaar is a relatively popular, mobile-based electronic marketplace (e-marketplace) operating in Bangladesh, which allows buyers and sellers to exchange information on products and services for sale by using their mobiles. Available to Grameenphone subscribers, the service is accessible basic SMS, WAP or even voice (IVR) services, as well as over the web, enabling even low-income households without access to a computer or Internet to use these services (see Annex 54). The study shows that even in unfavorable environments, innovative mobile-based marketplaces such as CellBazaar.com link buyers and sellers, provide a first step towards affordable mobile commerce for the BOP.
- BuzzCity, established in 1999 in Singapore is a widely used mobile-based social networking platform, targeted mainly at mid-low income earners in several Asian countries. It manages an advertising-funded mobile community called myGamma, essentially the “Facebook” of the mobile. The findings indicate that consumers demand unrestricted choice of content and applications; operators should leave that to content providers while restricting themselves to providing connectivity (see Annex 55).
- The prospects of m-government applications were explored in a case study of a mobile-based pension payment system in India developed by Mumbai based Zero Mass Foundation (ZMF). The system has been able to tackle two major problems with conventional pension payment systems, namely difficulties in issuing payments to the unbanked and money leakages in the system (see Annex 62).
- The potential for introducing a possible a service for sale and purchase of bus tickets via mobile phones and/or customized electronic cards was explored based on a proposal for the same put forward by the Private Bus Operators Association of Sri Lanka. The findings showed that the use of automated ticketing machines will address most concerns of bus owners and commuters. Bus conductors, however, may not have an incentive in adopting such a service; as such, such stakeholder groups may need to be compensated if this system is to be implemented (Annex 59).
- Mobile money (mMoney) applications from the Philippines (G-Cash and SMART money) were studied, looking at the potential barriers to uptake by the BOP. While operators and banks have an incentive to offer mMoney, in order to increase uptake, they should help users overcome the mental, material and skill barriers connected to accessing these services (Annex 63).
- A scoping study was conducted in Maldives on the potential of Cell Broadcasting for disaster warning in a public warning model. Despite enthusiasm, the findings indicate a lack of knowledge and capacity in the country for the implementation of cell broadcasting at present; the lack of local languages standards are also of concern. There was also interest in understanding the potential of cell broadcasting by the Maldives Monetary Authority (MMA), for the development of the Maldives Interoperable Payment System; this system aims to ensure ease of access to banking by creating a system whereby through both telecom providers all banks may be able to share and receive mobile banking information (Annex 56).
- A study of the provision of agriculture value added services through mobiles indicated that it is best to leave content provision to the experts where richer, specialized and timely information will be made available. Operators should concentrate on delivery. But when it comes to technology, voice is still king among the poor. Additionally, the analysis of a pilot project by IFMR Trust in Kadi, Gujarat (India) revealed two important factors required for farmers to more effectively engage in rural agricultural markets. Firstly, the case study reveals the significance of bringing together external actors and providing farmers access to services (other than ICTs) that are equally if not more important to their livelihoods, namely credit and warehousing facilities. Secondly the case study reveals the importance quality and grade standardization and reliable testing mechanisms. ICTs can play an important role in both of these facilitating the linkages between stakeholders as well as in measuring and transmitting grade and price information transparently (Annex 58).
- The use of mobiles in collecting health data and disseminating health alerts has been explored in the Real-Time Biosurveillance Program (RTBP) pilot project. The aim of this is to investigate whether software programs that detect events in health symbolic and categorical data sets and mobile phones that collect health data and receive health alerts are able to predict and prevent disease outbreaks in near-real time. The early findings showed that that

the data collection application was accepted by health workers at an early stage. However, with use, health workers have identified issues associated with social issues and the application's functionality. There are unanswered questions that the RTBP needs to assess through simulation in terms of the reliability and effectiveness of the technology on the long run as well as the interoperability of the m-HealthSurvey with the binding data processing and alerting components that completes the information propagation cycle (Annex 65).

- An evaluation of the different models for the issuance of licenses for service provision and frequencies explored the various tradeoffs and incentive structures created by the various mechanisms of allocations of licenses and frequencies in the telecom sector. The findings indicate that in order to unleash the potential of mobile technologies for the BOP, regulators could incentivize efficiency and innovation by mandating spectrum sharing. This is likely to reduce the demand for spectrum and subsequently the price offered (Annex 60).
- An investigation of the interface between telecommunication and banking regulations and policies to provide safeguards with respect to mobile money applications and services without showed that in order for user buy-in, especially within the BOP, it is vital that trust of the operator and trust in the service is assured. This suggests additional responsibility in areas of security and fraud management that both the telecommunication and financial institutions involved must address. Regulators are faced with the challenge of striking the right balance and avoiding over-regulation which could hinder innovation.
- Mobile number portability (MNP) refers to a system which allows users to switch mobile phone carriers without a change in their current number. In theory MNP makes sense: without the ability to change suppliers without disrupting social and economic relationships (a necessary consequence of having to give up one's number/address every time the service supplier is changed) competition may not work well. However, in practice, it may not. The critical question is "Will the cost of implementation outweigh the benefits?" The use of multiple SIMs at the BOP to make the most of on-net tariffs and friends & family schemes among the poor can prevent the need to port.

## 5.3 Indicators

### 5.3.1 Second Telecom Regulatory Environment (TRE 2) assessment

The TRE scores are a measure of the perceived effectiveness of the overall regulatory and policy environment. In terms of methodology, there are two research questions of interest:

#### a) Do TRE scores (i.e. perception) reflect reality?

In other words, do low perception scores on the TRE really mean the regulatory environment is bad and does this reflect in actual sector performance (i.e. are low scores a pre-cursor of bad sector performance as measured in output indicators like number of people connected, call quality etc)? With the 2008 study, we are able to answer this question (the answer is "yes"), because finally we have longitudinal TRE scores (from 2006 and 2008 for most countries). Indian TRE for universal service obligation (USO) provides an example of this. When we did the TRE survey in 2006, India received the lowest TRE Scores for USO among all countries studied. Within the dimensions in India, USO received the lowest score also. The reasons were obvious – Indian USO policy was designed in such a way that the USO subsidy was charged from mobile operators, and was given to the fixed operator, in essence leading to the mobile sector subsidizing the incumbent (government owned) fixed operator. This was the case even though rural telephony expansion was being driven purely by the mobile operators who (despite not receiving USO funds) were connecting rural India while the fixed line penetration was stagnant or declining. In March 2007 the Indian policy makers changed the USO rules, thereby enabling mobile operators to also receive USO funds when expanding rural coverage. The 2008 TRE score for India increased drastically, by 64%, and has been the biggest increase in a TRE score we have ever seen. So the actual implementation of "good" regulatory practice was reflected in TRE scores. However, though regulation improved, it's not perfect – operators are still charged 5% of revenues towards the USO fund that is the 2<sup>nd</sup> largest in the world and at USD 4 billion is mostly undisbursed. So the distortion is not completely removed. This is reflected in the fact that though the TRE scores increased dramatically, it only reached 3.1 out of 5, barely passing the mid-point (level of "average/acceptable" performance) of 3.0.

**b) Are TRE scores an effective way to compare regulatory environments across all countries?**

The answer is a qualified “yes”. Broadly the research shows that the TRE enables benchmarking of regulatory performance – i.e. if a particular dimension (e.g. TRE scores for Tariff Regulation) are compared across multiple countries, it is indeed the case that the countries with the best sector outputs (i.e. lowest prices) and the best practice tariff regulation (i.e. one that gives operators certainty, and removes arbitrariness) indeed receive the highest TRE scores. For example this was the case in India, which consistently receives the highest TRE scores for Tariff Regulation, and in fact has the lowest (or the 2<sup>nd</sup> lowest) prices in the countries studied and indeed practices forbearance from tariff regulation. Apart from this specific example, the comprehensive TRE results paper (Annex 30) provides many other examples that highlight the TREs ability to benchmark regulatory best practice.

However, in 2008 we conducted a TRE survey in Maldives and Afghanistan. The former is a micro state with less than 300,000 persons. The latter is at the earliest stage of telecom development. In both, the result is that the telecom sector is small and stakeholders are very well connected and networked to each other. As a result, both country researchers had difficulty in getting the stakeholders (survey respondents) to be open in their criticism (or praise) of the regulator (though off-line, stakeholders would indicate problems of regulation and policy, no one would commit on paper, instead giving artificially high TRE scores or refusing to complete certain questions). This has made us question the feasibility of conducting TRE surveys in very small markets. Therefore in using TRE results, it has been decided to treat micro-states or small markets differently, and not to benchmark TRE scores for such countries against other (more evolved and larger) markets.

Apart from the findings and commentary on methodology (stated above), each country’s regulatory environment was analyzed in detail and documented in 10 country reports (Annexes 18-26). Specific research findings per country are therefore available in these reports.

**5.3.2 Website survey**

In June 2008, LIRNEasia conducted a systematic assessment of regulatory websites in the Asia Pacific region. The full report is contained in Annex 1. This study benchmarked the way NRAs use their websites to improve their regulatory functions. The Survey evaluated how well NRAs achieve this objective in regard to their stakeholders. Each website is awarded marks for the availability of information and features that are useful to these stakeholders. A total of 32 websites were evaluated from the 62 Asia Pacific economies. LIRNEasia hopes to the survey will encourage NRAs to improve their websites so as to serve their stakeholders in a more effective and transparent manner.

Office of the Telecommunication Authority (OFTA) of Hong Kong was the best performer in terms of regulatory transparency, information and ease of use with a score of 94 percent.

Pakistan, India and Sri Lanka were amongst the top ten performers. The South Asian regulators covered most of the basic requirements of a regulatory website but seemed to miss out on transparency and efficiency aspects.

The survey noted that many of the websites have made significant progress since the last one, in 2005. The number of NRA having websites has increased and many including the Indian regulator’s site have improved.

In the current period, further research was conducted based on the data collected for the regulatory website survey. Some of the data, namely information about public hearings and consultation papers, was used to measure the level of transparency of the regulators. The data was compared with three of the existing indices from the World Bank governance indicators: Regulatory Quality, Government Effectiveness and Voice and Accountability. The data followed the same trend as the Regulatory Quality indicator and the Government Effectiveness indicator to a certain extent, however in order to come up with a more comprehensive indicator, the method would need to be further refined.

### 5.3.3 Benchmarks

#### 5.3.3.1 Mobile benchmarks

During the period which the study was conducted it was observed that Pakistan overtook Bangladesh, as the country with the cheapest monthly prepaid mobile basket in the SAARC region for both low and medium users. For high users Nepal over took Bangladesh with the cheapest monthly prepaid mobile basket.

However, the greatest drop in tariffs (50 percent) since September 2008 was seen in Nepal where competition in the telecom sector was seen to increase during the period.

With respect to the Southeast Asian baskets, Mongolia which was included to the study from October 2009 recorded the lowest monthly prepaid costs for a low-user, followed by Thailand, Indonesia, Malaysia, the Philippines and Singapore.

**Table 6: High and low tariff comparison between October 2008 and February 2010 – South Asia**

	October 2008		February 2010	
	Highest	Lowest	Highest	Lowest
<b>Prepaid</b>				
<b>Lower user</b>	AF (USD 8.8)	BD (USD 2.14)	AF (USD 6.23)	PK (USD 1.64)
<b>Medium user</b>	AF (USD 22.08)	BD (USD 5.08)	AF (USD 14.24)	PK (USD 2.90)
<b>High User</b>	AF (USD 46.61)	BD (USD 10.85)	AF (USD 28.58)	NP (USD 6.23)
<b>Postpaid</b>				
<b>Lower user</b>	MV (USD 18.83)	BD (USD 7.11)	AF (USD 11.1)	BD (USD 2.48)
<b>Medium user</b>	MV (USD 42.43)	BD (USD 15.34)	MV (USD 11.45) Closely followed by AF (USD 11.41)	BD (USD 3.15)
<b>High User</b>	MV (USD 88.77)	BD (USD 31.40)	MV (USD 20.26)	BD (USD 6.30)
2008 Included: SMS, Usage, Rental and connection				
2009 includes: MMS, SMS, Usage and connection				
South Asian countries: Afghanistan, Nepal, Bangladesh, Pakistan, India, Sri Lanka, Maldives, Bhutan				

**Table 7: High and low tariff comparison between October 2008 and February 2010 – Southeast Asia**

	October 2008		February 2010	
	Highest	Lowest	Highest	Lowest
<b>Prepaid</b>				
<b>Lower user</b>	PH (USD 5.65)	ID (USD 2.89)	SG (USD 8.34)	MN (USD 3.25)
<b>Medium user</b>	SG (USD 15.04)	TH (USD 6.29)	SG (USD 23.66)	MN (USD 7)
<b>High User</b>	SG	TH	SG	MN

	(USD 31.86)	(USD 9.91)	(USD 50)	(USD 14)
<b>Postpaid</b>				
<b>Lower user</b>	MY (USD 13.81)	ID (USD 4.76)	SG (USD 13.33)	ID (USD 6.44)
<b>Medium user</b>	MY (USD 21.30) followed by PH (USD 21.54)	ID (USD 11.86)	PH (USD 18.64) followed by SG (USD 18.76)	MN (USD 8.52)
<b>High User</b>	PH (USD 46.57)	ID (USD 25.89)	SG (USD 40.24)	MN (USD 12.33)
<p><i>2008 Included: SMS, Usage, Rental and connection</i>  <i>2009 includes: MMS, SMS, Usage and connection</i>  <i>Southeast Asian countries: Philippines, Indonesia, Thailand, Malaysia, Singapore and Mongolia in February 2010</i></p>				

### 5.3.3.2 Broadband benchmarks – broadband price

Over the grant period, it appears that broadband prices are converging within the South Asia region, with the exceptions of Afghanistan and the Maldives. Afghanistan is still a nascent market, and has no competition in the wholesale market. Maldives is an island nation, and so has higher costs associated with providing connectivity across islands. Particularly large drops have been seen in Bangladesh in the wholesale as well as retail markets. Overall the results are encouraging; with the exception of Pakistan, the declines in prices are due to competition, rather than regulatory changes.

### 5.3.3.3 Broadband benchmarks – broadband quality

The fixed broadband test results of the four rounds done at six month intervals starting from, February 2008 to October 2009 reveal some interesting broadband QoSE patterns in Bangladesh, Sri Lanka and India, where it was measured in multiple locations.

- Indian operators lead in delivering what has been advertised: Though they do not advertise for higher speeds (256 kbps or 512 kbps are common entry-level speeds advertised in most Indian cities) almost all tested packages in the latest round were found to deliver them. In fact, some operators even deliver more than what they promised.
- Quality has improved both in Sri Lanka (particularly) and India: For example in February 2008 both fixed broadband packages tested showed speeds around 20-25 percent of what is promised most of the time, when accessing international sites. One year later, one package achieved about 40 percent peak and 60 percent off peak performance, while the other is not too far behind. This shows that international bandwidth issues first observed in February 2008 still remain, but the impact is less.
- HSPA in Sri Lanka is overall doing better in terms of quality: Mobile broadband packages, available only in one country (Sri Lanka) within the scope were formally tested in the September 2008 round. The download speeds were better than for fixed, but still not too impressive. However, in the next six months an improvement in quality is seen both in throughput and other parameters. In the February 2009 round the two mobile broadband operators did far better than fixed ones in delivering what has been advertised.
- Latency of many, but not all, operators in the three countries is now closer to IDA-specified levels: IDA standards were the only benchmark available for latency (TRAI adopted the same with slight modifications). The February 2009 results show that many operators in all three countries now perform closer to 300ms, the level which the Singaporean regulator wants its operators to perform at. Notable exceptions are one Sri Lankan and one Bangladesh operator.

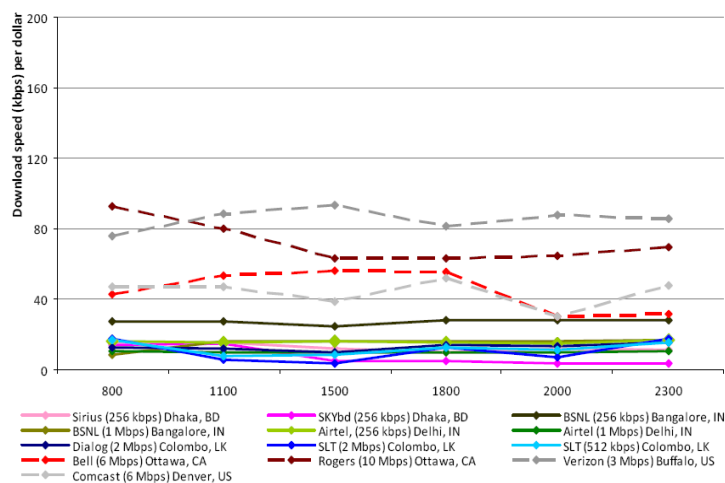


More trends were observed when the test results were analyzed together with the price changes. For example, a QoSE drop in Bangladesh is associated with a parallel price drop.

Timothy Gonsalves, PhD, who led the IIT-Madras team that developed AT-Tester, to measure broadband quality parameters for LIRNEasia research, compared it in a paper with widely used test tools Speedtest<sup>49</sup>, Speedtest2<sup>50</sup>, Internetfrog<sup>51</sup> and relatively less popular speed testers of BBC News<sup>52</sup>, ZDNet UK<sup>53</sup>, Toast Internet Service<sup>54</sup>, Thinkbroadband<sup>55</sup>, Broadband DSL Reports<sup>56</sup>, Auditmypc<sup>57</sup>, Voiptest<sup>58</sup>, and BSNL Free Broadband Speed Checker. It concluded though AT-Tester is technically superior to the rest as it measures (a) six quality metrics (others measure not more than three); and (b) in three network domains (while others invariably ping to selected international servers, it still needs improvement in ease of use). The paper concluded the necessity to improve AT-Tester using graphics and perhaps a browser version

In the October 2009 round fixed broadband quality of selected packages in two developed countries were tested for comparison purposes (Bell/6 Mbps and Rogers/10 Mbps from Ottawa Canada, Verizon/3 Mbps from Buffalo, US and Comcast/6 Mbps from Denver, US. The comparison was also done not just on the speeds or delivery vs. promise but on the value for money (kpbs per Dollar).

As Figure 4 shows it was evident that the users from Bangladesh, India and Sri Lanka in general receive less value for money than their counterparts in Canada and USA, assuming the widely used packages tested represent the quality across.



**Figure 4: Broadband quality – value for money: Download speed when accessing an international server**

Source: LIRNEasia test results, October 2009

<sup>49</sup> <http://www.speedtest.net>

<sup>50</sup> <http://www.speedtest2.com>

<sup>51</sup> <http://www.internetfrog.com/mypc/speedtest>

<sup>52</sup> <http://news.bbc.co.uk/2/hi/technology/7416471.stm>

<sup>53</sup> <http://resources.zdnet.co.uk/speedtest>

<sup>54</sup> <http://performance.toast.net>

<sup>55</sup> <http://www.thinkbroadband.com/speedtest.html>

<sup>56</sup> <http://www.dslreports.com>

<sup>57</sup> <http://www.auditmypc.com/internet-speed-test.asp>

<sup>58</sup> <http://www.voiptest.org>

The preliminary round of mobile broadband quality testing in Western Province Sri Lanka (Figure 5) unveils both hope and issues. While the quality of both key prepaid mobile broadband services is satisfactory, in majority of locations, unusual quality drops in several places indicates that this performance is not always a certainty.

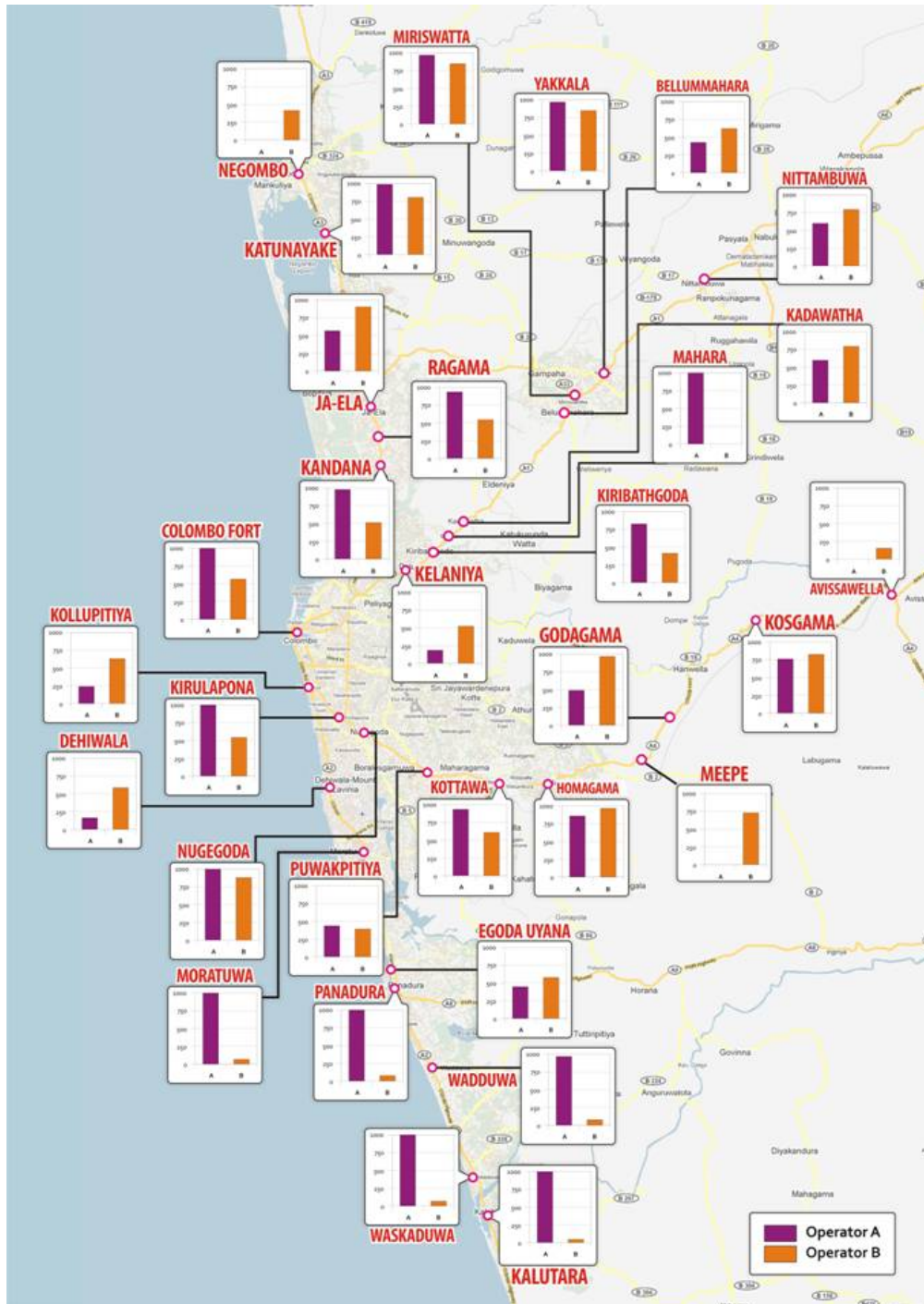


Figure 5: Mobile broadband download speed (from an international server) in selected locations in Western Province, Sri Lanka

Source: LIRNEasia test results, June 2010

### 5.3.3.4 International voice benchmarks

The general trends in international voice benchmarks that have been seen over the grant period are summarized in Table 8 and Table 9. Fixed international voice prices in Afghanistan, Bhutan (to Asian and European countries only), Nepal and Sri Lanka have declined across the board (Table 8). The changes in Afghanistan and Nepal can be attributed to competition being introduced in the market over the period.

Similarly, mobile international voice prices have come down in Bhutan (again only when calling Asian and European countries) as well as Nepal (all countries) over the period (Table 9). Annex 33 contains the complete benchmark data and methodology.

**Table 8: Summary of general international voice price trends between July 2008<sup>59</sup>-February 2010: Fixed**

Calling to	Calling from							
	Afghanistan <sup>60</sup>	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
SAARC			Except AF (n)	Except AF (n), LK (n)		Except AF (i)		
Southeast Asia			Except MY (n)					
East Asia								
Australasia								
Europe								
North America			Except CA (d)				Except CA (i), CU (d)	
South America								
Africa							Except CD (d), TZ (d)	
Middle East			Except AE (d)					
<b>Key:</b>								
	Decreased by more than USD0.05		No change (within USD0.05)	i= increase by >USD0.05 d= decrease by >USD0.05 n= change within USD0.05				
SAARC: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka Southeast Asia: Malaysia, Singapore, Thailand East Asia: China, Hong Kong, Japan Australasia: Australia Europe: France, Germany, Italy, Sweden, Switzerland, UK North America: Bahamas, Canada, Cuba, Mexico, USA South America: Argentina, Brazil, Chile, Peru, Uruguay, Venezuela Africa: Botswana, DR Congo, Egypt, South Africa, Tanzania, Tunisia Middle East: Lebanon, Saudi Arabia, Turkey, UAE								

<sup>59</sup> July 2008 data not available, therefore comparison is made between February 2009 and February 2010.

<sup>60</sup> July 2008 data not available, therefore comparison is made between February 2009 and February 2010.

**Table 9: Summary of general international voice price trends<sup>61</sup> between July 2008-February 2010: Mobile**

Calling to	Calling from							
	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
SAARC			Except AF (n)			Except IN (n)	Except IN (i)	Except MV (i)
Southeast Asia			Except MY (n)					
East Asia								
Australasia								
Europe								
North America			Except CA (d), US (d)	Except CU (d)	Except US (d)		Except CU (d)	Except CU (i), MX (i)
South America					Except BR (i), UY (i)			
Africa			Except ZA (d)				Except CD (d)	
Middle East			Except BT (d)	Except TR (d)				
Key:								
	Decreased by more than USD0.05		No change (within USD0.05)	i= increase by >USD0.05 d= decrease by >USD0.05 n= change within USD0.05				
SAARC: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka Southeast Asia: Malaysia, Singapore, Thailand East Asia: China, Hong Kong, Japan Australasia: Australia Europe: France, Germany, Italy, Sweden, Switzerland, UK North America: Bahamas, Canada, Cuba, Mexico, USA South America: Argentina, Brazil, Chile, Peru, Uruguay, Venezuela Africa: Botswana, DR Congo, Egypt, South Africa, Tanzania, Tunisia Middle East: Lebanon, Saudi Arabia, Turkey, UAE								

### 5.3.3.5 International roaming benchmarks

The first benchmarking exercise that LIRNEasia did on international roaming benchmarks indicated that for roaming rates within South Asia, the variation was large; roamers faced a high degree of uncertainty in terms of what range of rates they would face within the region. On the other hand, the ASEAN countries had managed to harmonize rates to a great deal within the region. Though the rates were not necessarily low, the variance was low. Therefore LIRNEasia made recommendations that the South Asian operators work toward harmonizing international roaming rates. In addition, it was recommended that operators work towards reciprocity in roaming rates; for instance, a Maldivian SIM roaming in Australia

<sup>61</sup> See Annex 33 for complete benchmark data and methodology for the grant period.

would pay USD11.16, whereas, an Australian SIM roaming in the Maldives would pay USD2.71 per minute.

Over the grant period, there have been no major changes in international roaming charges, with the exceptions of:

- Incoming roaming charges for Indian SIMs roaming in Europe (some increases, some decreases)
- outgoing roaming charges for Afghanistani, Indian and Sri Lankan SIMs roaming in other countries for calls to their home countries (some increases, some decreases)

#### **5.3.4 Banded forbearance**

Fast growing telecom markets, especially in the developing world, are attracting new types of users, especially those at the bottom of the pyramid (BOP). Innovative pricing is needed to respond to this increasingly heterogeneous demand. However, many regulators still claim to regulate prices using methods from the monopoly era, despite lacking capacity to effectively regulate proliferating tariff plans. What actually happens is that tariffs are “approved” for the most part without proper review.

One response has been asymmetric regulation/forbearance, wherein the regulator determines that certain operators do not have significant market power (SMP) and frees them from regulatory burdens, including, in many cases tariff regulation. This still leaves a few operators (possibly one each in different markets such as fixed, mobile, and broadband) under tariff regulation. They are required to file tariffs, and if not go through formal proceedings, at least go through a staff review. Given the leakiness of most regulatory agencies, this puts them at a significant disadvantage because their competitors can prepare precisely targeted and timed responses, unencumbered by regulation.

Forbearance was included in the 1997 legislation that created the Telecom Regulatory Authority of India (TRAI) (prior to the EU asymmetrical regulation model being fully developed). Possibly as a result, TRAI did not forbear from tariff regulation on the basis of SMP: all tariffs in urban areas were forborne, with some limited regulatory authority retained in rural areas. The results were some of the lowest tariffs in the world (Samarajiva, 2008).

Based on this lesson, it is proposed that “banded forbearance” be introduced, even in countries with far fewer competitors than in Indian circles (licensing areas). In this form of benchmark regulation, the regulator will: define a benchmarking methodology such as an adaptation of the OECD basket methodology, including peer countries and weights; define a band of allowed variance above and below, what is likely to be a moving benchmark, within which prices will be fully forborne; and specify competition-related criteria that will be used to evaluate price movements below the lower band (e.g., limited to tests on predation and price squeeze). Time limits and default outcomes can also be specified.

The introduction of bands and specified criteria will allow operators to use innovative marketing strategies, while retaining safeguards that may be important in markets with few competitors and possibly significant control over essential facilities by incumbents. It will also result in refocusing regulatory energies on creating the conditions for competition rather than sterile calculations of the X in RPI-X. The production and timely dissemination of standard price, minutes-of-use, and call-distribution data needed for OECD type benchmarking will also result in reducing the opacity of pricing for consumers, thus sharpening competitive pressures and improving the customer experience (See Annex 45 for full paper).

## **5.4 Capacity building**

### **5.4.1 CPRsouth**

The outcomes survey conducted on the *CPRsouth* paper presenters and young scholars show that all those who respond to the survey has been active in either the policy and/or academic sphere.

However, the response rate for the survey conducted in October 2009 was 38 percent. The results for the survey are given in Table 10.

**Table 10: CPRsouth Outcomes Survey data (2009)**

	Survey 2009 (n=118)	
	Paper Presenters	Young Scholars
# of respondents who wrote policy papers / brief	11	11
# of respondents who made policy submissions / presentations	9	10
# of respondents who wrote op-ed pieces in the media	4	1
# of respondents who gave interviews to the media	1	1
# of respondents who participation in blogs	6	3
# of respondents who had journal publications	7	6
# of respondents who presented conference papers	13	8
# of respondents who submitted their theses	3	3
# of respondents who submitted theses proposals	3	4
# of respondents who received grants	4	6
# of respondents who submitted grant proposals	7	5

CPRsouth outcomes survey, 2009

It should be noted that young scholars may have been a part of policy processes and grant submissions through their supervisors or mentors. The survey shows that there is commitment from at least 38 percent of all CPRsouth paper presenters and young scholars (up till CPRsouth3, 2008) to engage in both the academic and policy process. The survey also found that citations among the CPRsouth community (paper presenters and young scholars) were considerably low.

#### 5.4.2 CPRsouth evaluation

An evaluation of CPRsouth was conducted in 2010 as a part of IDRC's program for developing evaluation capacity, DECI (on-going as of 30 June 2010). A survey was carried out on all CPRsouth paper presenters, young scholars, supervisors (or mentees) of young scholars as well as the CPRsouth Board members and senior scholars who had been a part of CPRsouth.

The findings showed that 98% of the respondents (paper presenters and young scholars) found CPRsouth to be beneficial to their work. This sentiment was echoed by the supervisors and mentees of the young scholars. The survey also showed that a majority of the paper presenters or their organizations were willing to pay to attend CPRsouth, however the amounts fall far short of the actual costs. This may also be a reflection upon the financial situations of the participants or their organizations. Asian institutions may either not have the capability or the culture of paying for the participation in such events.

Nearly 90 percent of the survey respondents (paper presenters and young scholars) kept in touch with either a peer or a senior scholar they met at CPRsouth. The opportunity to network at CPRsouth was ranked equal to other similar conferences.

The survey also showed that the efforts made to mentor the CPRsouth paper presenters and young scholars are what make CPRsouth unique from other similar conferences. All respondent categories, paper presenters, young scholars, CPRsouth board members and senior scholars agreed on this. More efforts are currently being made in order to enhance this feature. The services of an expert have been retained in order to give feedback on the policy briefs for the paper presenters, prior to its final submission.

## 6.0 Project outputs

### 6.1 Research (outputs)

Output	Project	Annex #/ status
<b>RESEARCH REPORTS AND PUBLICATIONS</b>		
De Silva, H., Ratnadiwakara, D. and Zainudeen, A. (2009). Social Influence in Mobile Phone Adoption: Evidence from the Bottom of Pyramid in Emerging Asia. Teleuse@BOP3 Working paper.	T@BOP3; Mutual learning among LIRNE.NET members	1
Agüero, A. and de Silva, H. (2010). Bottom of the pyramid expenditure patterns on mobile phone services in selected emerging Asian countries. Teleuse@BOP3 Working paper.	T@BOP3; Mutual learning among LIRNE.NET members	2
Sivapragasam, N. (2010). Mobile phone ownership among low-income earners: substitutes or complements to traditional public phones. Teleuse@BOP3 Working paper.	T@BOP3	3
Sivapragasam, N., Agüero, A. and de Silva, H. (2010). The potential of mobile remittances for the bottom of the pyramid: findings from emerging Asia. Teleuse@BOP3 Working paper.	T@BOP3	4
Ramachandra, S. (2010). The willingness to pay for mobile telephony services among low income households in six countries of Asia. Teleuse@BOP3 Working paper.	T@BOP3	5 (Penultimate version; to be finalized in July 2010)
CKS Consulting (2009). Teleuse@BOP3: A qualitative study. Colombo: LIRNEasia.	T@BOP3	6
Teleuse@BOP3 main survey questionnaire	T@BOP3	10
Teleuse@BOP3 migrant survey questionnaire	T@BOP3	11
Teleuse@BOP3 field guides (qualitative module)	T@BOP3	12
Zainudeen, A., Samarajiva, R. and Sivapragasam, N. (2010). CellBazaar, a mobile-based e marketplace	Mobile2.0@BOP	54
Sirasontorn, P. (2010), Economic Analysis of Business Model for Delivering Mobile Value-Added Services in Thailand	Mobile2.0@BOP	55
Udu-gama, N. (2010), Mobile Cell Broadcasting for Commercial Use and Public Warning in the Maldives	Mobile2.0@BOP	56
Alampay, E. (2010), Mobile banking, mobile money and telecommunication regulations	Mobile2.0@BOP	57
Lokanathan, S. & de Silva, H. (2010), Leveraging Mobile 2.0 in India for Agricultural Market Access	Mobile2.0@BOP	58
de Silva, H. (2010). The need for an efficient bus and train ticket sale-and-purchase system in Sri Lanka: Possibilities for a Mobile2.0 solution	Mobile2.0@BOP	59
Uppal, M. & Malik, P. (2009). An Evaluation of Different Models for the Issuance of Licenses for Service Provision and Frequencies	Mobile2.0@BOP	60

Safaraz, H. (2009), Freedom of Expression in Mobile content: Pakistan	Mobile2.0@BOP	61
Bhatnagar, S. (2009), Exploring Conditions for Delivery of Successful M-Government Services to the Bottom of the Pyramid (BOP) in India	Mobile2.0@BOP	62
Alampay, E. & Bala, G. (2009), Mobile 2.0: m-money for the BOP in the Philippines	Mobile2.0@BOP	63
Iqbal, T. (2010), Mobile Number Portability in South Asia	Mobile2.0@BOP	64
Waidyantha, N., Kannan, T., Ryer, Sheebar, Pushpa-Marry, V., Prashant, S., Muthiah G. and Gow, G. (2009). Challenges of Operationalizing the Real-Time Biosurveillance Program's m-HealthSurvey	Mobile2.0@BOP	65
Wattegama, C., Soehardjo, J. and Kapugama, N. (2009). Telecom Regulatory and Policy Environment in Indonesia: Results and Analysis of the 2008 TRE Survey.	Indicators, continued	18
Galpaya, H. (2008) Telecom Regulatory and Policy Environment in the Maldives: Results and Analysis of the 2008 TRE Survey.	Indicators, continued	19
Nikomborirak, D. and Cheevasittiyanon, S. (2008). Telecom Regulatory and Policy Environment in Thailand: Results and Analysis of the 2008 TRE Survey	Indicators, continued	20
Malik, P. (2008). Telecom Regulatory and Policy Environment in India: Results and Analysis of the 2008 TRE Survey.	Indicators, continued	21
Alampay, E. (2008). Telecom Regulatory and Policy Environment in the Philippines: Results and Analysis of the 2008 TRE Survey.	Indicators, continued	22
Khaled, M. (2008). Telecom Regulatory and Policy Environment in Bangladesh: Results and Analysis of the 2008 TRE Survey.	Indicators, continued	23
Wilson, J. (2008). Telecom Regulatory and Policy Environment in Pakistan: Results of the 2008 TRE Survey.	Indicators, continued	24
Knight-John, M. (2008). Telecom Regulatory and Policy Environment in Sri Lanka: Results and Analysis of the 2008 TRE Survey.	Indicators, continued	25
Lokanathan, S. (2010). Telecom Regulatory and Policy Environment in Afghanistan: Results and Analysis of the 2009 TRE Survey.	Indicators, continued	26
Wattegama, C., and Kapugama, N. (2009). Prospects of Volunteer Computing model in performance data gathering for Broadband Policy Formulation: A Case study from South Asia.	Indicators, continued	27
Gonsalves, T.A., and Bharadwaj, A. (2009). Comparison of AT-Tester with Other Popular Testers for Quality of Service Experience (QoSE) of an Internet.	Indicators, continued	28
Samarajiva, R. and Iqbal, T. (2009). Banded Forbearance: A New Approach to Price Regulation in Partially Liberalized Telecom Markets.	Indicators, continued	29
Galpaya, H. & Samarajiva, R. (2009). Measuring effectiveness of regulation using perception surveys. Paper at 4th regional conference of the International	Indicators, continued	30



Telecommunications Society, Perth, Australia, 16-18 August.		
<i>Mobile Benchmarks: Price – South Asia &amp; Southeast Asia October 2008-February 2010</i>	Indicators, continued	31
<i>Broadband Benchmarks: Price and QoS – Emerging Asia February 2008-February 2010</i>	Indicators, continued	32
<i>International voice Benchmarks: South Asia July 2008-February 2010</i>	Indicators, continued	33
<i>International roaming Benchmarks: South Asia August 2008-February 2010</i>	Indicators, continued	34
Wattegama, C. and Alawattegama, L. (2008). Benchmarking Asia Pacific National Telecom Regulatory Authority Websites (Version 4).	Indicators, continued	35
Overview: The Asian ICT Indicators Database	Indicators, continued	36
Kapugama, N. (2010). Evaluation of Communication Policy Research South (CPRsouth).	Capacity building	88
LIRNEasia. (2009). 2004-2009: Five years in review. Colombo: LIRNEasia. Available at <a href="http://lirneasia.net/about/annual-reports/five-years-in-review/">http://lirneasia.net/about/annual-reports/five-years-in-review/</a>	Advocacy and dissemination	102
<b>VIDEO</b>		
LIRNEasia. (2009). Teleuse@BOP profile: Sayar Singh. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
LIRNEasia. (2009). Teleuse@BOP profile: Judy Baltazar. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
LIRNEasia. (2009). Teleuse@BOP profile: Chamara Pahalawattage. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
LIRNEasia. (2009). Teleuse@BOP profile: Lourdes Casipit. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
LIRNEasia. (2009). Teleuse@BOP profile: Kittipong Sangsri. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
LIRNEasia. (2009). Teleuse@BOP profile: Pradip Gogoi & Purni Gogoi. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
LIRNEasia. (2009). Teleuse@BOP profile: Pradip Soledad Alvis. Video available at <a href="http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/">http://lirneasia.net/projects/2008-2010/bop-teleuse-3/teleuse3videos/</a>	Advocacy and dissemination	
<b>PRESS RELEASES</b>		
LIRNEasia. (February 12, 2009). "Rural India drives the mobile telecom growth in India - A study by LIRNEasia". Press release.	T@BOP3	16

LIRNEasia. (June 28, 2009). "Bangladeshi overseas migrants call home more often than other Asian migrants (and pay the most); some domestic migrants use mobiles to remit money to families". Press release.	T@BOP3	17
LIRNEasia. (July 15, 2009). "Peace of mind for a tourist paradise". Press release.	Mobile2.0@BOP	80
LIRNEasia. (June 16, 2010). "Study: Mobile payments solution can extend benefits of m-commerce to those living on less than USD 2/day". Press release.	Mobile2.0@BOP	75
LIRNEasia. (June 16, 2010). "Revamping postal system can aid uptake of m-commerce at the bottom of the pyramid in Bangladesh". Press release.	Mobile2.0@BOP	74
LIRNEasia. (March 30, 2010). "Buzzcity in Thailand: Ideal mobile social networking model but attracting advertisers a challenge". Press release.	Mobile2.0@BOP	77
LIRNEasia. (March 30, 2010). "Thais at the BOP and M-cash: A unique opportunity for m-commerce". Press release.	Mobile2.0@BOP	76
LIRNEasia. (March 28, 2010). "Real potential for m-money in Bangladesh is among poor". Press release.	Mobile2.0@BOP	79
LIRNEasia. (March 28, 2010). "Mobile Number portability is not for Bangladesh poor". Press release.	Mobile2.0@BOP	28
LIRNEasia. (August 7, 2008). "Not all Asian Telecom Regulators value the power of the web". Press release.	Indicators, continued	46
LIRNEasia. (February 23, 2009). Hong Kong Regulator tops the best Telecom Regulatory Authority sites". Press release.	Indicators, continued	47
LIRNEasia. (November 4, 2009). "South Asians receive less value for money in broadband quality, shows study ". Press release.	Indicators, continued	48
LIRNEasia. (November 4, 2009). "India broadband users face bottlenecks in accessing international servers ". Press release.	Indicators, continued	49
LIRNEasia. (November 4, 2009). "Speed is not everything; broadband users in India suffer even with 'fast' links ". Press release.	Indicators, continued	50
LIRNEasia. (November 4, 2009). "India's Broadband Quality: Serious mismatches between advertised and delivered ". Press release.	Indicators, continued	51
<b>NEW METHODS, SOFTWARE TOOLS, ETC.</b>		

<p><b>Mobile benchmarks</b></p> <p>Since 2005, LIRNEasia has been working on accurate benchmarking for the Asian region; OECD methodology to measure the cost of mobile use was adapted by LIRNEasia for the emerging Asian region for the first time. The adapted methodology takes into account prepaid mobile phone use, which predominates in the emerging Asian region, and also calculates low, medium and high user baskets based on actual (average) usage levels in different countries. The methodology was initially refined by LIRNEasia, to incorporate actual minutes of use (MOU) and SMS data of operators from the region. Where breakdowns by prepaid and postpaid users were not available, and only overall average figures were reported, the ratio of prepaid to postpaid subscriber shares of the given operator in question, and a weighted average ratio of prepaid to postpaid MoUs and SMS data of other operators studied whose data is available, was used to estimate and apportion MOU and SMS data by prepaid and postpaid use. However, in the most recent round of calculations conducted in February 2010, it was decided to construct the basket using the volume of MOUs, SMS and MMS as given in OECD methodology, such that the basket values would be comparable with those constructed in other regions using similar OECD methodologies.</p>	Indicators continued	
<p><b>Concept of Quality of Service Experience</b></p> <p>As the suitability of term 'Quality of Service' (QoS) to encompass the actual user experience (which is what LIRNEasia sought to do in this new area of research) was questionable, LIRNEasia defined a new term 'Quality of Service Experience' to accurately encompass the concept, which it has begun using in its research. A Wikipedia page was created at <a href="http://en.wikipedia.org/wiki/Quality_of_service_experience">http://en.wikipedia.org/wiki/Quality_of_service_experience</a> to communicate the concept across a wider audience. As such <i>Quality of Service Experience</i> (QoSE) is the actual measure of a user's experience with an operator in terms of delivered quality with or without reference to what is being promised. This is measured technically and not subjectively. So it is different from Quality of Experience, sometimes also known as "Quality of User Experience," which is a subjective measure of a user's experiences with an operator.</p> <p>QoSE also differs from Quality of Service (QoS) which, in the field of computer networking and other packet-switched telecommunication networks, refers to resource reservation control mechanisms rather than the achieved service quality. Quality of service is the ability to provide different priority to different applications, users, or data flows, or to guarantee a certain level of performance to a data flow.</p> <p>The following broadband quality test tools were developed within this cycle:</p> <ul style="list-style-type: none"> <li>o AT-Tester Windows version (compatible with MS Windows XP, Windows Vista and Windows7)</li> <li>o AT-Tester cut down web version</li> </ul>	Indicators continued	

o Four AT-Tester mobile versions (for the operating systems Symbian, Windows CE, Apple and Android)		
<p><b>The Lowest Cost Frontier tool</b></p> <p>The Lowest Cost Frontier (LCF) tool has been developed for the countries that LIRNEasia works with in collaboration with Johannes Baur (Department of Telecommunication, Information Studies, and Media, Michigan State University). The LCF is a tool to find the cheapest offer for a broad range of communication services. It was developed as a complement to the basket method of comparing prices of advanced communications services of different service providers in one or more countries. It is particularly suited to compare prices of services with multiple tariff components. The method has been applied on a pilot basis to broadband in the U.S. and other countries. The method has been customized for the peculiarities of broadband markets in the countries in emerging Asia. The basic algorithm has been adapted to market characteristics. A data entry interface has been designed so that the data input can be done by the LIRNEasia staff. Data is stored in a searchable database on which the LCF algorithm is run. The tool is available to the general public on a web interface so that it can be utilized to compare prices between service providers as well as well different price plans offered by the same service provider. The tool allows users to do queries and make comparisons between post paid and pre-paid plans as well as fixed and mobile broadband services. The users of the tool can view the information they require in graphical manner.</p>	Indicators continued	

## 6.2 Capacity building (outputs)

### 6.2.1 Teleuse@BOP3

#### 6.2.1.1 Knowledge sharing workshop on methods for ICT user research

A one and a half day workshop was held in Negombo, Sri Lanka on 11-12 May, on “Knowledge sharing workshop on methods for ICT user research in emerging markets.” The workshop participants included 19 researchers and international experts from private sector and research organizations to exchange knowledge, experiences and learnings. The focus was methodological techniques and challenges of conducting demand-side research across emerging markets. In particular the researchers were exposed to innovative qualitative research methods used by commercial companies to understand the use and impacts of mobile technology. The workshop report is contained in Annex 13. Among participants from IDRC partner organizations<sup>62</sup> were:

- Aileen Familara, Philippines Community and Independent Media Programme Coordinator, Isis International, Manila
- Marion Cabrera, GCD Programme Coordinator, Isis International, Manila, Philippines
- Nazima Shaheen, Research Assistant, Sustainable Development Policy Institute (SDPI), Pakistan`

In addition, three researchers from Telenor Research and Innovation also participated: Per Helmersen, Grace Roldan and Andrew Wong. See Annex 13 for meeting report.

<sup>62</sup> Tesa de Vela (Isis International Manila) and Dr. Karin Astrid Siegmann (SDPI, Pakistan) were invited but unable to attend, therefore the above-mentioned participants attended on their behalf.

### 6.2.1.2 *Statistical mentorship by RIA researcher*

The participation of Christoph Stork (RIA) in the analysis of the quantitative data from the study has improved capacity within LIRNEasia for statistical analysis. It also led to the replication of an econometric model used by RIA to predict the factors affecting the adoption of mobiles at the BOP (Annex 1) as well as additional new ones.

### 6.2.1.3 *Training in qualitative research methods*

A one-day training session in qualitative research methods was organized for LIRNEasia's researchers in January 2009. The training was conducted by CKS consulting, a Bangalore-based qualitative research organization who conducted the qualitative research under Teleuse@BOP3. The training included an introduction to conducting mini-ethnographies as well as field visits to conduct mock research. The session prepared the researchers for making field visits during the qualitative fieldwork, and in addition, helped to sharpen the research tools (See Annex 10, 11 and 12). The capacity developed is expected to be useful for future research.

## 6.2.2 **Mobile2.0@BOP**

### 6.2.2.1 *Mobile money seminar for LIRNEasia researchers*

A half day session was held for LIRNEasia's Colombo-based staff in February 2010 to better understand the concept of mobile money and the full array of services and applications which fall under this category. Steve Esselaar of Intelcon (who was in Colombo for his own research) was invited to lead the discussion, bringing expertise and experience from Africa, specifically on the MPESA model from Kenya. Former Deputy Governor of the Central Bank of Sri Lanka, W. A. Wijewardene was also attended and participated in the discussion.

### 6.2.2.2 *Expert forum on Mobile2.0 applications and conditions*

The expert forum on 'Mobile 2.0 Applications and Conditions' which was co-hosted by LIRNEasia and the Pakistan Telecommunication Authority (PTA) was attended by a large number of telecom regulatory officials from the PTA as well as telco representatives. Though the event was mostly aimed at disseminating the Mobile2.0 research findings, it provided opportunity for cross-regional learnings on the various applications as well as regulatory issues arising from Mobile2.0 type service provision to be discussed (See Section 4.2 also and Annex 81 for the meeting report).

### 6.2.2.3 *Young scholar tutorial on mobile money*

A new tutorial module on mobile money was developed for the CPRsouth tutorials at the dissemination event held alongside the 2010 ICA conference in Singapore in June 2010. This was a product of the Mobile2.0 studies on mobile payments, as well as some of the knowledge and understanding gained from the half day session on mobile money (see Section 4.2 also). The tutorials were attended by 13 young scholars from the Asia Pacific (see Annex 96).

## 6.2.3 **Indicators continued**

The adaptation, and continued improvement of the OECD mobile user baskets continues to enable LIRNEasia to develop a new area of skill in its young researchers. The development of new methodology to measure broadband quality of service also continues to increase capacity within LIRNEasia as well as within the IIT Madras context.

### 6.2.3.1 *Expert Workshop on ICT Sector Indicators and Benchmarks Regulation for SAARC Regulatory Authorities*

The Expert Workshop on ICT Sector Indicators and Benchmarks Regulation for SAARC Regulatory Authorities was held from 14-15 June 2008 at the Changi Village Hotel, Singapore. Fourteen representatives from seven National Regulatory Authorities (NRAs) within the SAARC region, namely Afghanistan, Bangladesh, Bhutan, India, Maldives, Sri Lanka and Pakistan, participated at the forum. The aim of this event was to present current research on ICT Indicators and Benchmarks and to obtain their feedback. In addition, the participants attending the 12th Executive Course on Telecom Reform, held prior to the event, at the same venue also participated. Overall, participants from 17 countries attended (the full participant list is available in Annex 40). The problems and importance of collecting

comparable telecom sector and ICT indicators were discussed. The results of the LIRNEasia NRA website rankings were presented. Each senior representative (from each NRA) made a presentation in response to the survey methodology and rankings. Hands-on training on using the Asian ICT Indicator Database (developed by LIRNEasia in the previous research cycle, See Annex 36) was conducted (See Annex 37 for workshop report and Annex 40 for the participant list).

#### 6.2.3.2 *Training course on measuring ICT access and use by households and individuals*

LIRNEasia and the International Telecommunications Union (ITU) organized and conducted a five day training program on conducting demand-side surveys on ICT use. The Ministry of ICT, Thailand acted as local hosts. More than 25 senior level representatives from National Statistical Offices (NSOs) in the Asia Pacific participated in the event. LIRNEasia selected and funded the South and Southeast Asian participants (See Annex 38).

#### 6.2.3.3 *Training of volunteers on broadband quality testing using the AT-Tester*

Two sets of volunteers have been trained on broadband quality testing using AT-Tester over the current reporting period:

- LIRNEasia and Sarvodaya, a leading CBO in Sri Lanka, jointly organized a half day workshop for about 20 Sarvodaya telecenter operators on 25 November 2008 at Sarvodaya Head Quarters, Moratuwa, Sri Lanka. The resource persons were R. Thirumurthy from TeNet, IIT Madras and Chanuka Wattedgama from LIRNEasia.
- TeNet Group of IIT Madras organized a workshop at Computer Science and Engineering Department, IIT Madras for about 30 volunteers on 31 January 2009. The resource persons were Timothy. A. Gonsalves (PhD) and R. Thirumurthy from Tenet group IIT Madras.

### 6.2.4 **Capacity building**

#### 6.2.4.1 *CPRsouth and tutorials*

This component of the research program is in itself a capacity building initiative and as such aims to build local capacity in ICT policy and regulation in the Asia-Pacific in the first instance and then in the South. The CPRsouth3 and CPRsouth4 conferences included tutorials for young scholars on the technical and economic aspects of telecommunications policy and regulation (See Annexes 84 and 85 for conference reports). The requirement of paper presenters to construct policy briefs based on their research is aimed at helping Asia-Pacific researchers to make effective evidence-based policy interventions.

Nineteen paper presenters and 29 young scholars took part in CPRsouth3 held on 5-7 December 2008. In addition to the discussions there was a communications training session conducted for the paper presenters and young scholars. There was also a session that focused on how to bring research/evidence into the policy process (session titled 'Research to Policy'). Tutorials were held for 29 young scholars on 8-9 December 2008 (See Annex 42 for list of young scholars). The topics covered in the Tutorials included:

- Technology primer for policy intellectuals (Ashok Jhunjhunwala, IIT Madras/ CPRsouth Board)
- Foundational characteristics of information economies (William Melody, Chair CPRsouth Board)
- Designing research acceptable to policymakers and regulators (Yuli Liu, National Chengchi University, Taiwan /CPRsouth Board)
- Writing a policy brief (Sujata Gamage)
- Introduction to quantitative and qualitative demand-side research (Dimuthu Ratnadiwakara and Grace Roldan, Telenor Research and Innovation)
- Competition and convergence issues: satellite vs. fiber; cellular vs. copper (Heather Hudson, TPRC)
- Windows of intervention: picking the topics, doing the research and getting it out at the right time (Rohan Samarajiva and Helani Galpaya)

Twenty one paper presenters and 30 Young scholars took part in CPR*south4* from 7-8 December, 2009. The conference also included a panel session on how research is “consumed” in the policy process. The tutorials for 27 young scholars took place on 5-6 December 2009. The topics covered

- Foundational characteristics of information economies (William Melody, LIRNE.NET/Chair CPR*south* Board)
- Communication for policy influence (Rohan Samarajiva, Helani Galpaya and Nilusha Kapugama)
- Analyzing and realigning incentives (Sriganesh Lokanathan)
- How to do a policy brief (Sujata Gamage)
- Importance of Demand-side analysis (Harsha de Silva)
- Quantitative Research Methods and Analysis (Christoph Stork, RIA)
- Qualitative Research Methods and Analysis (Ekta Ohri, CKS Consulting, India)
- Working with supply-side data in telecom (Helani Galpaya)
- The most important thing I wish I learned in grad school, but did not (Millie Rivera, NUS/CPR*south* Board)

Tutorials for 13 young scholars from Asia Pacific were held in Singapore in June 2010 (co-sponsored by the Department of Communications and New Media of the National University of Singapore). The topics covered by the tutorials included;

- Basics of infrastructure regulation and what’s different in emerging Asia, (Rohan Samarajiva)
- Analyzing and realigning Incentives, (Sriganesh Lokanathan)
- How to use supply-side data, (Sriganesh Lokanathan)
- Demand-side research, (Nilusha Kapugama and Sriganesh Lokanathan)
- Why communication strategies are important in taking research to policy (Rohan Samarajiva)

In addition, a module on Communication for policy influence was taught by Rohan Samarajiva, Helani Galpaya and Nilusha Kapugama at the DRC PAN-ALL conference in Penang (June 2009).

#### 6.2.4.2 Training course scholarships

Scholarships were provided for the following numbers of persons to attend the following training courses over the project period (See Annexes 90, 93 and 96 for details of scholarship holders):

**Table 11: Training course scholarships supported**

Course	Total scholarships provided	Gender composition		Type of organization			
		Male	Female	Regulatory agency/ Government	Media	Academic organization/ NGO/Research organization	Industry
12 <sup>th</sup> Executive course on Telecom Reform, June 2008, Singapore	17	10	7	1	1	15	-
14 <sup>th</sup> Executive course on Telecom Reform, April 2010, South	13	11	2	5	4	3	-

Africa							
Young scholar tutorials, June 2009, Singapore	13	8	5	2	1	9	1

In addition, a module on Communication for policy influence was taught by Rohan Samarajiva, Helani Galpaya and Nilusha Kapugama at the DRC PAN-ALL conference in Penang (June 2009).

#### 6.2.4.3 Staff training

Over the reporting period, two of LIRNEasia's junior researchers and a senior research manager participated at the 12<sup>th</sup> Executive Course on Telecom Reform (June 2008) on scholarships supported by the current grant (included in those in Table 11).

Given the emphasis that LIRNEasia places on communicating research through the media as a means of policy intervention, LIRNEasia organized a short media training session at the May 2008 workshop on "Knowledge sharing workshop on methods for ICT user research in emerging markets" workshop. The main topic discussed was creating media strategies and executing them. Several of LIRNEasia's regional researchers also participated.

In January 2009 one of LIRNEasia's researchers also attended the first day of a five-day outcome mapping training program, organized by separate project team (unrelated to this project, namely the 3R Initiative) at LIRNEasia. The entire program was designed to come up with an outcome mapping strategy for 3R projects. The first day concentrated on giving an overall view of what outcome mapping is, the benefits of incorporating it to projects and the various methods that can be used to design a strategy.

In August 2008 four of LIRNEasia's junior researchers attended a training program in technical report-writing conducted by the Institute of Engineers Sri Lanka (IESL). The one day program gave the attendees an overall view of the differences between technical reports and other types of reports and the style of writing a technical report. It included a practical exercise and group activities. The participants were required to analyze different samples of writing and were also required to compile a technical report as a final exercise.

In June 2009 Senior Research Manager, Chanuka Wattagama attended the International Program for Development Evaluation Training (IPDET), Building Skills to Evaluate Development Interventions, held in Ottawa, Canada from 8 June to 3 July 2009. IPDET, a collaboration of the Independent Evaluation Group of the World Bank and Carleton University is an executive training program in development evaluation, established by co-directors Linda Morra Imas and Ray C. Rist. It is best known for its flagship program, an intensive and unique training opportunity offered once each year in Ottawa on the Carleton University campus. In addition to the core program, he took the workshops Evaluating Community-Based Development Initiatives, Introduction to Quantitative Data Analysis, Intermediate Quantitative Data Analysis, Performance Budgeting and Evaluating Private Sector Projects.

In June 2009 Researcher, Nilusha Kapugama took part in the IDRC evaluation Capacity Building programme DECI (Developing Evaluation Capacity for ICT4D). The program trained her in evaluation methodology, "Utilization Focused Evaluation". The program is yet to be completed as of 30 June 2010. The project component CPR<sub>south</sub> was evaluated under this program.

#### 6.2.5 Advocacy and dissemination

The aggressive dissemination program that LIRNEasia works with means that researchers are continually needed to develop communication skills for various types of presentations, for various types of audiences. The researchers are given regular training on communication. Over the current reporting period, one communication training sessions was conducted at the workshop at Negombo (May 11-12 2008) for researchers.



### 6.2.6 Mutual learning among LIRNE.NET members

Under this area, a young researcher from DIRSI interned at LIRNEasia for a period of six months. During her internship, she attended CPRsouth4 as a young scholar allowing her to develop skills needed to become a policy intellectual. As a result of this training, after returning to Peru she was encouraged to and volunteered to work in one of the groups of the Peruvian government commission on the development of the information society. The group, "Policy instruments and strategies" and commenced work in June 2010.

The participation of Christoph Stork (RIA) in the analysis of Teleuse@BOP3 data (starting with the analysis workshop held in November 2008 led to the replication of an econometric model used by RIA to predict the factors affecting the adoption of mobiles at the BOP (Annex 1) as well as additional new ones.

LIRNEasia has participated in the conduct of the LIRNE.NET training courses in Africa by RIA; Rohan Samarajiva and Helani Galpaya taught in both the 2009 as well as the 2010 course held in Cape Town. Teaching material was drawn from a range of LIRNEasia's ongoing and previous research projects (specifically from the current project, research from the Indicators Continued and Mobile 2.0 and T@BOP3 components were heavily used).

In addition, LIRNEasia assisted RIA in the replication of its capacity building conference, CPRsouth in Africa (CPRafrica), assisting with design and planning. Research staff (Rohan Samarajiva, Helani Galpaya and Sriganesh Lokanathan) also taught modules in the young scholar component of the inaugural CPRafrica conference in April 2010.

### 6.2.7 Evaluation

Researchers have been trained in evaluation methods over the period.

- Senior Research Manager, Chanuka Wattegama was trained in outcome mapping at the International Program for Development Evaluation Training (IPDET), Building Skills to Evaluate Development Interventions, in June-July 2009. Lead Scientist Sujata Gamage and researcher, Nilusha Kapugama was trained in outcome mapping through a training session (first day only) by Raj Verma organized by LIRNEasia's 3R project in January 2009.
- An external evaluation of LIRNEasia's policy influence success was commissioned by IDRC. The LIRNEasia team participated in this activity, and also provided assistance to the external evaluator in obtaining feedback from external stakeholders.

## 6.3 Policy and practice (outputs)

### 6.3.1 Teleus@BOP3

The Teleuse@BOP3 data has been used in several policy interventions under its Rapid Response program (See Section 4.5.1 for details):

- Response to planned environmental levy on mobiles (October 2007-August 2008)
- Response to planned procedures regarding registration of all mobile owners, as well as related regulations on phone sharing (July 2008)

Events for operators were held in India, Sri Lanka and Bangladesh, and were widely disseminated through the media (see Annex 99).

- In India, a presentation of the Indian findings was organized by the Cellular Operators Association of India (COAI) in February 2009, with CEOs, CMOs and other senior management of several operators (including Vodafone, Airtel, Idea and Aircel) and the executive director of COAI also.
- A presentation of the Sri Lankan findings was held in March 2009; in attendance were the CEO of Dialog Axiata, the CEO and CFO of Tigo, the Group COO of Axiata, among several representatives from all five mobile operators; see Annex 15 for participant list.

- In June 2009, a similar event was held in Dhaka to present the Bangladeshi findings, as well as launch the migrant study findings; the data was used to argue a case that Bangladesh's ILDTs policy is counterproductive and unfair. Among those present were several media representatives, leading to significant media coverage on the study (See Annex 99).

In addition, Teleuse@BOP3 regularly data feeds into policy outputs and interventions made under other projects (e.g., policy briefs on CellBazaar, mobile payments, etc). The Teleuse@BOP3 data was the basis of a significant background report on "How the developing world may participate in the global Internet Economy: Innovation driven by competition" (Annex 101) by Rohan Samarajiva, which was presented at "Policy coherence in the application of information and communication technologies for development," a joint workshop organized by the Organisation for Economic Co-operation and Development (OECD) and the Information for Development Program (infoDev) / World Bank from 10-11 September 2009 in Paris. The report has been published in the OECD's Development Dimension series: "ICTs for Development: Improving policy coherence."

The fundamental argument in the report is that many millions of poor people are engaging in tasks normally associated with the Internet such as information retrieval, payments and remote computing using relatively simple mobiles; understanding the business model that enabled impressive gains in voice connectivity as well as the beginnings of more-than-voice applications over mobiles is important not only because widespread broadband access among the poor is likely to be achieved by extending this model but because it would be the basis of coherent and efficacious policy and regulatory responses.

The data has also been used to contribute to the "telecenter debates", a series of articles published by the Telecenter Magazine, arguing that the mobile has greater potential to be the best vehicle for providing IT-related services to rural areas (as opposed to the PC).<sup>63</sup> The data has been used to contribute to other similar such discourses, including a debate on the potential of mobiles to be the most transformative ICT for developing countries held at the IDRC PAN-All conference in Penang, Malaysia in June 2009.<sup>64</sup>

### 6.3.2 Mobile2.0@BOP

The following dissemination events for policymakers, regulators and media were held based on the Mobile2.0 research:

- A seminar on cell broadcasting for public warning was organized by LIRNEasia on 29 September 2008 at the National Center for Information Technology (NCIT) in Male<sup>65</sup>. This seminar brought together all the stakeholders including: the Regulator (CAM), mobile operators (Dhiraagu, Wataniya), the National Disaster Management Center, and the Ministry for Planning and Development.
- The final report of the study was officially released at a meeting convened by the Communications Authority of the Maldives (CAM) in Male on 15 July, 2009.<sup>66</sup> It was attended by key officials from government (e.g., Disaster Management Center, National Defense) and from both operators. There was media interest as well, with the story being carried in the 1400 hrs national news and also on the prime time 2000 hrs news bulletin on TVM, the

<sup>63</sup> See <http://lirneasia.net/2009/08/pcs-not-the-best-vehicles-for-providing-it-delivered-services-to-rural-areas/>

<sup>64</sup> <http://lirneasia.net/2010/02/tbop3-findings-published-in-nokias-expanding-horizons-mag/> ;  
<http://lirneasia.net/2009/05/mobiles-the-developing-world-path-to-the-internet/> ;  
<http://lirneasia.net/search/?cx=005600070838260215994%3Azquvduhpm&cof=FORID%3A11&ie=UTF-8&q=penang+debate&sa=Search&siteurl=lirneasia.net%2F2008%2F05%2Ftelecentres-panacea-for-all-woes-or-over-hyped-and-under-delivered-phenomenon%2F#1199> ; [http://lirneasia.net/wp-content/uploads/2009/04/capetown\\_april09-20.ppt](http://lirneasia.net/wp-content/uploads/2009/04/capetown_april09-20.ppt)

<sup>65</sup> Also see <http://lirneasia.net/2008/10/maldives-ideally-positioned-to-lead-in-cell-broadcasting/>

<sup>66</sup> <http://lirneasia.net/2009/07/cell-broadcasting-for-early-disaster-warning-in-maldives-report-released-today/>

government channel. CAM indicated that they intended to initiate a pilot project based on which they would move to mandated operation of cell broadcasting.

- A well-attended one and a half day expert forum was co-hosted by LIRNEasia and the Pakistan Telecommunication Authority (PTA) in Islamabad on 26-27 April 2010. The objective of this forum was to:
  - Share LIRNEasia's Mobile 2.0 research results among regulators, operators, policy makers and researchers of SAARC and ASEAN countries;
  - Obtain feedback from key stakeholders on improving the research outputs;
  - Create a dialogue on policy and regulatory processes affecting Mobile 2.0; and
  - Explore replication opportunities for good practices.

The audience included telecom regulators and policymakers (primary focus), operators, researchers and local/international media. Media was also invited to participate given the importance and the relevance of the content. In addition to members of the Pakistani media, two journalists from India, and one each from Sri Lanka, Bangladesh and Thailand participated, providing wide media coverage in the respective countries (e.g., the senior journalist from *Hindu Business Line* in India who attended the meeting published five stories based on the research). One-on-one interviews with LIRNEasia researchers were arranged for the media. The full meeting report including a listing of the media coverage and participants is contained in Annex 81. The following policy briefs based on the Mobile2.0 research studies were compiled, and distributed to participants at the Expert Forum Meeting in Islamabad in April 2010; among the recipients were many of the Pakistan Telecom Authority (PTA) officials, including Chairman, Mohammed Yaseen (PhD) (See Annexes 66-73 for policy briefs):

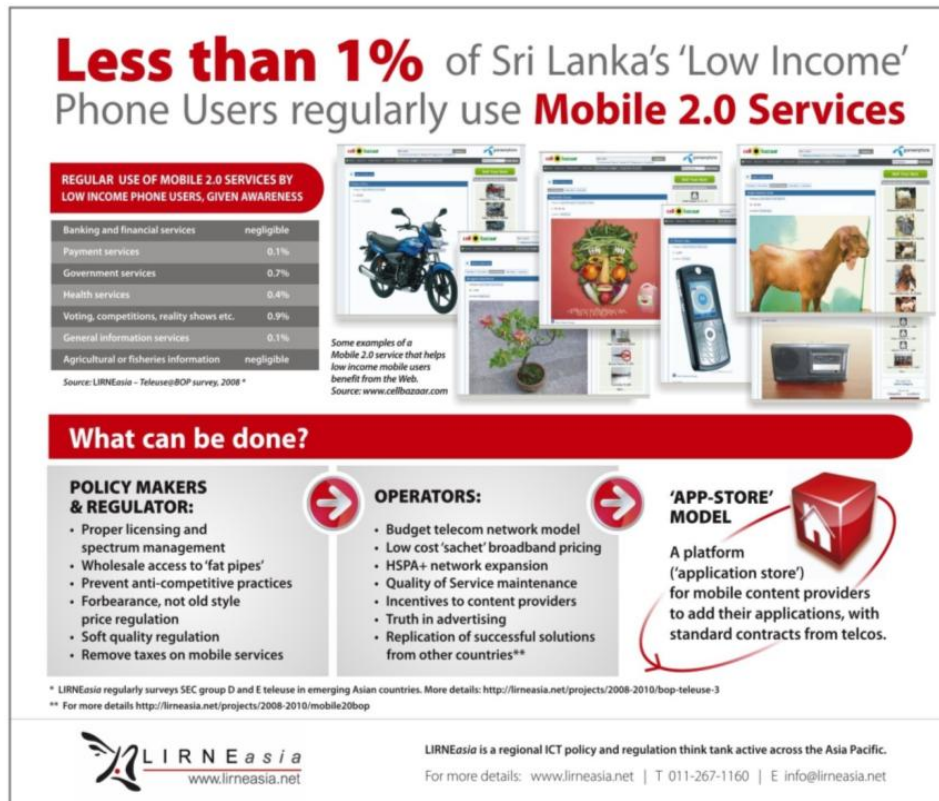
- LIRNEasia (2010). Agricultural Value Added Services (VAS) through Mobile 2.0. Policy Brief. (Annex 69)
- LIRNEasia (2010). CellBazaar: Enabling mCommerce in Bangladesh. Policy Brief. (Annex 70)
- LIRNEasia (2010). Spectrum Management: Unleashing the potential of mobile technologies for the Bottom of the Pyramid (BOP). Policy Brief. (Annex 71)
- LIRNEasia (2010). Possibilities for bus tickets to go mobile in Sri Lanka. Policy Brief. (Annex 66)
- LIRNEasia (2010). Is m-Gov the way forward? Policy Brief. (Annex 72)
- LIRNEasia (2010). Policy Implications of Introducing Mobile Money (mMoney) for the BOP. Policy Brief. (Annex 67)
- LIRNEasia (2010). To MNP or not : That is the question. Policy Brief. (Annex 73)
- LIRNEasia (2010). Business Models for Delivering Mobile Value Added Services (VAS) in Developing Markets. Policy Brief. (Annex 68)
- In June 2010, a public forum was held to disseminate the findings and policy recommendations from the study on the "Use of mobile payments in the public transport system." Senior officials from the Ministry of Transport, National Transport Commission and Ministry of Finance with representatives from the private bus operators responded participated (See Annex 83 for meeting report). The Secretary to Ministry of Transport chaired the event and responded to the presentation.

The key policy recommendation that came out of the Mobile2.0 research is that an 'App-Store' model be followed to push Mobile 2.0 usage ahead; in this model, operators would build a platform for mobile content developers to add new applications under standard terms and contracts. In this regard, multiple half page advertisements (Figure 6) aimed at regulators, policymakers and operators to communicate the recommendations were published in Sri Lankan English newspapers<sup>67</sup> coinciding with an international mobile application development conference in Colombo in June 2010.

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<sup>67</sup> Incidentally, one of Sri Lanka's mobile operators, Etisalat announced the introduction of an app-store within a few days of the placement of the advertisement:

<http://lirneasia.net/2010/06/sri-lanka-etisalat-to-adopt-%e2%80%98app-store%e2%80%99-model/>



**Figure 6 Advertisement placed in local newspapers to communicate Mobile2.0 research findings and policy recommendations**

### 6.3.3 Indicators

The TRE research was completed for eight counties in 2008 (the Afghanistan and Mongolia TRE studies are being completed at the time of reporting). The eight finalized country reports (Annexes 18-25; the draft Afghanistan report is contained in Annex 26) were shared with the stakeholders (who participated in the survey) and sent to all regulatory authorities.

In addition, the following dissemination events for policymakers and regulators were held:

- An event was organized in Manila, Philippines to disseminate the TRE results for the Philippines. Almost all the commissioners of the regulatory authority, senior public servants and media were in attendance. The regional results were presented by Helani Galpaya (TRE coordinator and COO). The Philippines results were presented by Erwin Alampay (Philippines researcher). Formal responses were given by Former Commission on ICT (CICT) Secretary, Virgilio Pena and National Telecommunications Commission Deputy Commissioner Jorge Sarmiento. An animated discussion (or debate) followed on a number of issues (for example, consumers in the audience complained that that one company owned more than one mobile service therefore the level of competition was not as high as it could be; the commissioners claimed that it was unclear how much more competition could be sustained by the industry). The commissioners accepted some of the recommendations made by the LIRNEasia researchers. The events (and results) were carried in two newspapers in the Philippines The Manila Times and Inquirer.net.<sup>68</sup> Participant list is provided in Annex 42.

<sup>68</sup> [http://newsinfo.inquirer.net/breakingnews/infotech/view\\_article.php?article\\_id=187404](http://newsinfo.inquirer.net/breakingnews/infotech/view_article.php?article_id=187404) and <http://www.manilatimes.net/national/2009/feb/09/yehey/business/20090209bus10.html>

- Another event was organized in collaboration with Voice & Data (an industry magazine) in Delhi, India in March 2009 to disseminate the Indian findings. Representatives from the regulator, all major telecom operators, ISPs, equipment manufacturers and other industry stakeholders were present in the audience. Rohan Samarajiva and Payal Malik presented the regional and Indian TRE study results, respectively. It was followed by a panel discussion of senior stakeholders. Participant list for the event is in Annex 43. Voice and Data magazine carried a lengthy article on the TRE Results.
- A third event was organized in Thailand, where TRE results were presented, and a Commissioner from the regulatory body as well as a participant from the incumbent operator responded to the findings. The event received significant media coverage. See Annex 45 for participant list.
- The following were the QoSE awareness events:
  - Dissemination Seminar at Institute of Engineers, Sri Lanka, March, 2008
  - Dissemination Seminar at Institute of Engineers, Sri Lanka, April, 2009
  - Awareness workshop at Sarvodaya Headquarters, Sri Lanka, November, 2008
  - Awareness workshop at IIT Madras, Chennai, India, February, 2009
  - Dissemination event in Chennai, India, November, 2009
  - Soft Launch of the first two versions of the mobile AT-Tester for bloggers, February, 2010

The objective of the above events was to create awareness among broadband users on the QoSE research work carried out by LIRNEasia and disseminate our test results among them. Operators participated at half of these events (they were absent at two workshops and the soft launch), responding to the research findings. Despite repeated invitations, the regulator did not attend any of the events.

Two policy memos (one on intra-SAARC international voice telephony and another on roaming in the region) were issued in time for the Summit of the South Asian Association for Regional Cooperation (SAARC), held in Colombo in August 2008. Understanding that Sri Lanka as the host country was looking for attractive initiatives (and considering also some terrible proposals!), the following policy memos were issued: (see Section 7.3.2.2 for details):

- Options for lowering intra-SAARC international voice telephony tariffs (Annex 52).
- International voice tariffs within SAARC: A cause for concern (Annex 53)

### 6.3.4 Capacity building

young scholar tutorial sessions at CPRsouth3 as well as CPRsouth4 included a full tutorial session on how to write effective policy briefs, taught by Sujata Gamage (PhD). At the CPRsouth young scholar tutorials held in Singapore in June 2010, a session on 'Why communication strategies are important in taking research to policy' was also taught by Rohan Samarajiva (PhD). The tutorials are aimed at training up-and-coming policy intellectuals in the ICT field (See Section 6.2.4).

### 6.3.5 Mutual learning among LIRNE.NET members

In July 2009, LIRNEasia collaborated with Alison Gillwald of RIA in a Rapid Response activity, responding to the Bangladesh Telecommunication Regulatory Commission (BTRC) on the public consultation paper using the experience in Africa to argue a case. See Section 4.5.1 for details.

### 6.3.6 Advocacy and dissemination

Most of the outputs in the advocacy and dissemination component of the project are aimed at policymakers and regulators (two of LIRNEasia's four key audiences<sup>69</sup>):

#### 6.3.6.1 *Participation in international and regional conferences, workshops and dialogues*

LIRNEasia has participated at numerous invited conferences over the grant period, giving presentations, keynote speeches, chairing panels, etc. In addition, LIRNEasia participates in many

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<sup>69</sup> The other two being industry and media.

other smaller local events in a similar manner. Annex 100 provides a list of the key events that LIRNEasia has participated in over the grant period.

#### 6.3.6.2 News/media coverage

LIRNEasia considers media as a key channel to get policymakers attention. During the reporting period, LIRNEasia has received significant media coverage. Full media coverage is detailed in Annex 99. In addition, LIRNEasia has taken out several advertisements in local newspapers with key research findings (see Figure 6 for example).

#### 6.3.6.3 Rapid response

Six rapid response activities were undertaken during the period; See Section 4.5.1 for details.

#### 6.3.6.4 Website

LIRNEasia's website plays a key role in the dissemination of the organization's research. The blog format allows easy commenting and discussion. Project information dissemination is done in two ways. While ongoing project details are presented in the static section of the site, a dynamic blog records the events – workshops, seminars, press conferences etc. The blog also tracks key media highlights about LIRNEasia projects and outcomes. Users are given the opportunity to download project documents and also comment on our work. The website has seen steady growth in the number of new visitors over the past five years, as Figure 7 shows.

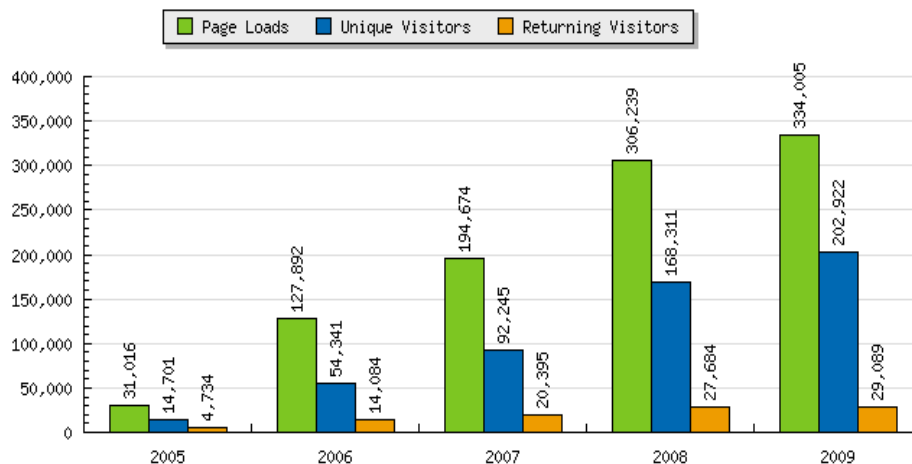


Figure 7: Number of total and returning visitors to [www.lirneasia.net](http://www.lirneasia.net): 2004-2009

#### 6.3.6.5 Training courses

LIRNEasia also uses the opportunity to disseminate its research at its training courses. The audience at this course generally includes regulators, policy makers, operators, consumer groups and academics. LIRNEasia research has been disseminated at the following training courses over the period:

- 14th Executive course on Telecom Reform, 12-16 April, 2010, Cape Town, South Africa
- 13th Executive Course on Telecom Reform, 14-17 April 2009, Cape Town, South Africa
- 12th Executive course on Telecom Reform, 10-14 June, 2008, Singapore

### 6.3.7 Evaluation

Data on media coverage and event participation by LIRNEasia researchers are regularly collected and categorized for further analysis and evaluation. These are key indicators of LIRNEasia's success capturing dissemination of research through different channels, to different audiences in different countries. These indicators are regularly reported in technical reports (biannually) as well as annual reports. In addition, all media coverage and event participation are captured on the LIRNEasia blog for further dissemination. See Annex 99 for media coverage and Annex 100 for event participation over the period, both categorized by project component.

## 7.0 Project outcomes

### 7.1 Teleuse@BOP

Much of LIRNEasia's research in this cycle was based on the idea that the mobile will be the primary device through which the BOP in emerging markets (such as the ones that LIRNEasia works in) engages with the Internet, or the tasks normally associated with the Internet such as information retrieval, payments and remote computing. At the time of writing this report, it appears that many others are also subscribing to this view. Teleuse@BOP3 has provided LIRNEasia with hard evidence that this is the case, and has formed the basis of many of its contributions<sup>70</sup> to this new discourse, most significantly the background paper presented by Rohan Samarajiva at the coherence in the application of information and communication technologies for development," a joint workshop organized by the Organisation for Economic Co-operation and Development (OECD) and the Information for Development Program (infoDev) / World Bank from 10-11 September 2009 in Paris (Annex 101). This report is gaining considerable traction within the OECD, and has triggered debates in other fora also.

The Teleuse@BOP3 findings have also fed into other important pieces of the research such as the understanding of the Budget Telecom Network business model that enabled impressive gains in voice connectivity as well as the beginnings of more-than-voice applications over mobiles; drawing from findings of the QOSE research also, LIRNEasia has extended its argument widespread broadband access among the poor is likely to be achieved by extending this model.

In addition, the Teleuse@BOP3 findings have also been used in other areas or research which looked at the changing policy and regulatory priorities, for example the understanding of multiple SIM ownership by the BOP from the Teleuse@BOP3 research has been used in arguing that MNP in emerging markets will not benefit the BOP.<sup>71</sup> Similarly, the Teleuse@BOP3 findings have fed into research on mobile payments, mobile commerce applications, spectrum, among others within the Mobile2.0 component.

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<sup>70</sup> See <http://lirneasia.net/2009/08/pcs-not-the-best-vehicles-for-providing-it-delivered-services-to-rural-areas/>; <http://lirneasia.net/2010/02/tbop3-findings-published-in-nokias-expanding-horizons-mag/> ; <http://lirneasia.net/2009/05/mobiles-the-developing-world-path-to-the-internet/> ; <http://lirneasia.net/search/?cx=005600070838260215994%3Azquvduehpzm&cof=FORID%3A11&ie=UTF-8&q=penang+debate&sa=Search&siteurl=lirneasia.net%2F2008%2F05%2Ftelecentres-panacea-for-all-woes-or-over-hyped-and-under-delivered-phenomenon%2F#1199> ; [http://lirneasia.net/wp-content/uploads/2009/04/capetown\\_april09-20.ppt](http://lirneasia.net/wp-content/uploads/2009/04/capetown_april09-20.ppt); <http://lirneasia.net/2009/08/pcs-not-the-best-vehicles-for-providing-it-delivered-services-to-rural-areas/>

<sup>71</sup> [http://voicendata.ciol.com/content/service\\_provider/110040211.asp](http://voicendata.ciol.com/content/service_provider/110040211.asp)

## 7.2 Mobile2.0

LIRNEasia advocated two models, each for regulators and operators to make Mobile 2.0 at the bottom of the pyramid a reality. One was the Budget Telecom Network model, where it was argued that broadband providers should follow the budget airlines in bringing Internet access within the means of the next layer of users (I.e. the BOP), though it may mean lower quality (or that regulators “go easy” on regulating quality) in the initial stages, until the network rollout is done, as the focus is on basic access rather than power use. The second was the “App-Store” model where LIRNEasia argued that operators allow content providers to add new mobile applications to their platforms with least hassle and on standard contract terms (instead of the current model which most often results in the operator taking the lion’s share of the revenues while the application developer only receives a small stage). While evidence on both need to be tracked, some early indications of changing stakeholder thinking is apparent. For example, at the closing session of the Mobile 2.0 Expert Forum Meeting organized in Islamabad (where above two models were advocated and discussed), we observed operators principally agreeing to the “App-Store” model. In response to a challenge from a LIRNEasia researcher about why Pakistan (which has been often innovative and exemplary in the field of telecom and telecom regulation) hasn’t taken the lead in developing Mobile 2.0 applications, one of the CEOs in the audience said he’s willing to give 90% of the revenue to the application developer if that is what would get Pakistan-centric applications for mobiles developed, as long as the marketing was done by the app developer. This statement was made in public, in front of regulators and the media (and some audience members expressed surprise, because the same CEO had previously never talked of sharing more than 40% of the revenues with the application developer). Also, a few weeks later, the Chairman of the Pakistan regulatory body PTA (and who was present at our Mobile 2.0 forum and whose organization co-hosted it with us) stated at another public event that Mobile 2.0 application was going to be his focus from now on. These are early evidence of influencing the way stakeholders think. But the proof is in the pudding, and we shall track the applications that do get developed to serve Pakistani mobile users.

Separately from Pakistan, but related to this project, in June 2010 Sri Lankan operator Etisalat, openly invited content providers to add application to its network on standard profit sharing terms.<sup>72</sup>

Another important idea proposed by LIRNEasia and largely agreed by the regulators and operators at the Expert Forum Meeting in Pakistan was that there should be little or no interference by the financial regulators for low value mobile payments. There was also a common consensus that m-agriculture applications should be based more on voice applications to enable partial literate agri-communities to gain the maximum benefits

## 7.3 Indicators continued

LIRNEasia has been engaged in both demand and supply side indicator data collection since the very beginning. For example, it has closely collaborated with the ITU and OCED – obtaining their input into LIRNEasia’s indicator work, and giving feedback in ITU’s indicator definition work. As a result of this ongoing relationship, LIRNEasia was invited to present on the status of Asian indicator work at the 7<sup>th</sup> annual ICT Indicator Meeting of the ITU, held in Cairo. LIRNEasia was the only organization to represent a regional-point of view on Asia (all other regional were represented by the relevant UN/regional body, such as UN-ECLAC, OECD, Eurostat and so on). Further continuing the collaboration, ITU agreed to co-fund (along with LIRNEasia) a training of SAARC and ASEAN NSOs on household hold (demand side) data collection, which took place in Bangkok in October 2009.

### 7.3.1 Regulatory website survey

The research was completed in June 2008, and a media release was issued along with the report, which was also sent to the NRAs that were surveyed in May 2008. The study (Annex 35) was picked up by the Indian Express on 18 August 2008, and was also brought to the attention of the Chairman of the Telecom Regulatory Authority of India (TRAI) (See Figure 8).

<sup>72</sup> <http://lirneasia.net/2010/06/sri-lanka-etisalat-to-adopt-%E2%80%98app-store%E2%80%99-model/>





Figure 8: *Essence: Watchdog Dynamics*, The Indian Express, 18 August 2008.

### 7.3.2 Benchmarks

#### 7.3.2.1 Mobile

LIRNEasia has always been critical of the method used for price comparisons by the ITU. The ITU reports the price of a three minute call for price comparisons. Since 2006, LIRNEasia has developed a basket methodology (adapting and building on OECD methodology) in its price comparisons (or benchmarking). A partial success in this direction has been the adoption of the basket methodology for price comparisons by the ITU.

#### 7.3.2.2 International Voice

The Summit of the South Asian Association for Regional Cooperation (SAARC) was held in Colombo in August 2008. Understanding that Sri Lanka as the host country was looking for attractive initiatives (and considering also some terrible proposals!), LIRNEasia decided to develop two proposals one on intra-SAARC international voice telephony and another on roaming in the region. Given the complexity of the latter and the broader impact of the former on people-to-people contacts and regional integration, a decision was taken to focus on intra-SAARC international voice telephony. Policy briefs were sent to all the SAARC regulatory agencies and an intensive effort to place the story in the media, including in news agencies, undertaken (See Annex 52 and 53). The proposal made it into the SAARC Chairman's speech<sup>73</sup> and the Declaration.<sup>74</sup> A follow up policy brief was sent to all the regulatory agencies as well.

The story was carried by media outlets, both online and offline media, including a widely circulating AFP article. For example (see Annex 99 for full list):

- "South Asian leaders urged to slash telco tariffs", AFP, July 16 2008, [http://afp.google.com/article/ALeqM5gJ55Sek\\_6dPodq\\_68f-NsVzmJ1QA](http://afp.google.com/article/ALeqM5gJ55Sek_6dPodq_68f-NsVzmJ1QA)

<sup>73</sup> The SAARC Chairperson, HE Mahinda Rajapakshe, President of Sri Lanka also called the SAARC members to "actively promote a reduced tariff for IDD calls within the South Asian region to bring our people much closer, sooner". Full speech available online at [http://www.priu.gov.lk/news\\_update/Current\\_Affairs/ca200808/20080802redouble\\_collective\\_efforts\\_to\\_combat\\_terrorism.htm](http://www.priu.gov.lk/news_update/Current_Affairs/ca200808/20080802redouble_collective_efforts_to_combat_terrorism.htm).

<sup>74</sup> Item number 6 of the final 15th SAARC Declaration called "the member states to endeavor to move towards a uniformly applicable low tariff, for international direct dial calls within the region". Full document available online at <http://www.saarc-sec.org/data/summit15/summit15declaration.htm>.

- "Making SAARC Real" by Rohan Samarajiva in *The Daily Star*, Bangladesh, 27 July 2008. <http://www.thedailystar.net/story.php?nid=47528>
- "Why are Pakistan's Long Distance Calling Rates So High for SAARC Countries?" by Barbar Bhati in the blog TelecomPK.net. <http://telecompk.net/2008/07/27/why-are-pakistans-long-distance-calling-rates-so-high-for-saarc-countries/>
- "Real SAARC" by Rohan Samarajiva in Lanka Business Online, 18 July 2008, <http://www.lbo.lk/fullstory.php?nid=1871648785>
- "Telecom Tariffs in SAARC Countries" by Rohan Samarajiva in Dawn Online Edition, July 21 2008, <http://www.dawn.com/2008/07/21/ebr8.htm>
- "Why is it costlier to call next door than overseas", by Rohan Samarajiva in Himal South Asian, <http://www.dawn.com/2008/07/21/ebr8.htm>
- Two Vietnamese publication (to be translated), <http://beta.baomoi.com/Home/KinhTe/www.vietstock.com.vn/LIRNEasia-Cac-nuoc-Nam-A-can-giam-thue-vien-thong-noi-vung/1813237.epi> and <http://www.ictnews.vn/Home/vien-thong/Nam-A-ban-viec-giam-cuoc-vien-thong/2008/07/1SVMC511106/View.htm>
- "SAARC leaders urged to slash Telecom tariffs," The Daily Mirror (via AFP) (Sri Lanka), 18 July 2008, [http://www.dailymirror.lk/DM\\_BLOG/Sections/frmNewsDetailView.aspx?ARTID=20791](http://www.dailymirror.lk/DM_BLOG/Sections/frmNewsDetailView.aspx?ARTID=20791)

### 7.3.2.3 Broadband

LIRNEasia's broadband QoS research outcomes have been widely discussed in the blogosphere, in Sri Lanka and India. Users have widely quoted our test results, inter alia, questioning the promises of the advertised packages. The debate could be one of the reasons that Sri Lankan operators have shifted to more ethical advertising. For example, Dialog Broadband one of the two players which offer mobile broadband solutions, changed the advertised speed of its 'Unlimited' package from 7.2 Mbps to 1 Mbps, when the previous promise was found too high. Mobitel, second player too stopped advertising speeds of 14.4 Mbps and settled for more realistic speeds of 3.6 Mbps.

Parallels to LIRNEasia's evidence-based policy recommendations were found in multiple places in the Broadband Wireless Access (BWA) Request for Proposal document issued to operators by the Bangladeshi regulator calling for bids for the provision of wireless broadband services. The following are selected examples:

- *Operators should now guarantee QoS not just in last mile, but at least till the first foreign entry point, by purchasing adequate international bandwidth. (Earlier the focus was only on last mile.)*
- *Contention ratios and download/upload speed ratios are defined, ensuring capacity increase parallel to the number of subscribers*
- *Connectivity need not be confined to WiMax (except in Dhaka and Chittagong Metropolitan area). Operators have the flexibility in using other media (e.g. Fiber or Copper wires) in conjunction*
- *Operators have to ensure QoS as per BTRC guidelines. There will be regular monitoring.*
- *Operators now have a better understanding on backbone/backhaul design. The system can be point-to-multipoint or mesh radio systems consisting of BWA distribution hub stations and their associated subscriber stations (or BWA access devices).*

Overall broadband performance has improved in India and Sri Lanka according to QOSE test results. It could be possible that LIRNEasia's performance testing (which LIRNEasia has engaged with and sought feedback on from operators in the country) may have acted as a stimulant in infrastructure development.

As a result of a joint rapid response from LIRNEasia with its partner IIT Madras, India regulator fixed the contention ratios, a key parameter that governs the broadband quality, to 1:30 for business and

1:50 for residential. This was only a slight deviation from our recommendations 1:20 for business and 1:50 for residential.<sup>75</sup>

In a parallel development (though possibly not influenced by LIRNEasia's work) the Federal Communications Commission in USA requested broadband and smartphone users in USA to use their broadband testing tools to help the feds and consumers know what speeds are actually available, not just promised by the nations' telecoms, in March 2010. Broadband users in USA can now go to the FCC's Broadband.gov site, enter their address and test their broadband speed using one of two testing tools.

This was how Wired.com saw FCC's efforts, which reflects LIRNEasia's initiatives too:

*Crowdsourcing this data is a brilliant move, given that telecoms have long fought against telling federal regulators what areas they cover and at what speed, arguing that information will be used by competitors to poach their customers. The data can also be used as a way to prevent telecoms from over-promising and under-delivering on upload and download speeds. If you listen closely you might actually hear the telecom companies hitting the backspace key to revise the speed numbers on their promotional fliers.*

## 7.4 Capacity building

### 7.4.1 CPRsouth

The aim of CPRsouth is to create policy intellectuals in the Asia Pacific who are able to contribute to the policy making processes in their respective countries. In order to do so, an annual conference and tutorial session is held for selected participants. A total of 39 paper presenters and 57 young scholars took part in the two conferences. The tutorials were restricted to the young scholars. The papers presented at CPRsouth have been uploaded on to the Social Science Research Network (SSRN), where they have received significant abstract views as well as downloads (see Annex 97).

In order to track the contributions made by the participants, an outcomes survey is done every year. The survey is sent to all past CPRsouth paper presenters and young scholars. The respondents are queried about their involvement in academic and policy activities. Academic activities include getting journal publications and conference papers while policy activities include making presentations to policy makers and writing policy briefs.

The surveys so far show that the respondents have been active in either the academic or policy sphere. Furthermore comments by young scholars and paper presenters speak of the value of the conference and tutorials for their work. The young scholars particularly seem to find the tutorial done on "how to write a policy brief" particularly useful. The findings of the survey can be found in Annex 89. The participants were also queried about the post conference networking. Data indicates that nearly 95% of those responded were in touch with at least one person they met during the CPRsouth conference.

The CPRsouth Board consists of nine senior scholars, most of them being attached to a university. During and post CPRsouth4 discussions took place between the Board Members, Ashok Jhunjhunwala of the department of electrical engineering of the Indian Institute of Technology, Madras, India (IIT-M) and Milagros Rivera of the department of Communications and New Media (CNM) National University of Singapore (NUS) about the possibility of the initiation of a joint PhD program for students with engineering and social science backgrounds. The initiative is still in its discussion stages.

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<sup>75</sup> India Regulator issues QoS guidelines; adopts some LIRNEasia-TeNet recommendations, <http://lirneasia.net/2009/03/3872>

## 7.5 Advocacy and dissemination program

### 7.5.1 Rapid response

Please see Section 4.5.1 for information.

## 8.0 Overall Assessment and Recommendations

### 8.1 Teleuse@BOP3

The Teleuse@BOP3 project has been well received overall. In comparison to Teleuse@BOP2, it has received less critique on the methods used as well as the findings.. Significant media coverage and the fact that LIRNEasia secured significant funding from industry towards the research implies relevance of the research; but also implies that it is less and less of a public good than it initially was, or thought to be. As such, LIRNEasia will attempt to obtain a larger share of the project funding from industry and less from IDRC.

The data generated from the diary component of the study was not utilized as much as in Teleuse@BOP2, due to issues with the format in which the data was entered, leading to delays in obtaining the data, therefore making it less usable in LIRNEasia's dissemination activities. In this regard, LIRNEasia may reconsider implementing it in future studies, or possibly using some other method to capture mobile usage patterns.

The migrant worker component of the study shed light on teleuse among such categories of people, providing an understanding of the current barriers to uptake of mobile remittance services. It will not be repeated in future, as it served its purpose (though if it had been done two years later, may have seen more significant use of mobile payment/remittance services).

The qualitative module very successful in comparison to that in Teleuse@BOP2. The two changes from Teleuse@BOP2 had a significant impact on the usefulness of the module, and will be repeated in future, namely the lagging of the qualitative research (i.e., after the quantitative findings are available), and breaking the qualitative research partner selection away from the quantitative research partner selection, enabling specialized parties to bid on the project.

The field visits by LIRNEasia researchers were extremely useful, and should be repeated, and visits should to the extent possible be made longer in future. Researchers need to get fully immersed from start to end.

The industry events in India, Sri Lanka and Bangladesh were successful; less effort in dissemination was put into Thailand, Pakistan and the Philippines, because there were not enough resources to hold six events..

In terms of outcomes, the Teleuse@BOP3 study has, and is continuing to have significant impact in contributing to the changing of the discourse, as noted in Section 6.3.1 and Section 7.1 and is therefore an important base for much of LIRNEasia's other research leading to outcomes in other areas.

### 8.2 Mobile2.0@BOP

The Mobile 2.0@BOP research was an important learning exercise for LIRNEasia. It explored a developing phenomenon which little research had previously been done on. International partnerships not just among the researchers, but with regulators and operators enriched the study, exposing LIRNEasia to new ideas. It is too early to comment in detail on the developmental impacts that the study has resulted in, however, positive responses have been received so far.

One of the most important ideas that came out of the project was the relevance of the "app-store" model. LIRNEasia has argued that growth in Mobile 2.0 application uptake will only be possible if operators make the process of introducing new mobile applications hassle-free. The content developers should be able to add new applications to mobile platforms with minimum cost and effort.

In this regard, it is recommended that operators have standard contracts and payment terms. Some operators already seem to be adopting this idea but further advocacy may be necessary.

The project has served its purpose from LIRNEasia's perspective in contributing to the changing discourse noted in Section 6.3.1 and Section 7.1, and has provided a good base from which LIRNEasia can start its proposed research on inclusive Knowledge based economies.

### 8.3 Indicators, continued

The indicators research consisted of two parts: The perception survey related to TRE work and the objective benchmarking work. The former (TRE) has continued to be incredibly successful in getting the attention of regulators (low TRE scores get as much regulatory attention as high TRE scores, when publicized – low scores resulting in a more defensive response from regulators while high TRE scores are cited by the regulator as validation of good regulatory performance). While the cost of conducting a TRE survey is significant (a senior level researcher is required in each country, because access to CEO level respondents is a requirement for a successful TRE survey), it has been decided that the impact of the studies is significant. As such, LIRNEasia will continue the TRE survey in the next research cycle. Our sister research network (RIA) conducts TRE surveys also, but the final output is reported in the form of a Sector Performance Review (SPR) which is more comprehensive in its analysis in that it covers broader ICT4D elements (e.g. ICT in education etc) than just telecom regulation. LIRNEasia will adopt this (SPR) format in its final reports starting with the next research cycle.

The second part of the indicator research is the benchmarking of price and quality data. From these, the price benchmarks have proven to be useful as a research output in themselves (for example, the international calling benchmarking results being directly used in interventions related to regional roaming in the SAARC region, as highlighted in Section 7.3.2) as well as a invaluable input into other research processes (e.g. the mobile price baskets data been used in developing and justifying the Budget Telecom Model related work). As such, the price benchmarks will be continued in the next cycle. However, our indicators related work has always aspired for sustainability – i.e. to get others (who are in the business of collecting indicator data, like regulators) to collect and report data, instead of a research organization like LIRNEasia doing it. A partial success in this direction has been the adoption of the basket methodology for price comparisons by the ITU (previously the ITU reported the price of a 3-minute call; we had always been quite critical about the drawbacks of this methodology). Now that the ITU has switched methodologies, we believe it is possible for LIRNEasia to not collect and report the same (relying on the ITU data instead, though we recognize a significant delay in the ITUs data coming out). The other price benchmarks (particularly broadband prices, retail and wholesale) continue to be important in monitoring and assessing the ICT sectors in emerging Asia. These will be continued in the next cycle, and the addition of international leased-line price benchmarking.

The final part of the indicator research is the benchmarking of broadband quality (through QoSE). The broadband quality testing will be continued in the next cycle, but the focus will be on mobile broadband than, fixed. It will use data collected both from formal and volunteer testing. The volunteer testing was not as successful as we initially thought, as the time and effort we expected the volunteers to contribute may be higher than what an average individual would put just for common good. We plan to introduce a different model which will be a cross between the two. While we still plan to keep the spirit of volunteerism, we will explore the ways to partially compensate for their contribution, which will cost us far less than directly paying them.

#### 8.3.1 Expert Forum on ICT Sector Indicators and Benchmarks Regulation for SAARC Regulatory Authorities

One of the main goals of the workshop was to promote the use of the LIRNEasia Indicator Database among the SAARC Regulatory Authorities. This *Asian ICT Indicators Database or II asia* for short, aims to foster coordination, cooperation and sharing amongst NRAs from Asia (initially from the SAARC countries) in the collection and dissemination of the latest and most accurate ICT Indicator data from the region (See Annex 36). As such, after a basic introduction and training session to *II asia*, the following decisions were collectively reached to further build capacity among the NRAs in terms of data collection (See Annex 37 for meeting report and Annex 40 for participant).

Subsequent to the workshops, LIRNEasia has had internal discussions to review the status of its indicators work. It has been agreed that LIRNEasia's own indicator work for benchmarking purposes (e.g. mobile price benchmarks, broadband quality and price benchmarks) is important and impactful and therefore should continue. However the case of getting regional regulators to collect indicator data and report it to LIRNEasia's database has proven to be challenging – even the ITU has not been able to get the NRAs to report timely data. As such, it has been decided to not push forward with the use of the database as per originally intended (it will be used by LIRNEasia staff, is open to all NRAs who are already registered, and will be open to anyone who wants new access. But it will not be actively promoted with NRAs).

## **8.4 Capacity building**

### **8.4.1 CPRsouth**

The objective of CPRsouth is to build policy intellectuals in Asia Pacific, who can in turn have influence over the policy processes in their respective countries. The outcomes survey conducted annually shows that past conference participants have been active in either the academic or policy sphere (Annex 89). Furthermore comments by young scholars and paper presenters speak of the value of the conference and tutorials for their work. The survey is sent out to all the past CPRsouth paper presenters and young scholars. Therefore the numbers are cumulative. However, it should also be noted that response rates on the survey are declining.

The CPRsouth evaluation was conducted as a part of IDRC's evaluation capacity building program DECI (Development of Evaluation Capacity of ICT4D). The evaluation is in its draft form as it is yet to be reviewed and commented on by the CPRsouth board members. The utilization focused evaluation methodology was used to carry out the evaluation. The evaluation findings showed that for nearly half of the young scholars, CPRsouth was their first opportunity to participate in a major conference. Most noted that CPRsouth had a unique format and objectives. As such it highlights the need for capacity building initiatives such as CPRsouth. A majority of the young scholars and paper presenters (or their respective institutions) were willing to pay an average of around USD 200 to attend the conference. The amount willing to pay may be a reflection of the financial capabilities of the individuals and institutions from the developing countries in Asia Pacific. Although, this is far below that of the actual cost of the event, it provides the necessary justification to begin charging at least a nominal fee in the future. For more details see Annex 88.

### **8.4.2 Internships**

The LIRNEasia internship program provided funding for five interns. The interns engaged in producing research papers, doing background research and developing research frameworks. The interns themselves were exposed to new research areas or had the opportunity to develop their existing knowledge and skills. The internships also gave the opportunity for LIRNEasia to foster inter regional relationships and engage in cross regional research activities. Four out of five of the interns were considered successful, producing high quality outputs. From the intern's perspective, we have only captured one of the intern's reflections upon their internship at LIRNEasia; that being a positive one, with the intern stating that the internship helped them in a positive way.

## **8.5 Advocacy and dissemination**

This is one third of our mission statement. It is essential to our objective of catalyzing the policy process. We feel, based on the outputs as well as outcomes, that this component of the project has been very successful, despite limited resources. LIRNEasia will continue with similar activities in the future.

## **8.6 Mutual learning among LIRNE.NET members**

This component has been very successful. It has led to very useful regional collaborations in terms of internships, capacity building activities, as well as replications of RIA and DIRSI BOP research papers using Asian (Teleuse@BOP3) data (detailed in previous sections). Similar activities are recommended in future.

## **8.7 Evaluation**

The regular collect data on performance on the inter-related components of LIRNEasia's activities is an extremely useful activity, helping to conduct a running evaluation of the project, and also to a certain extent to allow LIRNEasia to trace possible inputs into policy outcomes. It will be continued in future.

Training researchers in evaluation methods has also helped LIRNEasia to do its own internal evaluations, but also participate in the external evaluation conducted in July- August 2009 by an IDRC-appointed evaluator. Where similarly useful opportunities arise, similar training will be provided to researchers.