Building a Toolkit on Broadband Strategies for Developing Countries

infoDev/CITPO Project Concept Note (5 November 2009)

Background

Developing countries see broadband as essential to gain a global edge in productivity and long-term competitiveness. Furthermore, in the current global financial crisis, investment in broadband infrastructure is seen as a key element in the economic stimulus packages to create a platform for future knowledge-based growth (see Qiang, Christine (2009) Broadband infrastructure investment in stimulus packages: Relevance for developing countries).

Research by GICT shows that broadband can have a significant economic development impact for developing countries. For every 10 percentage-point increase in broadband penetration, GDP growth can increase by up to 1.38 percent (World Bank (2009), Information and Communication for Development: Extending Reach and Increasing Impact). Indeed, this potential growth effect of broadband is significant and stronger in developing countries than in developed ones, and higher than that of telephony, mobile phones or the Internet. The impact will likely be more robust once penetration reaches a critical mass. As most developing countries are at an early stage of broadband development, they are likely to gain the most from investing in these networks to reach the critical mass for higher impact and before the diminishing returns take effect.

Objectives

This project will develop a handbook, a toolkit and training materials on broadband implementation strategies (the “Broadband Toolkit”) focused on developing countries and building upon previous GICT work. This will create a modular global knowledge-product that: (1) demonstrates how broadband enables economic and social development and (2) provides developing country policy-makers and regulators with the tools to create strategies, design policies, and implement programs that expand the reach and increase the use of broadband ICTs so as to reap the developmental benefits they facilitate.

Scope of work

The Broadband Toolkit is intended to:

- Build on existing and on-going analytical and operational work carried out by GICT staff;
- Have an operational orientation and provide detailed information, self-assessment tools and guidelines that will help developing countries in implementing broadband strategies, with emphasis on implementation instruments;
- Become a useful knowledge resource both taken as a whole or in parts, i.e. both as an overall report and website, and as a series of separate modules and reference material;
- Help illuminate the details of how policies, regulatory frameworks, investment programs can actually be implemented in different country situations;
- Draw lessons from initial applications of the toolkit to operational work carried out at the Bank and by other agencies (who use the toolkit); and
- Be deployed as quickly as possible, in three phases, with increasing detail in each phase.
The team plans to follow the model of the successful ICT Regulation Toolkit (www.ictregulationtoolkit.org). Development of that toolkit began in 2000 with the release of the Telecommunication Regulation Handbook and continued in 2004, with the elaboration of the toolkit. The final module was posted in early 2009. Its website now attracts around 60,000 unique visitors per day and it is the most downloaded GICT knowledge product. That toolkit and the earlier handbook have been widely recognized by practitioners for their accessible and useful treatment of complex policy and regulatory issues.

This project will be implemented in three phases.
- The first phase will result in the development of a Broadband Handbook, based on the first three modules;
- The second phase will develop the full Broadband Strategies Toolkit, with an additional four modules;
- The third phase will focus on dissemination and will see the development of training materials based on the Toolkit.

Collectively, the three phases (Handbook, Toolkit and Training Materials) are referred to as a single product, the “Broadband Toolkit”. It will have two orders of impact. First, it will serve as a resource for developing countries and support the roll out of broadband ICTs (on both fixed and mobile platforms). Countries are increasingly looking for advice and support to expand the reach and increase the use of broadband ICTs and the toolkit will serve as a practical resource for policy-makers and regulators, primarily in developing countries, who are keen to support the expansion of broadband ICTs in their jurisdictions.

Second, the increased access to and use of broadband ICT will have a positive impact on economic and social activity. As indicated above, developing countries are hoping to realize the benefits of increased access to and use of broadband ICT, as a key tool to achieve global competitiveness.

With an emphasis on implementation and as a “how to” guide for policy-makers and regulators, the Toolkit will help developing countries spur the growth of broadband penetration, helping realize the development impact of advanced ICT.

Geographical coverage and partners

The geographical coverage of the project will be global, but with a specific focus on the needs of developing countries. GICT is open to partnering with all stakeholders that have material and inputs to contribute, but especially national regulatory agencies. Initial funding partners include the Republic of Korea (Korean Trust Fund), the UK Government’s Department for International Development and potentially the government of Brazil, but other partners will be sought.

Relevance to Work Program and Priorities

The World Bank is in an ideal position to capture the best practice lessons in successful broadband development strategies from high-income countries and to package this in a format that is accessible to regulators and policy-makers in the developing world. The GICT Department has successfully played this role for general ICT Regulation expertise (e.g., the Telecommunication Regulation Handbook and the ICT Regulation Toolkit) as well as for sector-specific knowledge (e.g., the ICT in Education Toolkit or the eGovernment Primer).
The World Bank, through its investment operations in developing countries, also has extensive experience in successful policies and targeted public sector investments for promoting rapid broadband deployment. In addition, the IFC arm of the World Bank Group has acquired considerable experience as an investor in private sector broadband infrastructure, service and applications providers. IFC’s experience will be leveraged in the development of the Broadband Toolkit to provide the commercial angle to the policies and instruments described in the toolkit.

Within infoDev’s work programme for FY2010-2012, this project fits within the Connect Domain and will complement the existing programmes on ICT Regulation research (principally the ICT Regulation Toolkit) and on Mobile Applications (see chart).

Who is the targeted audience and how does the product correspond to their needs?

The target audience for this work is principally regulatory agencies and policy-makers in developing countries. A secondary audience is likely to be other market players within the broadband arena (e.g., network operators, equipment manufacturers, application developers, service providers, users, etc).

The Broadband Toolkit project will learn from the experience of the ICT Regulation Toolkit (e.g., designing a facility for user-generated content from the start, providing downloadable content, etc) and will complement it as a global knowledge resource. The table of contents of the full Broadband Strategies toolkit will be coordinated with ITU to seek opportunities for cross-posting of content and to avoid duplication.

Similar to the ICT Regulation Toolkit, the Broadband Toolkit will take the form of a series of modules addressing various aspects of broadband for development, from the rationale for broadband and impact on development, to detailed implementation guidelines. An important new element will be the use of self-assessment tools, for instance to allow national policy-makers to compare their policies and performance with those of others.

The toolkit will be modular and layered, with high level content in the form of summaries, more detailed content in the form of the full chapters and reference materials in the form of laws, procurements documents and tenders, academic articles, news sources, practice notes and case studies etc. Material submitted by users of the toolkit (subject to a vetting process) will also add a further layer of interactive content and a forum for discussion.

This project will also benefit from the existing Korean Trust Fund supported study of the development of the broadband market in the Republic of Korea (approved under KTF-1). This study will provide an operational framework of key factors of broadband development (including policy sequencing, infrastructure requirements, and demand stimulation). The proposed project will use this framework and
study existing experiences from high- and middle-income countries. Moreover, the resulting report from that study will be disseminated through the proposed Toolkit.

**Description of expected outputs**

The aim of this project is to build a toolkit to assist developing countries in designing well-justified and sustainable strategies for the accelerated deployment of broadband networks and services at the national, regional, and local level.

Currently, the team has secured funding from the Korea Trust Fund (KTF) for the first phase of a multi-phase and larger project. This larger project will be the completed and detailed Broadband Toolkit. The first phase of the project will include completing the first three modules of the Toolkit (the Broadband Handbook), including the overview, the policy guidelines and an assessment of the implications for developing countries. It will also elaborate on the design of the complete Toolkit, and carry out an initial dissemination of the findings of the work.

**Overall program**

It is proposed that the development of the Broadband Toolkit would take place in three somewhat overlapping phases, of which Phase 1 is described in more detail:

| Phase 1 | (a) Development of the structure of the toolkit;  
|         | (b) Preliminary literature research and summaries for all modules and collection or development, where necessary, identification of key reference material based on previous and ongoing operational work and analytical products of the GICT Department;  
|         | (c) Selected country case studies developed based on the implementation of principles developed in the toolkit in specific client countries; and  
|         | (d) Completion of the first part of the toolkit (the Broadband Handbook), which covers the first three modules including the rationale for broadband deployments, policy guidelines and implications for developing countries. It will also provide an overview and introduction to the rest of the toolkit. |
| Phase 2 | Development of the remaining four modules, and elaboration of support materials including reference materials, case studies, practice notes and a framework for user-generated content. |
| Phase 3 | Development of training resources based on the Toolkit contents, including self-assessment tools, and provision of regional training courses. |

**Components of the project**

In designing the broadband toolkit, there are five main components to consider:

1) Rationale and development impact of broadband (the “why”);  
2) Strategy development that defines objectives, the vision statement, and the overall program; (the “what, when, where, and for whom”);  
3) Policy and regulations that create an enabling environment that closes market gaps (the “how” – making markets work);  
4) Programs to promote connectivity and extend coverage to close the access gap (the “how” – supply side promotion); and
5) Demand-facilitation for applications that will help to close the “adoption gap” (the “how” – demand side promotion).

Each of these components will need to be included in the final proposed toolkit. However, not all of them will have to be developed exclusively for it. Much of the knowledge on the policy and regulation is already available in the ICT Regulation Toolkit. Much analytical work and a range of operations have already been carried out by the GICT Telecommunications Practice and infoDev and this has led to the creation of a significant existing body of knowledge and material related to connectivity and coverage.

Such material and information can be integrated in the proposed toolkit. The area in which many country strategies are weakest, especially those in low-income countries, is demand-facilitation. The GICT e-Services and Applications Practices have a large body of knowledge related to this area, which again can be integrated into the proposed toolkit. Another area where knowledge is scant concerns the ways in which these policies and programs can be adapted so they will work in specific country environments, especially in low-income, fragile and low-governance states.

Hence, the task is now to develop the abovementioned components by translating and integrating existing work and including new knowledge into a coherent toolkit. For this, the toolkit should focus on three key areas: strategies and policy, regulation, and implementation.

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<thead>
<tr>
<th>Area of focus</th>
<th>Description</th>
<th>Existing work</th>
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<tbody>
<tr>
<td>Strategies and policy</td>
<td>• Why broadband, i.e. the economic, social, and cultural benefits of broadband and how can developing countries realize these benefits?</td>
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<td></td>
<td>• What are the factors underlying successful deployment strategies?</td>
<td>Economic impact of broadband (IC4D study); KTF-1 Korea case study; Case studies from operational work; Convergence strategy paper (IC4D study)</td>
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<td>• What is the status of broadband worldwide?</td>
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<td>• What are the different scenarios for future broadband development and what is their relevance for developing countries that want to leap ahead of the development curve?</td>
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<td></td>
<td>• Different policy phases: Promote, regulate, universalize</td>
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<td>Regulation</td>
<td>• Regulatory sequencing: what regulations are appropriate at different stages of national development strategies? What regulatory actions can implement the policies already designed? Is there a timing issue?</td>
<td>KTF-1 Korea study; Case studies from operational work; Spectrum studies (Wellenius &amp; Neto); Convergence regulatory issues (Singh &amp; Raja); Universal service paper (Navas-Sabater &amp; Muente); Interconnection issues in the IP era (Bezzina)</td>
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<td>• Regulatory issues in the broadband context: Licensing, Spectrum, Interconnection, Access, Universal service</td>
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<td>• Legal issues: Privacy and data security, cybercrimes, intellectual property issues</td>
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<tr>
<td>Implementation</td>
<td>• The “how” of broadband, including technology, deployment strategies, business models, managing state intervention, universal service strategies</td>
<td>Backbone study (Williams); AAA and lending operations in</td>
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- International, domestic, and last-mile programs: What best practices? What business models and how can the government support them?
- Demand facilitation programs

The structure of the completed toolkit

It is proposed that this basic structure be elaborated across seven modules, of which the first three will be completed in the first phase. On this basis, it is possible to envisage a basic table of contents for the different modules that can be elaborated further once work gets underway (see Annex).

Phase 1: Broadband Handbook (4Q2009 – 2Q2011)

Like the earlier toolkits, the Broadband Toolkit will also take time to develop and disseminate. Consequently, this proposal is only for the first of three phases towards the completion of the Toolkit.

However, because the Toolkit will be modular, the planned outcome of this first phase will be a self-contained useful product in itself. It will have:
- The structure of the completed Toolkit;
- The online presence and templates for the completed Toolkit;
- A full module on the rationale for broadband development in developing countries (i.e. Module 1: The case for broadband);
- A full module on policy guidelines for developing countries (Module 2: Broadband Strategies and Policies). This will draw upon the KTF-1 project.
- A full module, based on a series of country case studies on the implications of broadband for developing countries (Module 3: Making broadband word for development)
- Studies and summaries of the different modules to be published, both on the website and as a report;
- Reference documents and other relevant material; and
- Selected country case studies.

The first phase will be completed by April 2011. The second and third phases, envisaged for beyond April 2011, will complete the remaining four modules and produce training materials and self-assessment resources.

Donor Objectives

The principal source of funds is the Korean Trust Fund on ICT for Development, which was established in 2008 and awards grants to World Bank projects and activities submitted along cross-cutting strategic themes. To ensure that there are strong linkages between proposals and the strategic objectives of the Bank in ICT-for-Development, through this call for proposals, we are particularly interested to support strategic flagship projects that are cutting edge and that generate cross-border knowledge and capacity development related to priority ICT4D challenges. These priority challenges include:

- Use of ICT for economic and social integration of rural areas;
• Broadband connectivity;
• Innovative applications in health, education, agriculture and rural development, clean technology and public financial management;
• ICT-enabled enterprise creation;
• Mobile applications.

Additional funding is available from DFID (UK) for a study of the development potential of broadband (which will form part of module 3). A proposed project on “Digital inclusion through broadband” is under discussion with the government of Brazil. If this project is agreed, it would provide materials for Modules 2, 3 and 6 and could provide an additional standalone module of the Toolkit.

**Implementation and Procurement Arrangements:**

The Global Information and Communication Technologies (GICT) department of the World Bank will be the implementing agency for the project. It will be implemented through the cooperative work of Bank and IFC staff, consultants recruited for specific tasks, and external reviewers and experts. Within GICT, infoDev and CITPO will take the lead.

The team expects that no consultant firm will have complete knowledge of the entire range of broadband strategies, policies, regulatory frameworks, and programs (tried and successful) around the world. Hence, much of the work will have to be done through a collaborative effort of Bank and IFC staff and the consultants hired to prepare the different modules of the toolkit. The Bank staff will contribute knowledge from direct broadband policy and investment dialogue in relevant countries. IFC staff will contribute knowledge from their discussions and transactions with private sector firms in the developing world. The consultants can thus help the Bank teams by providing research and analytical support, and in writing up the cases using the same framework.

The team plans to hire several separate teams of consultants for substantive work, each of which will be supervised by Bank staff. For instance, one team could focus on the strategy, policy, and regulation modules, a second team could work on the various implementation modules, while a third team would focus on adaptation to specific country circumstances and drafting of case studies, where necessary, particularly for low-income, fragile, post-conflict, middle-income, and small states (Module 3). Where separate donor funding is available for discrete projects that contribute to the toolkit (e.g., from Brazil, UK and KTF phase 1) this may require a separate procurement process,

The consultants to be hired will be firms that have significant experience in the telecommunications and ICT industries. The team expects to hire firms with deep experience in developing countries and on the application of ICTs to solving real-world problems. There are also firms with experience in the developed world that might be useful for this study. If appropriate, the team will hire such firms as well.

The selection of consultants will be conducted following World Bank guidelines, and in particular AMS 15. The team expects to use a combination of the Fixed Cost and Consultant Qualification Selection methods to select the consulting firms for these tasks. We also intend to hire an editorial consultant to ensure consistency in tone and presentation of all the material prepared for the modules.

There will also be some operating costs to maintain the online resources, especially if these are based on Web 2.0 technologies, and costs associated with printing some of the material.
The project team is shown below (subject to adjustment following the initial brainstorming workshop):

<table>
<thead>
<tr>
<th>Core team Members</th>
<th>Name(s)</th>
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</table>
| Transaction leader / Contact persons | Tim Kelly *(infoDev)*  
Juan Navas-Sabater (CITPO) |
| Other team members (including back-up) | Doyle Gallegos  
Mark Williams  
Siddhartha Raja  
Rajendra Singh  
Carlo Rossotto  
Natasha Beschorner  
Others (tbc) |
| Quality Assurance | External Peer reviewers:  
Prof. Michael Best (Georgia Institute of Technology)  
Paul de Sa (FCC)  
Internal Peer reviewers:  
Christine Zen-Whei Qiang  
Yongsoo Kim |
| Managing Unit Managers | Philippe Dongier (CITPO)  
Valerie D'Costa *(infoDev)* |
| Director | Mohsen Khalil |

Overall Timeframe:

The planned timetable for phase I is shown below (with a slight adjustment from the original plan to allow for the fact that project is now designated as an ESW).

<table>
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<tr>
<th>Deliverable</th>
<th>Date</th>
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<tbody>
<tr>
<td>1. Initiation of the project (brainstorming workshop)</td>
<td>October 21 2009 (Start date)</td>
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<td>2. Project Concept Review meeting</td>
<td>December 3 2009</td>
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<td>3. Development of knowledge map (literature review) of existing work in this field</td>
<td>December 2009 – January 2010</td>
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<td>4. Revised outline of the structure of the Toolkit, consultant selection for Modules 1 and 3 (including case studies)</td>
<td>December 2009 – February 2010</td>
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<td>5. Development of skeleton structure of website, including facility for user-generated content through Web 2.0 technologies. Uploading already available content</td>
<td>December 2009 – May 2010</td>
</tr>
<tr>
<td>6. Preparation of Modules 1, 2 and 3. Modules 1 and 3 to be prepared by consultants; module 2 to be carried out in-house drawing upon earlier work</td>
<td>February 2010 – September 2010, with first drafts by June and second drafts in September</td>
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<tr>
<td>7. Author “writeshop” (bringing together authors of different modules with core team)</td>
<td>February 2010</td>
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<td>8. Review workshop</td>
<td>July 2010</td>
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<tr>
<td>9. Peer reviews and revision of modules 1,2 and 3 and case studies</td>
<td>October 2010 – December 2010</td>
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<td>of different summaries of modules, release of Part 1. Launch of Phase 2.</td>
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<td>11. Publication of Part 1 in consolidated handbook and on website</td>
<td>April 2011 (End date for the first phase of the project)</td>
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</table>
**Annex: Draft Table of Contents**

**Part 1: Broadband strategies for developing countries (handbook)**

1. **The case for broadband**
   1.1. Introducing broadband
   1.1.1. Concepts
   1.2. Why broadband
   1.2.1. GDP impact, growth, employment, innovation futures, public good value
   1.3. Market trends
   1.3.1. Technologies: Networks and devices
   1.3.2. Applications
   1.3.3. “Unexpected” broadband stories: e.g., KDN (Kenya), Ummiah (Jordan), Wi-Fi mesh/municipal networks, the Republic of Korea’s early success
   1.3.4. Lessons and principles from broadband experiences and other sources (e.g. mobile broadband)
   1.4. Ongoing efforts (at the Bank and beyond):
   1.4.1. The private sector push: Investment trends, technology development
   1.4.2. The public sector push: “Broadband stimulus”
   1.4.3. Others: Local efforts, bottom-up networks
   1.5. Broadband as part of fiscal stimulus packages

2. **Broadband strategies and policy**
   2.1. Developments in the information society
   2.1.1. Developments since WSIS
   2.1.2. The trends in information society strategies related to broadband
   2.2. Co-investments (e.g. IT/ITES related, e-Government)
   2.3. Sequencing policies
   2.3.1. Promote
   2.3.2. Regulate
   2.3.3. Universalize
   2.4. Need to have a “holistic” view of broadband—supply and demand, from first mile to user
   2.5. Competition policy and its implications for strategies and regulation
   2.6. The timing issue: Is it too early? Or will we be too late?
   2.7. Importance of not crowding out the private sector

3. **Making broadband work for development**: Case studies of broadband development in low income countries
   3.1. The least developed countries (e.g. Haiti)
   3.2. Fragile and post-conflict countries (e.g. Afghanistan, Liberia)
   3.3. The Arab World (e.g. Egypt, Saudi Arabia, Lebanon, the Maghreb)
   3.4. Middle income countries (e.g. India, Mexico, Ukraine)
   3.5. Broadband for digital inclusion: The case of Brazil
   3.6. Lessons and best practice principles on crafting a broadband development strategy for a particular country environment

**Part 2: Broadband strategies toolkit**

4. **Regulatory reform and legal issues**
   4.1. Authorizations
   4.1.1. Technology and service neutrality
   4.1.2. The range of options and their implications for broadband
   4.2. Spectrum
   4.2.1. New models of allocation
   4.2.2. Unlicensed spectrum
   4.2.3. Spectrum refarming issues, especially with respect to the digital dividend from the digital TV switchover
   4.3. Interconnection
4.3.1. IP-network interconnection and the impact on cost models

4.4. Access
   4.4.1. Open access for first and middle mile
   4.4.2. Network regulation (unbundling) in the last mile
   4.4.3. Infrastructure sharing
      4.4.3.1. Access to rights of way and communal infrastructure, e.g. ducts, as well as access to other infrastructures (power, roads, pipelines).
   4.4.4. The regulation versus investment debate

4.5. Legal issues
   4.5.1. Privacy, data security
   4.5.2. Cybercrime
   4.5.3. Intellectual property rights

5. Building connectivity
   5.1. The technologies for connectivity
   5.2. International connectivity
      5.2.1. Trends and experiences
         5.2.1.1. New developments (e.g. the second fiber wave)
         5.2.1.2. Terrestrial wireless connectivity
         5.2.1.3. Satellite connectivity
         5.2.1.4. Cable connectivity
      5.2.2. International models
      5.2.3. Regional models
      5.2.4. Implementation experiences and instruments
   5.3. Domestic backbones
      5.3.1. Trends and experiences
      5.3.2. New developments (e.g. the WiMax possibility for backhaul, using railways/power networks and other infrastructures)
      5.3.3. Domestic connectivity models
         5.3.3.1. Building new networks
         5.3.3.2. Extending existing networks
      5.3.4. Implementation experiences and instruments
      5.3.5. Financing models

6. Extending access and achieving universal service through Public/Private Initiatives
   6.1. Technologies in the access network: Wireline, wireless, fixed-mobile convergence (NGNs)
   6.2. Last mile
      6.2.1. Mechanisms to drive reach (coverage)
      6.2.2. Market growth
         6.2.2.1. Gaps that remain: Remote, the “bottom of the pyramid”, isolated communities
      6.2.3. Mechanisms to drive access
         6.2.3.1. Individual access
         6.2.3.2. Community access (e.g., kiosks, schools, post offices)
         6.2.3.3. Shared access (e.g. shared school PCs)
      6.2.4. The importance of sharing passive infrastructure
         6.2.4.1. Roads, electricity, water, sewerage, railroads
         6.2.4.2. Towers and ducts
      6.2.5. Implementation experiences
      6.2.6. Public/Private Partnership (PPP) models
   6.3. Universal service
      6.3.1. Expanding the scope of Universal Service Funds (USFs) to promote broadband
      6.3.2. Who pays into the funds, who gets the funds?
6.3.3. New models of universal service

7. Facilitating demand

7.1. People
   7.1.1. ICT Skills Development
   7.1.2. Digital literacy

7.2. Affordability programs (e.g. demand-side subsidies through vouchers/Conditional Cash Transfers)
   7.2.1. Devices
   7.2.2. Device subsidy programs
   7.2.3. Shared or community access (e.g. schools, post offices, rental devices)

7.3. Services
   7.3.1. Voice still as a “killer app”: The impact of anti-VoIP regulation
   7.3.2. Video: Convergence as a demand-driver
   7.3.3. Data / content

7.4. Applications
   7.4.1. E- and m-government
   7.4.2. E- and m-services (e.g. health, education)

Annex: Web-based self assessment tool for country policy-makers