Training Workshop

Rural Broadband – the changing paradigm

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Objective of Session

- Background – Broadband benefits
- Review of broadband issues & challenges
- Best practice responses
- Overview of broadband strategy options
- Country case examples

The benefits of broadband

Broadband makes the Internet available at a fast speed:

- Individuals enjoy a faster and more pleasant Internet surfing experience and the ability to use bandwidth-intensive multi-media applications (e.g., VoIP, IPTV, video-conference).
- Companies can keep websites up and running 24x7 and can deliver products & services in real time, anywhere in the world.
- Broadband enhances a range of socially desirable and valuable online services in areas such as government, education and health.

Broadband & Rural Development

- Multi-media for news and entertainment
- Education: online distance learning
- Business: e-commerce, e-banking, ICT-enabled services/BPO
- Health: access to medical information in rural/underserved areas
- Government: e-procurement, online tax filing, e-voting
- Environment: disaster management

Overview of Broadband Issues

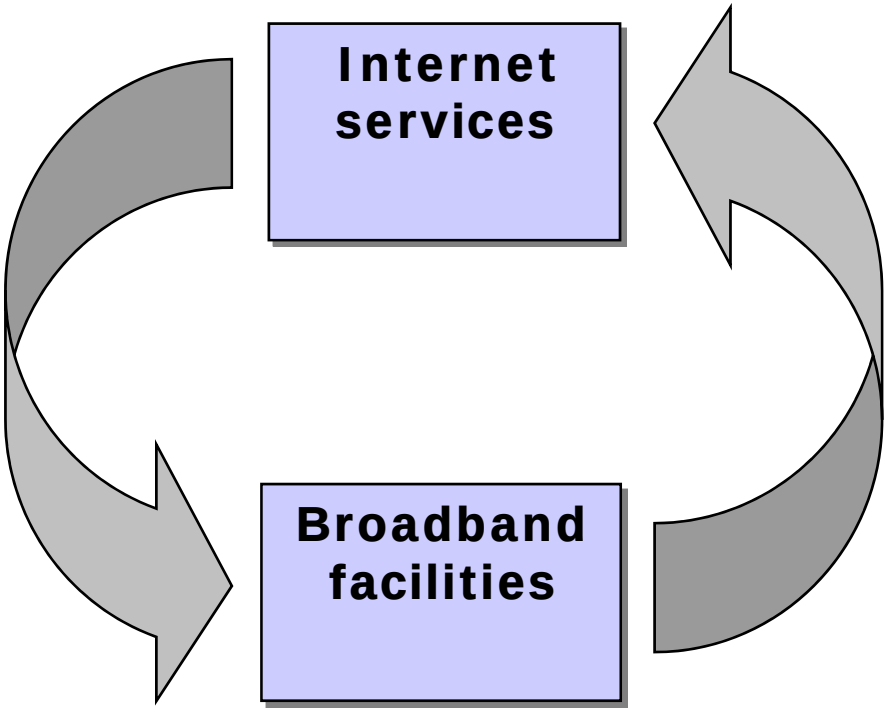
Key challenges facing increased broadband penetration

- Physical network infrastructure (or access) at the margins:
  - Rural & developing regions
- High costs for establishment & service provision in non-urban markets
  - Operator interest and viability of subsidy
- Lack of competition in service provision?
- Weak demand + lack of affordability for Broadband service?
- Computer literacy and training
  - IT skills, e-applications & Desktop PC/internet infrastructure needed

The issues relate to demand & supply

UAS policy

Regional access, spread and growth of Internet services creates demand for broadband



Broadband policy

Demand stimulation & supply strategy

e-government projects

price reduction measures

create investment & more opportunity for economic delivery

When does UAS migrate to Rural Broadband?

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General recommendations *ITU Sept 2008*

- Recognize importance of broadband; formulate national plans, including specific targets
- Award licenses & spectrum for wireless broadband technologies (3G, WiMAX)
- Open up the broadband market to new operators and stimulate competition to lower prices
- Create investment incentives in telecom sector
- Utilize **universal access & service funds** to bring broadband to rural and underserved areas
- Promote development of local content
- Encourage convergence and the transition to NGN including adoption of regulations allowing the use of voice and video over broadband networks.

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Four approaches to Broadband Policy

	Approach	Country examples
1	Competitive Tender to build new backbone infrastructure	Chile, Sri Lanka, Singapore
2	Create / Underwrite Demand	Malaysia, Singapore
3	Stimulate Private Demand in the ICT Sector	Egypt, Thailand
4	Regulatory Reform and Liberalisation	Pakistan, India

- These address the main obstacles to broadband development
- Not necessarily exclusive to one another
- May be pursued in combination

Issue (1) – Lack of Infrastructure (Supply)

Challenges

- Lack of network infrastructure at the margins - fixed-line copper, fibre & wireless
- Poor competition & access to existing network infrastructure
- High costs of infrastructure & operation are barriers to investment & user uptake in rural areas
  - Lower populations, distance and geographic constraints

Best Practice responses

Progressive regulation and open access policies

- Public-Private-Partnerships for network establishment
- Subsidies through competitive bidding;
- Government purchase and use of bandwidth

Issue (1) Infrastructure - Case Example

Province of Alberta Supernet

- **Challenge:** Lack of infrastructure & affordability in rural areas; important resource-based economy
- **Approach**
  - PPP between government & consortium of network builder (Bell) & network operator/reseller (Axia); build-operate (BO) type agreement
  - USD 157 million government; USD 102 million private sector with 10 year renewable contract for operation
  - Axia Open Access Model – standard bandwidth price for all users:
    - Government applications – health facilities, regional offices, &schools;
    - Rural ISP
- **Outcomes**
  - Bandwidth prices same for all ISP & ASP company; similar to urban rates
  - Rural network publicly owned; operating contract renegotiable on term
  - Increase from 7 rural ISPs to 100 now

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Issue (1) Infrastructure – Smart Subsidies

Competitive Tendering & Output-Based Aid Approach

- Smart Subsidy Approach
  - One-time subsidies, non-distortion of markets
  - Open to both infrastructure and service providers foreign and local
  - Stakeholder input into design
- Bundling of Strategic Regions
  - Strategies to ensure subsidies are tied to both commercially promising and challenging regions
- Competitive Bid Process
  - Formulation of bid design with stakeholders
  - Clearly outline eligibility criteria & requirements
  - Use of least subsidy or reverse auction approach

Issue (1) Infrastructure - Case Example

Chilean BackBone Network financed by smart subsidy

- **Challenge:** Lack of open access & physical infrastructure to reach rural areas; Alternative approaches required to reach rural areas
- **Approach**
  - *Arica to Puerto Montt – North –South Fibre Backbone*
  - Competitive bidding conducted by Chilean Regulator Subtel
  - $4.7 million US with $2.6 million US subsidy from Telecom Development Fund
- **Outcomes**
  - Awarded July 2007 to 3rd Operator Telefonica del Sur (Telsur); requirements for open access
  - Innovative agreement established with operators Telsur & Movistar November 2008
  - Favorable roaming arrangements; expansion of their combined mobile and wireless coverage

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Issue (1) Infrastructure – Case Example

Sri Lanka National Communications Backbone Network

- **Main Challenge:** Lack of open access to existing networks due to incumbent operator positions
- **Approach**
  - Regulator TRC and ICT Authority (ICTA) conducting competitive bids using Smart subsidy and Output-based Aid approach
  - Reformed regulatory framework in areas of interconnection, tariffs, infrastructure sharing, regulatory fees, and service reselling
- **Outcomes**
  - Subsidy funds drawn from e-Government project funding: e-Sri Lanka Initiative
  - Support for conducting & evaluating bids provided via Public Private Infrastructure Advisory Facility
  - Network integrated with Lanka Government Network (LGN) e-Government project – 325 government offices connected including WAN access; IT capacity & skills training for staff

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Issue (2) – Lack of Critical Demand

	Approach	Country examples
1	Competitive Tender to build new backbone infrastructure	Chile, Sri Lanka, Singapore
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4	Regulatory Reform and Liberalisation	Pakistan, India

Challenges

- Low demand for Broadband considered problem of lack of common and locally useful broadband applications
- Large % of internet users dialup, lower demand in rural areas
- Lack of broadband traffic constraining public exposure & market entry by service providers
- Barriers: Price point & limited applications relevant to local circumstances

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Issue (2) Stimulating Demand for Broadband

- **Solutions**
  - Establish & support development of broadband applications in government operations and public service provision which include:
  - e-Government applications and networked government information system
  - E-procurement systems for local businesses
  - Subsidizing bandwidth and interconnection costs for broadband in high cost areas
- **Desired outcomes**
  - Stimulate greater use and interaction of public with useful broadband e-Government applications
  - Subsidized bandwidth to support local capacity building institutions e.g. schools and IT-based business incubators
  - Create local appreciation and demand for broadband

Issue (2) Stimulating Demand - Case Example

Malaysia's National Broadband Plan, 2004

- **Key Challenge:** Encourage widespread adoption of broadband; not enough awareness of broadband potential
- **Strategies**
  - Broadband Policy - Key pillar of 2006 National ICT & Knowledge Society Strategy MyICMs 886

"Critical Mass" Approach — Creating 'Tipping Point' for Demand

- Fund broadband applications to attain critical subscriber penetration rates (50% household) or 1.3 million subscribers by 2010
- Fund public broadband applications to 'critical' subscriber level to initiate wide-spread private sector uptake
- Government departments (EG*NET); hospitals & clinics; public schools (SchoolNet); universities and internet community centres
- Implement a 11.3 billion Ringgit national broadband network funded (2.4 billion) by the Malaysian Government as a PPP

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Issue (2) Stimulating Demand - Case Example

Malaysia's National Broadband Plan

- **Regulatory measures**
  - Mandate BB access nationwide, and fund designated remote rural areas under UAS program (USP)
  - Establish facilitative role of local authorities to speed up e-infrastructure projects
- **Incentives**
  - Tax rebates for broadband equipment & PCs; soft loans for ISP rollout
  - Support shared use of private networks(MNCs);
- **Outcomes:**
  - Achieved increase in household penetration rate to current 18%
  - Updated Broadband Plan due 2008/2009
  - Realized plan for the enhanced national broadband backbone network
    - Sept 2008 – the PPP agreement signed between Government & Telekom Malaysia

Issue (3) – Lack of Core IT & Capacities

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Challenge

- Low demand for Broadband considered problem of lack of IT skills & basic PC/internet infrastructure
- Issues for developing regions and rural areas
- Lack of access to useful applications & core IT hardware: Networked PCs
- Limited IT skills and capacities

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Issue (3) – Lack of Core IT & Capacities

Building Core IT Capacities for Demand

- **Solutions**
  - Programs to provide needed IT infrastructure, capacity development and training to public and community institutions
  - Provision of internet-enabled PCs & broadband connection to public schools and community institutions
  - Establish e-Government services and applications for local needs
  - Basic computer and internet skills training and capacity development to targeted groups
- **Desired outcomes**
  - Develop IT and internet skills to stimulate demand among high-impact users including local businesses and youth
  - Develop IT capacities and infrastructure at public access points & businesses e.g. schools, community centres & chambers of commerce

Issue (3) – Core Capacities – Case example

Thailand – Building Core Capacities for Broadband

- **Challenge:** Identified barriers to broadband penetration are lack of IT hardware, connectivity & core IT skills
- **Approaches**
  - Thailand's ICT Directions 2004 Policy - To improve ICT skills and access to ICTs for all Thais to benefit from information
  - Provision of necessary IT hardware & internet connectivity
    - Subsidized PCs & software for purchase; lowered long-distance rates for internet; establishment of public internet booths with dialup internet access
  - Encourage telecom operators to expand wired/wireless communication services in rural areas i.e. rural telephone project
  - Provide educational and local content - Tambon and Schoolnet projects to provide internet access to village groups and public schools
- **Outcomes:** Increased PC penetration from 5% in 2001 to 27% in 2005

Issue (4) – Enabling Regulation

Challenges

- Restricted competition
  - poor access to incumbent network
  - lack of new service providers
  - License limitations
- Cost barriers – network/spectrum access, interconnection fees;
- Limited ability to utilize innovative and converging technologies e.g., service bundling, VOIP, etc.

Best Practice – improve policy & regulatory frameworks

- Deregulation - open up service provision to multiple operators
- Open access – enforcement of RIO, interconnection, spectrum allocation
- Progressive Licensing, e.g., unified licensing
- Targeted subsidies for new entrants & challenging areas
- **Establish & utilize UAS / government programs**

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Issue (4) Enabling Regulation – Case Example

Pakistan

- **Challenges:** Broadband expansion needs & opportunities
  - Expanded network infrastructure; local internet content/applications & IT capacity development
  - Capitalize on dramatic expansion of mobile/wireless network
  - High tariffs considered main impediment
- **Approaches**
  - Establishment of formal policies i.e., Broadband Policy 2004
  - Utilize UAS funds for targeted support and subsidy
  - Encourage entry and growth of new service providers
    - No restriction on number of broadband providers (must meet minimum QOS standards)
- Backhaul facilitation
    - Subsidies for intl. bandwidth for startup period in project areas services in rural areas, i.e., rural telephone project

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Issue (4) Enabling Regulation – Case Example

Pakistan (Cont.)

- Spectrum management promoting wireless services
  - Open auctions for wireless fixed access spectrum
  - Regulatory framework for free access to IEEE 802 bands
- Interconnection strategies
  - Reduced primary rate interface charges (PRI) for dial-up connection to facilitate future switch to broadband
  - Promotion of national/regional peering points & "domestic" network to reduce use of costly backbone international
- Licensing
  - New class license available for data providers enabling agreements for network & local loop access with any operators (LDI/LL Licensees)

Issue (4) Enabling Regulation – Case Example

Pakistan (Cont.)

- **Outcomes**
  - Increased broadband connectivity - 132,000 current subscribers
  - Although still marginal (0.8%)
- Marked improvement in enabling conditions for broadband penetration
  - Backhaul network access is now relatively inexpensive
  - Price of end-user broadband equipment is reducing
  - Regulatory frameworks for broadband and new wireless applications i.e. Branchless Banking are opening new markets
    - Recent examples include Wateen Telecom launch of WiFi service in December 2007 with 10,000 wireless broadband subscribers in 4 months

End of Session

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