

Socioeconomic impact of wireless broadband -An overview of existing studies-

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This document presents a broad overview of existing studies focusing on the economic and social aspects of broadband deployment. The majority of the studies pertain to developing or emerging markets, but in order to compare with and see how similar studies are conducted in more developed markets, studies from OECD and the US Department of Commerce are also included. More over, the collection includes studies from the World Bank, ITU and GSMA to name some.

The abstracts are written by Telenor.

1. OECD: *Broadband Growth and Policies in OECD Countries, 2008*

<http://www.oecd.org/dataoecd/32/58/40629032.pdf>

This paper was prepared for the *OECD Ministerial Meeting on the Future of the Internet Economy* in Seoul, 17-18 June 2008.

Abstract: This report provides an overview of the current state of broadband development and policies in OECD countries and highlights challenges such as connecting users to fibre-based networks or coverage of rural areas. Furthermore it outlines key policy areas that need more attention which can also be relevant for emerging economies designing broadband strategies.

The report encourages increased cooperation between governments and the private sector in the evolution towards more advanced broadband applications in social sectors such as education, tele-work, e-government services, energy, health and transport. It underlines that sharing good practices and learning from existing public-private partnerships across the OECD should be high on the list of policy priorities.

On the current state of broadband development, positive market and policy developments are reported with focus on increased subscriptions and reduced overall prices. For example, from 2004 the broadband subscriptions in OECD countries have increased by 187%, reaching 221 million by June 2007.

One of the policy challenges that the report points out pertains to how governments should focus their attention on improving metrics and analysis to better understand new usage trends, their impacts on the economy and society as well as policy. Another key policy challenge is that related to the significant divides between rural and urban connectivity. Similarly, differences in income, education as well as gender are factors influencing the intake and use of broadband in OECD countries. The report recommends that these issues to a larger extent must be understood and addressed. The report acknowledges the need for increased effort to

put government services and content online as E-government services and broadband applications would help organise the public sector more efficiently.

Author: Both authors, Taylor Reynolds & Sacha Wunsch-Vincent are economists and policy analysts with the OECD Information, Computer and Communications Policy Division.

2. World Resource Institute (WRI): *The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid*, 2007

<http://www.wri.org/publication/the-next-4-billion>

The World Resource Institute is a Washington DC based environmental think tank with one of four main goals being *Markets & Enterprise: Harness markets and enterprise to expand economic opportunity and protect the environment*. The other three relate to climate change, improving access to information regarding natural resources and to reverse the degradation of ecosystems. The study outlines the potential market size for several industries in bottom of the pyramid (BOP) markets. ITC is one of the examined industries.

Abstract: Drawing on income data from 110 countries and standardized expenditure data from 36 countries across the globe, *The Next 4 Billion* provides a first look at the market opportunity represented by the people who make up the BOP. The analysis also provides a quantitative assessment and characterization of BOP markets, by addressing the place and size of the market, market segmentation as well as how new technology enhances new market potential.

The study emphasizes the rapid development of mobile phones, but acknowledges that the potential for low-cost fixed wireless networks in rural areas, bringing internet access and VoIP to phones and other devices in areas too sparsely populated to support conventional cellular networks is equally important. “Adding a WiFi chip to a mobile phone to allow access to such rural networks will cost only a few dollars”.

According to the WRI, the combination of powerful phones, inexpensive networks, and voice accessible internet applications- for obtaining market prices, health information, distance education or government services- may open up the internet to large numbers of new users. In any event, the study concludes, it is clear that ongoing innovation in technology will help increase the potential of rural and largely BOP- ICT markets.

Author: Allen Hammond is World Resource Institute’s Vice President for Innovation.

3. ITU: *Telecommunications/ ICT markets and trends in Africa*, 2007

http://www.itu.int/ITU-D/ict/statistics/material/af_report07.pdf

This report provides a comparative analysis of the development of the African telecom market with regards to fixed lines, the internet, broadband and mobile telephony. The report points out the challenges of the African telecom market as well as the need for coordinated action.

The reports underline that given the lack of fixed line infrastructure in Africa, wireless access is considered a solution to bridge the digital divide. It presents the following advantages of broadband wireless access:

- New, cost effective and flexible standards for wireless technologies such as WiMAX.
- Providers, possibly also local champions, can offer broadband services to geographically challenging areas.
- Public service applications, such as e-government or e-learning, can be used via these technologies. Further, many models of financing are possible: local municipalities could enter into partnerships with business owners, wealthier users might be charged more for the use than poorer neighbourhoods or free public access points could be established all over the city.
- Companies can easily observe and direct their production-chain and do e-business.

Author: ITU Development Sector / Market Information and Statistics Unit (STAT)

4. MIT Press Working paper series: ITID (Information Technology and International Development), 2006/2007

The following three studies were published in the winter 2006 edition of *Information Technology and International Development (ITID)*, a quarterly journal published by the MIT Press. The reports can be accessed by creating a login and username free of charge by following the accompanying links.

4.1 Rohan Samarajiva/LIRNEASIA: *Preconditions for Effective Deployment of Wireless Technologies for Development in the Asia-Pacific*, 2006/2007

<http://www.mitpressjournals.org/doi/pdf/10.1162/itid.2007.3.2.57>

Abstract: This article examines the relationship between the booming demand in the Asia-Pacific region and the surrounding regulatory environment for wireless technologies. The core question raised is why the technology and business innovations centred on wireless have not been effectively and fully applied to meet the unmet demands of the people of the Asia Pacific. This is discussed by referring to the poor policy and regulatory environments.

According to the author, this has not only driven up the costs of supplying telecom services by wireless but has in some cases actually barred the deployment of wireless technologies. The article addresses key regulatory challenges and provides suggestions for optimal environment for rural supply of wireless. More than half the Asia-Pacific countries now allow some form of market entry in basic services (higher in mobile). However, even where entry is allowed, conditions are not optimal for investment. "In sum, wireless matters, but only when policy and regulatory preconditions allow it to matter".

4.2 Galperin, H. and Bar, F., *The Microtelco Opportunity: Evidence from Latin America*, 2006/2007

<http://www.mitpressjournals.org/doi/pdf/10.1162/itid.2007.3.2.73>

Abstract: This research article presents case studies from Latin America which highlight the potential for non traditional, small actors to enter the market and provide low cost broadband access to the community. Innovations in wireless communications are allowing for new actors such as small entrepreneurs and user cooperatives to enter the market. As wireless technology is more easily scalable, market entry is less defined by firm size than by spectrum management policies.

Case studies from Latin America:

Peru: Lack of communications created problems for the efficient management of common water resources for local farmers. This was solved by providing a wireless network connecting twelve villages.

Brazil: The Digital Pirai project reports developments from two phone lines and two computers to wireless broadband where traditional cable operators could not justify investment. The project focuses on four areas: E-government, education (distance education in collaboration with public universities), public access points and SME adoption.

4.3 Francisco Proenza: *The Road to Broadband Development in Developing Countries Is through Competition Driven by Wireless and Internet Telephony*, 2006/2007

<http://www.mitpressjournals.org/doi/pdf/10.1162/itid.2007.3.2.57>

Abstract: The focus of this paper is on the significance of VoIP and wireless for low-income people. The paper underlines that rural demand is best met gradually, beginning with low bandwidth sufficient to provide the basic communications services that people value (e.g. voice) while simultaneously laying the groundwork to expand as income and demand grows.

The article states: “Telecommunications networks are underdeveloped in rural areas that are difficult to serve because of rugged terrain, dispersion of customers and low income and limited ability to pay for services. These are precisely the conditions under which the wireless technologies have advantages over wire lines. Wireless networks are easy to deploy, easy to upgrade to accommodate increases in demand and they require relatively small investments.”

Furthermore, the article addresses the regulatory challenges related to VoIP and wireless (cases from Korea, India, and Indonesia) as well as strategic considerations for rural broadband development.

5. GSMA Universal Access Report, 2006:

<http://www.gsmworld.com/universalaccess/index.shtml>

Abstract: Pilot initiatives undertaken to date have found that there is a significant demand for data services from low income consumers in both urban and rural areas. This report stresses that it is important to offer relevant e-services as well as simple Internet access. The most popular services mentioned in this report include job information, e-government, telemedicine, entertainment, news and educational programs.

The report states: “By initiating projects in Africa, Bangladesh and India to test different mobile data solutions – from enhanced sms-based data sourcing to high speed internet solution, involving partnerships with schools, health authorities, post services, multinational companies and multilateral development organisations such as the UN and WHO, mobile operators are assisting policy makers in the development of the internet and ICT/information service components of their UA programs”.

Author: Intelcon (www.inteleconresearch.com)

6. World Bank: *Connecting Sub-Saharan Africa (SSA)*, 2006

<http://event-africa-networking.web.cern.ch/event-africa-networking/cdrom/Worldbank/ConnectingSub-SaharanAfrica.pdf>

Abstract: This paper aims at providing recommendations on how to face the infrastructural challenges in Sub-Saharan Africa (SSA). The report suggests reforming the internet service provider market is a key part of the solution.

For Sub-Saharan Africa (SSA) to enjoy the wealth of the information accessible via the internet, and to benefit from the trade and commercial opportunities provided by internet access, additional infrastructure must be developed and stronger competitiveness must be introduced in the ISP (Internet Service Provider) market. Only further reforms aimed at the ISP and broadband markets can spur the development of the infrastructure. The paper also highlights the different barriers to development, including the regulatory challenges existing in the SSA markets.

Author: World Bank / World Bank Working Paper nr. 51

7. World Bank infoDev: *Wireless Ghana*, 2006

http://www.schmoller.net/documents/Wireless_Ghana_A_Case_Study.pdf

infoDev is a global grant program managed by the World Bank to promote innovative projects on the use of information and communication technologies for sustainable development and poverty reduction.

Abstract: This study presents a pilot project which aims to measure the social, economic and educational effects of broadband on a community in Ghana. As the project is in its infant stages, statistical data are scarce, but some measurable results are mentioned below.

Educational benefits: The lack of reading culture in Ghana is a problem that needs innovative attention and solutions. By providing access to the internet, communities are exposed to vast collections of information and literature in various languages. By using the internet to find information, communities begin to realize the immediate economic gains that come from such information. A school student can go online to read educational texts and a farmer can search the web for tips on better rural agricultural processes.

Social benefits: The establishment of a computer learning centre allows people who have never managed their own projects can now see the results of their own effort. Building confidence, learning the value of collaboration and empowering women in the business are key contributions.

Business benefits: Small businesses, organizations and churches are made aware of the immediate economic gain from becoming literate.

Author: Community Based Libraries and Information Technology (www.cblit.org). Wireless Ghana is a project of Community-Based Libraries and Information Technology, based both in Ghana and the US. It is a rural project-initiated in response to the local community's request for connectivity to help them break their isolation and move closer to the 21st century and be competitive with their urban counterparts.

8. US Department of Commerce: *Measuring Broadband's Economic Impact, 2006*

http://www.eda.gov/ImageCache/EDAPublic/documents/pdfdocs2006/mitcmubbimpactreport_2epdf/v1/mitcmubbimpactreport.pdf

The analysis presented in this paper represents an attempt to measure broadband's impact by applying controlled econometric techniques to national-scale data. The main findings of this report support the view that broadband access does enhance economic growth and performance, and that the assumed economic impacts of broadband are real and measurable.

Among other things the report finds that between 1998 and 2002, communities in which mass-market broadband became available by December 1999 experienced more rapid growth in employment, number of businesses overall, and businesses in IT-intensive sectors. To conclude the report underlines the need for dialogue between policy makers and the industry to develop reasonable ways to measure other broadband indicators. This means focusing more on measuring the use of broadband (demand side) and not only the availability (supply side). This recommendation is based on the fact that once broadband is widely available, differences in economic outcomes are likely to depend more on how broadband is used than on its basic availability.

Author: Massachusetts Institute of Technology (MIT) / Sharon E. Gillett

9. New Brunswick University: *Study on the impact of broadband on rural New Brunswick, 2006*

<http://www.nburc.ca/pdfs/non/shippagan.pdf>

The purpose of this report is to describe the understanding of the current state of Broadband and to identify and measure the social and economic transformational changes that can be attributed to the uptake of broadband technologies and to find the key criteria for economic development in the rural communities of New Brunswick. This is a survey study and is included here to exemplify how broadband deployment directly affects a rural society that was previously not exposed to broadband. Key results are mentioned below.

Economic Impacts include improved communications and operational efficiencies. Some companies reported increased revenues while other, fairly new businesses saw little growth. Decreased costs attributed to broadband were also reported (reduced travel, lower communication costs and lower shipping costs). Reduced time to market and improved customer relationship management activities were also reported.

Social Impacts can be summarized to improved communications (access to information such as banking and trading) and efficiencies in routine activities (being able to work from home). The report also mentions how age and the fear that broadband might require new or upgraded computer equipment may act as barriers to the use broadband.

Author: New Brunswick Universities Broadband Research Consortium

10. University of Essex: *The Social Impact of Household Broadband Internet Access, 2005*

<http://www.essex.ac.uk/chimera/content/Pubs/wps/CWP-2005-06-Social-Impact-BB.pdf>

Abstract: This study is based on a Social Impact Survey (e-Living) of selected EU countries and looks at how households that are already using Internet are affected by the introduction of broadband. This study is not based on experience from developing countries, but is never the less included because of the micro perspective in which is presented.

- Those with the most experience and knowledge gain the most benefits while those who lack skills are left further behind.
- No evidence that switching to broadband will have any effect on the amount of money people spend online.
- Switching to broadband made little difference in time spent online and there is no evidence of a TV or social leisure substitution effect.

Author: Chimera: The Institute for Socio-technical Innovation and Research at the University of Essex.

11. Galperin, H. and Bar, F.: *Wireless Networks and Community Development, 2003*

http://arnic.dinfo/Papers/HG-FB_Wireless_and_Community_Development_Sep03.pdf

Abstract: This report published in 2003 gives a good overview of the potential benefits of broadband deployment in the developing world. It specifically focuses on how the development of cost effective solutions allow for a more bottom-up infrastructure build up that is more closely tied to community needs.

The report states: “Recent developments in wireless Internet access technologies are raising new hope for sustainable internet diffusion in the developing world. These technologies allow sharp reductions in internet deployment costs, particularly for last-mile connectivity in low density areas (where the underprivileged are most likely to live). More importantly, they make possible an infrastructure development model based on community shared resources, small scale investments and user experimentation. They also open the door for quite different approaches to development and use of information infrastructure. For example, low cost wireless networking may support local information sharing, only later to explore the benefits of connection to remote resources. These technologies are powerful, flexible, and economical. Wireless internet access technologies therefore hold the potential to redefine the terms of the debate about the sustainability and cost-effectiveness of strategies to promote global internet diffusion”.

Author: Annenberg Research Network on International Communication, University of Southern California / Galperin, Bar

Other relevant studies:

12. The European Commission: The **i2010 strategy** is the EU policy framework for the information society and media. It promotes the positive contribution that information and communication technologies (ICT) can make to the economy, society and personal quality of life. http://ec.europa.eu/information_society/eeurope/i2010/strategy/index_en.htm

13. European Commission (tbd): The Beacon project will conduct a socio-economic impact assessment of broadband access and use. The aim is to provide policy-makers with scientific support to help them define, implement, update and monitor policies related to broadband access and use. This study is not yet published, but it is never the less worth noticing.

<http://www.ovum.com/beacon/project.asp>
http://ec.europa.eu/research/fp6/ssp/beacon_en.htm

14. UNDP: “Creating Value for All: Strategies for Doing Business with the Poor”, 2008

The Growing Inclusive Markets Initiative at the UNDP Private Sector Partnership division released a report entitled “*Creating Value for All: Strategies for Doing Business with the Poor*” on July 1 this year. The report includes several best practice cases across industries and is a source of comparison with regards to other industries’ impact in developing countries. Some of the more than 50 case studies include: <http://www.undp.org/gimlaunch/>

Tsinghua Tongfang (THTF) (China) Affordable computers for rural users

Money Express (Senegal) Remittance transfer services

Amanz'abantu (South Africa) Supplying water through smart card technology

Association of Private Water Operators (Uganda) Public-private partnership to provide water in small towns

Smart (Philippines) Mobile telecom products and services for low-income and overseas communities

M-PESA (Kenya) Mobile banking services

Celtel (Dem. Rep. Congo) Mobile communication and mobile banking in a postwar economy