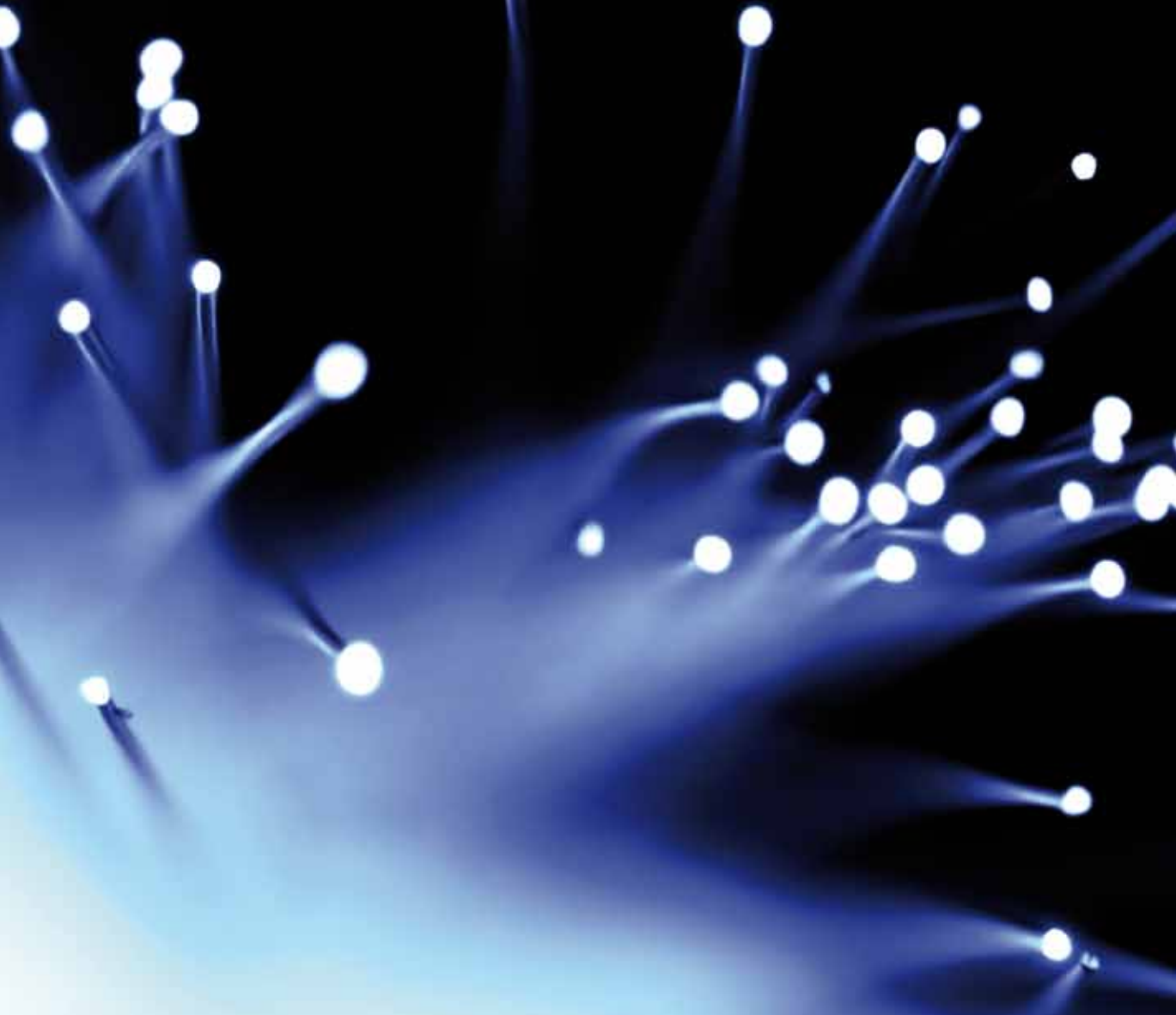


A 2010 LEADERSHIP IMPERATIVE: THE FUTURE BUILT ON BROADBAND

A REPORT BY THE BROADBAND COMMISSION

ITU

UNESCO

TABLE OF CONTENTS

1. A 2010 Declaration of Broadband Inclusion for All

2. Executive Summary - A 2010 Leadership Imperative: Towards a Future Built on Broadband

3. Creating a Broadband Development Dynamic: A Strategic Framework for Action

   - 3.1 Policy: From Clear Policy Leadership to an Enabling Environment
   - 3.2 Infrastructure: Investing in Infrastructure for the Future
   - 3.3 Technology: Future-proofing Technology
   - 3.4 Innovation: The Changing Face of Innovation
   - 3.5 Content and Applications: The Growing Importance of Content and Applications
   - 3.6 People: Building the Network of Ideas and Information
   - 3.7 Government: Government takes the lead in creating demand

4. Broadband and the Interlinked and Interdependent MDG Agenda

5. Broadband and Beyond the MDGs

6. Recommendations and Proposed Plan of Action

Acknowledgements

DISCLAIMER

This Report does not necessarily represent the opinions of the International Telecommunication Union (ITU) or the United Nations Educational, Scientific and Cultural Organization (UNESCO) or their respective Member States, Sector Members, Associates and Secretariat.

The views of the Commissioners reflected in the Report are personal and do not entail any responsibility for their respective Administrations or the Organizations to which they are elected or associated with or of which they are staff members.

A 2010 DECLARATION OF BROADBAND INCLUSION FOR ALL

NEW YORK, SEPTEMBER 19, 2010

We, the members of the *Broadband Commission for Digital Development*, address this Declaration to the world leaders attending the *2010 MDG Summit* at United Nations Headquarters.

We call upon you to embrace a common leadership vision that has profound implications for the accelerated achievement of the Millennium Development Goals (MDGs) by the internationally-agreed deadline of 2015. That common vision is broadband inclusion for all. It is a vision that embodies effective and sustainable solutions to the great global challenges of the 21st Century in poverty, health, education, gender equality, climate change and the seismic demographic shifts in youth and ageing populations.

We believe that the Internet and other information and communication technologies (ICTs) should be used for the benefit of all mankind. Beyond any physical or virtual infrastructure that has preceded it in the industrial revolution or information age, and as a catalyst and critical enabler for recovery in the wake of the recent economic slowdown, broadband will be the basis for digital invention and innovation and the foundation for digital and other investments that lie at the very heart of our shared knowledge economy and society.

We firmly believe that with the strategic and innovative use of broadband ICTs, the international development community can move beyond 'business as usual' and that it will be possible to achieve the inherently interlinked MDG agenda by 2015 to address the existing and emerging global challenges of the 21st Century.

Put plainly, we believe the models of the mobile and Internet revolutions can transform global development and have fundamentally thrived because they are bottom-up, market-led models. By forging a common vision and understanding of the needs and requirements for ubiquitous and higher capacity access to the Internet, governments have today an unprecedented opportunity to unleash the creativity and inventiveness of their citizens and industries to innovate and invest in health and education. Although broadband is a means to an end, and not an end in itself, ICTs and broadband can help generate jobs, growth, productivity and, ultimately, long-term economic competitiveness.

Timing is everything. In September 2000, when the historic *Millennium Declaration* was agreed by 189 UN Member States,

there were some 740 million mobile cellular subscriptions and nearly 400 million Internet users worldwide. In 2010, there are more than 5 billion mobile cellular subscriptions and over 1.8 billion Internet users according to ITU's most recent data, with the majority located in the developing world. It is now high time to take the next great digital leap forward toward our broadband future.

The implications are enormous. International estimates suggest that for every 10 per cent increase in broadband penetration we can expect an average of 1.3 per cent additional growth in national gross domestic product (GDP), and we concur with OECD findings that justify rapid broadband roll-out in all OECD member countries. ITU estimates that by 2015 at least half the world's population should have access to broadband content and communication.

We believe that broadband inclusion for all will represent a momentous economic and social change commensurate with the very problems that the MDGs aim to solve, and that it will be a game-changer in addressing rising healthcare costs, delivering digital education for all, and mitigating the effects of climate change. Already, we see the transformational progress which digital inclusion offers to youth, women, the elderly and people with mental and physical disabilities in rich and poor countries alike.

We strongly believe that getting the broadband policy and investment mix right requires coherent and concerted political will and leadership from the top as well as grassroots support. Critically, this will require a newly proactive and progressive approach to creating an enabling environment for broadband inclusion for all via the convergent and interdependent forces of policy, infrastructure, technology, innovation, content and applications, people and government.

While local conditions vary, there are some similarities in the issues affecting developed and developing countries and in the solutions to those issues – including enlightened political leadership, shared responsibility for a shared resource and the need to create a regulatory environment conducive to investment and innovation.

We urge national governments not to limit market entry nor tax broadband unnecessarily to enable the market to achieve its full growth potential; to radically rethink the availability of adequate radio frequency spectrum in the broadband era; and to adhere to the guiding principles of fair competition to promote access to all, including fair licensing procedures. At the international level, coordinated standards for interoperability must be established that can grow markets in devices, networks and software through economies of scale and significantly increased user satisfaction.

While broadband infrastructure is crucial, we urge world leaders to recognize that connectivity and content go hand in hand. Therefore, it is essential that we examine ways to develop local content and applications in order to serve the MDGs and other key development priorities. Promoting access to education, health services, agricultural and environmental information should thus become an integral part of the strategic deployment of broadband infrastructure.

We affirm that in order to realize its full potential, broadband must be anchored around the concept of knowledge societies, including principles of freedom of expression, quality education for all, universal access to information and knowledge of and respect for cultural and linguistic diversity. Equitable and affordable universal access to broadband networks and broadband-enabled applications are the key for the delivery of online public goods and services, the sharing of scientific information, the strengthening of social cohesion and the promotion of cultural diversity.

Digital literacy and e-skills should remain a key preoccupation of governments and business. We encourage all to seize the opportunity in developing further the multilingual Internet by building on the recent deployment of the first internationalized domain names. Preservation of cultural diversity and promotion of multilingualism in cyber-space will have a positive impact on growth in the number of Internet users around the globe.

Trust and confidence are prerequisites. We believe that recognition is needed by all relevant stakeholders that, in a digital economy, the unprecedented opportunities afforded by flows of ideas and information and almost limitless access to content, culture, knowledge and applications, pose immense challenges for existing national and international rules and regulations.

As broadband usage increases, issues of online privacy, confidentiality and security are becoming more important and must be addressed at the national, regional and international levels. This will require the development of technical solutions as well as education, awareness-raising and the establishment of related laws and regulations. At the same time, a global cooperative framework is needed as these issues often extend far beyond the boundaries of individual nations or sectors.

Digital creators are entitled to fair compensation. Digital networks have led to unprecedented levels of content piracy that will be further exacerbated in the broadband era. New models are needed for the remuneration of content creators, distributors and network operators – models that are best developed through partnership and consensus between policy-makers and industry.

We therefore make a clarion call for 'Broadband Inclusion for All': for global leadership from the top and a ground-swell of support in shaping the broadband future through the deployment of National Broadband Plans, and for full-scale recognition in policy-making of technology, innovation and private sector investment as the critical enablers of the international development agenda and development in the 21st Century.

With this Declaration, we submit to you our final Report of the *Broadband Commission for Digital Development* to the United Nations Secretary-General. We draw your attention to the Recommendations and Proposed Plan of Action contained therein with a full pledge and commitment from us all to continue the work of the *Broadband Commission for Digital Development* until 2015 specifically in service of the accelerated achievement of the MDGs.

Broadband inclusion for all rests in the hands of each and every one of us – and it begins here with your vision and leadership.

CO-CHAIRS

H.E. MR. PAUL KAGAME

President of Rwanda

MR. CARLOS SLIM HELÚ

Honorary Lifetime Chairman of Grupo Carso

VICE-CHAIRS

DR. HAMADOUN I. TOURÉ

Secretary-General, ITU

MS. IRINA BOKOVA

Director-General, UNESCO

COMMISSIONERS

H.E. Prof. Dr. Ali M. Abbasov
Minister of Communications and Information Technologies, Republic of Azerbaijan

Mr. César Alierta
CEO, Telefónica

Mr. Orlando Ayala
Corporate Vice President, Chairman Emerging Markets
Microsoft Corporation

Sir Richard Branson
Founder, Virgin Group

Ms. Kathy Calvin
Chief Executive Officer, United Nations Foundation

Dr. Vinton G. Cerf
VP and Chief Internet Evangelist, Google

Mr. John T. Chambers
Chairman and CEO, Cisco Systems

Dr. Choi Soon-hong
Assistant Secretary-General
Chief Information Technology Officer, United Nations

Ms. Helen Clark
Administrator,
United Nations Development Programme

H.E. Senator Stephen Conroy
Minister for Broadband, Communications and the Digital Economy, Australia

Mr. Edouard Dayan
Director-General, Universal Postal Union

Ms. Milagros Del Corral
Former Director General of the National Library of Spain

Ms. Ingrid Deltenre
Director General, European Broadcasting Union

Mr. Cheick Sidi Diarra
Under Secretary-General, United Nations
Special Adviser on Africa and High Representative for Least Developed Countries and Small Island Developing States

Mr. Amir Dossal
Executive Director, United Nations Office for Partnerships

H.E. Mr. Ricardo Ehrlich
Minister of Education and Culture, Uruguay

H.E. Ambassador Walter Fust
Former Director-General, Swiss Development Corporation

Mr. Julius Genachowski
Chairman, Federal Communications Commission,
United States

Mr. Angel Gurría
Secretary-General, Organisation for Economic Cooperation and Development

Mr. Francis Gurry
Director General, World Intellectual Property Organization

Mr. Mo Ibrahim
Founder and Chairman, Mo Ibrahim Foundation

Mr. Yoshinori Imai
President, Asia-Pacific Broadcasting Union
Executive Vice-President, NHK, Japan

H.E. Mr. Ivo Ivanovski
Minister of Information Society,
The Former Yugoslav Republic of Macedonia

Dr. Paul Jacobs
Chairman and CEO, Qualcomm

Dr. A. Reza Jafari
Chairman and CEO,
E-Development International

Dr. Kim Seang-tae
President, National Information Society Agency,
Republic of Korea

Ms. Neelie Kroes
Vice President of the European Commission
Commissioner for the European Digital Agenda

Mr. Bruno Lanvin
Executive Director, eLab, INSEAD

Prof. Dr. Klaus M. Leisinger
President and Managing Director, Novartis
Foundation for Sustainable Development

Mr. Leong Keng Thai
Deputy Chief Executive and Director General
(Telecoms and Post), Infocomm Development Authority
of Singapore

H.E. Ms. Suvi Lindén
Minister of Communications, Finland

Mr. Sunil Bharti Mittal
Chairman, Bharti Airtel, Bharti Enterprises

Mr. Luis Alberto Moreno
President of the Inter-American Development Bank

Mr. Jay Naidoo
Chair, Development Bank of Southern Africa
Chair, Global Alliance for Improved Nutrition

Dr. Speranza Ndege
Director, Institute of Open, Distance & e-Learning, Kenyatta University

Mr. Youssou N'Dour
Musician, Goodwill Ambassador, UNICEF

Mr. Denis O'Brien
Chairman, Digicel Group

Mr. Paul S. Otellini
President and CEO, Intel Corporation

H.E. Ms. Safuneitu'uga Pa'aga Neri
Minister of Communications and Information Technology, Samoa

Mr. Esteban Pacha-Vicente
Director General, International Mobile Satellite Organization

Mr. Supachai Panitchpakdi
Secretary-General, United Nations Conference on Trade and Development

Dr. Sam Pitroda
Adviser to Prime Minister of India on Public Information Infrastructure and Innovations

Mr. Christian Roisse
Executive Secretary, EUTELSAT IGO

Mr. José Manuel do Rosario Toscano
Director General and CEO,
International Telecommunications Satellite Organization

Prof. Jeffrey Sachs
Special Adviser to the United Nations Secretary-General for the Millennium Development Goals,
Director, The Earth Institute, Columbia University

H.E. Mr. Adama Samassékou
President, International Council of Philosophy and Human Sciences

H.E. Ambassador Sha Zukang
Under Secretary-General,
United Nations Department of Economic and Social Affairs

Sir Martin Sorrell
Group Chief Executive, WPP

Dr. Shashi Tharoor
Member of Parliament, India

Mr. Ben Verwaayen
CEO, Alcatel-Lucent

Mr. Hans Vestberg
President and CEO, Ericsson

Dr. Wang Jianzhou
Chairman and CEO, China Mobile

Ms. Sun Yafang
Chairperson, Huawei Technologies

Professor Muhammad Yunus
Nobel Laureate
Managing Director, Grameen Bank

2

EXECUTIVE SUMMARY

A 2010 LEADERSHIP IMPERATIVE: TOWARDS A FUTURE BUILT ON BROADBAND

"No problem can be solved from the same level of consciousness that created it" – Albert Einstein

Timing is everything. The year 2010 marks not only a key milestone on the road to achieving the Millennium Development Goals (MDGs) and the outcomes of the Geneva and Tunis phases of the World Summit on the Information Society (WSIS). It also marks the 25th anniversary of the landmark 'Missing Link' report of the Maitland Commission, which called for the now seemingly humble target of bringing virtually the whole of mankind within easy reach of a telephone by the early part of the 21st Century.

While strong market demand in the form of mobile telephony and the Internet have since driven the explosion of worldwide ICT diffusion even in the world's poorest countries, we believe we have once again arrived at a crossroads in the evolution of the global digital highway, with broadband as the next great leap forward.

The new realities and opportunities for digital development must be fixed without delay in the minds of world leaders as a leadership and development imperative. Indeed, as these very leaders gather this week at the United Nations in New York for the watershed *2010 MDG Summit*, and with only five years left to meet the MDGs amid a continuing climate of fiscal and donor uncertainty, progress still needs to be accelerated if the MDGs are to be met, particularly in the world's Least Developed Countries (LDCs).

Meanwhile, in this second decade of the 21st Century, the digital divide continues to be a development divide that must quickly be bridged. We firmly believe that today, the social and economic development of every country on earth will depend on accessible and affordable access to broadband networks, based on a multilingual approach, as the basis of human opportunity for all citizens – wherever they live and whatever their circumstances.

We recognize the significant progress made in recent years by many governments to put in place an enabling environment for ICT investment, and the resulting investment and growth in mobile networks and services in particular, especially in developing countries. If we are to replicate this 'mobile miracle' for broadband, then all stakeholders must come together to address the significant policy, regulatory, structural and institutional hurdles that remain in the way of widespread, global broadband roll-out.

To look at the long-term broadband picture, we must engage our imaginations to envision broadband connectivity and content as the full ripening of the digital revolution, the fruits of which in many cases have yet to be invented or imagined, but which will transform our lives, livelihoods and lifestyles permanently and profoundly. By pulling the levers of policy and investment together, we believe that in 2010, we can take the first steps towards this exhilarating future.

The question is not 'why broadband'? The question is rather who will rise to the challenge for social and economic transformation offered by the mobile and broadband revolutions? Are governments fully aware of the enormous potential of broadband to deliver services to their citizens, and can industry deliver broadband inclusion for all, even for market segments where the business case is less certain? Another important question is how can broadband connectivity and content be delivered in the most accessible and affordable way, and to all citizens, in their own languages?

In this brave new world of 'digital opportunity', we believe the burning issue is what price will be paid by those who fail to make the global, regional, national and local choices for broadband inclusion for all – choices which must be made sooner rather than later.

In 2010, from Brussels to Kigali, and from New Delhi to Washington, advanced and forward-looking policies and plans are being put in place for nothing less than the unleashing of ubiquitous invention, innovation and investment via the accelerated deployment of a ubiquitous broadband Internet. Countries as diverse as Australia, Brazil, China, India, Macedonia and South Africa have launched broadband initiatives, offering important insights and experience to other countries.

These developments are radically and irrevocably shifting the policy and investment debate away from arguments over increasing the supply of connectivity to high-speed broadband links towards increasing demand and adoption of digital public and private goods and services for the benefit of all society, via access to a vast range of content, information, knowledge and applications delivered by and across all sectors of the economy.

It is critically important to build inclusive knowledge societies in which people can gain the capabilities from broadband-enabled applications to transform information into knowledge and understanding which can empower them to enhance their livelihoods and contribute to the social and economic development of their societies.

Uniting this human development agenda with the strong business case for broadband to boost progress towards the MDGs is the key challenge for policy-makers. The *Broadband Commission for Digital Development* unites a panel of pioneering policy leaders with top business executives to draw tentative policy conclusions and best practices from their rich fusion of experience and insights. This Report summarizes the key findings of the Commission's consultations to date.

Meeting the Millennium Development Goals by 2015

For the international development community, the watchwords among policy-makers and practitioners for meeting the interlinked MDG agenda of poverty, education, gender, health and environment are 'scalability' and 'replicability'. Projects delivered through broadband networks can deliver these goals. They offer the potential to leverage shared knowledge interactively and instantaneously across the globe and the possibility of unleashing people and community power by moving from dependency to a self-help model.

Significantly, of all the MDG targets, the most advanced is the target for ICTs. As the technical and policy debate on broadband deployment now unfolds in real-time and on a global, regional, national and local basis, we believe it is essential that both developed and developing countries take a seat at the same table.

By turning on the broadband tap, we believe it will be possible to overcome the many early obstacles encountered on the global digital highway, as well as many of the perennial development challenges. The *Broadband Commission for Digital Development* has focused on the seven convergent and interdependent forces of **Policy**, **Infrastructure**, **Technology**, **Innovation**, **Content and Applications**, **People** and **Government**, which we believe need to be harnessed by the international community to build a *Broadband Development Dynamic*. These forces are expanded on in later sections of this Report.

A Shared Responsibility for a Shared Resource - From Mobile to Broadband

Today, it is widely understood that nothing scales to critical mass quite like cell-phones and cyber-space. The value of the worldwide mobile and wired Internet increases exponentially as more people, communities and nations become connected to it. Such 'network effects' have been in evidence almost from the birth of the mobile and Internet market phenomena, but we are rapidly entering a new and dramatic phase of growth and demand.

However, deployment of broadband goes hand in hand with the development of applications and content. Broadband is a tool for advancing further along the path of inclusive knowledge societies where access to information, freedom of expression and human creativity are vital.

Likewise, although broadband has the inherent capability to cut a swathe through the silos associated with the health, education, culture, energy, transport, environment and other sectors, it has all too often fallen between sectors as a casualty of short-term micro- and macro-economic planning. Many would argue that these sectors are on the threshold of systemic and fundamental change requiring re-engineering from top to bottom. Fundamentally, like mobile and the early Internet, broadband could be the next disruptive technology tool that is about to catalyze that change.

In today's global networked economy, broadband ICTs are a vital engine

driving economic growth. Broadband technologies enable the fast and efficient communications across different countries critical for success in the new world economy. Broadband technologies and services are among the high-value, high-tech products which are growing fastest in international trade, generating new skills and sustaining strongest growth in incomes.

ICTs generally, and broadband more specifically, can drive economic recovery after the recent economic slowdown. Broadband is spurring technological change across a range of economic sectors – from agriculture to finance, from construction to healthcare and a range of other modern services. The ICT sector is a vital, strategically-important sector which countries ignore today only at their peril. Neglecting the deployment of broadband networks and services can severely jeopardize countries' long-term economic growth prospects and competitiveness in the information age. Future service delivery in health, education, business, trade and government will all rely on broadband-enabled platforms, so countries must plan for a future built on broadband.

Despite the lower entry barriers, faster payback periods, economies of scale and convenience of mobile communications, developing countries cannot just 'make do' with mobile broadband as their access network of choice without running the risk of being condemned to a low-speed path in the future information economy. Regardless of the choice of access network, the physical transport layer in the 'backbone' networks needs to be wireline and capable of delivering sufficiently fast data speeds to ensure that developing countries can participate in the digital revolution and reap the full benefits of technological progress.

The challenge for policy-makers is to promote investments in high-speed networks (backbone and access) to ensure their widespread deployment in an era of changing business models. More flexible licensing frameworks and more efficient spectrum management have succeeded in helping the industry navigate the transition to mobile over the last two decades; the policy consensus must now evolve to promote the transition to broadband networks.

All stakeholders must come together to address the policy, structural and institutional hurdles to widespread broadband roll-out around the globe. We believe that the greatest hope for success for promoting the deployment and use of broadband networks lies in a market-led approach facilitated by an enabling policy environment. A market-led approach can harness the drive, dynamism and discipline of the private sector. Correspondingly, governments have a role to play in policy leadership creating an enabling environment for broadband roll-out and creating demand for advanced national broadband networks.

Those countries that have succeeded in rolling out extensive broadband networks, applications and associated content and integrating them into their economic and social fabric have done so not necessarily on the back of vast wealth or even great investments, but on the basis of strong private sector participation facilitated by early and consistent prioritization of broadband at every level of policy-making.

In a market-led approach, however, incentives need to be designed and given to rolling out infrastructure to ensure that telecommunication networks with high fixed costs extend beyond profitable urban areas to include rural communities as well. Otherwise, success in deploying broadband networks may be only partial at best, excluding rural populations and many of those in greatest need.

Since broadband technologies are pervasive and cross-cutting, broadband must be clearly prioritized in a virtuous 'broadband development dynamic' across all the different policy domains – investments in broadband are simply too important to be allowed to become a casualty of bureaucratic rivalries or changing policy priorities.

Forging Consensus for Commitment and Coordination

For each of the seven forces mentioned above, we believe the tide is already turning in a way that is ushering in a tidal wave of digital opportunity for the MDGs and beyond. Each of these forces exists within a complex eco-system of its own, with determinants for change that are still highly subjective in nature and only partially understood. Yet as next-generation networks based on broadband rapidly become the backbone of the digital economy, certain assumptions can be made in crafting a consensus for commitment and coordination towards broadband inclusion for all:

- Fundamentally, this will require government-wide leadership from the very top, at the level of Prime Minister or Head of State, with a supporting governance mechanism;
- A broad-based 'bottom-up' approach is also required to build commitment to the concept of broadband inclusion for all;
- Raising awareness of the economic and social benefits of broadband should be publicized among policy- and decision-makers, as well as the general public;
- Most of the investments for broadband will come from the private sector, so policy-makers need to engage with industry and investors to promote policy objectives more broadly;
- Providing policy development skills to public authorities could help abolish some of the existing barriers and factors that hinder widespread uptake of broadband use in the population;
- For areas where private investments are not feasible, public authorities and private entities should find innovative ways of cooperating to achieve widespread access to and use of broadband;
- Content and applications development is undergoing profound change. As the creation, funding, sharing and distribution of content in the digital world increases in complexity, a fundamental concern of business, government and civil society should be the stimulus of local and diversified development-centric applications, in local languages;
- Security, authenticity, and integrity issues will become ever more important, particularly with regard to privacy, protection and confidentiality, and must be addressed, otherwise large-scale investment in broadband infrastructure is unlikely to fulfil its potential.

Defining Broadband in 2010

In its work, the *Broadband Commission for Digital Development* did not explicitly define the term 'broadband' in terms of specific minimum transmission speeds[1] in recognition of the range of market definitions in different countries. Broadband is sometimes also defined in terms of a specific set of technologies,[2] but many members of the Commission found it appropriate to refer to broadband inclusively as a network infrastructure capable of reliably delivering diverse convergent services through high-capacity access over a mix of technologies.

This Report therefore refers to broadband as a cluster of concepts, including:

- **Always-on**: the Internet service is subject to real-time instantaneous updates, without users re-initiating connection to the server (as is the case with some dial-up Internet connections).
- **High-capacity**: the connection should be low latency and high-capacity[3] in its ability to respond rapidly and convey a large quantity of bits (information) arriving per second (rather than the speed at which those bits travel).
- As a result, broadband enables the **combined provision** of voice, data and video at the same time.

Against this background, the *Broadband Commission for Digital Development* proposes that all relevant stakeholders engage in creating a strategic framework for building a *Broadband Development Dynamic*, specifically targeted at the accelerated achievement of the MDGs, Knowledge Societies and beyond through the inter-dependent forces of **Policy, Infrastructure, Technology, Innovation, Content and Applications, People** and **Government** (see Figure 1).

1 ITU has defined broadband telephony as a service provided over an access network "able to contain at least one channel capable of supporting a rate greater than the primary rate, or supporting an equivalent information transfer rate" – see the ITU-T Database of terms and definitions (SANCHO), available at: http://www.itu.int/sancho/index.asp.

2 For example, the ITU Trends in Telecommunication Reform Report (2009) notes fixed broadband can be implemented through technologies such as cable modem, DSL, FTTx, Metro Ethernet, WLAN. Mobile broadband is implemented through wideband CDMA2000, CDMA2000 1xEV-DO, HSDPA, etc.

3 For measurement purposes, ITU and the Organisation for Economic Co-operation and Development (OECD) recently harmonized their broadband definitions for fixed (wired) and wireless broadband. ITU recognizes fixed (wired) broadband services as subscriptions to high-speed access to the public Internet (over a TCP/IP connection) at downstream speeds equal to, or greater than, 256 kbit/s. Wireless broadband services include satellite, terrestrial fixed wireless and terrestrial mobile wireless subscriptions with advertised download speeds of at least 256 kbit/s. Broadband definitions were revised at the ITU Expert Group on Telecommunication/ICT Indicators meeting, held in Geneva on 29-31 March 2010. For further information, see: http://www.itu.int/ITU-D/ict/events/geneva102/index.html.

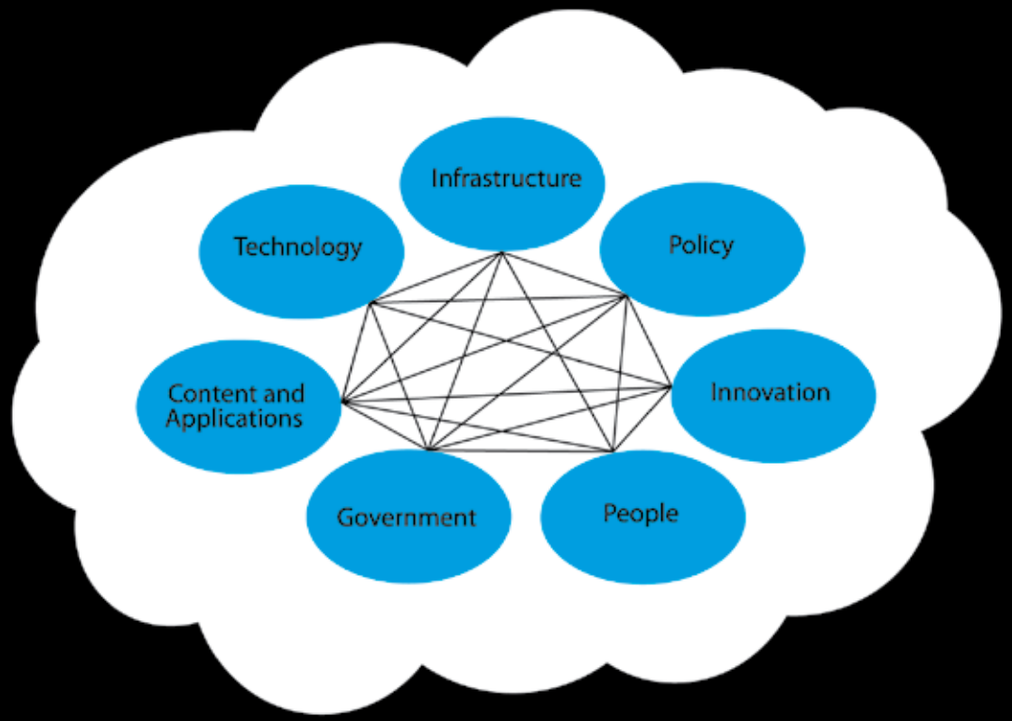
TABLE 1: THEORETICAL TIME TO DOWNLOAD DATA ONLINE AT DIFFERENT CONNECTION SPEEDS

Download:	56 kbps (dial-up)	256 kbps	2 Mbps	40 Mbps	100 Mbps
Simple web page (160 KB)	23 seconds	5 seconds	0.64 seconds	0.03 seconds	0.01 seconds
ITU home page (750 KB)	107 seconds	23 seconds	3 seconds	0.15 seconds	0.06 seconds
5 MB music track	12 minutes	3 minutes	20 seconds	1 second	0.4 seconds
20 MB video clip	48 minutes	10 minutes	1 minute	4 seconds	1.6 seconds
CD / low quality movie (700 MB)	28 hours	6 hours	47 minutes	2 minutes	56 seconds
DVD / high quality movie (4 GB)	1 week	1.5 days	4.5 hours	13 minutes	5 minutes
Stated national broadband targets (% population or households [HH] to be covered)			UK (100%), France (100%), EU-defined target (100%)	Germany (75% HH, 50Mbps)	Australia (90%), Denmark (75%), Finland (100% HH), Korea (100%), New Zealand (75%), Portugal (35% HH), Singapore (90% HH with 1 Gbps).

Source: ITU

3 CREATING A BROADBAND DEVELOPMENT DYNAMIC: A STRATEGIC FRAMEWORK FOR ACTION

FIGURE 1: THE BROADBAND CLOUD – A VIRTUOUS CYCLE FOR DIGITAL DEVELOPMENT



Source: Broadband Commission

Focusing on MDG Acceleration and Delivery in 2010

In times of economic and social crisis, models and mindsets must adapt rapidly, and ubiquitous broadband is a big idea for which the time has come. As identifying replicable lessons and key gaps for scaling up and fast-track implementation of the MDGs becomes the primary focus for the international development community in 2010, what should leaders in business, government and civil society be doing to re-energize and re-focus on delivery?

- Firstly, it must be recognized that progress in achieving the interlinked MDG agenda of poverty, education, gender, health and environment is not helped if there are inter-agency disconnects, or if incentives for innovation and investment by the private sector are choked. Identifying replicable lessons and key gaps for scaling up and fast-tracking joined-up implementation of projects remains a key challenge for the development community that must be addressed head-on.

- Secondly, the at-once immensely disruptive yet hugely collaborative nature of the mobile, Internet and high-speed broadband value chains must be embraced and exploited for the global public good sooner rather than later. Swift adjustment of broadband policy and plans must be prioritized.

- Thirdly, advocacy for both technology and development must be used to reignite the MDG campaign and put it once again at the forefront of the global agenda. The *Broadband Commission for Digital Development* must focus the attention of all actors on exploiting the use of communication technologies to accelerate joined-up delivery of the MDGs today rather than tomorrow.

Broadband Spill-Over Effects

Today, the increasingly general purpose platforms for innovation and investment afforded by the mobile, Internet and now broadband revolutions are already leading to connected nations and national transformation in the delivery of 'digital public goods and services'. In the 21st Century, the social and economic development of every country on earth will depend on equitable and affordable access to broadband networks for all citizens.

The 'spill-over' benefits of digital network investment in terms of innovation and cost-savings in other sectors of the economy, including health, education, energy, transport and content distribution, are now recognized with a view to action by both the public and private sectors.

In its report, *Network Developments in Support of Innovation and User Needs*, the OECD offers a new approach to building the most forward-looking networks possible by evaluating what short-term cost savings would have to be achieved in other key economic sectors to justify the investment. The perhaps surprising answer is that, on average, cost savings of just 0.5 per cent to 1.5 per cent in each of these four key sectors over ten years could justify the cost of building national point-to-point, fibre-to-the-home (FTTH) networks in OECD countries.

In many cases, the social returns of broadband connectivity are potentially much larger than the costs of building networks. Savings in the health sector alone in OECD countries could justify the cost of rolling out a fast broadband network if health costs were to fall between 1.4 per cent and 3.7 per cent as a direct result of having the new network in place. In other words, the inability of all stakeholders to take into account the full social costs and network externalities may lead to non-optimal provision of services and reduced innovation.

Opening up telecommunication markets to competition, and the ability for entrepreneurs to internalize some externalities, can help lead to increasing access and innovation with demonstrable benefits for people living in developing countries (eg, in online remittances and mobile money transfer etc.). On the other hand, although public funding often provides the bulk of expenditure for health and education, governments have not always seized the opportunities for economic savings and improved services that can be established in these areas by developing communication services further.

In the 21st Century, broadband networks must be regarded as vital national infrastructure – similar to transport, energy and water networks, but with an impact that is even more powerful and far-reaching. As a general purpose platform for innovation and investment, broadband networks can help to: control and use energy more efficiently; manage healthcare in poor, ageing or isolated populations; deliver the best possible education to future generations; take better care of our environment; streamline transport networks; and also help to accelerate progress towards the MDGs.

The following sections delineate the convergent and interdependent forces of **Policy**, **Infrastructure**, **Technology**, **Innovation**, **Content and Applications**, **People** and **Government** and how they can be harnessed, and critically assessed by multi-stakeholder development partners, to create a *Broadband Development Dynamic*.

3.1. POLICY: FROM CLEAR POLICY LEADERSHIP TO AN ENABLING ENVIRONMENT

In many industrialized countries, regular attention is given by policy-makers, regulators and industry to quarterly figures for broadband investments, deployment and subscribers as a measure of their national ability to compete in the global economy. In some countries, there is a clear understanding (and constant media coverage) of the importance of national rankings in terms of broadband infrastructure and take-up. Which factors distinguish the countries leading in the national deployment of broadband? Do these countries lead in broadband deployment by fortune, sheer wealth or design?

Policy leadership and political willpower at the highest level are fundamental to promoting the deployment of broadband networks and development of content and ICT skills. Those countries that have succeeded in rolling out broadband networks and integrating them into their economic and social fabric have done so not necessarily on the back of vast wealth or huge investments, but on the basis of early and consistent prioritization of broadband at every level of policy-making. The most successful adopters of broadband (including Japan, the Republic of Korea and Scandinavian countries) were quick to recognize broadband as a national priority needing separate and steady investments, in addition to investments in the broader telecommunication domain.

Successful countries often advocated the simultaneous development of National ICT Policies which provided the enabling environment and capacity-building programs for their citizens to acquire the skills and confidence to create, share, preserve, and ethically use information.

Coordinated policies are needed across a variety of different domains. In fact, the countries leading the world in broadband have often succeeded in establishing a

Broadband Development Dynamic where **policy**, **infrastructure**, **technology**, **content and applications**, **innovation**, **people** and **government** interact in a virtuous cycle of supply and demand. Policies should not focus solely on the supply of infrastructure, but must take into account demand for broadband services and content across the range of user groups. Since broadband technologies are pervasive and cross-cutting, broadband must be prioritized across different policy domains.

National policy priorities must also be translated into practical strategies. According to ITU's latest statistics, 161 countries and territories had a national e-strategy in place by April 2010, with another 14 countries and territories currently formulating a national e-strategy.[4] (Note: The number of Broadband Commissions globally is being researched for the forthcoming background Report).

Broadband strategies deserve special consideration in terms of their own national framework to ensure that countries are not left behind on a low-speed path to a non-competitive future. For developing countries, broadband strategies must be integrated with national strategies for education, healthcare, power and transport infrastructure, as well as their Poverty Reduction Strategy Papers (PRSPs). Effective regulatory and policy frameworks merit additional consideration to ensure that broadband services are realized beyond higher-income, more profitable urban areas.

Policy priorities must be developed in context, and have to reflect the telecommunication market structure of each country and accommodate legal and administrative traditions and market realities. Establishing an enabling policy environment within which the provision of broadband networks and services can flourish can only be done in collaboration with industry. Governments are encouraged to work together with industry and other stakeholders to take onboard their concerns in arriving at regulatory solutions to the challenges affecting their market.

For most operators, beyond a clear statement of policy leadership, the everyday reality of policy-making takes the form of regulation, taxation and customs and import duties in the set of rules and regulations established by government. Governments are encouraged to re-examine these regimes with fresh eyes with a view to promoting the faster growth of networks and services.

Towards Effective Regulation

A conducive regulatory environment which balances the needs of business with the needs of consumers is essential. Governments should recognize the need for an appropriate regulatory framework fostering broadband access to enable the development of infrastructure-based competition in addition to service-based competition. To fully exploit the benefits of wired and wireless technologies and convergence (allowing the delivery of services across different technological platforms and giving users access to new kinds of communication and media services), governments need to create a favourable regulatory environment including allowance for total service convergence (in multi-play offers) and competition in all building blocks of broadband deployment.

4 "National e-Strategies for Development: Global Status and Perspectives 2010", ITU, published in collaboration with the UN, UNECA, UNECE, UNESCWA and UNESCAP, May 2010.

Policy-makers and regulators need to establish appropriate policy goals related to broadband and refrain from imposing regulatory restrictions except where strictly necessary to promote competition and consumer protection. Governments should adopt simplified, flexible and technology-neutral licensing regimes to provide for existing players as well as easy market entry by new players, whilst making more spectrum available for broadband and commercial use, and allowing providers the choice of the most appropriate technologies.

Governments may also choose to encourage commercial infrastructure-sharing and the greater availability of frequency bands to allow operators to deliver broadband services (wireline or wireless) more effectively, and to promote the utilization of new and emerging technologies, such as smart grids. Governments also need to create the regulatory incentives to move towards next-generation mobile broadband (4G/IMT Advanced).

Taxation and Customs Duties as an Incentive, Not a Burden to Business

Although the telecommunication sector is often an important source of tax revenues and levies in the formal economy in many developing countries, there are serious consequences to applying taxation regimes or rates which prove too great a burden for business. Overly aggressive approaches to taxation reduce the growth potential of any market by making the purchase price of handsets and the ongoing cost of services too expensive, often for the very people who can least afford telecommunication service, but whose need may be greatest.

For mobile telephony, overly aggressive taxation has been shown to impact the diffusion of wireless broadband negatively, with an adverse impact on economic development.[5] The removal of taxation and import duties on computers and ICT equipment could help enable schools and hospitals to benefit fully from the advantages of ICTs by boosting their use of computers. Fiscal policies that apply specific, special taxes to the telecommunication sector are often inefficient and cause distortions that "crowd out" private spending, ultimately diminishing consumer welfare. Policy-makers and regulators should take onboard the concerns of industry and work with operators to develop efficient tax regimes which aim to develop the ICT sector through longer-term investment incentives. Depending on the elasticity of the local market, taxes and customs duties on the one-off purchase and import of telecommunication equipment can often be recouped over lower tax rates on greater market revenues from added growth in ongoing demand for telecommunication services.

3.2. INFRASTRUCTURE: INVESTING IN INFRASTRUCTURE FOR THE FUTURE

In addition to ensuring an adequate supply of national bandwidth, the availability of affordable international Internet bandwidth is vital for providing high-speed Internet connectivity to citizens, governments and businesses alike. International Internet bandwidth remains unequally distributed, with far less international Internet bandwidth available to developing

5 "The Impact of Taxation on the Development of the Mobile Broadband Sector 2010", Telecom Advisory Services LLC and the GSMA.

countries compared with developed countries. By the end of 2009, fixed broadband penetration in the developing world stood at 4 per cent, compared with close to 23 per cent in the developed world, according to ITU analysis.

Partly as a result of the limited availability of Internet bandwidth, broadband access remains prohibitively expensive in many developing countries. In Africa, for example, there is an inverse relation between penetration and prices: while mobile penetration is high, prices are relatively low. Broadband Internet prices, on the other hand, are very high and penetration levels are very low. The prohibitively high price for broadband services in Africa clearly remains a major bottleneck to greater uptake of broadband services.

Wireless technologies play an important role in providing greater connectivity to high-capacity networks, particularly in the developing world. By the end of 2009, there were around 670 million mobile broadband subscriptions, of which over a quarter were in the developing world. This trend, as well as with the strong growth in subscriptions and the advances in wireless technology, highlight growing opportunities for countries to join the information society. The demand for radio frequency spectrum is likely to grow rapidly, a major issue which policy-makers need to address urgently – noting that, as a precious resource, spectrum allocation must be based on costs, efficiency of use and the needs of users.

Broadband networks and services can enable operators to take advantage of market convergence and create new revenue streams, while expanding access to ICT services at lower costs to consumers. A high-capacity fibre optic packet transport backbone is the fundamental backbone infrastructure that countries need to deploy to support the growth in broadband services. Developing countries can leap-frog and take advantage of the latest cost-effective and easy-to-deploy fibre optic technology instead of following the evolutionary path taken by developed countries. Public-private partnerships (PPPs) can help drive the deployment of broadband, particularly in rural and underserved areas. Public investments and subsidies in broadband services need to be accompanied by regulations to ensure effective competition and transparency of information.

3.3. TECHNOLOGY: FUTURE-PROOFING TECHNOLOGY

In planning the roll-out and deployment of broadband networks, it is unlikely that any single technology will be able to provide all the answers. Optical fibre is desirable at the core of the Internet, and for the majority of backhaul traffic, to achieve a high-capacity backbone, but at the edges of the network, and in particular in the hands of end-users, it is most likely that mobile devices will deliver many broadband applications and services. Indeed, this is already the case, with nearly 900 million mobile broadband subscriptions forecast to be achieved globally by the end of 2010.

Satellites also provide invaluable solutions, particularly for providing capacity in hard-to-reach rural areas and for providing the essential backhaul capacity needed by other operators to reach their customers. Recent catastrophic events have also highlighted to governments the important role played by satellites for achieving emergency preparedness and responding to events (such as the earthquakes in Chile and Haiti and the floods in Pakistan).

Depending on local conditions such as geographic location, economic prosperity, rural or urban environments and local terrain, there is a role for a host of different technological solutions in providing broadband access – from cable to fixed wireless; from satellite to microwave; from xDSL to mobile technologies; and many more. Policy-makers should seek to adopt a technology-neutral approach as regulation needs to accommodate new upgrades of current technologies, as well as future technologies which do not yet exist. Future-proofing technology – as well as the regulation to cope with the technology – may be impossible to achieve fully, but some technologies are likely to be more future-proof than others (eg, those with greater transmission capacity). Regulatory frameworks need to be designed with this in mind, so the future development of broadband is not stifled by bureaucracy, inefficiency or lack of regulatory foresight.

Alongside convergence in content, technological convergence means that devices such as radios, televisions, telephones, cameras or computers are often no longer unique or even separate from one another in the digital era. Smartphones have proved to be game-changers, combining a mobile phone with personal organizer, music player, digital camera and multimedia entertainment with Internet access and email on the move. Consumers are having to adjust their expectations and behaviour with demand for services taking new forms.

As the 'Internet of Things' emerges, driven in part by new monitoring, measurement and reporting activities – such as those needed to run smart grids, for example, or modern public transport systems – there will be increased interaction and interdependence between different devices and networks. It is therefore important to recognize that the full benefits of broadband cannot be realized without maximum interoperability and globally-agreed standards – and to ensure that these standards are used to create and preserve openness and transparency, rather than proprietary applications, devices or services.

As well as standards, enforceable interconnection policies can enable providers, suppliers, third parties and end-users to gain the maximum benefits of ubiquitous, always-on connectivity, and enable widespread information-sharing and e-business.

Lastly, from a technology perspective, it is essential to recognize that local conditions and the availability of supporting technologies are often critical factors in determining technology choices for the roll-out of broadband infrastructure. In areas where there is no regular or reliable electricity supply, for example, there is a need for creative power solutions to keep the network and routers running, as well as recharging the mobile devices which connect to them.

3.4. INNOVATION: THE CHANGING NATURE OF INNOVATION

The telecommunication industry is characterized by constant innovation. Many vital innovations have been made in network technologies (eg, DSL, DOCSIS 3.0, UMTS, LTE, TCP/IP protocols, IMS and encoding algorithms to mention just a few) or in business models (eg, marketing innovations, such as pre-paid tariffs). Without the innovations of pre-paid or flat-rate tariffs by operators and content providers, millions of people would not have been able to afford to use ICT services.

The emergence of broadband networks is rewriting the rules for innovation. Too often equated with high-cost research and development (R&D) carried out in technical research labs, most innovation (the process) and some of the most valuable innovations (or individual inspirations) in fact arise through incremental learning and continual technical improvements at the grassroots – on the factory floor and elsewhere. ICTs are empowering consumers, workers and employees to improve products and services to the benefit of all. Broadband in particular offers the opportunity to accelerate and transform innovation through faster and more unrestricted access to advanced services and applications.

Barriers to entry and obstacles to innovation are being lowered or eliminated; ideas can be published and shared online; problems can be outsourced or solved collaboratively. In the information age, the very nature of innovation is changing. Today, a single piece of software or innovative device can:

- Create a new market (eg, eBay created a global market-place for online auctions);
- Take an existing market online (eg, ebooks);
- Transform an established market (eg, Voice over Internet Protocol has revolutionized voice communications); or
- Combine existing markets into a converged market in the digital age (eg, smartphones successfully unite a mobile phone with a digital camera with a music player and online Internet access for information and entertainment).

Broadband networks and the Internet are transforming the nature of innovation – creative individuals with interest can now acquire the knowledge and skills needed to innovate in the information society online. If ICTs and the Internet are populist and collaborative platforms, innovation is less likely to be characterized by high sunk costs and long lead-times and will become increasingly dominated by user-generated content, crowd-sourcing or, put simply, the strength of a good idea.

Firms' relationship with innovation is also changing. Many companies are introducing collaborative platforms and social networking platforms to mine for innovations and inspirations among their workforce, without ideas getting lost in the vertical hierarchy. Some companies have even closed down their R&D departments and transferred their innovation & improvement function to their customers (eg, Lego). More recently, initiatives are emerging uniting network operators and manufacturers to collaborate with application developers and businesses in innovative business models to generate valuable innovations (eg, the Wholesale Applications Community or WAC). Open source code or applications can be developed by online communities of developers to solve the everyday problems they encounter in their lives as consumers, parents or individuals. As a result, more efficient processes in business and development and innovation are starting to emerge, tailored to real need.

But how can any of these changes in the innovative process help poorer communities or individuals in developing countries? Using broadband networks, poorer communities or individuals can be empowered to voice their challenges online for solution with the help of others. Innovative solutions to practical problems (eg, for a broken water pump or irrigation system) can be posted or shared online. The policy emphasis needs to shift from the prioritization of formal R&D towards prioritizing incremental learning, in collaboration with other partners and other people, using the Internet as a platform for communication and problem-solving. It is only once the changing nature of innovation is recognized, and basic functional literacy needs are met, that poorer communities in developing countries can really start to benefit from the problem-solving capabilities of the world's largest information exchange network.

3.5 CONTENT AND APPLICATIONS: THE GROWING IMPORTANCE OF CONTENT AND APPLICATIONS

As has been witnessed across the ICT world, connectivity without content can make even the most sophisticated technologies irrelevant or of limited value. In today's virtual world, it is vital that governments do not neglect the importance of content. Policy-makers have to emphasize the development of rich and diverse online content and applications alongside infrastructure and propose concrete policies and practices for inclusion of new languages and tools for the measurement of linguistic diversity. Some of the main issues with regard to content include making more online material accessible in local languages or accessible to people with limited functional literacy skills. The digital divide is a result not only of a lack of access to connectivity and infrastructure, but also of a lack of relevant and locally-developed content which can make a big difference to the lives of ordinary people. It is important to recognize that broadcasting also plays an important role in the developing world in the creation and dissemination of rich media content.

Linguistic diversity on the Internet is growing. One of the latest examples of the evolution of the multilingual Internet is the introduction in the root of the first internationalized country code domain names. It is expected that millions of people around the world who do not know Latin script-based languages can now join the family of existing Internet users.

So there are grounds for optimism. The changing nature of innovation in Web 2.0 means that consumers are increasingly writing and developing their own user-generated content. Communities of full-time application developers are springing up, creating applications to suit their own needs. Meanwhile, opportunities in the local development of content offer fresh business possibilities for small- and medium-sized enterprises (SMEs) and for young entrepreneurs in developing countries to exploit. At the same time, multilingual content production is closely linked to complex issues such as the availability of funding and various types of other resources at local, national or regional levels and the political, cultural and economic environment. It will be important to continue lowering the costs of technology, to make it more accessible to all groups of society, and in particular, future generations of application developers. Free and open source software is now available that is enabling the creation of localized applications.

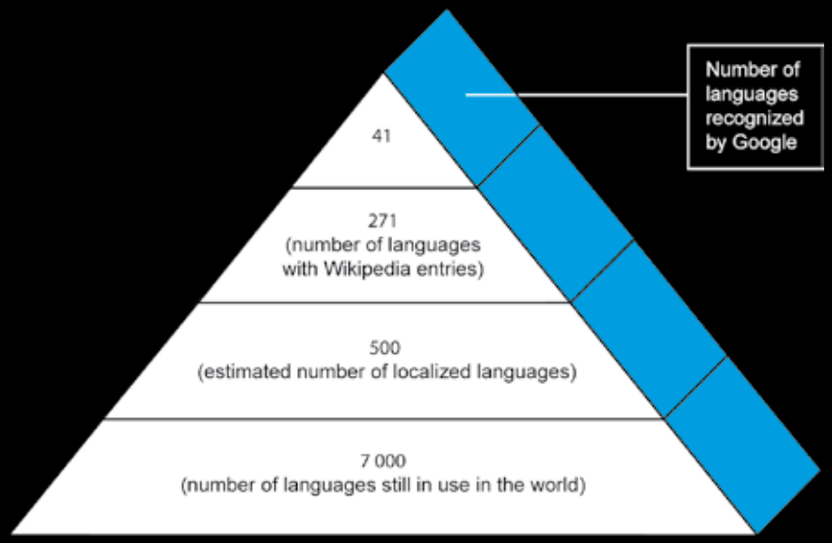
The power of collaborative online services to crowd-source, mine for ideas and produce a coherent product from multiple disparate inputs is illustrated by services such as YouTube, Facebook and Wikipedia, the online encyclopaedia written mainly by volunteers. Although it has faced quality control issues of reliability, bias and accuracy, one study by Nature magazine found that Wikipedia had an accuracy rate close to that of the Encyclopaedia Britannica.[6] Such services illustrate the growing power of crowd-sourced services to provide diverse, yet coherent products.

6 "Internet encyclopaedias go head to head", Nature 438: 900–901, Jim Giles, December 2005 at: http://www.nature.com/nature/journal/v438/n7070/full/438900a.html; "Wikipedia survives research test", BBC, 15 December 2005 at: http://news.bbc.co.uk/2/hi/technology/4530930.stm.

Box 1: Broadband and linguistic diversity[7]

Available data to measure the linguistic diversity on the Internet suggest that the majority of content on the worldwide web is produced and hosted in a limited number of countries, and published in only a limited number of languages. The figure below visually highlights the linguistic diversity of cyberspace by showing that while there is a total of 7,000 languages still in use in the world, only 41 languages are recognized by one of the world's most popular search engines (although other estimates put the number of languages supported by Google higher, at 104 languages). This compares to 271 languages with Wikipedia entries and 500 localized languages.

FIGURE 2: KEY FIGURES FOR LANGUAGES ONLINE AND OFF-LINE, 2010



Source: ITU World Telecommunication Development Report 2010, based on data from Ethnologue, SIL International (Summer Institute of Linguistics), Wikipedia and Google.

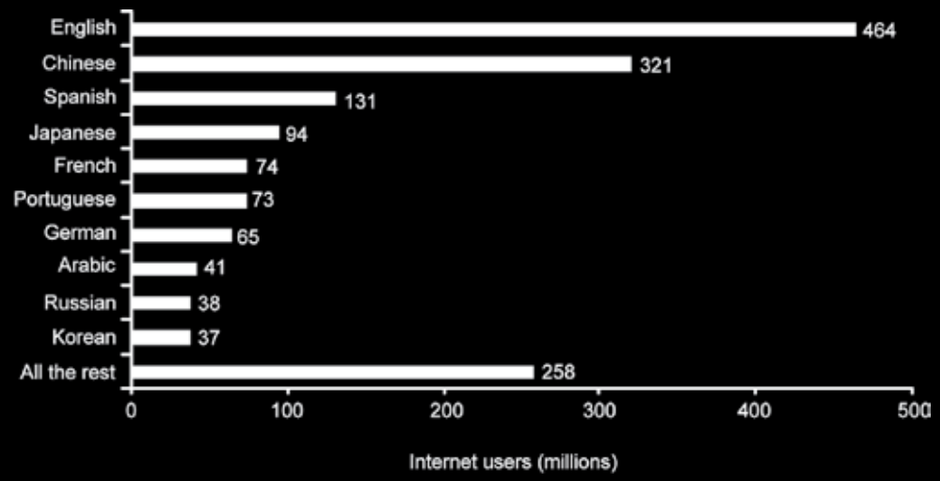
There is no agreement among linguists on the size of the language universe, but the figures usually range between 6,000 and 9,000, due to difficulties in distinguishing between dialects and languages. The number of localized languages is an estimate. Many sources also stipulate that there is a huge number of endangered languages. The latest edition of the Atlas of the World's Languages in Danger lists about 2,500 languages (including some 230 languages which have become extinct since 1950), approaching the generally-accepted estimate of some 3,000 endangered languages worldwide (source: http://www.unesco.org/culture/ich/index.php?lg=en&pg=00139). The Internet can be seen also as tool for language conservation and preservation, if digitalization can be undertaken soon enough.

7 Abridged from "Measuring the Information Society 2010" report published by ITU in May 2010, available at: www.itu.int.

Box 2: The most popular languages on the Internet

The distribution of Internet users by language further suggests that a few major languages are dominating the online world. The largest share (about 30 per cent) of Internet users speak English, followed by Chinese (20 per cent) and Spanish (8 per cent) and the top ten languages by Internet users make up some 84 per cent of all Internet users. At the same time, the percentage of English-speaking Internet users dropped from 80 per cent in 1996 to 30 per cent in 2007, reflecting the fact that an increasing number of non-English speakers are going online.

FIGURE 3: TOP TEN LANGUAGES (BY INTERNET USERS) ON THE INTERNET, 2009



Source: Internet World Stats, quoted in ITU World Telecommunication Development Report 2010.

3.6. PEOPLE: BUILDING THE NETWORK OF IDEAS AND INFORMATION

Modern ICTs are proving to have a transformational effect on people's lives. The Internet has been described by one observer as "an explosion of capacity thrust into the hands of people worldwide, the instrument not only for the greatest outburst of creativity and self-expression ever seen, but also of the greatest autonomy and self-determination, as well as an unparalleled mechanism for cooperation and cohesion".[8]

One of the greatest contributions of broadband to global development will be that it provides a platform which can exponentially increase the ability of people to create and exchange ideas and knowledge. Just as the wonders of the brain cannot be understood by studying individual neurons, the benefits accrued from broadband go far beyond individuals — in particular, ideas and creativity and self-expression emerge out of linkages between people, as well as complexity of those linkages.

Throughout history, the real engine of human progress has been the "meeting and mating of ideas to make new ideas".[9] It has been argued that it is even unimportant how clever individuals are — what really matters is their collective intelligence. Therefore, our objective should be a highly interconnected world of creativity, ideas and knowledge to help us address the challenges set out in the MDGs. To that end, broadband inclusion for all is a fundamental component of the global development agenda with transformational potential, for example, in e-learning, e-literacy and e-skills.

From a people perspective, what is needed to build this network of ideas? How can people contribute their human capital to this phenomenon? Two distinct sets of needs are apparent. The first is the specialized human capacity, knowledge and skills to build out broadband networks - whether from a policy, regulatory, business or technical perspective.

The second is the human capacity, knowledge and skills to use and benefit from these networks – which should be considered part of normal cognitive skills development, whether through normal education or lifelong learning. In both scenarios, ICTs are part of a virtuous circle – because access to broadband helps people to exchange ideas, creativity and knowledge about how to build, use and leverage ICTs.

Investing in broadband is not necessarily an investment in infrastructure, but rather an investment in people. For broadband is really an investment in an interconnected world of ideas and knowledge that can be spread in seconds from one corner of the earth to another — the "meeting and mating of ideas to make new ideas". And investing in people and their ideas to solve their own problems contributes more to empowering those people and making progress in the global development agenda than virtually anything else policy-makers can do.

8 Stephen Downes' blog, available at: http://halfanhour.blogspot.com/2010/06/gathering-of-ideas.html.

9 Author Matt Ridley, at the Technology, Entertainment, Design (TED) Global 2010 conference

3.7. GOVERNMENT: GOVERNMENT CAN TAKE THE LEAD IN CREATING BROADBAND DEMAND

Government plays a special role in many developing countries in creating demand for next-generation broadband services. Building out fixed broadband infrastructure typically involves large-scale investments over long-time horizons and the private sector benefits from more certain prospects in its attempts to finance and roll out such infrastructure.

If governments can aggregate their connectivity needs over the National Broadband Networks (NBN), they can make the business case for national infrastructure more compelling. This is especially the case in developing countries, where government is usually one of the major users of broadband infrastructure, but it is increasingly also the case in industrialized countries and transition economies, including Azerbaijan, New Zealand and Singapore.

Moving government services online offers the prospect of revitalizing public administration and improving the speed, efficiency and effectiveness of service delivery. More fundamentally, it also promises to transform the way in which citizens relate to their governments and policy-makers, by making the work of politicians and civil servants more public and transparent. Governments are increasingly having to respond to growing expectations for communication with tech-savvy citizens.

The UN Department for Economic and Social Affairs (UNDESA) notes that while on-demand access to public services over the Internet is now a norm in many developed countries, barriers persist in many LDCs, due to the cost of technology, lack of infrastructure, limited human capital, a weak private sector and a paucity of public sector resources.[10]

However, exceptions exist, such as e-education in Bangladesh and Ethiopia, and m-health in Rwanda. UNDESA notes that these experiences demonstrate that significant gains can be realized in LDCs where there are legal and regulatory frameworks in place, including more specifically an e-government strategy with clearly identified sectoral priorities aligned with national development goals. For example, Ethiopia has now connected nearly 600 local administrations to regional and federal offices, linked 450 secondary schools to a national education network, and provided some 16,000 villages with access to broadband services.[11]

For many users, however, the potential of e-government goes far beyond basic connectivity and relies on developing services which people want, in their local languages. Countries which have made a determined effort to develop local script and language tables, content and applications have seen a significant surge in the usage of ICTs. Broadband demand is thus intrinsically linked to the creation of local content, services and applications which citizens then can leverage for their own progress. Technology will never be any substitute, however, for ethical and cooperative public sector service delivery, which can only be led from the top echelons of government.

10 & 11 P. 4, UN E-government survey 2010, available at: http://www2.unpan.org/egovkb/documents/2010/E_Gov_2010_Complete.pdf.

4

BROADBAND AND THE INTERLINKED AND INTERDEPENDENT MDG AGENDA

The remodelling of the ICT 4 Development landscape in real-time presents key challenges and opportunities to all players. Each must chart a path toward digital inclusion through unknown terrain.

For major donor agencies who have been struggling to incorporate ICT into their official development assistance (ODA) strategies, the MDGs provide a welcome compass. After years of experimentation on ICTs in often stand-alone, often unsustainable pilot projects, attention is now being drawn to the need to leverage ICTs for poverty reduction strategies and the MDGs through a focus on integration, scaling and replication. And broadband provides a new and innovative entry point.

From experience, it is clear that ICT and technology 'push' projects have generally been ill-suited to fulfilling the requirements of the MDGs. Rather, 'pulling' ICTs and now broadband into development projects where appropriate and relevant at an early stage – often with a mix of traditional and new media and achieved through multi-stakeholder partnerships – to achieve greater efficiency and improved service delivery will have far greater poverty impact.

In practice, any blueprint for a national e-development strategy will comprise a number of essential elements: a clear e-strategy vision championed at the highest political level; a multi-stakeholder approach to enhance results; a cross-sectoral holistic strategy; realistic priorities for e-strategy actions and programmes; simplified implementation modalities; national and international cooperation and partnerships for a prioritized and nationally-owned e-strategy; global inclusion of developing countries and ICT in ODA; ICT to facilitate regional integration and regional integration to facilitate ICT deployment; telecommunication and ICT policy cohesion, convergence, and low-cost cutting edge solutions; and an overarching focus on achieving the MDGs themselves.

So what is the critical role of knowledge and information in economic and human welfare with respect to the MDGs? How can ICT and the MDGs practically contribute to empower stakeholders in the PRSP process, improve the efficiency of public and private service delivery, and enhance livelihoods? To what extent should ICT 4 Development priorities, policies and practices differ with respect to 'off-track' versus 'on-track' developing countries? These key questions must now be revisited in the broadband context.

Yet resistance by government and business to full acceptance of the critical role to be played by ICT in support of the MDGs must quickly be displaced by hard data on development impact and the real potential to scale up and replicate. While

significant anecdotal evidence has already been amassed in this direction, major efforts are now underway to produce systematic measurement criteria. Today, mainstreaming ICT and broadband for the achievement of the MDGs remains very much a work in progress, and this Section describes the generic development impact across all eight MDGs.

Progress towards achieving each of the MDGs can be accelerated with ICTs in general, and broadband in particular. This is not because ICTs and broadband are ends in themselves, but because they act as enablers like no other technology in the modern world – bringing healthcare, education and government services to people wherever they live, as well as leveraging training opportunities around the world.

Mobile cellular has proved to be the most widespread and fastest-adopted technology in history, with five billion mobile subscriptions globally in 2010, and a household penetration rate of over 50 per cent in many developing countries. Mobile telephony is empowering billions of individuals worldwide by enabling them to enter the workforce, earn a living or work more efficiently, and benefited millions of communities worldwide.

The next step is to bridge the Internet divide, and especially the broadband divide, in the same way that we are so successfully bridging the mobile divide. With ICTs and broadband, successful efforts to advance the MDG agenda can then be scaled up and replicated around the globe.

GOAL 1: ERADICATE EXTREME POVERTY AND HUNGER

While access to ICTs and broadband may be seen by some as less urgent priorities than meeting the basic needs of food and shelter, it is increasingly the case that information poverty – especially in developing countries – can actually lead to and contribute to poverty and hunger.

Between 1998 and 2008, the global number of working poor – workers living with their families on less than US$ 1.25 a day – fell from 944 to 632 million, or from 38 per cent to 21 per cent of total workers. However, as a result of the economic and financial crisis, it is estimated that in 2009, this number increased by up to 215 million, reversing much of the progress achieved during the previous decade. Globally, the number of hungry people rose from 842 million in 1990-1992 to 1.02 billion people in 2009,[12] of which the large majority were women and girls.

Access to knowledge assets such as information, know-how, market price data, and basic healthcare and nutrition guidelines can dramatically improve living standards and bring people out of the poverty trap – and ICTs and broadband are key to making this happen.

Available data suggest a strong and positive correlation between communications and levels of development. At the micro-level, studies from Africa and India consistently show that, even for very small farming and fishing businesses, market-matching efficiencies will apply when there are good communication links. Such

12 Source: The Millennium Development Goals Report 2010, UN New York, at www.un.org/millenniumgoals.

'disintermediation' cuts out middlemen, resulting in higher profits and rewards for farmers and producers and lower prices for consumers when price information is shared on-demand via mobile phones and text messaging.

Since women are more affected by poverty than men, enabling women to create and / or enter employment is an effective strategy to combat poverty, and ICTs and broadband are key to helping women become functionally literate for greater access to skills training. The experience of the Grameen Bank in Bangladesh has shown that women with experience of even basic mobile phones are more likely to be willing to use and benefit from other ICTs for information or work opportunities.

GOAL 2: ACHIEVE UNIVERSAL PRIMARY EDUCATION

Even as many poor countries make tremendous strides, hope is dimming for Universal Primary Education (UPE) by 2015. Although 89 per cent of children in the developing world are now enrolled in primary education, some regions – in particular, countries in sub-Saharan Africa – will see a drop-out rate of up to 30 per cent before the final grade.[13] And demand from those who continue in education is now putting pressure on the next step in the system: secondary education.

Broadband offers a potential solution in the ability to deliver education in developing and developed countries alike. Broadband networks can deliver information, interactivity, shared resources and help level the playing field for everyone.

Online education is easing the resource bottleneck in training teachers; UNESCO estimates suggest that as many as 10 million additional teachers will be needed globally by the 2015 MDG deadline.[14] Many countries are already actively pursuing an intensive programme of teacher training online, but more needs to be done: in particular, access to broadband needs to rapidly become more affordable, particularly in the developing world. PPPs designed not only for students but also for the communities in which they live (such as ITU's *Connect a School, Connect a Community* initiative) can achieve a great deal in accelerating progress towards bridging the broadband divide.

Using ICTs and broadband to advance universal primary education does not need to be limited to boys and girls, but can also include men and women who never had the chance to attend school – and studies consistently show that literate, educated women are more likely to ensure that their children attend school. ICTs and broadband also enable inclusive education of persons with disabilities.

Around the world, m-learning and e-learning over broadband networks is growing, with mobile network growth continuing to outpace fixed-line networks, and the number of mobile broadband subscriptions approaching 900 million in 2010. Mobile phones offer the advantages of already being in billions of hands in the developing world and offering relatively well-deployed and stable network infrastructures. Many schools that have been using TV and radio systems are now

13 Source: The Millennium Development Goals Report 2010, UN New York, at www.un.org/millenniumgoals.
14 Source: World Telecommunication/ICT Development Report 2010, available at http://www.itu.int/ITU-D/ict/publications/wtdr_10.

switching to online learning opportunities, due to their inherent interactivity. Broadband-enabled ICT applications should be seen both as a pedagogical tool and as a discipline in their own right for the development of effective educational services.

GOAL 3: PROMOTE GENDER EQUALITY AND EMPOWER WOMEN

In many emerging economies and rural areas, women remain economically and socially marginalized and under-educated, suffering from relatively poor employment prospects. While many countries have achieved or nearly achieved primary school gender equality – the enrolment gap narrowed from 91 girls to 96 girls for every 100 boys in the developing world between 1999 and 2008 – progress still remains slow in other areas. Women are disproportionately represented in vulnerable or insecure employment. In some countries, women represent only 20 per cent of the workforce employed outside agriculture, while within agriculture, incomes remain low.[15]

ICTs and broadband are key to achieving empowerment and gender equality. They provide an excellent means of opening up opportunities in education and employment, as well as access to information, and have the potential to neutralize much of the discrimination traditionally faced by women. The flexibility provided by the use of ICTs and broadband in education and work can enable women to better fulfil their work commitments, and can help overcome issues of mobility. ICTs and broadband can also be used to influence public attitudes to gender equality, create opportunities for women as educators and activists, and enhance opportunities for networking and organizing for gender equality, as well as female participation in political processes.

ICTs and broadband are directly relevant to empowerment and gender equality in both cause and effect – increasing women's access to ICTs and broadband will help achieve these goals, and achieving gender equality will help increase women's access to ICTs and broadband. Key stakeholders must develop gender-focused or gender-neutral technology and application programmes to ensure that broadband mitigates, and does not widen, gender gaps.

GOAL 4: REDUCE CHILD MORTALITY

In many regions of the world, including Northern Africa, East Asia, South-Eastern Asia, Latin America and the Caribbean, child mortality rates have more than halved since 1990, but globally, the fall has only been 28 per cent, which is still well short of the target of a two-thirds reduction.[16] Tragically, most of the major causes of child mortality – malnutrition, pneumonia, malaria, diarrhoea, measles, HIV/AIDS, tetanus – are treatable, but communities lack both the resources and the knowledge to treat them. Children's health is closely correlated with maternal health and (more loosely) with maternal education.

15 & 16 Source: The Millennium Development Goals Report 2010, UN New York, at www.un.org/millenniumgoals.

Given that there are rarely enough health practitioners to serve everyone in need of healthcare, ICTs and broadband are essential for bridging this gap. Advances in modern medical technology usually require large amounts of money, but telemedicine can make a huge impact with relatively simple low-cost technology. Just one computer, a scanner and a digital camera, for example, can transform a hospital, making a real difference where it counts. It is also important to automate systems properly in hospitals (eg, through the use of Entreprise Resource Planning or ERP) to minimize the manual paperwork in offices, clinics, health centres etc. that can cause delays and queues in providing health services to patients.

Mobile technology can also be used to disseminate basic health and sanitary information to parents (such as vaccine reminders, and advice on maternal hygiene and nutrition); to train intermediary healthcare workers and rural doctors; to track disease and epidemic outbreaks; to monitor patients remotely; and to remind patients about the need to take medicines or come in for a check-up.

To leverage the full power of telemedicine, broadband is needed to enable doctors to share images and diagnose patients hundreds of miles away using technologies such as video- conferencing, for example. A number of developing countries – for example, Kenya and Rwanda – are already prioritizing broadband as a platform for future health service delivery in a bid to improve patient care, dissolve distance and bring telemedicine to tens of millions of people, thereby reducing child mortality.

GOAL 5: IMPROVE MATERNAL HEALTH

More than half a million women die every year as a result of complications in pregnancy and childbirth, almost all of them in the developing world.[17] The vast majority of these deaths are preventable. Although maternal mortality rates are falling, the rate of reduction is still considerably short of the 5.5 per cent decline needed annually to meet the MDG target, however. In Africa and South Asia, fewer than half of all births are attended by a midwife or skilled health worker, and complications during pregnancy and childbirth remain the most frequent cause of death for women.[18] Lack of access to health services is particularly acute for women in remote rural areas.

While there is obviously no substitute for increased numbers of healthcare professionals and their attendance before, during and after childbirth, broadband services have already begun to demonstrate their potential for improving the health of women and their babies. High-speed Internet connections enable health workers outside major centres to receive quality training and exchange experiences and information through video-conferencing, interactive discussion forums and the use of social networking sites.

Broadband services give women easier access to information on family planning, hygiene and other reproductive health issues, including visual presentation materials, information in local languages, and culturally-appropriate content. Expectant and new mothers can get better information about childbirth and the early

17 Source: United Nations, as reported at www.un.org/News/Press/docs/2010/dsgsm497.doc.htm.

18 Source: The Millennium Development Goals Report 2010, UN New York, at: www.un.org/millenniumgoals.

warning signs of infection or disease for themselves and their children. Broadband applications linked to 'smart' mobile phones or portable computers linked to mobile broadband networks can enable health workers to create and access online patient records and to transmit health information to policy-makers and researchers. And there is an important and growing role for community centres with Internet access to deliver essential connectivity and health information, especially to women in rural and remote areas.

GOAL 6: COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES

Although there has been progress in curbing the rate of new infections – the new HIV infection rate fell from an estimated peak of 3.5 million in 1996 to 2.7 million in 2008, for example – diseases such as malaria, tuberculosis and HIV/AIDS still kill more than four million people annually, and an estimated one billion people suffer from neglected tropical diseases.[19]

Success in combating these diseases often depends on the effective dissemination of information about prevention, treatment and cure, and persuading people to take simple low-tech preventive measures, such as using condems or insecticide-treated bed-nets. The provision of quality information to those at risk, to patients, to care-givers and to health-workers and researchers, is fundamental.

For instance, HIV prevention is critical to controlling the AIDS epidemic, yet less than a third of young men and less than a fifth of young women in developing countries know how HIV/AIDS is transmitted and how to prevent infection.

By making customized access to information quick and easy, broadband applications are already helping in the global fight against disease. They include:

- Interactive e-learning courses on HIV/AIDS for educators, such as the ones developed by UNESCO;[20]
- Online training and refresher courses for health workers, including video-conferencing;
- Information-sharing between health professionals on treatment practices, guidelines and so on, through online discussion forums, bulletin boards and social networking sites;
- Continuing professional education online;
- Personalized risk assessments for HIV/AIDS through interactive online programs. Some people may find it easier to answer questions posed by a computer than to talk face-to-face about sensitive subjects;
- Information, education and awareness-raising campaigns about the risks of getting infected and effective ways of protection (through websites, including interactive visual features and hotlines providing advice and additional information on demand).

Combining broadband with the mobile phones that are most widespread in the developing world also has the potential to transform health service delivery – for example, by expanding schemes to check that AIDS and tuberculosis patients are taking their medicines, and to enter and access patient information.

Broadband Internet can also provide powerful research and surveillance tools to tackle disease more effectively – by mapping the Mycobacterium tuberculosis genome, for example, or using satellites to map areas where malaria-carrying mosquitoes are likely to be found.

Last but not least, ICT community centres can give girls and women access to undistorted and objective information on how to prevent sexually-transmissible diseases, including AIDS. Women with HIV can receive information on treatments for preventing the transmission of HIV to their unborn babies, and those caring for relatives with HIV can access support and advice. ICT community centres can also provide women with valuable information on how to combat and treat malaria, tuberculosis and other diseases.

GOAL 7: ENSURE ENVIRONMENTAL SUSTAINABILITY

The MDG on ensuring environmental sustainability spans a wide range of targets, from the provision of safe drinking water and basic sanitation facilities to reducing biodiversity loss and improving the lives of slum-dwellers.

In virtually all these areas, broadband networks can make an important contribution. They can swiftly transmit information from ground sensors or satellites to monitor the effects of climate change or impending natural disasters, such as drought or floods. They can provide early warning systems that reduce vulnerability to disasters. Combined with Global Positioning System (GPS)-enabled mobile phones, they can support emergency communications and medical assistance when disaster strikes. And by enhancing environmental surveillance, they can help policy-makers devise suitable response strategies and make more efficient use of resources.

Broadband-powered GPS-based applications can also help monitor environmental abuses (eg, illegal logging or pollution levels) and transmit that information to authorities. They can facilitate knowledge exchange and networking among policy-makers, practitioners and advocacy groups, boosting public awareness and encouraging environmental activism.

Automatic weather stations at mobile phone masts can be used to provide information directly to farmers and fishermen via mobile phones, enabling them to predict and cope with erratic weather patterns due to climate change. Broadband can enhance such systems further, by supporting more sophisticated modelling and faster information-sharing. Environmentally-friendly work habits are also increasingly prevalent in many countries, promoted through ICT and broadband in areas such as reducing paper consumption and facilitating teleworking.

Innovative ICT projects have already proved their worth in improving the lives of slum-dwellers – for example, in Brazil, India and Kenya – by providing access to employment and training. Broadband

19 Source: The Millennium Development Goals Report 2010, UN New York, at: www.un.org/millenniumgoals.

20 Source: http://hivaidsclearinghouse.unesco.org/.

Internet can do far more than this, however, by enabling the delivery of government services online and giving small businesses in slum areas the opportunity to participate in e-commerce. Perhaps most importantly, broadband can empower slum-dwellers often excluded from the political process to have a 'voice', delivering access to information and providing a means for them to communicate, share their concerns and mobilize for change. Sharing experiences of what works, learning from others and changing people's expectations of their living conditions and livelihoods are all part of the complex challenge of empowering people to improve their own lives.

GOAL 8: DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT

MDG 8 includes a specific target on extending the benefits of new technologies, including ICTs, in cooperation with the private sector. While the phenomenal growth of mobile telephony in the developing world has transformed access to basic connectivity, the 'digital divide' persists, especially where the Internet and broadband are concerned.

While around a quarter of the world's population now uses the Internet, in the very poorest countries, that proportion is just one or two per cent.[21] The gulf in access to broadband networks is even greater.

Progress will depend on thinking creatively about how to speed up access to broadband, including building multi-stakeholder partnerships involving governments, the private sector and civil society. Only then, with full access to the information society, will people be able to find innovative ways out of poverty.

Broadband networks can also help with other targets within MDG 8, such as addressing the special needs of land-locked and Small Island Developing States (SIDS). High-speed Internet connections can enable these countries to overcome geographic disadvantages and link up with the rest of the world, including through e-business and by exporting services that can be delivered through communication networks, such as call centres and business processing.

Similarly, distance working enabled by broadband can help in advancing another MDG 8 target, to develop strategies for 'decent and productive work for youth'. And by enhancing distance learning through video-conferencing, interactive discussion and social networking, broadband Internet can help improve skills of all kinds, not only in ICT. Broadband networks hold great promise for broadband-enabled scientific applications with the need to manipulate and transfer extremely large datasets.

The greatest contribution of broadband towards achieving the MDGs may be its catalytic role in empowering people by giving them both knowledge and a voice in the public arena, as ICTs and broadband have the power to level the playing field across different countries and different types of economies. Beyond 2015, broadly universal and widespread access to broadband should be a key concern of policy-makers in setting the next round of global targets.

21 Source: ITU – see Internet users 2009, at www.itu.int/ITU-D/ICTEYE/Indicators/Indicators.aspx.

5 BROADBAND AND BEYOND THE MDGS

This section reviews some of the key global challenges of the 21st Century that broadband connectivity and content are uniquely placed to address, namely: climate change; the shifting burden and demography of ageing populations; and the growing costs associated with healthcare.

Broadband and Climate Change

Climate change is one of the biggest challenges facing humanity today. Although climate change is a natural phenomenon and debates continue over the origins, mechanisms and extent of climate change, it now seems likely that human activities are accelerating this natural phenomenon in an artificial way, ultimately contributing to a sudden and rapid warming of the planet, partly through the release of greenhouse gases (GHG) and carbon-based emissions. Human activities may also interfere with the planet's natural mechanisms for responding and adapting to climate change.

Hundreds of millions of people are now increasingly vulnerable to the knock-on effects of climate change, living in areas at risk from more frequent and more severe natural disasters (such as floods, hurricanes and landslides). A disproportionate number of these people live in developing countries with only limited resources to cope with the impact of climate change. Despite the scientific, statistical and political uncertainties surrounding climate change, what is certain is the need for coordinated international action – to enable countries to monitor, plan for and respond to the inevitable impact of climate change on their peoples, cities and communities.

ICTs have a critical role to play in combating climate change through the reduction of GHG emissions. Defined in its narrowest sense (as telecommunications, computing and the Internet), the ICT sector has been estimated to account for between 2-2.5 per cent of GHG emissions – mainly in the power demands of devices (such as phones or computers) and the operation of ICT networks (through the operation of data centres or telecommunication equipment).

However, since ICTs are cross-cutting technologies used in other industrial sectors, the representative figure for the broader ICT sector may be higher than this baseline estimate. It is clear is that, unless further decisive action is taken soon, the contribution of ICTs to GHG emissions is likely to rise in parallel with the strong

market growth and growing use of data and ICT services worldwide. However, many promising initiatives are underway in the ICT sector which should help curtail this rise.

ICTs, and broadband in particular, also offer significant promise for combating climate change – ICTs can also be part of the solution. Broadband technologies are more energy-efficient than other, older and more traditional means of delivering services, and ICT solutions can result in lower overall carbon-based emissions. In addition, the availability of broadband will reduce the emissions of other sectors through greater adoption of more energy-efficient ICTs. An excellent example is the use of smart grids, which could reduce GHGs by 5-9 per cent (for the United States)[22] or the power needs of electrical supply systems by as much as 30 per cent (in the case of India, according to the SMART2020 report).[23] In addition, virtualization (eg, reading e-books) and the use of advanced technologies (eg, video-conferencing) could substitute for carbon-intensive activities (such as printing paper books or air travel). 'Green ICTs' or 'smart ICTs' are a recent, but important and fast-growing sector in their own right.

Even more importantly, because ICTs are pervasive cross-cutting technologies, prioritizing the use of more energy-efficient technologies such as broadband offers policy-makers an effective means of leveraging reductions in GHG emissions across different industrial sectors at once. Investments in smart ICTs offer developed and developing countries alike the opportunity to invest in – and innovate for – the future, for the sake of future generations. The initial upfront costs of investing now in more energy-efficient broadband technologies pale into insignificance compared with the longer-term costs of coping with the effects of climate change. Greater adoption of more energy efficient ICT-based solutions is no longer an option, but a necessity.

Broadband and the Shifting Burden and Demography of Ageing Populations

Declining fertility and birth rates, combined with increased life expectancy, are leading to ageing in the global population. In 1990, one in every twelve persons (or 8.95 per cent of the world population) was over 60.[24] In 2009, this had grown to one in every nine persons and the so-called "older population" of the world amounted to 737 million persons, nearly two-thirds of whom live in developing countries. The global population aged 60+ is projected to reach 2 billion in 2050 or 22 per cent of the global population.[25] By 2050, older persons will outnumber children (less than 14 years of age). The UN Population Division has concluded that population ageing is "unprecedented, profound, enduring and pervasive", [26] affecting nearly all countries on earth.

22 "Connecting Smart Grids & Climate Change", Silver Spring Networks, November 2009, available at: http://www.silverspringnet.com/pdfs/SSN_WP_ConnectingSmartGrid-1109.pdf.

23 "SMART2020: Enabling the Low Carbon Economy in the Information Age", The Climate Group/GeSI, at: http://www.smart2020.org/_assets/files/02_Smart2020Report.pdf.

24 World Health Report 2001, available at: http://www.who.int/whr/2001/annex/en/.

25 "Ageing and Population", UN population division, at: http://www.un.org/esa/population/publications/ageing/ageing2009chart.pdf.

26 http://www.un.org/esa/population/publications/WPA2009/WPA2009_WorkingPaper.pdf.

This global demographic trend is split sharply, however, between developed and developing countries. In developed countries, populations are generally ageing earlier and more rapidly – the number of people aged 60+ exceeded the number of 12- to 24-year-olds in the late 1990s. In developing countries, the number of people in less developed countries aged 60+ is not expected to exceed the number of 12- to 24-year-olds until 2045.[27]

This ageing in the world population will have a profound impact on all aspects of social and economic growth – on savings, investment, consumption, labour markets, pensions, taxation, the demand for housing, epidemiology and the need for healthcare services. Broadband infrastructure is important for catering to the range of different needs of elderly persons. As the current digitally-literate generation matures, they will continue to participate in online services. A computer-literate generation used to shopping and spending time online is likely to indulge these habits in retirement or seek alternative online careers to supplement meagre pension payments (where these are available). Some of their most basic ongoing needs may be for information, entertainment, lifelong-learning and retraining.

Broadband infrastructure is likely to prove vital in the delivery of healthcare services to growing numbers of elderly persons. Always-on real-time connectivity is essential for the monitoring and surveillance of elderly persons, enabling them to live independently for longer. Broadband connectivity is also essential for medical "compliance monitoring" to ensure that elderly people take their treatments – the main reason why medical treatments fail, according to Philips Medical.[28] Sensor networks can be used to monitor the long-term situation of elderly persons in poor health, from mundane matters such as the formation of skin lesions and bedsores to more serious monitoring of cardiac function, diabetics' sugar levels or blood pressure. Monitoring and alert systems can also be used to notify distant health personnel in case of crisis (eg, a stroke, cardiac arrest or epileptic seizure).

Broadband infrastructure is also essential for long-distance diagnosis, teleconsultation and medical imaging. High-bandwidth computing is needed for recording, storing and transmitting detailed images using advanced software for the analysis of degenerative diseases associated with ageing (eg, dementia, Parkinson's disease or Alzheimer's). The ageing of the real-world global population is likely to be reflected online in the virtual world in ways that are as yet only beginning to be understood.

Broadband and the Growing Cost of Healthcare

The World Health Organization (WHO) has observed that huge inequities exist in the provision, health outcomes,

27 United Nations, World Population Prospects 2004, Prepared by Larry Rosenberg and David Bloom (Harvard University); quoted in "Global Demographic Trends", IMF magazine, September 2006, at: http://www.imf.org/external/pubs/ft/fandd/2006/09/picture.htm.

28 Presentation by Philips Healthcare, to the FTTH Council Europe Conference, February 2010, quoted at: http://www.ftthcouncil.eu/home/latest_news/hot_news_from_the_ftth_conference_in_lisbon!/?cid=37&nid=527&catid=8.

financing of and access to healthcare services, within and between countries.[29] The WHO records that, globally, annual government expenditure on health varies from as little as US$ 20 per person to over US$ 6,000. Population growth, the ageing of populations, scientific progress and medical advances in diagnosis and treatment mean that the annual costs of healthcare are rising in many countries around the world. Healthcare is now the world's largest service industry, an industry that alone was worth US$ 4,000 billion in 2006.

Meanwhile, systems for financial protection are in disarray – the WHO estimates that for 5.6 billion people in low- and middle-income countries, more than half of all healthcare expenditure is made from out-of-pocket payments, while expenditures on health push over 100 million people below the poverty line each year. In many countries, the financing of healthcare may be haphazard, with people who are well-off and generally healthier having the best access to the best health care, while the poor may be left to fend for themselves.

The roll-out of broadband infrastructures for health may require significant upfront investments. However, broadband technologies are likely to prove cost-efficient and reduce ongoing costs for the digitization, transmission and storage of patients' medical records and imagery. E-health can reduce the costs on the system via remote consultation and intervention - especially as the proportion of the population over age 60 rises significantly.

Even beyond positive cost savings, the digitization of vital patient medical records offers key advantages in the recording, preservation and availability of patients' known medical history and risk factors for maximum information disclosure in diagnosis and treatment. Electronic health records can help treat patients along complex referral chains, speeding up treatment and potentially improving health outcomes.

Broadband does not necessarily mean 'high-tech', however. Broadband backbones connecting major hospitals can be used effectively to deliver lower-bandwidth services to local populations (such as basic monitoring or communications with outlying clinics in more rural areas). Simple services (such as SMS alerts, appointments or patient reminders) can be used effectively to improve the delivery of health services and reduce secondary costs (eg, the travel costs to remote clinics).

In its *World Health Report 2008*, the WHO noted that healthcare is often delivered according to a model that concentrates on diseases and high-tech specialist care, with health viewed as a product of biomedical intervention, with the power of prevention largely ignored.[30] The WHO has called for a return to holistic primary healthcare, with a focus on community support. In countries with high broadband penetrations, there is potential for greater doctor-to-patient interaction between hospitals/doctors and end-users at home to improve awareness and education about health outcomes and steps to prevent illness and disease. Most types of healthcare, including primary healthcare, can be enhanced by investments in improved infrastructure.

29 & 30 Press release, World Health Report 2008: http://www.who.int/mediacentre/news/releases/2008/pr38/en/index.html.

6

RECOMMENDATIONS AND PROPOSED PLAN OF ACTION

Action

The United Nations General Assembly is asked to note the recommendations of the *Broadband Commission for Digital Development* and in particular the concept of 'Broadband Inclusion for All' and its mapping to achieving the MDGs in relation to the relevant resolutions of its Second Committee and to acknowledge the work of the Commission in support of Article 19 of the Declaration of Human Rights.

ACTION POINT 1 CONNECTING BROADBAND WITH THE MDGS AND KNOWLEDGE SOCIETIES

Building global commitment to broadband inclusion for all by connecting broadband with the MDGs and knowledge society priorities.

a) At the global level, world leaders at the *2010 MDG Summit* must galvanize the international community to act on a common vision of the power of technology and innovation, built on broadband, to accelerate the achievement of the MDGs and other internationally-agreed development goals and key knowledge society priorities such as those of the WSIS by 2015, in the context of the new digital realities and opportunities of the networked society and economy.

b) At the national level, governments should adopt national broadband strategies, recognizing that, in the information age, broadband – like water, electricity, and roads in the industrial age – is not just a tool for communication, but a social asset that provides one of the most cost-effective and efficient means for delivering services to citizens and comprises a nation's core functions, provides a variety of services, and should be made available to all members of society, in their own languages.

c) National ICT Policies should be encouraged to build inclusive knowledge societies where all citizens have the skills and confidence to create, share, and preserve information and knowledge to improve their lives. Governments need to promote policies in universal access and these policies should include broadband access as an essential element of universal access and services.

d) Special consideration should be given to the direct application of broadband solutions to address the cross-cutting and cross-sectoral aspects of the MDG agenda. Specifically, evidence pertaining to impact, new business and social models, and sustainability is essential in demonstrating the benefits of broadband diffusion for scale-up and replication across all eight MDGs.

e) A mid- and long-term perspective, taking into account the requirements of diverse communities and stakeholders, is essential

in forming a consensus for broadband investment and uptake. Governments should play a pivotal role in exploring innovative financing mechanisms and incentive strategies.

f) Advocacy efforts should be prioritized for building a global market in broadband devices, networks, software and solutions that will harness the power of network effects, as well as spill-over effects of broadband across multiple sectors, while improving framework conditions for interoperability between broadband products and services.

g) Ultimately, new national development models based on universal access to broadband connectivity and multilingual content can aspire to the goal of 'digital opportunity' – that is social and economic development made possible via access to knowledge that can narrow gaps between rich and poor and among classes and regions.

h) We urge all relevant stakeholders to continue to pose the key questions of what incentives can be created by governments to encourage and enable the private sector to invest.

ACTION POINT 2
BENEFITTING FROM TRANSFORMATIONAL CHANGE

Maximizing social and economic stimulus with broadband inclusion for all via transformational change in healthcare, education, government and environmental sustainability.

a) Fundamentally, what matters for development is how much value will be created by broadband inclusion for all. We request all Governments at various levels to expedite the delivery where possible of all public services for government transformation centrally and locally using broadband to substantially improve the access, transparency, convenience, security, flexibility, quality and cost of service delivery.

b) Political will and leadership at the level of Prime Minister or Head of State is required: a future-oriented networked society and economy require future-oriented vision, thinking and prioritization. Broadband must be clearly embedded in national development policies that build on broadband as a development accelerator.

c) National success stories have shown that a top-down approach matched with grassroots involvement and ownership is necessary for constructing a national digital economy. A clear national policy must be developed that not only contributes to the expansion of basic broadband infrastructure, but is also an engine for national competitiveness. Promoting broadband roll-out to key public institutions (such as schools, libraries, post offices, hospitals and health clinics) is an effective private-public partnership strategy.

d) Broadband is an unrivalled tool for social integration and e-inclusion, so applying broadband to address economic and social challenges such as rising healthcare costs, ageing populations and climate change must be a primary focus for multi-stakeholder partnerships, including public-private partnerships. Governments must recognize that the success of broadband initiatives will depend as much on the demand side in all its forms, including education, healthcare, ICT skills, availability of public e-services, etc. as on the supply side.

e) Governments should consider policies aimed at stimulating private sector growth and investment through innovative loan and incentive structures, avoiding additional taxation on the ICT sector. They may also consider proactive subsidies by government in services in countries where there is little or no possibility of attracting private investments, and in-demand stimulus through the promotion of digital public goods, which have been shown in some cases to contribute to a virtuous cycle of investment from both public and private sector entities and a proliferation of public-private partnerships.

f) Policy objectives for broadband inclusion must include the provision of broadband-enabled service and applications for vulnerable, disadvantaged and remote groups, the youth, and Indigenous Peoples. In addition, boosting trust and confidence in ubiquitous broadband with regard to safety, protection, privacy and security is a prerequisite to building consensus and commitment to broadband inclusion for all.

g) Special attention must be paid to increasing the availability and affordability of radio frequency spectrum as a critical enabler for wireless broadband growth. Fair competition and new services, as well as regulatory reform and fair licensing procedures, need to be taken into consideration in allocating radio frequency spectrum, under a technology- and service- neutral approach.

h) Special attention must also be paid, notably by equipment manufacturers, to ensuring the development of global standards and the interoperability of global networks.

i) While in many cases, the cross-cutting and cross-sectoral benefits of broadband have in the past resulted in stalled or unsustainable investments and in many ways obscured the catalytic effect that broadband inclusion for all will ultimately have on the MDGs, these benefits must be better explained to citizens and consumers.

j) We believe that broadband policies should be expanded to include hardware and software needs, financing requirements, and policy priorities. We believe that there is a need for complementary investments in supporting technologies (such as electricity) and investments in community-based access models.

k) Broadband policies should be expanded remembering that one of the main reasons for fostering broadband is the great overall benefit for society in the new applications and services which can be delivered over it. Given changing demographics, it will be impossible for both developed and developing countries to deliver adequate education and health services, for example, to all their citizens, without broadband infrastructure in place.

l) While the benefits of constructing broadband networks and promoting broadband-embedded devices may not always appear obvious in the short-term, over the intermediate and long-term, they demonstrably accelerate the provision of high-profile digital public goods such as digital health (e-health and m-health), e-learning and e-literacy,

e-government and e-business, leading to economic revitalization, green growth and social integration.

m) To benefit from the cross-cutting and cross-sectoral nature of broadband, governments should consider ways of aggregating connectivity on national broadband networks. The connectivity needs of public sectors in all countries will grow as populations come to expect their governments to expedite and deliver public administration and government services over broadband networks.

ACTION POINT 3
USING TRANSPARENT, FAIR, COMPETITIVE, TECHNOLOGY-NEUTRAL MODELS

Addressing issues of convergent broadband networks toward transparent and fair, competitive, technology-neutral models, offering interconnection and interoperability at the national, regional and global levels.

a) Higher capacity access to the Internet provides a platform for a wider range of applications so it is implicit that investments in such capacity can benefit and reward innovative and creative ideas for applications. Those who invest in communications capacity are not necessarily those who may benefit from applications and services, so innovative mechanisms need to be found to ensure that broadband deployment is not stalled through lack of investment.

b) The maximum benefits of broadband access and transport will likely be derived if sufficient capacity is available and access to this capacity is possible through adequate and fair mechanisms. In general, reasonable network management practices should deliver 'fair' access to resources among competing providers of access.

c) It should be recognized that intelligently-managed state-of-the-art broadband infrastructure is the prerequisite for future new content services and applications. Without such infrastructure, which needs to be financed adequately by the users and end-users (eg, customers and anyone offering services and applications over the Internet), there will be no possibility for sustainable growth in data and Internet usage.

d) It is also important to recognize that no single technology will provide ubiquitous broadband services. It is likely that, where economically and physically feasible, the core of the Internet will typically use optical fibre to achieve very high speeds. The interconnection of fibre-based networks in the global Internet is most likely to deliver success where fibre connections can be implemented. In addition, radio infrastructure clearly has an ongoing role to play. Whether wide-area terrestrial or satellite, broadband radio access can provide favourable economic characteristics in areas lacking fixed infrastructure.

e) If the full benefits of the broadband Internet are to be realized for all, international cooperation will be required for enforcing the meaning and utility of digital signatures, law enforcement, agreement on the definition of abuses and

remedies, and mutual support in the event of attacks and / or malware propagation, among other issues, bearing in mind that there are already several existing international cooperation programmes to address these issues.

f) Global standards, designed to act as enablers not barriers, deliver clear advantages including interoperability, economies of scale, and a level playing-field for all stakeholders.

ACTION POINT 4
ENABLING CONTENT AND APPLICATIONS CREATION

Developing the right conditions for broadband content and applications creation, diffusion and distribution via an enabling environment based on trust and confidence for economic and social stability and prosperity.

a) All relevant stakeholders must recognize that in the digital economy, the unprecedented opportunities afforded by flows of ideas and information and almost limitless access to content, culture, knowledge and applications pose challenges for existing national and international rules and regulations.

b) Digital networks have given rise to unprecedented levels of content piracy that will be further exacerbated in the broadband era. As copyright and intellectual property right infringements multiply, the issue of remuneration for content creation and distribution will become a central concern for all relevant stakeholders that requires a far better understanding of the value chains of digital production. Policy-makers must recognize the need for balance between the creation and diffusion of content, and that creators in the digital world are entitled to fair compensation.

c) The global spread of broadband provides unprecedented opportunities for promoting cultural diversity through the provision of a multitude of content and services in local languages. This in turn would lead to a burgeoning of local cultural industries, capacity development and help in the creation of jobs. Such a development also has the potential of significantly lowering the costs of access, by creating demand for local content and services.

d) Policy-makers should also note that digitization has enormous potential to reduce the cost of content distribution, enabling the online exchange of content at very low rates, no matter how small or dispersed a community might be. Today, innovative new legal content business models for the Internet (eg, Hulu, Spotify) are being created which suggest that traditional business models may need to change to tackle the challenges associated with piracy.

e) As broadband usage increases, issues of online privacy, confidentiality and security are becoming more important and must be addressed at the national, regional and international levels. This will require the development of technical solutions, as well as education, awareness-raising and the establishment of related laws and regulations. At the same time, global international cooperation based on multi-

stakeholder partnerships is needed as these issues are often multi-sectoral in nature.

f) Implementing local broadband projects requires a well-organized administrative system that stimulates not only the government's engagement, but also participation from the local community. Local communities should be encouraged to voluntarily engage in projects by identifying and promoting the best practices in local ICT development, taking into account local languages.

g) Promoting and preserving ethical aspects and principles, while developing creative multilingual content and universal access to ICTs is central for achieving an equitable presence in, and access to, cyberspace. Embracing coherent ethical guidelines is essential in the face of increasing globalization. Thus, the definition and adoption of best practices and voluntary, self-regulatory, professional and ethical guidelines should be encouraged among media professionals, information producers, users and service providers with due respect to freedom of expression. Access to information for all remains a fundamental right which should be upheld with efficiency and imagination in a spirit of equity, justice and mutual respect.

ACTION POINT 5
EMPLOYING BROADBAND TO HELP COMBAT CLIMATE CHANGE

Utilizing broadband technology and innovation for energy conservation and improved efficiency, emergency disaster response, and monitoring, reporting and verification of climate change data.

a) We urge public and private partners to make full use of technologies and applications such as smart grids, remote working and intelligent transport systems which use broadband connectivity to ultimately benefit all nations in the drive towards energy conservation and efficiency.

b) We encourage investment strategies to maximize energy savings via the use of 'virtual' services enabled by broadband infrastructure in health, education, public administration, transportation, agriculture, environment and content distribution networks, among others.

c) We encourage the widespread utilization of renewable energy sources such as water, wind and solar energy in the deployment of broadband networks.

d) We note that the global increase of devastating earthquakes, floods, tsunamis, hurricanes, drought and wildfire activity, which may result from global warming, have emphasized the critical need for instant and interactive emergency response, disaster relief and post- reconstruction efforts that can be enhanced via broadband networks.

e) We believe the universal deployment of broadband networks will be an invaluable tool for better monitoring, measuring and evaluation of climate change data.

ACTION POINT 6
ACCELERATING BROADBAND ACCESS FOR WOMEN AND GIRLS

Accelerating access to broadband infrastructure and services for women and girls, to promote gender equality and social and economic development.

a) Active steps should be taken to accelerate access to broadband infrastructure and the use of broadband-enabled services by women and girls, in order to promote gender equality, empowerment and the social and economic development of both men and women.

b) Governments should encourage investment in broadband infrastructure to help women become better educated and support their children's education, improve their access to healthcare, receive job training, conduct meaningful commercial activities, enforce their legal rights, and play an active role in local and national government affairs.

c) Policy-makers should also recognize the importance of broadband for women in the unpaid economy and domestic female workers in fulfilling their work commitments, and bring reliable remittance services and affordable communications to those working away from their home countries.

d) Governments should set targets for the provision of broadband access and services to women and girls and track their progress through the collection of reliable sex-disaggregated data, as recommended by the United Nations Division for the Advancement of Women in 2005. Specific targets should be set for broadband-enabled training. Governments participating in the MDG assessment may consider setting the target of ensuring that at least 50 per cent of women and girls have broadband access by 2015, including through community ICT centres connected to broadband networks.

e) Policy-makers should encourage the use of broadband networks to eradicate functional illiteracy and promote career training, and other essential ICT skills, including financial and business literacy skills for women and girls. Such training, which can be provided in community ICT centres, will enable women to set up online businesses, or to use broadband services, such as e-commerce and social networking sites, to enhance their ongoing livelihoods and economic activities.

f) Governments must recognize the potential dangers posed by broadband services to women and girls, especially in luring them into prostitution or trafficking, and take active steps to minimize these dangers.

g) Governments should be encouraged to create policies to ensure that women and girls have access to the same opportunities as men and boys in terms of access to broadband-based services at school and work.

ACTION POINT 7
SUPPORTING WIDER BROADBAND INCLUSION FOR ALL

Supporting wider broadband inclusion for all for least developed countries and countries in special need and extending broadband access to rural and remote areas and vulnerable and disadvantaged groups.

a) Efforts should be renewed to mobilize public and private support for a significant improvement of basic ICT infrastructure in countries where such infrastructure is most lacking, as well as in rural and remote areas, and for disadvantaged groups. In this regard, the particular suitability of special solutions such as mobile broadband and the potential offered by satellite systems with strong fibre optic backhaul to serve LDCs and other countries in special need should be noted. Using the tools that get the job done best, a partnership should be forged between broadband (point to point) and broadcasting (point to multipoint) infrastructure, applications and services.

b) An economic analysis relevant to Least Developed Countries, Landlocked Developing Countries and Small Island Developing States should be undertaken to determine sustainable business models for adequate returns on broadband investment at minimum income levels with maximum spill-over benefits across multiple sectors of the local society and economy. The same applies to rural and remote areas, and disadvantaged groups. The innovative use of 'digital dividends' should be considered.

c) Where broadband networks are built in underserved communities, continued support such as training and promotion is necessary to facilitate their use, taking into consideration local languages, education needs and literacy issues.

d) Special attention should be given to the provision of broadband for education as well as for disadvantaged and vulnerable groups, with particular reference to indigenous peoples, women and girls, persons with disabilities, youth and children and ethnic minorities.

e) Support should be given to partnerships to facilitate the setting up of local Internet exchange points (IXPs) and national Internet Service Provider (ISP) associations to promote wider broadband inclusion, especially in the regions and populations of the world who need it most.

f) The specific needs of LDCs should also be taken into account while planning regional Internet backbones. History proves that communication linkages between neighbouring countries have been key promoters and levers to promote socio-economic prosperity and continuous development. International connectivity and regional network infrastructure can be a powerful tool for elaborating sustainable development in LDCs.

g) Encouragement should be given to equipment and service providers to work cooperatively with LDCs, for example via PPPs to reduce delivery costs.

h) Broadband should also be considered as a solution wherever disaster relief and post-conflict reconstruction are priorities - satellite services are of particular relevance and importance in this regard, as well as other mobile broadband technologies.

ACTION POINT 8
BROADBAND MODELLING, EVALUATION AND MONITORING

Modelling, evaluation and monitoring of relative targets and timelines for broadband inclusion, with the development of economic, social and usage indicators appropriate to the broadband environment.

a) It is likely that new methods for modelling the social and economic evidence of impact of broadband diffusion will need to be developed in a multi-stakeholder partnership that can be facilitated by a system-wide UN response, such as the *Partnership on Measuring ICT for Development*.

b) Effective implementation of broadband policy needs reliable evidence and comparable indicators on ICT access, use and impact. Hard targets and timelines, such as those identified to monitor the World Summit on the Information Society (WSIS) targets, are required for evaluating and monitoring Member States' and regions' progress in broadband deployment, as well as agreement on annual actions to help meet and measure such progress. To assess global improvements, relative indicators and global comparisons are needed.

c) A core list of ICT indicators, including a number of broadband-related indicators, has been agreed upon by the international statistical community under the framework of the global *Partnership on Measuring ICT for Development*. This work needs to be expanded to develop measurable indicators on all aspects of an inclusive, broadband-based society and methods for modelling the social and economic impact of broadband diffusion, in cooperation with relevant stakeholders.

d) A set of specific indicators should be created that will allow broadband progress to be measured. Such indicators will need to combine hard/quantitative data (eg, infrastructure, equipment, penetration, cost etc) and soft/qualitative ones (eg, value and content created from broadband, cultural/linguistic diversity, etc).

ACTION POINT 9
BUILDING A GLOBAL PARTNERSHIP FOR BROADBAND DEVELOPMENT

Building a global partnership for broadband development with concrete commitments, recognizing that the cross-sector and cross-cutting nature of broadband will take us beyond the MDG agenda.

a) Urgent and renewed attention is needed in capitalizing on the consensus agreed in MDG 8 to build a global partnership for development in cooperation with the private sector and ICT communities to reap the full rewards of innovation and investment.

b) Examples could include identification of UN system and Member State programmes or initiatives for development that are based on technology outreach platforms and which may benefit from broadband scalability. An initial step should be to identify and carry out various broadband

projects that require global cooperation, such as knowledge-sharing through broadband, global disaster prevention, resolving educational problems and disease eradication.

c) A baseline evaluation of the catalytic impact of broadband technology as an enabler for the achievement of the inter-dependent MDG agenda should be developed in order to quantify the socio-economic impact of these public private partnerships.

d) The successful deployment of broadband would be assisted by a practical support system at the United Nations level which will enable the best practices of broadband use to be shared and spread globally.

ACTION POINT 10
NEXT STEPS FOR BROADBAND PARTNERSHIPS AND PROJECTS

Next steps for partnerships, with concrete coordination including innovative and multi-stakeholder follow-up mechanisms at the national, regional and global levels, including national broadband committees.

a) A number of follow-up mechanisms to the *Broadband Commission for Digital Development* are recommended that would comprise innovative, dynamic and flexible working methods:

- A High-Level Advocacy Group modelled on the *Broadband Commission for Digital Development*.
- A Public Private Partnership Platform for Sustainable Broadband Business Models.
- A multi-stakeholder Think Tank for Broadband 4 Development.

b) It is strongly recommended that the principal follow-up actions suggested by the *Broadband Commission for Digital Development* are firmly and effectively anchored in the United Nations' forthcoming 'MDG Accelerator and Sustainability Framework'.

c) We request the UN Secretary-General to consider embedding broadband in the UN Development Assistance Framework (UNDAF). In practice, this would be a two-part actionable item:
a. Agreement of a universal policy for broadband in the UN System; and
b. Inclusion of a discrete line item in all technical assistance projects.

d) This task should be pursued under the umbrella of building a global partnership for development between the private sector, the civil society and ICT community, including making available the benefits of new technologies, especially ICTs (MDG8). A baseline measurement of the catalytic impact of broadband technology as an enabler for the achievement of the inter-dependent MDG agenda should be developed in order to quantify the socio-economic impact of these PPPs.

e) Best practices and case studies of investment projects in developing countries should be collected and summarized, ideally using an online repository. The *Broadband Commission for Digital Development* should consider forming a project or a working group to compile this information. Project criteria should be defined so that the information collected is useful to the Commission. The Commission should then analyze good case studies for replicability and scalability.

f) Broadband Commissioners may support pilot projects which will demonstrate the use of broadband technologies in supporting the MDGs.

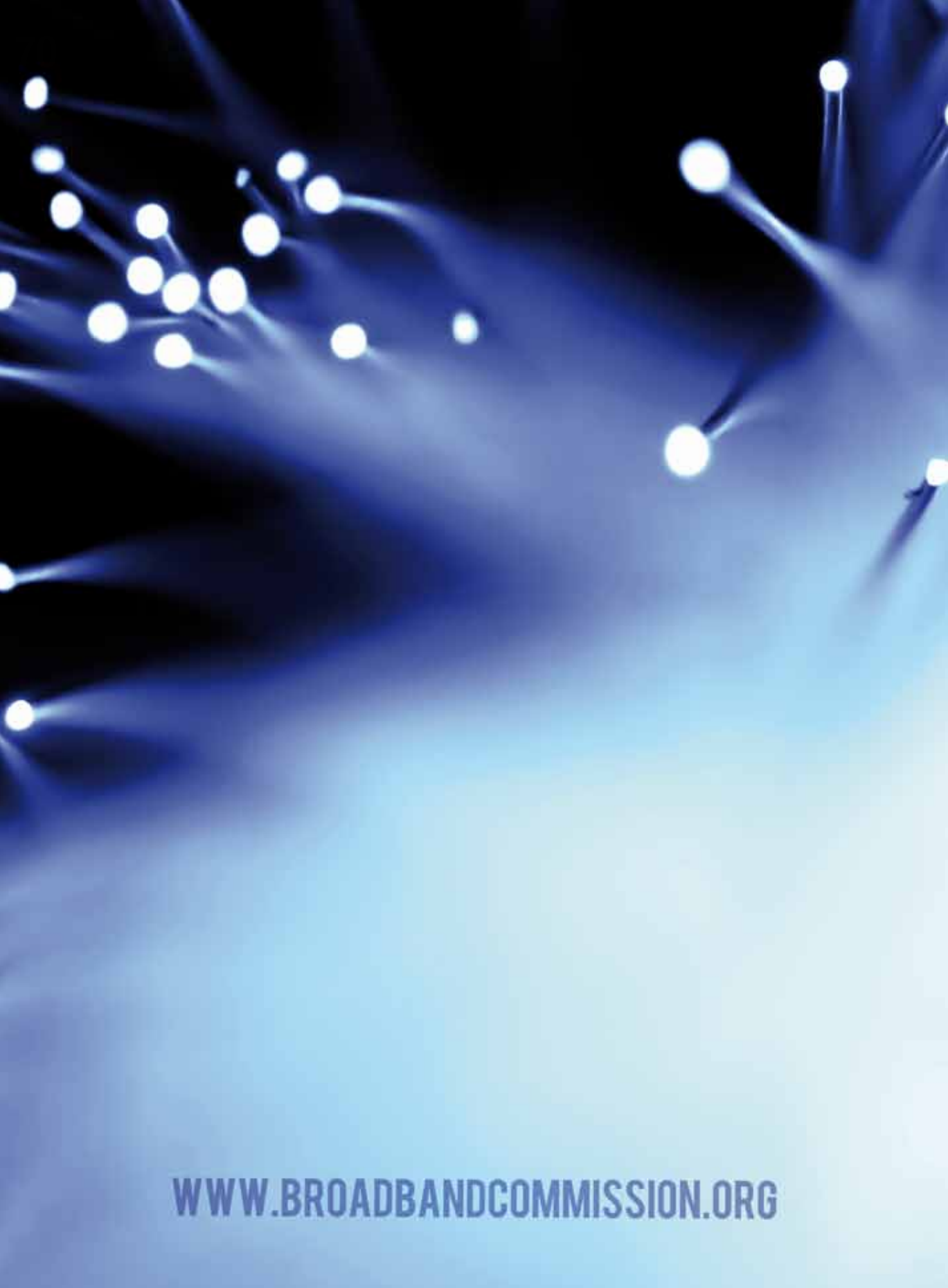
g) Finally, we recommend the creation of National Broadband Plans in all the 192 Member States of the UN, with a twin focus on advocacy and investment in broadband.

Acknowledgements

The Co-Chairs and Vice-Chairs would like to thank the Secretaries of the Commission – namely, Indrajit Banerjee, Doreen Bogdan-Martin and Denis Gilhooly – and the core team of Patricia Benoit-Guyot, Phillippa Biggs, Janet Burgess, Jose Maria Diaz Batanero, Vanessa Gray, Toby Johnson, Piers Letcher, Youlia Lozanova, Sarah Parkes, Béatrice Pluchon, Jaroslaw Ponder, Ana-Dory Rodriguez, Susan Schorr, Robert Shaw and Susan Teltscher, as well as Paul Budde, for their unfailing efforts in the preparation of this Report. The InDesign version of this Report was prepared by Nkumbe Njume-Ebong, under the supervision of Daniel Lutz. We also thank all Commissioners and Focal Points for their dedicated and extraordinarily substantive input throughout this process.

LIST OF ACRONYMS AND ABBREVIATIONS

4G	Fourth-Generation Mobile Telephony
AIDS	Acquired Immune Deficiency Syndrome
CDMA	Code Division Multiple Access
DOCSIS	Data Over Cable Service Interface Specification
DSL	Digital Subscriber Line
ERP	Entreprise Resource Planning
EV-DO	Evolution-Data Optimized
FTTH	Fibre-To-The-Home
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GPS	Global Positioning System
GSM	Global System for Mobile Communications
HIV	Human Immunodeficiency Virus
HSDPA	High-Speed Downlink Packet Access
ICT	Information and Communication Technology
IMS	IP Multimedia Subsystem
IMT	International Mobile Telecommunications
IP	Internet Protocol
IPRs	Intellectual Property Rights
ISP	Internet Service Provider
ITU	International Telecommunication Union
IXP	Internet exchange point
LDCs	Least Developed Countries
LTE	Long-Term Evolution
MDGs	Millennium Development Goals
NBN	National Broadband Network
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
PRSP	Poverty Reduction Strategy Paper
R&D	Research & Development
SIDS	Small Island Developing States
SMEs	Small- and Medium-sized Enterprises
TCP	Transmission Control Protocol
UMTS	Universal Mobile Telecommunications System
UNDESA	UN Department for Economic and Social Affairs
UNECA	UN Economic Commission for Africa
UNECE	UN Economic Commission for Europe
UNESCAP	UN Economic & Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCWA	UN Economic & Social Commission for Western Asia
UPE	Universal Primary Education
WAC	Wholesale Applications Community
WHO	World Health Organization
WLAN	Wireless Local Area Network
WSIS	World Summit on the Information Society



WWW.BROADBANDCOMMISSION.ORG