

**ICT4D**

# Trends in ICT and the Question of Sustainable Development

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# Agenda

- About me
- Role of Information and Communication Technology & sustainable development
- Reality of haves and have-nots in the global context
- Perspectives on ICT and Sustainable Development
- New ICT trends and information sharing
  - Web-based kiosks
  - Wireless technologies
  - Web 2.0. (social networks, mashups, digital convergences)
- Cases (BOP)
- Building sustainability

# About Me

- Academic Background
  - Ph.D., M.Phil. in Mathematics Education, Columbia University
  - Management & Leadership in Education Program, Harvard University
  - Executive Education in E-Commerce, Columbia University
  - Ed.M. in Instructional Technology & Media, Columbia University
  - M.S. in Computer Science, New York University
- Professor of E-Business and Information Technology, Pace University
- Visiting Professor, UMH Business School, Belgium
- Fulbright Scholar, Fulbright Mentor and Reviewer
- High-level Adviser, United Nations Global Alliance for ICT & Development
- Adviser, Various NGOs, nonprofits and corporations including CIO, Computerworld, Microsoft, International Commission on Workforce Development
- Judge, World Summit Awards, CIO 100, Imagine Cup, Computerworld Honors, Emmy Awards for Advanced Technology
- 8 Years as Academic Dean, 14 Years as Professor

Internationalist, Professor, Computer Scientist, ICT Advisor & Strategist

# Role of ICT & Sustainable Development

- “To reach the goal of harmonious economic, societal and environmental advancement, development must be managed by a comprehensive approach.”<sup>1</sup>
- By realizing and harnessing the potential of what ICT can do to support and advance the sustainable development.
- What? Why? How? (Infrastructure and support base)

Source: 1. Unsure about what ICT to use in developing world. “Appropriate ICT is not yet available for many sustainable development needs,” Speech given by Wang Qiming, Director of Information Networking Division, Ministry of Science and Technology of China, 2. Arunachalam, Reddy, Subrahmanian & Tongia, Carnegie Mellon University.

# Reality of haves and have-nots in the global context

- World - 6,6B<sup>1</sup>
- “It has been estimated that in 2001, 1.1 billion people had consumption levels below \$1 a day and 2.7 billion lived on less than \$2 a day.”<sup>2</sup>
- “The 4 billion people are at the base of the economic pyramid (BOP) – all those with incomes below \$3000 in local purchasing power - live in relative poverty.”<sup>3</sup>
- Severity depends on the region (North-South problem)
- Market potential – \$ 5 trillion global consumer market

Sources: 1. U.S. Census Bureau, 2. The World Bank, 3 & 4. International Finance Corporation & World Resource Institute, 2007

# Global Opportunities Global Challenges

Health Issues, Diseases

Environmental Issues

**About 3 billion people are living under \$2 a day.**

Hunger

**Poverty**

Gender Equity

Lack of Basic Education

**About 4 billion people are living under \$3,000/year.**

Conflicts, Wars

Unemployment



United Nations

**Millennium Development Goals (MDGs)**

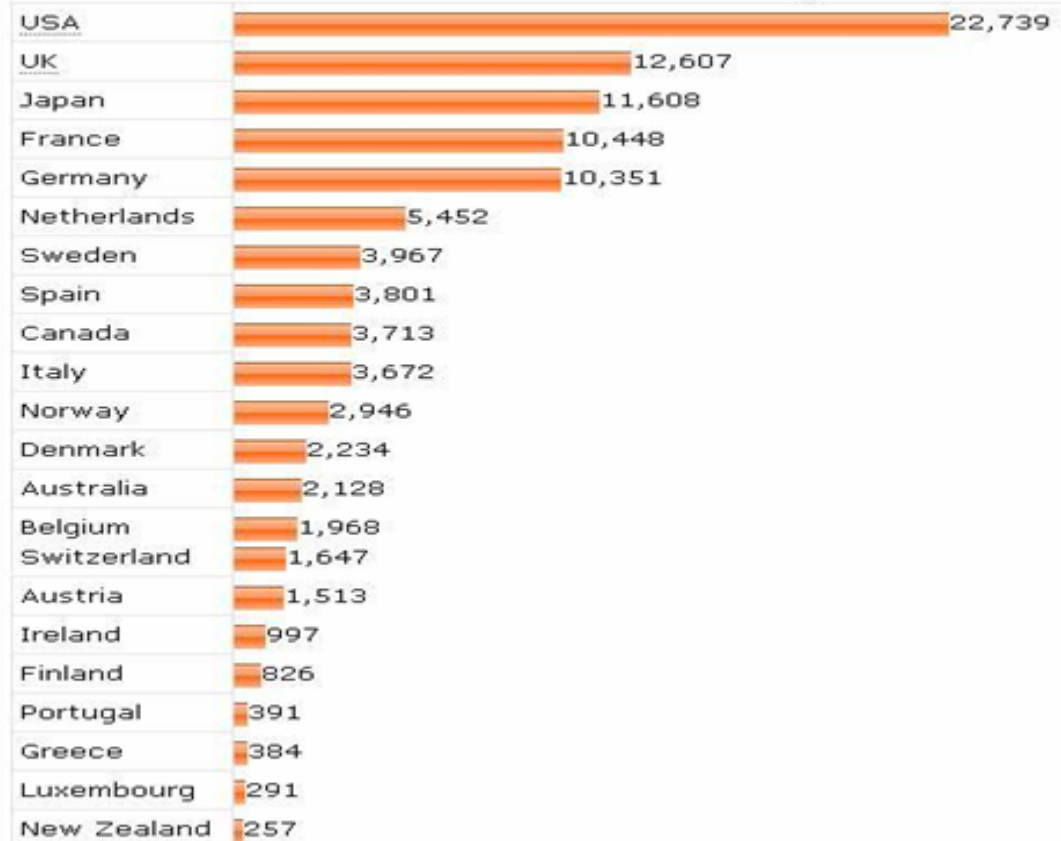
# Rich Countries

- Recently, EU pledge to spend 0.56% of GNI on poverty reduction by 2010, and 0.7% by 2015.
- However, the donor governments promised to spend 0.7% of GNI on ODA (Official Development Assistance) at the UN General Assembly in 1970—some 35 years ago.
- The deadline for reaching that target was the mid-1970s. “In recognition of the special importance of the role which can be fulfilled only by official development assistance, a major part of financial resource transfers to the developing countries should be provided in the form of official development assistance. **Each economically advanced country will progressively increase its official development assistance to the developing countries and will exert its best efforts to reach a minimum net amount of 0.7 per cent of its gross national product at market prices by the middle of the Decade.**”  
*(International Development Strategy for the Second United Nations Development Decade, UN General Assembly Resolution 2626 (XXV), October 24, 1970, para. 43)*
- By 2015 (the year by when the Millennium Development Goals are hoped to be achieved) the target will be 45 years old.

The charts and data below are reproduced from the OECD (using their latest data, at time of writing. It will be updated when new data becomes available).

[Aid as % of GNI](#) **Aid in dollars** [Raw data since 2003](#) [More charts](#)

### Net ODA in 2006 as US dollar amounts (millions)



Source: [OECD Development Statistics Online](#) last accessed Saturday, April 07, 2007

Total: \$104 Billion

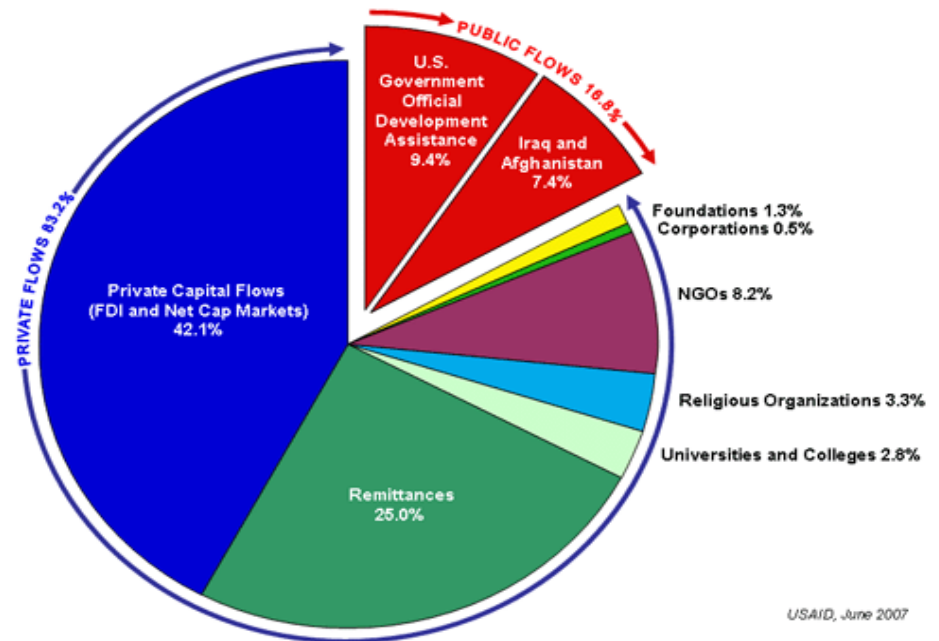
Source: <http://www.globalissues.org/TradeRelated/Debt/USAid.asp#RichNationsAgreedatUNto07ofGNPToAid>

# Private Capital

“The relationship between Official Development Assistance (ODA) and private flows into the developing world has been completely reversed in recent decades, and the latest figures bear out this continuing shift.

A new analysis from USAID's Global Development Alliance (GDA) shows how **private capital increased from about 30 percent in the 1960s to more than 80 percent in 2005**. In contrast, public funding of development, once the driving force for international giving, has diminished in proportion, accounting for less than 17 percent in 2005, even as the total value of ODA has increased. Between 2003 and 2005 alone, public-private flows increased by \$52 billion, bringing the total to \$164 billion.

Building alliances with private sector partners is critical to leveraging the effectiveness of public aid to poor countries. Through the GDA, USAID recognizes the vital role of **public-private alliances in achieving transformational development goals.**”



USAID, June 2007

Source: USAID

# Corporate Social Responsibility (CSR) Debate

“is a concept whereby organizations **consider the interests of society by taking responsibility for the impact of their activities on customers, employees, shareholders, communities and the environment in all aspects of their operations.** This obligation is seen to extend beyond the statutory obligation to comply with legislation and sees organizations voluntarily taking further steps to improve the quality of life for employees and their families as well as for the local community and society at large.” (Wikipedia)

# Progress with Cost

- **Industrial Revolution to Information Revolution (Dirty → Clean?) to Automation (Virtual)**
- **Knowledge Society (physical assets → knowledge assets)**
- **Are “we” ready?**

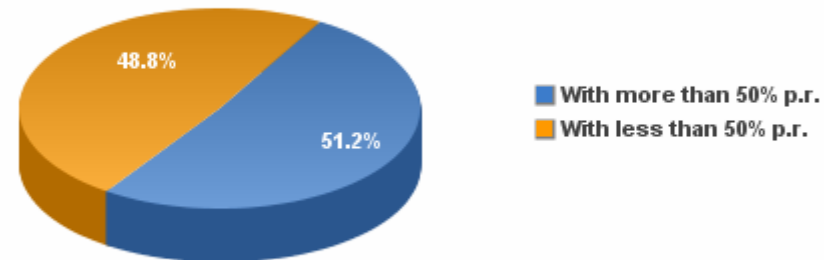
# Internet

## Over 1 Billion Internet Users Worldwide

Younger, well-educated, higher income, more male



**Internet Users Distribution  
December 2007**



Source: Based on 1,319,872,109 Internet users in the world  
Copyright © 2008 - [www.internetworldstats.com](http://www.internetworldstats.com)

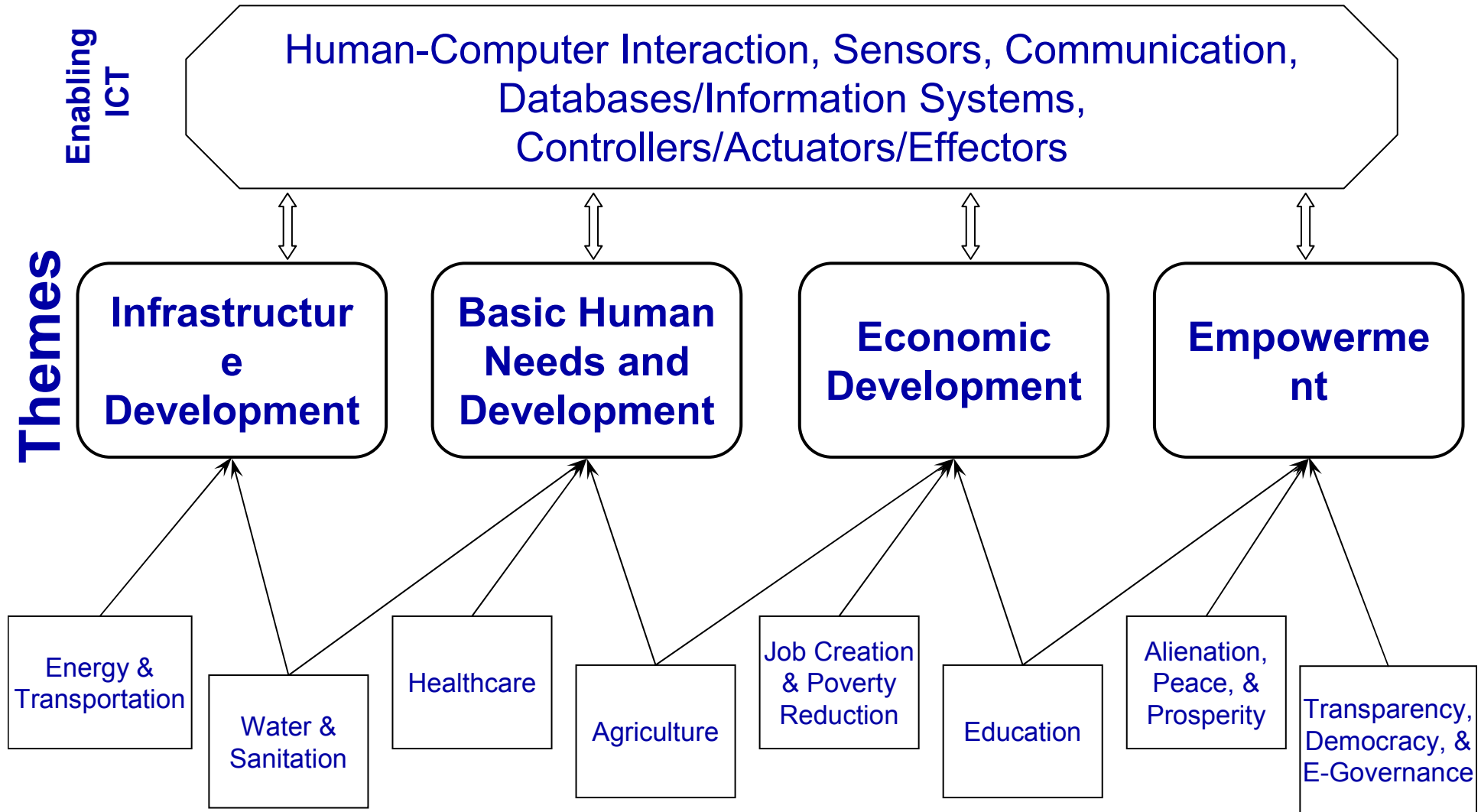
# Perspectives on ICT and Sustainable Development

- **No question about what ICT can do. 25/60 years**
- **But ICT for Sustainable Development?**
- **Factors: “political stability, economic infrastructure, literacy, healthcare,”<sup>1</sup> governance basic structure (water, housing, electricity etc)**
- **ICT played a significant role as part of the national development strategy**
  - **ICT Development on the production of hardware and software for export (Costa Rica, Taiwan)**
  - **Meet the internal needs (Brazil, India and Korea)**
  - **Additional mean for the enhancement of their economic development<sup>1</sup>**
- **“more than 75% of world’s internet users live in the developed countries that make-up less than 15% of the world’s population” “the world was witnessing a new wave of migration of the youths in info-poor to info-rich countries, in search of opportunities.”<sup>2</sup>**

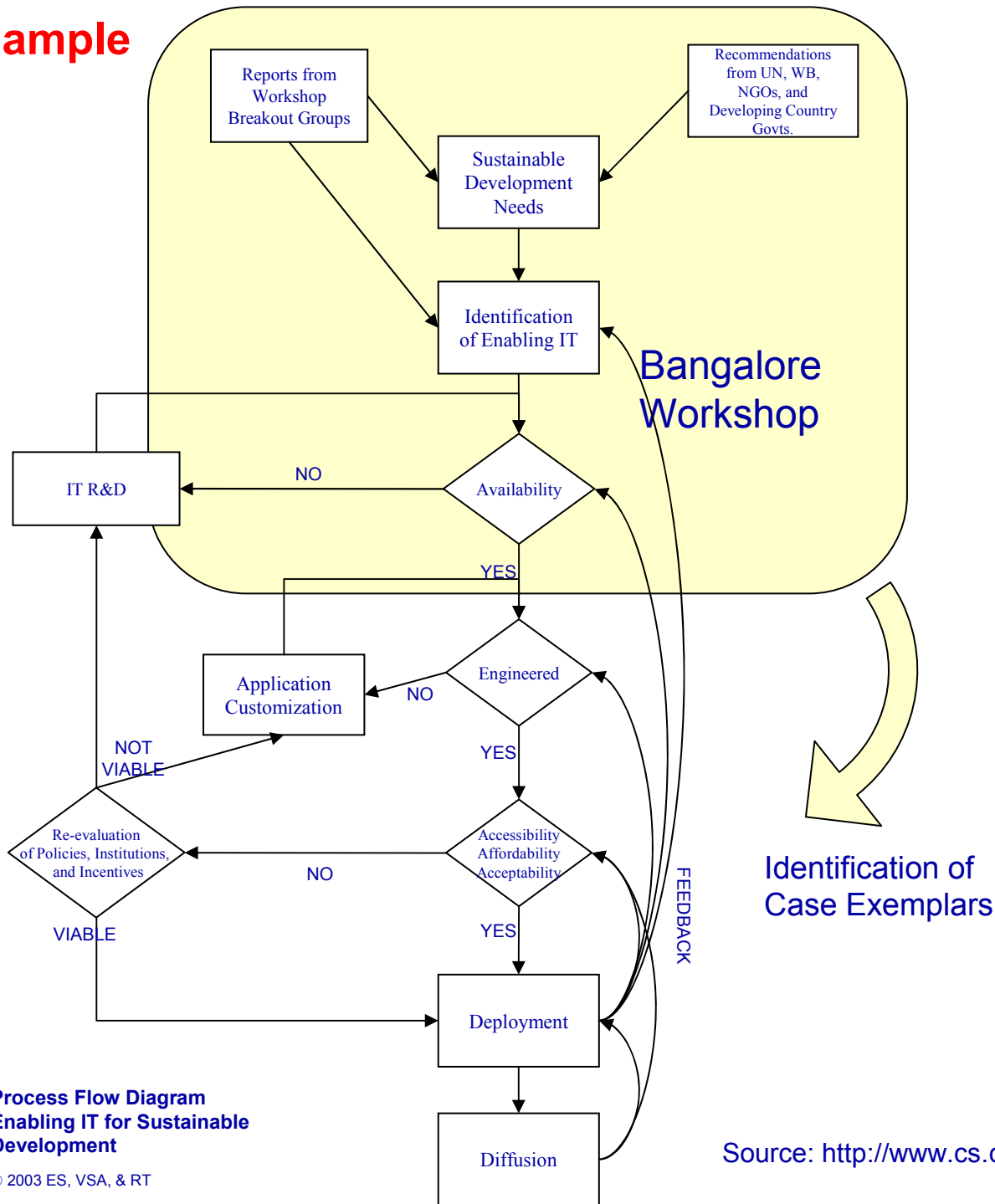
Source: 1. K. Boyannov and O. Mrtikainen, “Some Trends in ICT – the Challenges for Europe,” International Workshop NGNT, 2. “Digital Solidarity Fund Regional Director for Africa Speaks at the European Forum on ICTs and Sustainable Development.”

Sample

# ICT and Development (Groups)



# Sample



# Research, Development, and Diffusion Process Template for ICT

Issues of Appropriateness, Affordability, and Impact are *central* to ICT research and design, instead of merely affecting penetration and deployment

**Process Flow Diagram  
Enabling IT for Sustainable  
Development**

# Beyond Research

- MIT
- CMU

# New ICT trends and information sharing

- Web-based kiosks (Developing countries)
- Wireless technologies
- Web 1.0 (hyperlinks, static) → Web 2.0 (tagging knowledge objects with social component, dynamic) → Web 3.0 (Smart Web)
- Web 2.0. (social networks, mashups, digital convergences, social software –wikis, blogs, vlogs)
  - Ipod economy
- Wikinomics

# Mass Collaboration

“we are talking about deep changes in the structure and modus operandi of the corporation and our economy, based on new competitive principles such as openness, peering, sharing, and acting globally.” (Don Tapscott, Wikinomics)

# Cases (UN Role)

“One success story is the Sustainable Development Networking Programme (SDNP) which has assisted 30 to 40 countries for Internet connectivity.”

Source: “Can ICT Promote Sustainable Development?” Speech given by Wang Qiming, Director of Information Networking Division, Ministry of Science and Technology of China

# Cases (BOP)

- Grameen Bank, microcredit, Bangladesh
- Grameen Phone
- Muhammad Yunus, Social Business
- Microlending

# Cases (Food)

- **Increasing population (9B in 2050)**
- **Decreasing availability of natural resources**
- Food – ICT to enhance food security and support rural livelihoods endorsed by World Summit on the Information Society 2003-2005
  - Enhancing agricultural production
  - Improving market access
  - Capacity-building and empowerment
- Recommendations
  - ICT should be integrated into agricultural sector policies and lead to supportive programmes.
  - Foster learning and exchange of information at various levels.
  - Raise awareness on the role of ICT4D in poverty alleviation.
  - Ensure availability and access to relevant information, media and tools for communication (on demand)
  - Enhance rural access, cheaper and improved connectivity

Source: J. Stienen, W. Bruinsma, and F. Neuman, "How ICT can make a difference in agricultural livelihoods," International Institute for Communication and Development, 2007.

# Cases (Healthcare)

- Cape Town, South Africa
- ICT-Enabled Development Case Studies Series: The Compliance Service uses SMS technology for TB treatment
- Problem - Cape Town has one of the world's highest incidences of TB, largely due to socio-economic and climatic factors. TB patients must strictly follow a difficult drug regime -- four tablets five times a week for six months -- and they often forget to take their medication. Non-compliance with the drug treatment has exacerbated the high occurrence of TB and has created difficulties for the local, overburdened healthcare service. Precious medicines are wasted when people do not take their medication on schedule, and non-compliance causes the TB virus to become increasingly drug resistant.
- Solution - Dr. Green uses SMS (Short Messaging Service) -- text message service that enables short messages of up to 160 characters to be transmitted between cell phones -- to alert patients to take their medication. Healthcare professionals were skeptical whether the uptake of cell phone technology was high enough to justify the project. However, Dr. Green found that over 50% of people in the Cape Peninsula had access to cell phones. At the clinic where the pilot study was conducted, 71% of TB patients had access to a cell phone. Dr. Green enters the names of TB patients onto a database. Every half an hour his computer server reads the database and sends personalized messages to the patients, reminding them to take their medication. The technology that he uses to send out the messages is extremely low-cost and robust: an open source software operating system, web server, mail transport agent, applications, and a database. Currently Dr. Green charges the City of Cape Town R11.80 per patient per month to send out SMS messages.

Source: IICD and bridges.org

# Cases (e-government)

- Hyderabad/Secunderabad and Ranga Reddy District, India
- Efficient and integrated way of delivery G2C and B2C services
- 44 centres (with 400 service counters). The online Saukaryam centres of the Visakhapatnam Municipal Corporation are operating as 'eSeva Saukaryam' centres following the merger of eSeva and Saukaryam. All service counters are facilitated with an electronic queuing system. eSeva operates from 8.00 am to 8.00 pm, on all working days and 9.00am to 3.00pm on holidays (Second Saturdays & Sundays). eSeva is a One-stop-shop' for over 66G2Cand B2C services.
  - Payment of Utilities Bills
  - Certificates
  - Labour Department
  - Permits / Licences
  - Transport Department Services
  - Information
  - Reservation
- Over 2 millions citizens are served every month as of June 2004

Source: "Make ICTs work for people," [http://www.nisg.org/ictd\\_docs/ICT%20case%20studies.pdf](http://www.nisg.org/ictd_docs/ICT%20case%20studies.pdf)

# Building sustainability with ICT

- Appropriate application and deployment according to linguistic, cultural, social, economical and religious conditions
- Enabling local communities
- Education and training, knowledge transfer
- Partnership between private and public sectors
  - examples
- Funding, investment with ROI expectation
- Market development

“ the United Nations can only do its job properly with partners. We will need to forge even closer ties with civil society groups, foundations, academic institutions, the media, labor unions and the private sector. Each has unique contributions to make.”

- Secretary-General Ban

(In address to UNA-USA Business Council, 10 January 2007)

# Contact Me

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