# Approaches to
# Information and Communication
# Technologies (ICTs)

December 18, 2005

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# Presentation Outline

- **Enabling Environment**
  - Legal & Regulatory – Telecom, IPR, Etc.
  - Examples

- **Infrastructure**
  - National Networks - Backbone and Distribution
  - Government Networks
  - Examples

- **Content and Services**
  - Government
  - Private Sector
  - Examples

# Enabling Environment – Keys to Success

- Essential Pieces: Political Will & Supporting Policy
- Focus: Expanding Access to ICTs
- Rational: Socioeconomic Growth
- Leveral Point: Setting the Legal and Regulatory Environment so Private Sector will Invest and Built-out Infrastructure
- Work Closely with MDBs and other Donor – Takes a Concerted Effort beyond USAID resources
- Fundamental to Success in Many Other Areas

# Enabling Environment – Type of Engagements

- **National ICT Strategic and Tactical Plans**

- **Drafting New Telecom Law – Opening Competition**

- **Setting up and Strengthening Regulatory Function**

- **Drafting Telecom Regulations**

- **Frequency Management – Allocation & Monitoring**

- **WTO's Basic Telecom Agreement (BTA)**

- **WTO's Information Technology Agreement (ITA)**

- **USTTI-Supported Training in Policy, etc.**

- **Intellectual Property Rights (IPR)**

# Enabling Environment – A Few Examples

- **Armenia: Developed National ICT Strategic & Tactical Plan**

- **Armenia: Drafting New Telecom Law**

- **Armenia: Strengthening Multi-Utility Regulator**

- **Jamaica: Review-Comment on Draft Telecom Law**

- **Jamaica: Clearing Frequency for new Mobile Licenses**

- **Vietnam: Shaping Universal Access-Service Program with Funding**

- **TLP Conferences & Workshops**

- **USTTI Seminars & Training**

# West Africa Roaming & High Speed Internet Access

- Objective: lower the cost and increase the accessibility of mobile and Internet services across the West African sub-region

- Focus: promote uniform telecommunications policy and regulation and enabling the expansion of intra-regional backbone networks.

# Infrastructure – Type of Engagements

- National Networks - Backbone and Distribution

  - International Connectivity – Satellite and Fiber

  - Rural Broadband (Last Mile Initiative)

  - Studies for In-Country Backbone

- Government Networks

  - Central Services (Internet Access, Web Hosting, E-Mail

  - Government Wireless Network

  - Departmental Networks

- Examples

# Infrastructure - Current Realities

- **Mobile**
  - 1994: 1 Million; 2004: 1.8 Billion; 2007 EOY: 3.25 Billion
  - 50% World's Population
  - 65% of Mobile Subscribers are in Developing Countries
  - Key 1: Market Liberalization is Working
  - Key 2: Voice Gap is Rapidly Narrowing

- **Internet**
  - 13% with Access to Internet;
  - Only 5% with Broadband Access;
  - Only 1% of Broadband Access is in Developing Counties
  - Key 1: Broadband is Essential for WSIS Commitments
  - Key 2: Broadband Internet Gap is Growing

# Infrastructure - Last Mile Initiative (LMI)

- Focus: Expanding Telecom into Rural Areas
- Keys: Innovative Technology and Business Models, along with Public Private Partnerships
- Implementations in 33 countries
- Key Technologies: Broadband Wireless & Voice over IP
- Sustainability and Scalability: Private Sector approach
- Platform of Delivering Content and Services
- Tapping into Universal Service-Access Funds
- Led to USTTI Expanding Rural ICT Access Seminar
- Led to PPP between USAID and Intel
- Other Key PPPs with Qualcomm & Microsoft
- Lessons Learned for Adoption beyond LMI
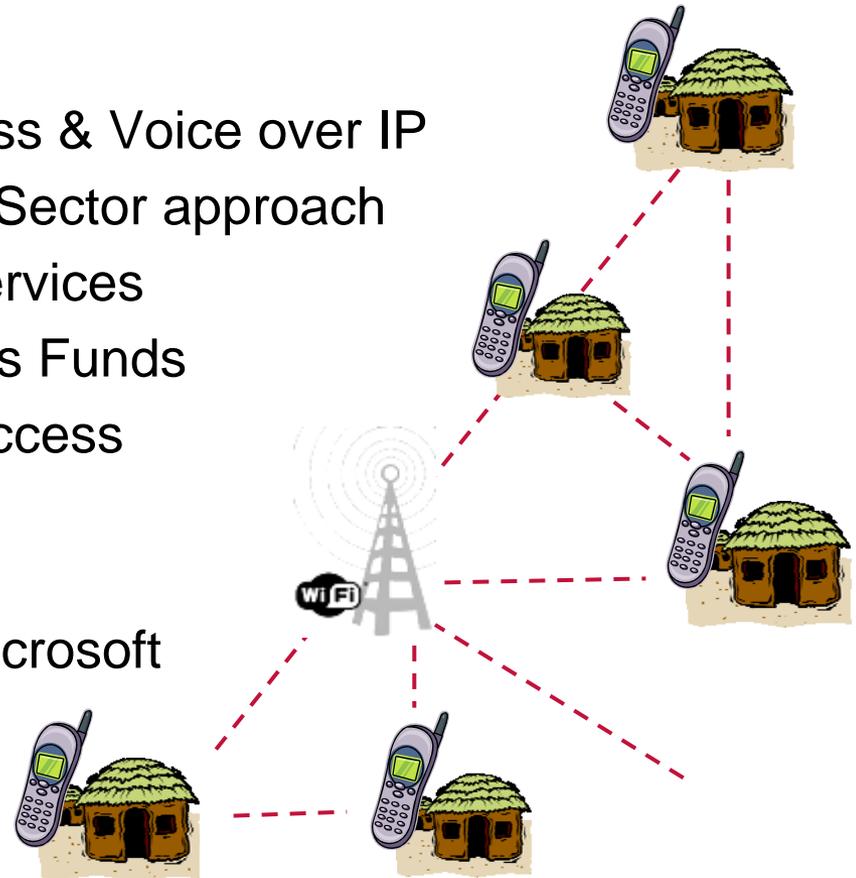
# Infrastructure – A Few Examples

- Eritrea: Provided Technical Assistance for Roll-out of Mobile

- Vietnam LMI: Demonstration of Rural Solution using Satellite-WiMAX-WiFi-Internet-VoIP Approach

- Mongolia LMI: Launch of Satellite-WiFi-Internet-VoIP solution with Local Firm…reaching rural Soums & Baghs

- Sri Lanka LMI: TeleCenters providing Broadband Internet Access, International VoIP, Content-Service Packages

- Latin American LMIs: microTelcos

- Africa LMIs: Study of Joint Satellite Capacity Purchase

# Infrastructure – A Few More Examples

- Armenia: LAN with PCs and Training for Various Ministries

- Armenia: Network for Linking Central Bank with Private Banks

- Armenia: Setting up ATM Network

- Multiple Countries: Setting up CISCO Academies

- Georgia Internet Assessment

- West Africa Roaming and High Speed Internet Access – Lower Cost

- Haiti: Government Wireless Network

# Haiti IFMS

- Assessed the utilization and effectiveness of the current metropolitan network in combating corruption;

- Provided technical assistance in extending the MEF network into 31 sites in 15 regional centers and border posts; to provide assistance to the MEF in the implementation of the IFMS system;

- Provided assistance in the maintenance (including the establishment of protocols and procedures, technical training, vendor-based maintenance agreements, local maintenance provision) of the network.

# Content and Services – Type of Engagements

- Government
  - National Internet Portal
  - Online Development Agency – One-Stop-Shop
  - Financial Systems
  - Customs
  - Cadastre

- Private Sector
  - IT-Related Business Associations
  - IT-Study Tours
  - IT-Related Training, Conferences-Workshops

- Examples

# Content & Services – A Few Examples

- St. Vincent: National Portal

- Armenia: Portal for Armenian Development Agency

- Armenia: Business Registry

- Armenia & Others: Support of National ICT Association and membership into WITSA

- Armenia: Cadastre – Real Property Tracking

- Multiple Countries: FinA (Central Bank Financial Audit Package)

- Haiti: Integrated Financial Management System (IFMS)

# Content & Services – A Few More Examples

- Azerbaijan: Treasury Management System (TIMS)

- Asian Influenza Spot Map package

- Several Latin American Countries: Labor Portals

- African Virtual Open Initiatives and Resources (AVOIR)

# Treasury Information Management System (TIMS)

- The BPA's first project was a rapidly executed effort to assess the effectiveness of the TIMS project in Azerbaijan. We sent a team of financial system specialists to analyze a USAID sponsored deployment of SAP software for the Government of Azerbaijan and report on what had been accomplished and make recommendations for follow-on work.

- The scope of this project is to determine the resources (institutional, human and financial) required to maintain and effectively use the current functionality of the TIMS; to determine whether further technical assistance is needed to enhance the future functionality of the current TIMS through follow-on support; to assess the additional resource requirements to support and exploit such additional functionality; and, should follow-on support be deemed beneficial, the scope of this project will include the determination of high-level requirements for the maintenance and development of current functionality and the implementation of future functionality and a supporting project plan and Level of Effort (LOE) estimate.

# FinA Africa

The objectives of this project are threefold:

- Enhance the FinA software such that all known bugs are fixed and appropriate enhancements that help maintain the utility of the software are completed.  This includes updating third party components used in the application and ensuring that the software meets industry standards for stability, reliability and documentation.
- Build upon the experience in existing installations to add two new installations in sub-Sahara African countries, as designated by the EGAT Office of Economic Growth (EG).
- Establish a demonstration system that incorporates a model regulatory reporting format which can be used for banks and non-bank financial institutions, including micro-finance institutions.

# ICT in DG, Health, Education

*…ICT is a powerful means to enhance impact of DG, Health, Education Programs*

- Education
  - The universal appeal of computers in schools
  - The great challenge of using ICT well as teaching tool

- Democracy and governance
  - e-Government services, e-governance…
  - Strengthening independent media
  - ICT to enhance election processes

- Health – *where (much of) the money is*
  - PEPFAR, Malaria, Avian Flu
  - And beyond



*… leverage ICT investments across programs!*

# ICT and Competitiveness

- **Questions to ask during value chain analysis**
  - What types of ICT are VC actors already using – shared or not?
  - What types do they have *access* to – how affordable?
  - Sources of power – price, availability?
  - Competition between providers you can leverage?
  - Other donor projects using ICT to piggyback on?
  - Universal service fund opportunities?

- **Questions to pose to experts in your target end market(s)**
  - How does competition use ICT along its value chain?
  - How do key end market customers use ICT today?
    - Internally
    - With other suppliers

# POTENTIAL SOLUTIONS ACROSS THE VALUE CHAIN

| Where in VC | Key Constraint | ICT-enabled Solution |
|---|---|---|
| End Market | Fishermen don't know which port paying most for fish | Cell phone calls to agents in ports |
| Vertical linkages | Wholesale customers want closer relationships with "their" coffee co-ops | Email for coffee coops via cell phone networks |
| Upgrading + Power Balances | Tropical fish catchers not gaining value from higher quality harvesting techniques | Bar-coding enables end market to reward quality with better price |
| Support Markets, End Market, Power | Farmers don't know market prices, weather | Farmers in Mali get weather, prices by radio<br><br>Indian farmers get prices, info on weather, inputs, more via PC |
| Support markets | Finance: Farmers not making loan payments; banks can't monitor well | Farmers use cell phones to pay loans; banks can selectively SMS reminders |

# Quick Look:  RADIO HELPS FARMERS IN MALI

- **Constraint:**
  - **Vertical Linkages**:  Farmers across Mali unaware of market prices so don't know when to harvest, when and where to sell -
  - **Support Services:**
    - Crops wiped out from rare but severe rain, flooding
    - Extension workers hampered by poor roads, huge territories to serve

- **Solution:**
  - Government extension service uses country's network of community radios for market price
  - Radios provide key weather warnings from extension service
  - Radio stations paid for services so helps sustainability

- **More:**
  - Many farmers illiterate – but illiteracy often not such a big constraint for key applications
  - Community radio stations widespread, provide variety of services (some paid for by donors)
  - Power often not available so low-end battery radios best
  - Radio stations now have Internet access so can tap Web for farmers, others
  - SMS or voice messages via cell phone could work where cell phones used

# Quick Look:  MACEDONIAN APPAREL SECTOR DOOMED



- **Constraint:**
  - **End Market:**  Chinese competition about to wipe out key Macedonian sector due to cheaper prices per global market expert – so new market niche identified:  Italian quick-turnaround fashions
  - **Upgrading:**  Macedonian factories using outdated technology, slowing processes, increasing costs

- **Solution:**
  - 3rd party provider set up CAD/CAM fee-for-service so factories could share required upgraded technology they could not afford alone
  - USAID used tendering to provide up-front capital + management know-how to entrepreneur winner -- with terms requiring *service offering to all that will pay and incentives* to be profitable

- **More:**
  - Factory owners leery at first – so started with only the "CAD" part
  - Moved quickly to "CAM" due to entrepreneur's marketing
  - Brought in vocational schools so stream of pre-trained workers
  - Model proven so private investors stepping in to scale, extend to Bosnia

# Quick Look:  INDIAN FARMERS FACE TOUGH MOVE TO HORTICULTURE

- **Constraint:**
  - **Upgrading Farmers**:  Farmers have to grow new, perishable crop to meet end market timing, quality standards
  - **Support Market needs productivity gains**:  Private farm extension workers too expensive to reach all farmers well
  - **End market** demanding traceability of crops back to plots

- **Solution (now being implemented):**
  - Farm extension workers leverage PC's, PDA's to reach farmers via village reps
  - Supply chain software to tighten vertical linkages, reduce spoilage, allow harvesting to respond to variations in market demand
  - Traceability requirements integrated into supply chain application

- **More:**
  - Tricky to build partnerships so sustainable:  who pays for on-going operations?
  - Allows farmers to leverage traceability requirements to hone precision of their farming processes
  - Jury still out!

# Quick Look:  SMALL HOTELIERS LOST IN WEB

- **Constraint:**
  - **End Market:**  Web a must for reaching tourist – but complex and consolidating; stand-alone or even group websites not good enough
  - **Upgrading**:  Hoteliers and others in tourism sector don't understand end market and have poor + expensive access to Internet

- **Solution:**
  - Internet-based service for reservations, customer service – fee based
  - Includes web consolidation and visibility; coaching + feedback on meeting customer service expectations
  - Links hoteliers with other tourism service providers

- **More:**
  - Evolving business model – not quite sustainable
  - Had financial "leg up" from IFC
  - Small hoteliers apparently earning more
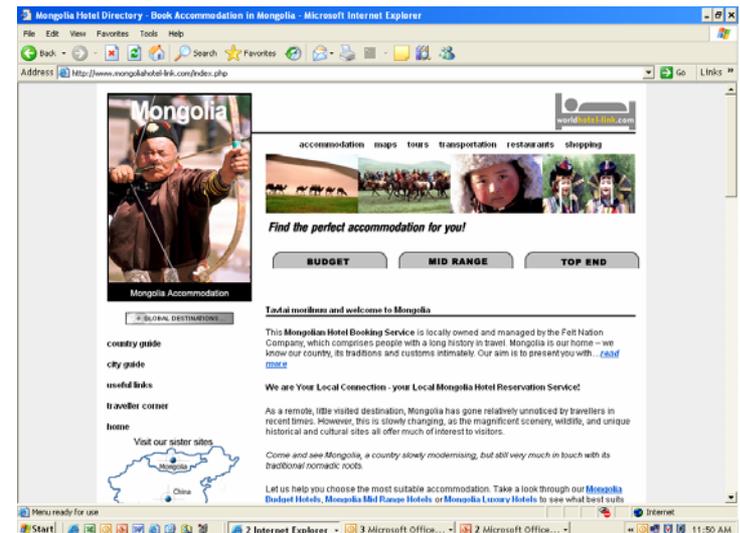
# Quick Look:  GHANAIAN FARMERS' PINEAPPLES SPOIL ON DOCK

- **Constraint:**
  - **Vertical Linkages:**  Ghanaian pineapples not bar coded so last to move off docks
  - **Upgrading:** Farmers have lower yields due to hit-or-miss processes and burdened with traceability paperwork with no benefits

- **Solution:**
  - Bar-coded pallets – on flash drive to port
  - Traceability integrated with pack house-to-field PDA application to meet requirements while ratcheting up precision similar to plantation techniques

- **More:**
  - Jury still out… being implemented now
  - If it works, software will be available for other USAID-sponsored projects
  - Using cell phone network, not Internet per se
  - Leveraging Universal Service Fund investments in extended cell phone access

# Quick Look:  Rwandan Coffee Farmers Disconnected from Their "Relationship" Customers

- ## Constraint:

  - **End Market:**  Rwandan coffee farmers boosted earnings dramatically by moving into "relationship" coffee market niche but this market requires much tighter relationship with end market

  - Internet access not pervasive and expensive

- ## Solution:

  - Farmers now have email link to their customers via cell phone network

- ## More:

  - Farmers needed to learn business etiquette for email use

  - Donor project pushed (probably) too far to provide expensive Internet access to some cooperatives

  - Lack of technical know-how to keep network running *may* be overcome by link to nearby University's tech students
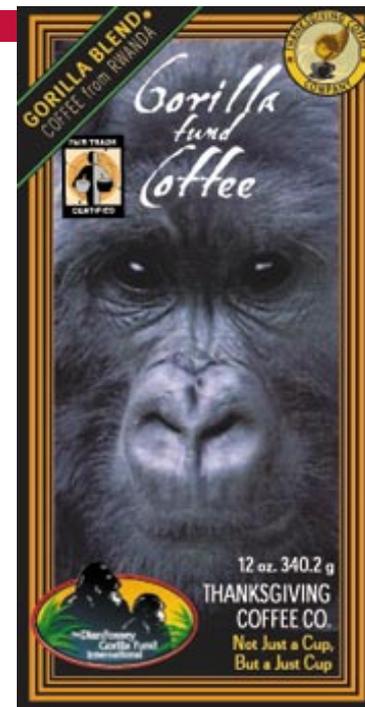
# WHAT WORKS AND WHAT DOESN'T …



- ☒ "Technology Push" (Coolness factor)

- ☒ Thinking mostly of the Web (access, presence)

- ☒ Full blown internet access points in rural areas (rarely unless VOIP)

- ☒ Sharing across projects (should work much better!)

- ☒ Beware of "pilots"!

- ☒ Give-aways, one-time subsidies may have a down side…

*If it is not sustainable, it isn't scalable.*

# WHAT WORKS …

☑ **Business approach** for service delivery – local entrepreneurs

**E-Mail** - still the killer application for most businesses

☑ USAID $ to pay for services - awarded via tenders

☑ Sharing application development & maintenance across users

☑ Care about telecom legal & regulatory environment

☑ Not re-inventing the wheel. Keep rights to source code!

☑ Plan exit strategy up-front – before spending $$$

☑ GDA's with local or international firms

☑ Who else wins when ICT access added?

☑ Can you share devices/applications across users?

*Stick to minimum needed*

# THANKS!

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