WORLD BANK GROUP
Transport & ICT

infoDev
Growing Innovation

SOME SUCCESS STORIES FROM THE ICT4D KTF

KTF on ICT4D Korean Trust Fund

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Expanding Broadband for Economic Development

Context

The objective of this project was to develop the "Broadband Toolkit," consisting of a handbook, a toolkit, and training materials for broadband implementation strategies focused on developing countries and building upon previous World Bank work. This objective has led to the creation of a modular global knowledge product that: (i) demonstrates how broadband enables economic and social development; and (ii) provides developing country policymakers and regulators with the tools to create strategies, design policies, and implement programs that expand the reach and increase the use of broadband ICTs so as to reap the developmental benefits they facilitate.

Impact of the Project

The completion of the broadband strategies handbook and toolkit has brought a high level of visibility to the analysis, shown, for instance, in the large number of countries that have adopted national broadband strategies. To date:

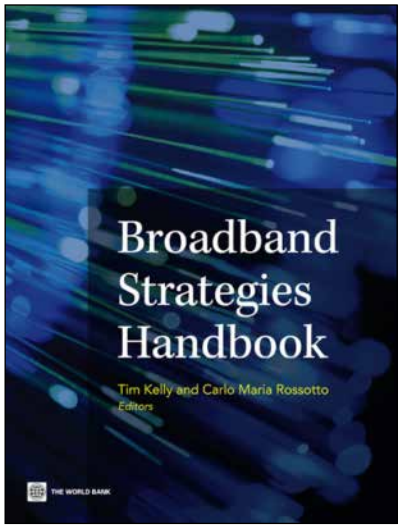
- There has been a high rate of dissemination of the handbook and toolkit, through distribution of handbook and web downloads. From February-March 2014, the website received an average 819 views per day, from 300 unique visitors with downloads of more than 200 MB per day (see chart).
- There has been an identified influencing policy development, especially relating to national broadband plans. An example of this is the national broadband plan of Mauritius, available at the mitc.gov website, which draws extensively on the handbook.
- South Africa has invited a World Bank representative to join their National Broadband Advisory Council as a result of this work.
- The work is widely cited in the academic world. Google Scholar lists more than 70 citations related to the work and the number is growing.
- The work has influenced other broadband resources, notably the OECD broadband portal and the work of the UN Broadband Commission.
- The work has informed World Bank lending programs, notably in the RCIP, WARCIP and CAB programs in Africa.

Seven Project Modules.

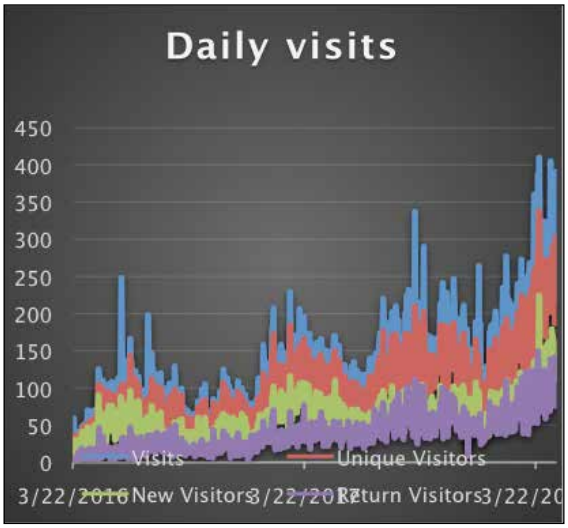
Expanding Broadband for Economic Development

Key Outputs and/or Outcomes

During the first phase of the project, the "Broadband Strategies Handbook" was published (February 2012) and three out of seven full modules were completed. A website was developed (www.broadband-toolkit.org) and seven case studies of broadband development completed and published: Brazil, Kenya, Morocco, Sri Lanka, St. Kitts, Turkey, and Vietnam. The first phase was completed in June 2012. A second phase saw the completion of the four remaining modules. These cover: universal access (Module 4), broadband technologies (Module 5), user demand (Module 6), and global footprints (Module 7). The final modules were uploaded to the website on April 16, 2014. Additional research was carried out on the absorptive capacity of different economies for broadband and its impact on economic growth.



Affordable broadband is a key pillar of the World Bank Group ICT Sector Strategy, 2012-2015.



Broadband Strategies Toolkit, web usage statistics, since launch on March 21, 2012 to April 22, 2014 www.broadband-toolkit.org.

Leveraging the HELP Grant for transformational projects

Context

The objective of the HELP Grant (a network of high level government leaders, experts, and practitioners) was to identify and catalyze high impact e-transformation projects and fee-based (FBS) engagements in countries that seek to leverage cutting-edge technologies and policy approaches, such as Open Data, cloud computing, cybersecurity, big data analytics, microwork, and open innovation for economic growth, poverty reduction, and citizen engagement.

Impact of the Project

The grant built a network of high-level government leaders, experts, and practitioners (The HELP Network), promoting the benefits that ICT can bring for socioeconomic development.

Key Outputs and/or Outcomes

In October 2012, the World Bank facilitated a study visit of then-Minister of IT of Ulyanovsk Oblast of the Russian Federation, Ms. Svetlana Opyonysheva, to the U.S., where she visited Albany, the Fairfax local governments, the ICEGOV 2012 conference, and held a series of meetings in Washington, DC. This study visit has had a major impact on the conclusion of the FBS agreement between the World Bank and the Government of Ulyanovsk Oblast in the area of Open Data and open government.

In November 2012, the World Bank took part in a high level international conference on Open Government in the Russian Federation, which presented a unique business development opportunity enabling the Bank to showcase its expertise and service offerings in open government among Russia's federal and regional executive leadership, including Prime Minister Dmitry Medvedev, Minister for Open Government Mikhail Abyzov, and 17 regional governors. Participation in this conference has facilitated further business development in the country by allowing the Bank to establish and deepen relationships with prospective federal and regional clients. As a result, the Bank was able to catalyze a new FBS agreement in the area of e-government and ICT development with the Ministry of Telecom and Mass Communications in the summer of 2013, which came about thanks to a major upstream effort facilitated by this HELP activity.

The video snapshot of the first conference day can be found here: *http://www.youtube.com/watch?v=hkqUXyv0z6A&list=UUIXvK4iqxyx6B-9BiluF1q_w&index=3* and event photos are accessible through this link: *https://www.dropbox.com/sh/4cq25ruye9u0avl/IPSdFN19WQ* Several Bank and Bank-invited experts have led a set of master classes (*http://xn--e1aajfpcds8ay4h.xn--80abeamcuufxbhgound0h9cl.xn--p1ai/broadcast/*) on specific topics of Open Government. The first part of the plenary session featuring Prime Minister Medvedev and Chris Vein can be viewed here: *http://www.youtube.com/watch?v=nymZLVxH2jo&list=UUIXvK4iqxyx6B9BiluF1q_w&index=4*, and the second part with Chris Vein and Andrew Stott can be accessed here: *http://www.youtube.com/watch?v=ZVFdKUdhwt4&list=UUIXvK4iqxyx6B-9BiluF1q_w&index=2*.

In late February 2013, the World Bank convened ministerial level representatives from several client countries (Rwanda, Ghana, Philippines, Kazakhstan, and Nicaragua) to participate in the high-profile HELP event on Smart Solutions during the Sustainable Development Network Forum 2013. The event was streamed live; recordings and speaker presentations can be accessed here: *mms://wbmswebcast1.worldbank.org/SDN/2013-02-28/SDN_Sector_Week..asf*.

Leveraging the HELP Grant for transformational projects

SMART Government Days in May 2013 in Ulaanbaatar, Mongolia were designed at the request of the Government of Mongolia to support its objective of greater competitiveness, transparency, and citizen engagement. A total of 200 participants from government agencies, private sector and civil society were convened to exchange experiences and knowledge on how to make use of the latest information and communication technologies to produce smart solutions for governance.

Under the auspices of the HELP grant, a series of discussions with global experts took place aimed at co-creation of a Smart Rwanda vision. The first co-creation exercise was "Smart Rwanda Workshop" organized as part of the ICT Solutions Day 2013 that engaged senior policy makers, World Bank specialists, external experts, and audiences in an open, collaborative, and iterative process of developing ICT-driven approaches to country-specific development challenges in health, education, and rural development. This workshop has deeply inspired the Rwandan Minister of Youth and ICT who subsequently requested the World Bank to continue the discussions with Rwandan stakeholders by helping to organize the "SMART Rwanda Days" event in Kigali, Rwanda in June 2013.

The smashing success of Smart Rwanda Days further inspired Minister Nsengimana and the Bank's team to replicate this approach at a regional level during the Transform Africa Summit in late October. Transform Africa was a major four-day pan-African ICT summit attended by more than 1,200 delegates, including Heads of States from Burkina Faso, Gabon, Kenya, Mali, Rwanda, South Sudan, and Uganda, senior representatives of more than 100 governments, top executives of major global brands like Facebook, Google, Microsoft, HP, SAMSUNG, SAP, Korea Telecom, and others. Thanks to HELP grant activities, the "smart" transformation agenda is now being mainstreamed across Africa through the newly created Smart Africa Alliance. These activities have illustrated how the Bank can help bring fresh and bold ideas to address client countries' most difficult development challenges.

In October 2013, the Government of Tanzania requested the World Bank to set up a videoconference consultation on Open Data policies with global experts from nations that

SMART Government Days Forum in Ulaanbaatar, Mongolia.

Leveraging the HELP Grant for transformational projects

have a first-hand expertise in implementing Open Data programs, including Kenya. Tanzania had started to implement its Open Data Initiative and wanted to learn about their Open Data experiences from a few countries. In view of this, the World Bank has facilitated a videoconference session between its global ICT experts group and Tanzanian leaders with an aim to provide targeted expert advice in response to some key questions raised by countries. Among experts invited to this discussion were senior officials and high-level experts from Kenya, UK, U.S., and Moldova. Representatives from Rwanda joined the consultation as observers.

The HELP grant was instrumental in identifying and facilitating the visit of city level officials and mayors from Europe and Central Asia to the CitiSense Conference in Spain in November 2013, organized by the World Bank, ESMAP and the Barcelona City Council. CitiSense hosted more than 230 stakeholders from about 90 emerging and developed cities, including city and municipal leaders, urban and energy specialists, and technologists from all around the world, combining the best expertise in smart cities, open innovation, and energy efficiency.

A video describing CitiSense is available at *https://www.youtube.com/watch?v=LRFBXSrTqUQ&feature=youtu.be*

Participation in the town hall Debate on Smart Transformation at ICEGOV 2013 presented an opportunity to exhibit the World Bank's thought leadership in the areas of smart government and Open Data, to showcase success stories from World Bank experience, and to engage in business development with Bank's clients from Tanzania, Ethiopia, Moldova, India, Uganda, and other countries.

The HELP grant has facilitated development of CIO and open data networks by co-financing World Bank's experts participation in key Open Data and e-government events, such as:

- European Regional Meeting of the Open Government Partnership in Dubrovnik, Croatia (September 2012);
- Open Knowledge Festival in Helsinki, Finland (September 2012);
- Global CIO Forum in Helsinki, Finland (May 2013);
- UN Public Service Awards Forum in Manama, Bahrain (June 2013);
- Open Knowledge Conference in Geneva, Switzerland (September 2013); and
- Global e-Government Forum in Seoul, Korea (October 2013).

In addition, the HELP grant has co-financed organization of a knowledge-sharing workshop "Innovative Georgia" in Tbilisi, Georgia, focusing on Open Data, cloud computing and development of broadband Internet.

BANGLADESH: Creating a Viable Model for Mobile Applications

Context

The project objective was to create an economically viable model for mobile applications, which would work as a new service delivery channel in Bangladesh.

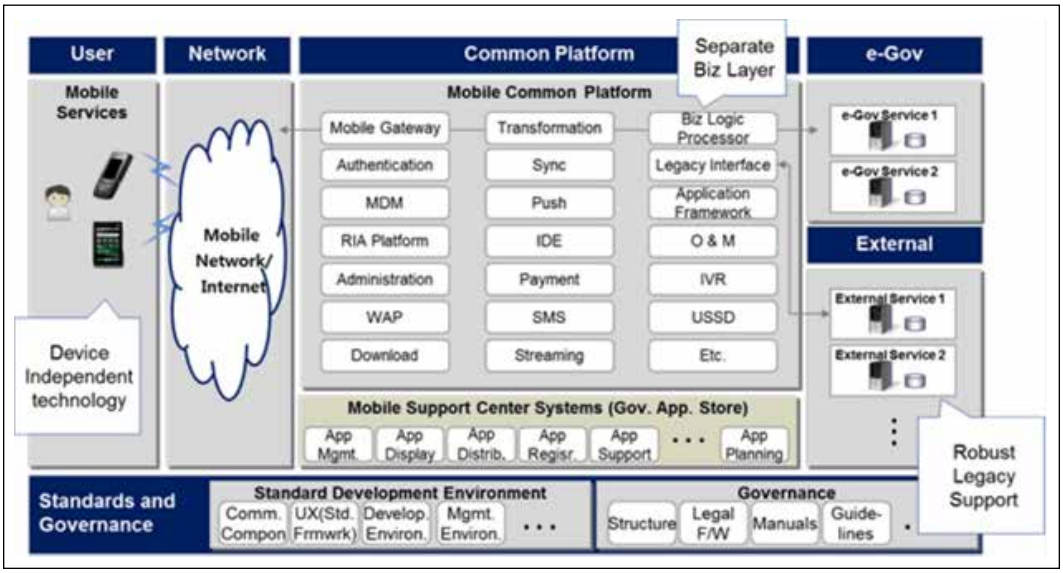
Impact of the Project

The project produced a highly useful and practical high-level architecture to develop a common mobile service delivery platform (MSDP) that could be shared across the private sector and used for public service delivery across Bangladesh. The government has decided to build this architecture under the Leveraging ICT project (P122201), which has an e-Government component, as they recognize its high relevance and usefulness for the country.

Key Outputs and/or Outcomes

The project consulted extensively with relevant counterparts on the ground to ensure strategic relevance of its effort. The architecture is recognized by key stakeholders as the most important next step for leveraging mobile applications for public service delivery in the country. The project was also able to deliver a high-quality and timely output because it leveraged extensive expertise from Korea as a best practice country in mobiles for service delivery. The project received consultant support from Korea's National Information Society Agency and National IT Industry Promotion Agency, consisting of three missions to Bangladesh with contributions from five consultants provided on a non-chargeable basis.

The project's output is highly useful for transforming services delivery in Bangladesh, as it will enable all ministries and public sector agencies to leverage the mobile channel for delivery of public services to citizens and businesses.



COLOMBIA: Tailoring Technology Solutions for Urban Challenges

Context

The KTF program in Colombia aimed at laying the foundation for the development of tailored technology solutions to solve urban challenges, as well as the creation of an enabling environment for smart cities. Barranquilla, Cali, and Manizales were the three Colombian cities included in this program. In particular, the objectives of this activity were: (i) to modernize e-government back-office to support a smart city environment; (ii) to develop smart applications in Colombian cities initiating the use of ICT tools to increase efficiency and effectiveness of municipal public service delivery; (iii) to create a smart applications exchange and initiate a smart cities network of practitioners; and (iv) to build consensus at the national level to develop action lines for a national Smart Cities Strategy in Colombia.

Impact of the Project

Stemming from the KTF grant, upstream activities have been triggered and ongoing discussions with Colombian ICT Ministry are taking place to scale up this support to cities nationwide. In addition, at the end of 2013, the ICT Ministry launched a National Smart Cities Strategy for Colombia[1] aimed at improving the life of citizens by harnessing ICTs. Last but not least, this program has changed mindsets towards technology at the subnational level by (i) raising awareness among mayors and city leaders on how ICTs can help deliver better services to citizens; (ii) building capacity among city officials in leveraging existing ICTs to improve quality of life in their city; and (iii) showing the benefits that engaging with the local ecosystem (i.e. academia, private sector, civil society) creates.

1. http://estrategiaticolombia.co/ciudadesinteligentes/

Key Outputs and/or Outcomes

The starting point was a forward-looking analysis that focused on understanding the existing IT infrastructure in each city to set a path towards a smart city model. Based on this exercise, an action plan and road map fostering further investment in ICTs was proposed and tailored to the specific context of each city. This component was developed in partnership with the Korean National Information Society Agency (NIA) that adapted its well-known National eGovernment Assessment Tool to the city level, and prototyped eMunicipal Assessment (eMAT) tool. To apply eMAT, a team of NIA's experts travelled to Colombia to go in depth into the local context.

NIA experts visiting Cali's transport control room and municipality data center.

COLOMBIA: Tailoring Technology Solutions for Urban Challenges

Under Component 2, interactive sessions were organized with main stakeholders (civil society organizations, local universities, software developer communities, public officials, and sector specialists) to discuss their main needs and priorities, focusing on those that could be solved through technology. Inspired with practical examples from other cities, stakeholders co-designed technology solutions to overcome their urban challenges. The co-designed solutions shared the following principles: (i) cross-sectorial collaboration to break silos and build consensus; (ii) high impact and cost efficiency; and (iii) sustainability and scalability.

Co-create Colombia (Component 3) was a collaborative process to crowdsource ICT solutions and applications from local talent. It was done through a hackathon carried out simultaneously in the three cities with the goal to enhance local communities with civic innovation. More than 200 entrepreneurs and university students participated and proposed 45 ICT solutions to overcome their city's development challenges. Then, the nine finalist teams went through a two-month mentoring phase to develop a minimum viable product (MVP) and finally, the best team traveled to London to visit the local innovation ecosystem and strengthen its entrepreneurial skills. The visit included the participation in London´s Insanity Hackathon, and mentoring sessions with representatives from Google, Wayra, and TechHub, among others.

A feature story about the hackathon: http://www.worldbank.org/en/news/feature/2013/05/07/colombia-cities-hackathon

To continue the engagement with the city ecosystem and keep the traction generated by previous components, Component 4 comprised a roadmap to implement an innovation lab. The concept and the various models behind Urban Innovation Labs were

Hackathon Announcement and Manizales Hackathon finalists.

COLOMBIA: Tailoring Technology Solutions for Urban Challenges

brought to Colombia by experts from the European Network of Living Labs and through best practices around the world. Additionally, Colombian city and national government officials were also exposed to international examples by participating in a customized training course "City as a Laboratory. Training Program on Open Innovation in Cities." This training combined lectures focusing on design-thinking technics and peer experiences from cities like Amsterdam or Helsinki, with on-site visits to different Innovation Labs (i.e. City Lab, Urban Lab, Fab Lab, etc.).

Video summarizing training for city officials: *http://www.youtube.com/watch?v=_LKGQei5b9g*

Finally, under Component 5, Colombian officials participated in CitiSense, a conference organized by the ICT Unit and ESMAP as a side event to the Smart City Expo World Congress (SCEWC). During CitiSense, local officials exchanged experiences with other cities around the world (close to 100 cities) and learned from peers coming from developed and developing countries. Additionally, a representative from the Colombian Ministry of ICT presented the country's ICT strategy during a panel shared with the Head of NIA.

A video describing CitiSense: *http://youtu.be/LRFBXSrTqUQ*

Presentations and a more detailed description of the event: *http://bit.ly/CitiSense*

INDONESIA: Enabling Key Factors for e-Government

Context

The Government of Indonesia is developing, or planning to develop, a number of programs at the national and sub-national level to offer services to the business community and the public through e-Government. These include an education portal, an electronic ID card program (e-KTP), e-Procurement, online tax payment, and the national single window. Key technical requirements to allow such programs to work effectively across the country would include the following:

- A secure high speed inter-ministerial communications network to facilitate more efficient internal communications, and to provide a platform for high-priority applications, including prospective government e-Services;
- Secure government data center(s) with disaster recovery capability and cloud computing capacity; and
- Standards, and a common government enterprise architecture, including information/cyber security, to achieve interoperability.

However, no such network or other foundational elements exist today. Instead, government ICT infrastructure in Indonesia is quite fragmented among and within individual ministries, each using low-bandwidth connectivity, many small "data centers" or servers typically lacking disaster recovery and little or no interoperability between databases and applications used. Currently, key databases are created in information silos within different individual ministries and agencies.

As cloud computing, and more importantly development of Service-Oriented Cloud Computing Infrastructure (SOCCI) is made technically possible, the Indonesian government could leverage these technologies for a more strategic and integrated approach to public service delivery A central information and data strategy is essential as the foundation of an integrated e-Government plan, as all future decision support systems within the government will need access not only to large databases, but also single source data to ensure the integrity of reporting structures.

In this context, the objective of this work was to analyze the key enablers for e-Government services in Indonesia, including current status, and prospects for development in the short to medium term, taking into account policy, regulatory, institutional, and technical factors. This work was designed to feed into the new Indonesia National Broadband Plan and new regulations on e-Government and e-Services currently under development by the country's policymakers.

INDONESIA: Enabling Key Factors for e-Government

Impact of the Project

This work is paving the way for a long-term development program, involving multiple stakeholders, development partners and the private sector. Short-term impacts of this work are as follows:

- Comprehensive assessment of challenges and constraints to government e-Transformation in Indonesia and engagement of multi-agency counterpart team in better-informed discussions on the way forward;
- Identification of practical implementation options;
- Contribution to Indonesia's medium-term development planning process, led by Bappenas;
- Contribution to draft regulations related to e-government/e-services under preparation;
- Engagement of public and private sector in discussion on government network issues and options;
- Sharing of international expertise and good practices, including specific focus on security and experiences of Korea (to be continued, if possible, in extension phase, including proposed study visit to Korea); and
- Informing other World Bank support programs including on governance/ public sector reform, and urban development.

Koridor Ekonomi	Jumlah Provinsi	Jumlah Kabupaten/ Kota	Jumlah Kabupaten/Kota Dijangkau Serat Optik (2012)	%
Sumatera	10	151	109	72,2
Jawa	6	118	117	99,2
Kalimantan	4	55	39	70,9
Sulawesi	7	82	53	64,6
Bali - Nusa Tenggara	3	40	28	70,0
Maluku - Papua	3	51	0	0,0
Total	33	497	346	69,6

Sumber: Kementerian Komunikasi, PT Telkom, 2013

Existing fibre-optic connectivity to 364 kabupaten/kota districts/municipalities; PT Telkom to extend fibre-optic backbone to a total of 446 by 2015.

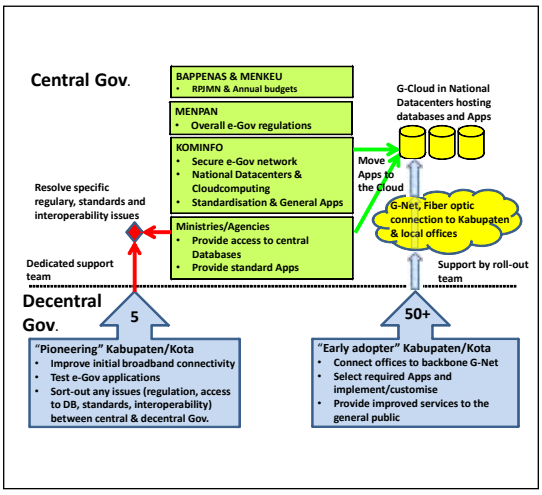
Remaining 51 kabupaten/kota targeted for support from Government's ICT Fund.

INDONESIA: Enabling Key Factors for e-Government

Key Outputs and/or Outcomes

The activities undertaken included analytical work, knowledge-sharing and dissemination of international best practices in support of project preparation, and involve a multi-agency counterpart team composed of representatives of the State Planning Ministry (Bappenas), the Ministry of Communications and Information Technology (Kominfo), the National ICT Council (Detiknas), plus other key stakeholders, including the Ministry of Finance and the Coordination Ministry for Economic Affairs. Principal outputs are:

- Development of a secure, dedicated, high-speed government communications network, separate from the public Internet to interconnect all central government agencies, offices, databases, and applications developed to support e-Government/e-Services;
- Integration of government voice and video communications;
- Consolidation of Government data centers to provide a secure environment for government data resources, applications, and provide additional business continuity and disaster recovery capacity;
- Virtualization of applications and storage into an efficient ICT operational environment, and implement government cloud using appropriate business model (could be PPP);
- Centralization of key information and databases across the Ministries and Government agencies and determine who "owns" which data set. Each "owner" of data set maintains the data set and makes sure their data fits in an interoperability model to share and disseminate the data;
- Establishment of technical, operational, data, interoperability, and governance standards; and
- Development of a legal basis and precedent to implement frame agreements for ICT equipment and service acquisition to secure more reliable service level agreements, operational security, and favorable economies of scale.



LIBERIA AND SIERRA LEONE: ICT for Improving Basic Services

Context

The objectives of this activity were to leverage the findings of the regional flagship study ("Africa Flagship") financed by the African Development Bank's KTF, and bring it to the implementation level in the Liberia and Sierra Leone context. The grant looked to (i) improve basic service delivery and accountability through the use of ICTs, and in particular mobile phones, for communication and citizen feedback; and (ii) to assess e-government opportunities in Liberia and Sierra Leone facilitated by the arrival of the submarine cable (end of 2011) and prepare a blueprint for coherent IT investment and diffusion across departments.

Impact of the Project

Based on findings from the KTF workshop and study, a new World Bank project, named eTransform Sierra Leone, with $10 million of IDA financing is being prepared. The project is slotted for FY15. Project appraisal and decision meeting are completed, and next stages of negotiations are expected, in tandem with ongoing policy discussions with the government on ICT sector.

Two diagnostics on digital identity, as an enabling application for cross-sector transformation, in Sierra Leone and Liberia are being prepared. In-country meetings and review is being done during April/May and final diagnostic studies will be delivered by June 2014.

Key Outputs and/or Outcomes

- Sierra Leone eTransform Workshop—as part of the KTF study, a Ministerial workshop was held in Freetown, Monrovia, in May 2013. The workshop focused on the use of ICT for innovation and transformation in Sierra Leone. The Minister of Information and Communications gave a keynote address. The IFC and the World Bank presented. Brainstorming discussions were held on potential applications across sectors. Attendees included National Telecommunications Commission (NATCOM), Ministry of Health, Ministry of Education, Ministry of Labor, ISPs, and mobile operators.
- eTransform Study for Sierra Leone—a study reviewing the ICT sector and highlighting opportunities for innovation and transformation in Sierra Leone has been conducted. The study is based on detailed discussions with the various stakeholders in Sierra Leone, including MOIC, MOH, MOE, MOL, NATCOM, and the private sector. The final study will be delivered by June 2014.

LAOS AND MOLDOVA: ICT for Better Governance of Forests

Context

ICTs are essential tools for development, transforming rural lives and livelihoods through computer use, mobile phones, and Internet applications. Many e-government and e-governance initiatives are making governments more efficient and responsive while improving service delivery. This applies to the forest sector as well.

The objectives of the project were to identify and apply ICT applications to improve forest governance and to identify the factors that strengthen the use of ICTs in the forest sector. The project also provided field-tested experience for further support by the Bank and other development partners.[2]

Impact of the Project

The project has had notable impact on the Bank's engagement, particularly in Moldova. The second phase of the EU-funded ENP1-FLEG[3] program has a special component on e-development. Experiences from the KTF-funded project are being shared across the region in the seven countries participating in the regional program. Additionally, the Bank is developing a forest policy note for Moldova with a strong focus on institutional development, including improved information management. This work benefits from the KTF project findings. The policy note is expected to lead to a Bank investment project at a later stage.

It is worth noticing that one of the tools developed on a pilot basis by the project has been made mandatory across state forest administration. Now all volume calculations are being done with the application developed by the project.

In Laos, the uptake has been slower, but the work done has informed both Bank operations and bilateral projects in the country.

Key Outputs and/or Outcomes

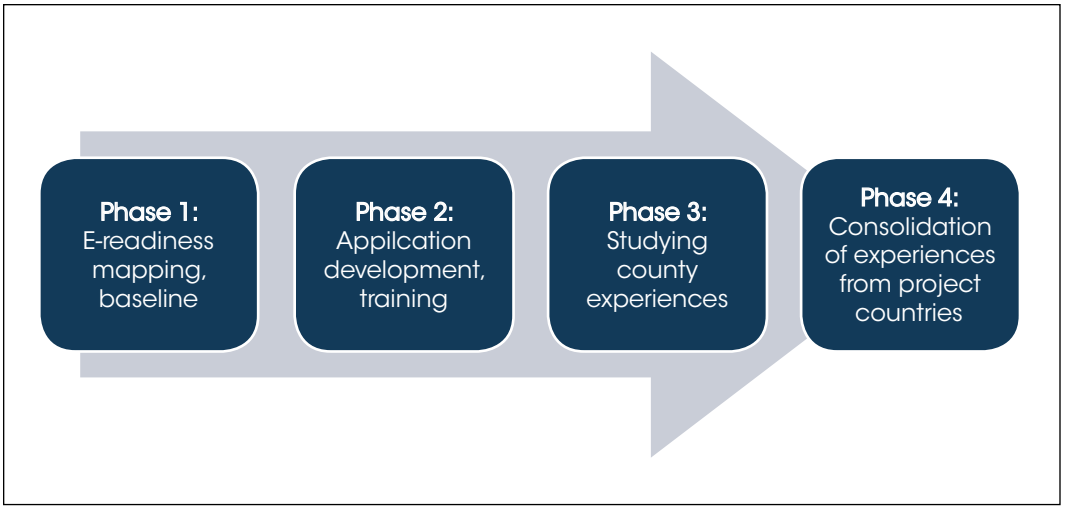
The project consisted of four components that ranged from capacity mapping through application development to studying the lessons learned.

Component 1 assessed the current ICT capacity in the forest sector in Laos and Moldova and the potential for new applications. The main activities were (i) stakeholder consultations to identify forest governance challenges and how ICTs could be used to address them; (ii) how to develop ICT applications to strengthen forest governance; and (iii) building partnerships with potential local ICT innovators. The main stakeholders in Laos were the Department of Forest Inspection (DOFI) and in Moldova: Modsilva (national forest authority).

2. See e.g. Castrén, Tuukka and Madhavi Pillai. 2011. Forest Governance 2.0: A primer on ICTs and governance. Washington DC: Program on Forests (PROFOR), available at http://www.profor.info/profor/sites/profor.info/files/docs/Forest%20Governance_web.pdf

3. The regional "European Neighborhood and Partnership Instrument (ENPI) East Countries Forest Law Enforcement and Governance (FLEG) II Program" will promote sustainable forest governance, management, and protection of forests in Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia and Ukraine. This program is funded by the European Commission and will be implemented by the World Bank in partnership with WWF and IUCN over a four year' period (2013-2016). See http://www.enpi-fleg.org/

LAOS AND MOLDOVA: ICT for Better Governance of Forests



ICT for Forest Law Enforcement and Governance Project Structure.

It is recognized that the current level of ICT use is relatively low, particularly in the countryside. However, at the same time, expanding the use of mobile phones has created opportunities for introduction of new applications.

Component 2 focused on the Development and use of ICT applications for forest governance and REDD+. Based on the capacity mapping done in Component 1 few applications were developed in both participating countries. Component 2 included also capacity building for information management development.

The project engaged also with other stakeholders (e.g. other public administration, civil society organizations, media, and private sector).

Component 3 looked at post-country analysis and in-country dissemination. An assessment of the capacity change was prepared based on the capacity mapping done earlier during Component 1. This included identification of main implementation issues and lessons learned.

Component 4 focused on lessons learned and global dissemination. A cross-country comparison analyzed the key success factors and ways in which ICT-supported governance reforms can best be supported. Dissemination will be done through publication of a summary report (summer 2014), learning events in connection to relevant forestry and ICT-for-development events, and through a website hosted by a relevant international body hosting the findings and outputs on their website.

LAOS AND MOLDOVA: ICT for Better Governance of Forests

The project worked in close collaboration with other on-going development activities. In Lao PDR, close collaboration was established with Sustainable Forestry and Rural Development Project (SUFORD), Strategic and Tactical Enforcement Patrol Project (STEPP), as well as various bilateral and REDD+-related projects and programs. In Moldova, the project interacted with the Improving Forest Law Enforcement and Governance in the European Neighborhood Policy East Countries and Russia -project (ENPI-FLEG) and the E-Transformation project on Open Data.

Perhaps it is still too early to discuss best practices; tested practices would be more appropriate. The experiences from Lao PDR and Moldova demonstrate that a gradual, stepwise approach to e-development is feasible or even preferable compared to large-scale sudden changes. This applies particularly to cases where existing e-knowledge is limited. Once initial awareness has been built, more ambitious 'leapfrogging' can be launched.

Much of ICT use is about communication and engaging with diverse stakeholders outside the forest agencies. Technological development has introduced a large number of innovative solutions that can be used by forest agencies to deal with their clients and partners. These range from mobile data collection and crowdsourcing to network analysis and educational games.

As they continue to involve ICTs in their work, forest agencies will be able to count on some fundamental global trends. Access to the Internet and mobile phones will continue to increase, as will the number of people owning smartphones. The costs of connectivity, satellite imagery, and computational power will continue to decrease. Together, these trends only point to new opportunities with technology and with larger audiences.

NIGERIA: Supporting Job Creation and Citizen Engagement

Context

Nations cannot be competitive— that is innovate and generate tomorrow's jobs— without technology and digitally literate citizens. The World Bank is striving to reduce the extreme poverty rate to no more than three percent and boost income growth of the bottom 40 percent by 2030. These goals cannot be achieved without fully embracing the transformative powers of technology and innovation.

Since the establishment of its Ministry of Communication Technology in 2011, the Nigerian government has made notable progress in advancing its ICT agenda. The government has catalyzed significant efforts in the area of policy and regulation, with an ICT Policy developed in 2012, a National Broadband Development Plan developed in 2013, and an e-Government Strategy now in the works.

The Ministry has also made a push for increased use of ICT in government to drive efficiency and service delivery by launching a Federal e-Government Services Portal, institutionalizing a government-wide messaging system, and establishing cadres and councils to drive implementation of various ICT initiatives. In addition, the Ministry brokered relationships between telecommunications companies and federal and state governments to negotiate lower right-of-way costs to decrease consumer prices and increase rural connectivity.

Impact of the Project

In framing the vision of moving to a "Solutions Bank," World Bank President Jim Yong Kim is not only using the language of technology, but is also signaling that ICT is fundamental to achieving the goals of eliminating extreme poverty and boosting shared prosperity. ICT is essential to generating the data, analytics, and solutions delivery mechanisms, especially mobile, needed to realize this vision.

While Nigeria is leading the way in some of the areas, a great deal remains to be done. The country is well positioned to capitalize on the booming mobile market and anticipated growth of broadband penetration rates. Nigeria is already home to many ICT innovations that are proven to work in a developing country context and that are already changing the lives of ordinary citizens. These need to be taken to scale. Instead of building bespoke technologies and standalone solutions, the focus should be on developing reusable ICT solutions that can be replicated.

The truth is that ICT is not only a key foundation for economic growth and environmental sustainability, but can also have a direct, measurable impact on the lives and prosperity of people, whether they live in rural communities or crowded cities. Nigeria is well placed to play a key role in the development of a digital Africa.

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Key Outputs and/or Outcomes

The World Bank leveraged the Korean Trust Fund to partner with the Nigerian government on a number of areas, including developing an Open Government technology framework; leveraging virtualized job opportunities to support job creation; fostering a telecom Policy Dialogue; and providing assistance with launching a Federal Open Data Initiative.

1. Developing an Open Government technology framework

The World Bank's ICT team worked closely with the Nigerian government on the development of key documents, which laid a foundation for more open and efficient government. While the Ministry of Communication Technology championed this process, the thinking and documentation has been developed through collaborative processes, which included face-to-face interviews with focal points at line Ministries and four separate workshops. Now the Government of Nigeria is equipped with these important tools:

- An Open Government readiness assessment and action plan, including a vision statement, country commitments, and key recommendations;
- A roadmap for creation of innovation ecosystem by leveraging open data;
- A technology roadmap, which includes recommendations for establishing cloud-based government infrastructure, mobile service delivery platform, a proposed list of initial pilot services, a scale-up implementation plan, and changes to the existing regulatory environment; and
- Investment cost estimates for technology, capacity building, and change management activities.

2. Leveraging virtualized job opportunities to support job creation

For this task, a joint World Bank ICT/Education team worked very closely with Nigeria's Ministry of Communication Technology and Federal Ministry of Education. This initiative, designed to increase awareness among young Nigerians about virtualized job opportunities, became known as the NaijaCloud Initiative (www.naijacloud.com.ng). The government was a key partner in building awareness among the job-seeking student population through websites, press conferences, newspaper articles, and television interviews, while the Bank team drove the outreach to platform companies. The NajiaCloud Initiative included:

- Analysis and recommendations to better understand the Nigerian economic landscape and identify virtual job opportunities, which was prepared for the Ministry of Communication Technology (*https://www.dropbox.com/s/817gg78vdxv9i85/Final%20Report%20v2.docx?m*);
- An awareness campaign around virtualized job opportunities, which was carried out through a website (www.naijacloud.com.ng), a Facebook page (http://www.facebook.com/naijacloud), a Twitter account (https://twitter.com/naijacloud), and traditional media sources;
- A series of workshops that helped connect more than 1,000 potential workers to international microwork and freelancing organizations including Elance, oDesk, and Mobile Works;

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- Workshops that helped acquaint approximately 60 local, regional and international companies and organizations with business opportunities for job creation on virtual platforms; and
- Elance-organized events that gave the company's leadership a chance to reach out to current employees, prospective clients and potential workers.

3. Fostering a telecom policy dialogue

At the request of Nigeria's Ministry of Communication Technology, the World Bank ICT team provided assistance to the Broadband Development Committee through feedback on a draft Broadband Implementation Plan. This feedback reflected World Bank experience and best practices from around the world, including from Korea.

4. Providing assistance with launching an Open Data Initiative

A cross-sectoral team of the World Bank experts, together with Open Government Alliance, have been working with Nigeria's Ministry of Communication Technology on identifying ways to leverage Open Data in support of four priority areas (agriculture, health, education, and trade and investment). This yearlong effort resulted in the official launch of Nigeria's Open Data Initiative in January 2014 by the Minister of Communication Technology, Mrs. Omobola Johnson, who stated: "We would like to ensure that our Open Data initiative is driven by demand. We will be guided by the practical needs of Nigerians to ensure that Open Data fuels innovation and grows the Nigerian economy."

In this respect, Nigeria is the world's first federal Open Data Initiative to simultaneously launch inclusive and continuing consultations with both government and grassroots nongovernment communities on their Open Data priorities. We commend our Nigerian counterparts for having convened a wide range of civil society, academic, media and technology stakeholders to explore the demand for Open Data.

PHILLIPINES: Transport Crowdsource ICT Demonstration

Context

Nearly everything done in transport begins with data. The quality of transport planning, operations, and management depends largely on the quality and availability of available data (e.g., corridor travel time, traffic counts, origin-destination surveys, transit operating data, etc.) as well as a transport agency's capacity to manage and analyze them. But often, resource-constrained transport agencies do not have the financial resources or technical capacity to collect, manage, or analyze these data, which impedes their ability to make evidence-based planning, policy, and investment decisions. This issue is particularly acute in the Philippines, where there are very few resources dedicated to such on-going data collection activities, and as a result, there are significant inefficiencies in the transport system, resulting in unnecessary congestion, fuel usage, accidents, and GHG emissions.

There are emerging trends in open-source software, open data standards, and open data, which, when combined with the rapid spread of ICT networks in developing countries (Internet connectivity, cellular networks, etc.) may be leveraged to reduce the barriers to traditional transport data collection and analysis. Leveraging the Korea ICT4D trust fund and other supplemental resources, the team conducted a series of pilot activities in the Philippines to establish a proof of concept and identify new best practices for leveraging these emerging ICT trends to increase resource-constrained transport agencies' capacity to plan and manage transport systems.

The pilot activities sought to address the following two key transport challenges: (i) In the Philippines, traffic management and road investments are not typically based on observed congestion or travel time, because these data tend to be too costly to collect on a regular basis, resulting in sub-optimal investment decisions and losses in terms of potential emissions and travel time savings; and (ii) although traffic accident rates in the Philippines are high relative to the region—causing substantial congestion and resource loses—to date, no cohesive action has been taken to overcome the systemic issues causing these accidents.

Impact of the Project

To overcome the challenges noted above, through the project, a set of open source tools were developed, including (i) a web-based platform for maintaining and sharing a geo-spatially-referenced, real-time digital record of all traffic incident data (including accidents, flood information, road closures, broken traffic lights, etc.); and (ii) a mobile and web-based platform for collecting, visualizing, and analyzing real time travel speed conditions in a city.

The project platform has won first-prize for the 2013 Philippines E-Governance Competition. The platform is hosted by the National Computing Center under the Advanced Science and Technology Institute, which provides free hosting and technical support services to participating local government units. The platform is equipment-neutral and open-source, thereby supporting easy replicability in other cities, and the platform, originally developed for Cebu, has since been adopted in MetroManila.

Since completion of the project, the Department of Transportation and Communications has set up its own planning team focused on using open-source solutions to solve transport challenges. For example, the team is currently building on the project platform to create an open-source tool for bus location management. Also the Philippines National Police have adopted the platform to map crimes in MetroManila to support their crime prevention program.

PHILLIPINES: Transport Crowdsource ICT Demonstration

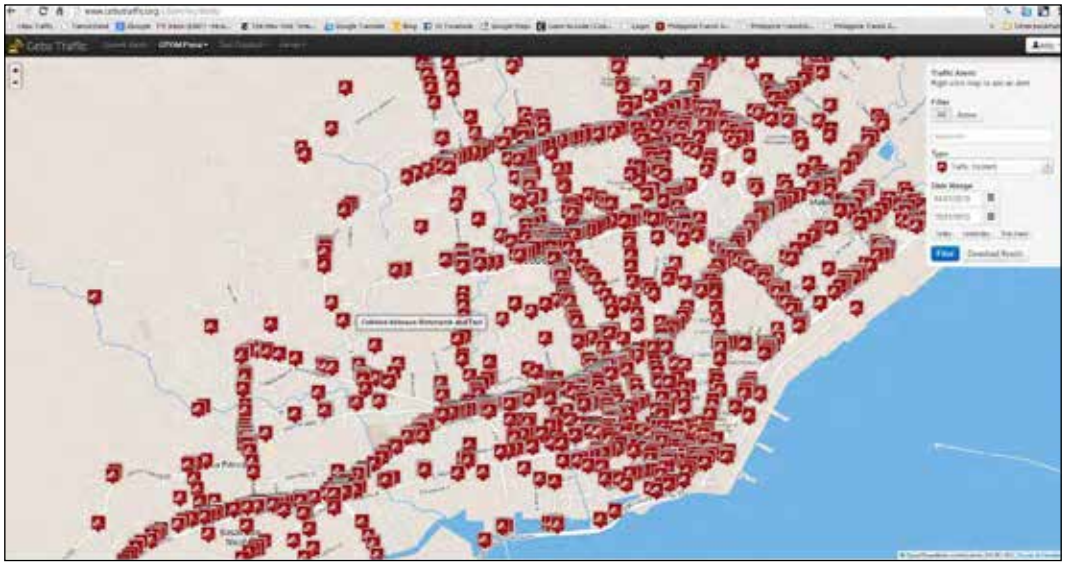
Key Outputs and/or Outcomes

To date, more than 20 million unique travel speed data points have been collected since project inception, and now Cebu City has very accurate travel time data for all corridors in the city, eliminating all future need for targeted travel time surveys and creating a valuable input for future traffic management and planning activities, resulting in better, evidence-based decisions.

Also, more than 8,000 unique accident reports have been entered into the system to date. In Cebu, using these data, the city has ranked all urban intersections by accident likelihood by day of week and time of day and has, accordingly, redesigned its traffic enforcer deployment assignments to support accident prevention. Also, based on the database injury and fatality data, the city has ranked every intersection by economic cost and has identified the top ten "most expensive" intersections. These results will be presented to City Council for a budget request to improve these intersections. By using data, Cebu can leverage its scare resources to make targeted, evidence-based decisions that will result in fewer accidents. The data and platform are hosted at the central government level, such that additional cities can be readily added in the future.

The open-source code developed through the platform is freely available to anyone, here: *https://github.com/WorldBank-Transport/traffic-tools*

OpenTraffic – Traffic Incidence Reporting



With geo-spatially and temporally referenced reports, city can use data to inform investment decisions and traffic enforcer assignments.

RWANDA: Feasibility Study–To Conduct an E-GP Assessment for Rwanda's Public Procurement Authority

Context

Governments are always striving to drive up efficiencies and obtain financial savings through reduced transactional costs, particularly in the current global economic climate. The existing public procurement system in Rwanda is decentralized across government which poses some significant practical challenges to achieving these objectives , e.g., fragmentation of the procurement of common use items across a large number of procuring entities has introduced inefficiencies and lack of cost-saving standard methods of procurement. However, these challenges can be addressed with the implementation of an eProcurement system (e-GP) which will enable the transformation of public procurement itself, streamline the information sharing among the decentralized procurement entities, and optimize the delivery of services to the citizens of Rwanda.

The major objective of this Korea Trust Fund project was to conduct a feasibility study for the implementation of e-Government Procurement (e-GP) for the Government of Rwanda. The study reviewed the Government's existing legislative and e-GP landscape, and international consultants were awarded a contract by the World Bank to identify issues, analyze current e-GP practices and advise responsible authorities on the best suitable e-GP system. The consultant's approach for this task was aligned with the definition of Public Private Partnerships (PPP) provided by the Multi-lateral Development Bank Expert Group on Electronic Government Procurement.

Impact of the Project

Public procurement in Rwanda is about US$0.8 billion a year. It plays a critical role in effective public expenditure management. Introducing e-procurement would increase efficiency in addition to transparency, improved accounting and increased compliance with good procurement practices. The feasibility study found that Rwanda could start the implementation of a comprehensive e-GP reform following the allocation of the necessary funding. There is now very strong support from both the Minister of Youth and ICT and the Minister of Finance to move this urgently into implementation and there are some significant benefits in undertaking the e-GP project in parallel with the Government's ongoing Information Financial Management System (IFMIS) upgrade and rationalization.

The study also noted that Rwanda's biggest challenges are capacity building for such a system both in terms of human resources and technology infrastructure, e.g., training in e-GP processes, lack of equipment, and last mile connectivity. A piloted phased roll-out by all the procuring agencies, national and local – as well as private sector—will have to be carefully planned and form a huge part of the change management strategy.

On the technology infrastructure front, the e-GP project will need to be aligned with the current on-going 'last mile' initiative to ensure connections to rural government offices. It will also need to employ and reuse innovative platforms or strategies such as business support centers, kiosks, KLab, eRwanda ICT buses, e-learning tools and involve key stakeholders such as the ICT Chamber of the Private Sector Foundation (PSF).

RWANDA: Feasibility Study–To Conduct an E-GP Assessment for Rwanda's Public Procurement Authority

Key Outputs and/or Outcomes

The study reviewed the Government of Rwanda's existing legislative and e-GP landscape and the international consultants were tasked to deliver 7 separate reports focused on i) design of a nationwide e-GP system, ii) cost estimate of the proposed new system, iii) development of a time-bound roadmap for e-GP implementation of recommended approach, iv) capacity building for Rwanda's Public Procurement Authority (RPPA) and private sector suppliers, v) feasibility of a PPP approach, vi) Overview of best practices, and vii) an analysis of current e-GP practices as followed currently by the RPPA. The conclusion reached by the consultants was that Rwanda would benefit greatly from the adoption of e-GP.

This grant activity has also led to the design of an e-procurement sub-component under the Public Sector Governance Program-for-Results project currently under preparation for Rwanda. Korea Telcom has been invited by the Government to submit both technical and financial proposals to implement a solution based on the Korean e-procurement experience, and Korea's deployment and sustained use of KONEPS (Korea On-line e-Procurement System).

Photos from launch of e-GP Procurement component.

SENEGAL: Harnessing the Transformative Potential of ICT

Context

In Senegal, the new Government recently adopted an ambitious "Plan Senegal Emergent" that covers the next 10 years. A focus group, chaired by the ICT Minister and led by the recently appointed "directeur général de l'économie numérique," met for the first time in early April, to start a series of high-level technical discussions among key stakeholders from the public and private sector, as well as civil society, with a view to adopt a national digital economy strategy, based on the framework that was delivered through this KTF project.

The opportunities are enormous. For instance, in the area of e-Government, Senegal could easily catch up with the front leaders in digitalizing and modernizing public service delivery for the benefits of the business community, as well as the citizens at large. This could be achieved with a strengthened program management arrangement and a leadership with decision-making power placed at the prime minister or presidential level. The "Agence de Développement Informatique de l'État" (ADIE) operates its own fiber optic national network, and develops and builds know-how in the area of public service delivery.

The project allowed the capture of these opportunities and proposed a realistic way forward relying greatly on private sector involvement.

There are also threats for Senegal to fall down on the UN e-readiness ranking. For instance, Senegal counts a large number of talented business people in the ICT sector, civic ICT developers and a diaspora committed to helping their country grow and eradicate poverty. However, it has lacked an ICT champion who could help the different stakeholders—public, private and civil society—to efficiently harness these strengths and effectively help the country embark on an in-depth sector reform which would allow fair competition and efficient regulatory mechanisms. Internet access remains unaffordable for many in Senegal.

Impact of the Project

The KTF project allowed the re-establishment of dialogue with the line Ministry, the Ministry of Communication and Digital Economy. The Ministry led the consultative dialogue with the different sectors and stakeholders through which the draft strategy took shape, first by (i) reaching out to the key counterparts in the different ministries and agencies; (ii) verifying data, facts and numbers; and (iii) providing feedbacks on the draft diagnostic (May 2013) and the draft strategic framework (October 2013). There were several lessons learned in the process:

- Broadband connectivity is limited and unaffordable for the majority of Senegalese and download speeds are relatively low;
- ICT is not equally used throughout the different economic sectors. The Education and Justice sectors are more advanced, whereas the Agriculture, Health, Craft, and Tourism sectors are lagging behind;
- eCommerce initiatives are moving ahead, whereas e-Government is not rolling out in a coordinated and efficient manner; and
- The developers' community is active and creative in Dakar: for example, the University Gaston Berger, the incubator CTIC and Jokkolabs nurture an enabling environment for innovation through projects including mapping the capital city, Dakar, using OpenStreetMap.

SENEGAL: Harnessing the Transformative Potential of ICT

The strategic framework has four dimensions:

- Broadband: lower the prices (by 2018 halve the price of broadband), increase bandwidth (to 10 Mbps by 2018) and improve access (broadband access to 90 percent of the population).
- ICT sector and Internet development: enhance the usage by SMEs through capacity building, improved affordability, open source and shared resources; the ICT sector currently represents 11 percent of GDP, and the proposed target is 19 percent by 2018.
- Digital economy: systematically embed ICT in the public and private sector, with a paced approach for each sector; strengthen the e-Government implementation and coordination, as well as enable a greater uptake of e-commerce.
- E-literacy and national content: in the long run, stimulate the demand through improving e-literacy and the creation of local content with local languages.

Key Outputs and/or Outcomes

This KTF grant allowed the World Bank to support a national multi-stakeholders consultative effort to define a new strategic framework for the transition of Senegal to the digital economy. In addition, the KTF permitted the raising of the ICT profile throughout the World Bank country portfolio. While this has not led directly to the identification and preparation of a project, it has significantly raised the level of awareness of the country team to the need for increased broadband connectivity and the transformational potential of ICT-based innovation.