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International Telecommunication Union
WSIS Stocktaking Process

REGIONAL WSIS STOCKTAKING REPORT 2016
ICT PROJECTS AND WSIS ACTION LINE RELATED ACTIVITIES IN AFRICA

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ITU

WSIS STOCKTAKING REPORT IN AFRICA

2014 – 2016

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Foreword

Since October 2004, the WSIS Stocktaking Platform has served as a global repository for collecting and reporting on ICT-related projects that implement the WSIS Outcomes in accordance with the WSIS Action Lines. It has also proved to be an efficient mechanism for sharing best practices towards advancing development goals, a role that I am confident will add additional value by highlighting the linkages between the WSIS Action lines and the United Nations' Sustainable Development Goals (SDGs), the hallmark for global growth since 2015.

The outcome document of the UN General Assembly High-Level Meeting on the Overall Review of the Implementation of the Outcomes of WSIS recognized the importance of reporting and sharing of best practices for the implementation of the WSIS outcomes by all stakeholders beyond 2015 and towards 2025, and thereby recognizing the WSIS Forum as a key platform for doing so. Moreover, the WSIS Overall Review called for close alignment between the WSIS process and the United Nations 2030 Agenda for Sustainable Development, highlighting the crosscutting contribution of ICTs to the SDGs.

During the WSIS Forum 2016, while noting United Nations Economic and Social Council (ECOSOC) Resolution 2015/26, the WSIS multi-stakeholder community expressed the need for customized regional WSIS Stocktaking reports highlighting the efforts made towards implementation of the WSIS Action lines at the regional level.

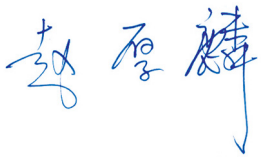
The WSIS Stocktaking Regional Reports of ICT Projects and Activities for the Period 2014-2016 for Africa, the Americas, Arab States, Asia and Pacific, CIS, and Europe are being diligently prepared. Continuing the collection of projects reflecting the linkages between WSIS Action Lines and SDGs, the WSIS Stocktaking Regional Reports showcase the impact these projects have on the ground at the regional level.

Until 2016, the global WSIS Stocktaking Reports reviewed more than 8,000 entries from around the world. In past reports one entry may have consisted of one or many actions carried out by international organizations, governments, the private sector, civil society or other stakeholders. I am pleased to note that the WSIS Stocktaking community now includes more than 200,000 stakeholders.

Through the WSIS Prizes contest, which has now been an integral part of the WSIS Stocktaking for the fifth year in a row, WSIS recognizes outstanding success stories from around the world for their part in building an inclusive information society. It is my pleasure to recognize the WSIS Prize 2014-2016 winners and champions from the Africa Region, and to applaud their dedication and commitment to the implementation of the WSIS Outcomes, while also honoring and awarding outstanding projects from the international WSIS community.

Since 2014, hundred and thirty-six entries (136) were submitted from the Africa Region to the WSIS Stocktaking platform while seven entities from this region have been awarded WSIS Prizes as winners and champions since 2012. I use this opportunity to congratulate them again on their achievements and their ongoing dedication to the WSIS process. It is also with pleasure that I recognize the commitment of this region to the implementation of the WSIS Outcomes, including the commitment made to share best practices regarding the use of ICTs to help advance the SDGs.

I invite all stakeholders to fully use the WSIS Stocktaking platform and align the various ICT-related local, national and regional databases with our WSIS Stocktaking database for the world's mutual benefit. Your projects and initiatives will continue to be promoted at the regional and global level in a common endeavour to achieve the goals set out by global leaders at WSIS and taken forward in the WSIS Beyond 2015 and Sustainable Development Agenda 2030.



Houlin Zhao
ITU Secretary-General

Introduction

On the occasion of the World Telecommunication Development Conference (WTDC) 2017, special edition of the WSIS Stocktaking Report for the ITU Africa Region for the period 2014-2016 was produced as the information document for the Regional Preparatory Meeting taking place from 6 to 8 December 2016 in Kigali, Rwanda.

The World Summit on the Information Society (WSIS), which was held in Geneva in 2003 and in Tunis in 2005, drew up an action plan to bridge the digital divide and build an inclusive, people-oriented information society. World leaders committed themselves to regularly review and follow up progress in implementing the action lines outlined in the WSIS Outcomes.

The United Nations Economic and Social Council (ECOSOC) resolution 2015/26 "Assessment of the progress made in the implementation of- and follow up to the outcomes of the World Summit on the Information Society" , that reiterates the importance of sharing best practices at the global level, and, while recognizing excellence in the implementation of the projects and initiatives that further the goals of the World Summit, encourages all stakeholders to nominate their projects for the annual WSIS Prizes, as an integral part of the WSIS Stocktaking process, while noting the report on the WSIS success stories.

The outcome document of the UNGA High-level Meeting on the overall review of the implementation of the outcomes of WSIS recognized the importance of reporting and sharing of best practices for the implementation of WSIS outcomes by all stakeholders beyond 2015, recognizing the WSIS Forum as a key platform for doing it. In this context the WSIS Stocktaking process plays a strategic role in supporting WSIS Forum in its endeavor.

Moreover the WSIS Overall Review called for close alignment between the WSIS process and the 2030 Agenda for Sustainable Development, highlighting the cross-cutting contribution of ICTs to the Sustainable Development Goals. In this context also the WSIS Stocktaking evolves into the unique global process for collection of information on actions carried out in context of WSIS, while underlining their contribution to the implementation of the 2030 Agenda for Sustainable Development.

In the period 2014-2016, WSIS Stocktaking Reports have reviewed 136 ICT-related projects and activities carried out by international organizations, governments, the private sector, civil society and other stakeholders in the Africa Region, with those in 2016 highlighting the efforts deployed by stakeholders involved in implementation of the SDGs. WSIS Stocktaking reports are based on the multistakeholder approach, including input from stakeholders from all over the world responding to ITU's official call for stocktaking updates and new entries. The inputs from WSIS action line facilitators and co-facilitators also contribute to the reports.

Most of one hundred and thirty-six projects listed in this Report were also nominated for the WSIS Prizes contests in the period 2014-2016, while some of them (highlighted in the gray boxes) were awarded with the WSIS Prize Winner or WSIS Prize Champion recognition. WSIS Prize is a unique global recognition for excellence in the implementation of WSIS outcomes. The contest is open to all WSIS stakeholders.

The WSIS Stocktaking community comprises of more than 200.000 stakeholders who are eager to contribute to the WSIS Process year after year. By identifying trends in implementing WSIS Outcomes, the WSIS Stocktaking Process makes a significant contribution towards building an inclusive Information Society.

The principal role of the WSIS Stocktaking exercise is to leverage the activities of stakeholders working on the implementation of WSIS outcomes and share knowledge and experience of projects by replicating successful models designed to achieve SDGs.

The WSIS action lines break down into 18 categories:

1) The role of governments and all stakeholders in the promotion of ICTs for development
2) Information and communication infrastructure
3) Access to knowledge and information
4) Capacity building
5) Building confidence and security in the use of ICTs
6) Enabling environment
7) E-government
8) E-business
9) E-learning
10) E-health
11) E-employment
12) E-environment
13) E-agriculture
14) E-science
15) Cultural diversity and identity, linguistic diversity and local content
16) Media
17) Ethical dimension of the information society
18) International and regional cooperation

17 Sustainable development goals (SDGs):

Goal 1. End poverty in all its forms everywhere

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3. Ensure healthy lives and promote well-being for all at all ages

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

We take this opportunity to extend sincere gratitude to all of the stakeholders from the CIS region who have been engaged in the WSIS Process, sharing their national advances on implementation of the WSIS outcomes since 2004. We would also like to invite all ITU Member States and Sector Members of the CIS region to continue engaging with the WSIS Stocktaking process by submitting projects relevant to WSIS Action Lines and the newly established SDGs, promote the WSIS Stocktaking process within their communities, and follow new developments of the WSIS Prizes 2017 contest.

The role of ITU in WSIS implementation

It is important to stress here that ITU has been contributing enormously to WSIS implementation and follow-up from 2005 to the present. The tasks carried out by ITU at the operational and policy level cover all mandates assigned to it relating to the WSIS process, in particular:

- in its capacity as lead facilitator in coordinating the multistakeholder implementation of the Geneva Plan of Action (§ 109 of TAIS) and primary organizer and host of the annual event in May, the WSIS Forum;
- as facilitator for Action Lines C2 (Information and communication infrastructure) and C5 (Building confidence and security in the use of ICTs), as well as C6 (Enabling environment);
- as co-facilitator for Action Lines C1, C3, C4, C7 and C11
- as partner in Action Lines C8 and C9;
- as rotating chair and vice-chair of the United Nations Group on the Information Society (UNGIS) (§ 103 of TAIS);
- as lead partner on Measuring ICT for Development (§ 114 of TAIS);
- as facilitator of the WSIS Stocktaking process (§ 120 of TAIS);
- as organizer of World Telecommunication and Information Society Day (§ 121 of TAIS);
- as lead of the Connect the World Initiative (§ 98 of TAIS).

Countries in Africa Region

- Angola (Republic of)
- Benin (Republic of)
- Botswana (Republic of)
- Burkina Faso
- Burundi (Republic of)
- Cameroon (Republic of)
- Cape Verde (Republic of)
- Central African Republic
- Chad (Republic of)
- Congo (Republic of the)
- Kenya (Republic of)
- Lesotho (Kingdom of)
- Liberia (Republic of)
- Madagascar (Republic of)
- Malawi
- Mali
- Mauritius (Republic of)
- Mozambique (Republic of)
- Namibia (Republic of)
- Niger (Republic of the)
- Nigeria (Federal Republic of)
- Rwanda (Republic of)
- Côte d'Ivoire (Republic of)
- Democratic Republic of the Congo
- Equatorial Guinea (Republic of)
- Eritrea
- Ethiopia (Federal Democratic Republic of)
- Gabonese Republic
- Gambia (Republic of the)
- Ghana
- Guinea (Republic of)
- Guinea-Bissau (Republic of)
- Senegal (Republic of)
- Seychelles (Republic of)
- Sierra Leone
- Somali Democratic Republic
- South Africa (Republic of)
- South Sudan (Republic of)
- Swaziland (Kingdom of)
- Tanzania (United Republic of)
- Togolese Republic
- Uganda (Republic of)
- Zambia (Republic of)
- Zimbabwe (Republic of)

ITU contribution to the implementation of the WSIS outcomes: 2014

As at July 2014, over 6 000 updated entries had been registered in the WSIS Stocktaking Database, reflecting innovative activities including projects, programmes, WSIS thematic meetings, conferences, publications, training initiatives, guidelines and toolkits. Entries may contain information on more than one project.

The sixth edition of the WSIS Stocktaking Report was officially released during the WSIS+10 High-level Event in June 2014. The 2014 report reflects more than 500 WSIS-related activities submitted to the WSIS Stocktaking process for the period May 2013- April 2014, each highlighting the efforts deployed by stakeholders involved in implementing the WSIS goals.

In 2014, the WSIS Stocktaking Platform encompassed 33 000 stakeholders representing governments, the private sector, international organizations, civil society and others, and continued to constitute a major ICT for development (ICT4D) online platform.

One innovative component was the “World Café”, which provided an opportunity to promote the winning projects of the WSIS Project Prizes 2014 contest at the international level, share best practices and discuss the purpose and impact of the projects recognized for their excellence in the

implementation of WSIS outcomes. Stakeholders highly appreciated the contest's multistakeholder approach and highlighted the importance of continuing the platform as a mechanism for granting recognition to stakeholders for their efforts to implement WSIS outcomes.

ITU contribution to the implementation of the WSIS outcomes: 2015

In 2015, the WSIS Stocktaking Platform has seen the biggest increase in new entries, including the number of stakeholders registered, reaching a total of more than 100 000 stakeholders representing governments, the private sector, international organizations, civil society and others. This has strengthened its position as the major ICT for development (ICT4D) online platform. As at April 2015, over 7 000 updated entries are registered in the WSIS Stocktaking Database, reflecting all manner of innovative WSIS-related activities.

The seventh edition of the WSIS Stocktaking Report will be officially released during the WSIS Forum 2015 (25 to 29 May 2015, in Geneva, Switzerland). It should reflect the more than 1 000 WSIS-related activities that were submitted to the WSIS Stocktaking process for the period April 2014- March 2015.

In addition, more than 300 international projects have been competing in the prestigious WSIS Project Prizes contest and are also to be included in the 2015 Stocktaking report. This marks an increase of 114 per cent in project nominations since 2014. The WSIS Project Prizes contest is part of the WSIS Stocktaking Process, and is a unique way of recognizing excellence in the implementation of WSIS outcomes.

More than half of the projects submitted this year were government initiatives, while 12 per cent originated from civil society, 11 per cent from the business sector, 10 per cent from international organizations, and another 12 per cent from other, mainly academic, entities. As regards geographic distribution, 31 per cent of the projects in 2015 were submitted by Arab States, 18 per cent were from Europe, 16 per cent each from the Asia-Pacific Region and the Americas, 12 per cent from Africa, and 4 per cent from the CIS, while 3 per cent came from international organizations and international NGOs.

The WSIS multistakeholder community was invited to participate and cast its vote for one project in each of 18 categories. The deadline for votes was 1 May 2015. The list of the 18 most appreciated/ voted projects was identified and winning projects were announced officially to the public during the prize ceremony held during the WSIS Forum 2015. The success stories showcased examples of projects on the implementation of WSIS outcomes, emphasizing the achievements of stakeholders working towards achievement of WSIS goals, transferring experience and knowledge at the global level, and spreading and fostering WSIS values.

ITU contribution to the implementation of the WSIS outcomes: 2016

As at April 2016, almost 8 000 updated entries are registered in the WSIS Stocktaking Database, reflecting all manner of innovative WSIS-related activities.

The eighth edition of the WSIS Stocktaking Report and the fifth edition of Success Stories 2016 will be officially released during the WSIS Forum 2016 (2 to 6 May 2016, in Geneva, Switzerland). It should reflect activities which were submitted to the WSIS Stocktaking process for the period March 2015 - March 2016.

While last year's contest was already a record-breaker in terms of the number of projects submitted, the **WSIS Prizes 2016** contest has hit a new high with a 15 per cent increase in submissions. Following a comprehensive review of the projects submitted, the ITU Expert Group nominated more than 300 projects and posted them online for public appreciation. The 311 nominated projects break down into 179 projects from the government sector, 41 from the business sector, 31 from civil society, 14 from international organizations and 46 from other entities (mostly academic). As regards regional distribution, 86 projects are from the Arab region, 73 from the Asia and Pacific region, 53 from the

Americas region, 36 from the Europe region, 31 from the CIS region and 27 from the Africa region, while five nominated projects come from international organizations.

The members of the WSIS multistakeholder community were invited to participate and cast their votes for one project in each of 18 categories. The deadline for voting was 10 March 2016. The list of the 18 most appreciated/voted projects will be identified and winning projects will be announced officially to the public during the prize ceremony to be held during the WSIS Forum 2015. The success stories will showcase examples of projects for implementation of WSIS outcomes, emphasizing the achievements of stakeholders working towards the achievement of WSIS goals and SDGs, transferring experience and knowledge at the global level, and spreading and fostering WSIS values. Besides the 18 winners, an innovation in this year's **WSIS Prizes** contest is the **WSIS Prize Champions** category, which recognizes those contenders having emerged from the online voting phase with at least 245 000 votes from the WSIS community. Their projects are among those having received the highest number of votes and having gained the best reviews by the members of the Expert Group. Among the five projects selected in each of the 18 categories, one will be the Winner and the runners-up will be WSIS Prize Champions.

C1. The role of public governance authorities and all stakeholders in the promotion of ICTs for development

Targeting **African countries**, the organization African Civil Society on the Information Society (ACSIS) has developed the *ACSIS WEB PLATFORM*, which aims to provide African civil society and all partners (African governments, civil society, communities, the private sector, academia and international organizations) with a consistent information system focusing on WSIS and ICT activities relating to the African continent. The project directly meets several sustainable development goals (SDGs), namely **SDGs 1, 3, 4, 5, 8, 9, 10, 16** and **17**, by promoting inclusive and sustainable ICT growth, peaceful and inclusive societies and lifelong learning opportunities for all African countries, ensuring healthy lives and equitable quality education, building resilient infrastructure and fostering innovation. The goal of the programme is to inform, train and educate Africans on issues related to Internet governance and WSIS action lines, as part of a unique platform for Africa and the African Diaspora. The platform will also be progressively establishing an observatory on ICTs and the ICT profile of each African country.

The Ministry of Telecommunication and Information Technology of **Angola** prepared the *ANGOLA ONLINE PROJECT*, whose main goal is the social and digital inclusion of Angolan society by bringing ICT to the neediest communities. The project is framed within the executive guidelines set out in the National Development Plan 2013-2017, focusing on the integration of young people into working life by implementing programmes which foster the use of new information technologies for access to culture and entrepreneurship. The provision of public Wi-Fi areas enables anyone with a wireless or card device (PC, smartphone, tablet, etc.) to access and surf the Internet for a period of two hours per day in all such locations. In the short term, it is expected to achieve 60 000 connected devices per month and some 15 to 30 access points per province.

The project ties in with a number of **SDGs,** particularly **1.4** and **1.a**, by seeking to ensure that Angolan society has access to basic services and by implementing programmes and policies to end poverty in all its dimensions. It is also in line with **SDGs 4** and **11** by working towards inclusive and equitable quality education, promoting lifelong learning opportunities for all, and fostering inclusive, safe, resilient and sustainable cities.

In **Burkina Faso**, the overall goal of the governmental *Open Data Initiative* is to make relevant data available to all, and especially to encourage the reuse of data in order to create value-added services (**SDGs 10 and 17**). Its specific objectives are to:

- Allow the government to be accountable to citizens on the management of public goods
- Enable citizens to participate in the management of public goods through feedback
- Enable civil society, journalists, investors and academics to access big data on Burkina Faso
- Help the private sector to create jobs and contribute to the reduction of unemployment in Burkina Faso

Accelerate the economic and social development of Burkina Faso.[1]

In **Nigeria**, the *Nigerian ICT4D* plan was developed by National Information Technology Development Agency (NITDA) in collaboration with the United Nations Economic Commission for Africa (ECA). The development of the Nigerian ICT4D Strategic Action Plan, which began in 2003, is in line with the WSIS outcome documents as well as the African Information Society Initiative (AISI) initiated by ECA. It was developed within the context of achieving various Federal Government socio-economic development programmes and initiatives aimed at positioning Nigeria among the 20 leading economies in the world by 2020. The plan covers ICT in agriculture, education, health, e-government, infrastructure, human

[1] Project nominated for a WSIS Project Prize 2015

resource development, national security and law enforcement, legal and regulatory framework, research and development, private-sector participation, and ICT awareness and popularization. It is already serving as a roadmap on how the national information technology system will be upgraded and used in addressing several development issues. Coordination of the implementation process is ongoing, through the printing of abridged versions and the hosting of stakeholder workshops to create ownership and ensure inclusion in the annual budgetary estimate for all sectors. The plan contributes to **SDGs 1, 3, 5, 10, 16, and 17**.

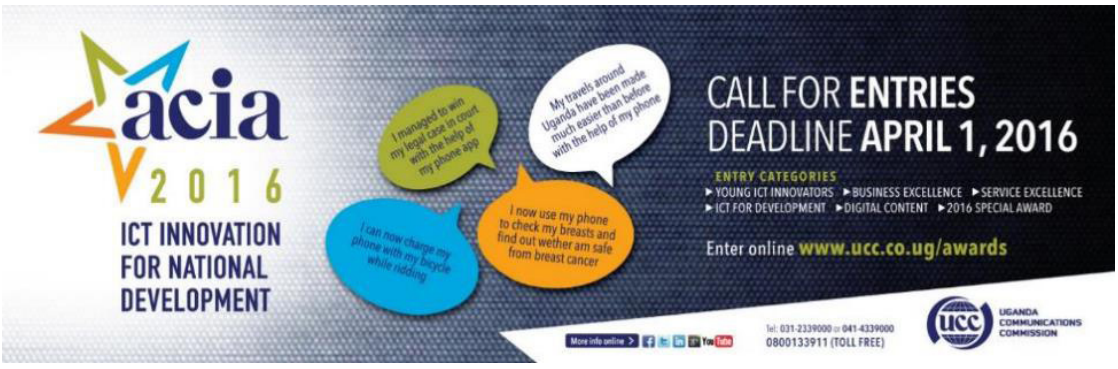
In addition, NITDA is continuously evolving *relevant ICT policies* to guide the development and deployment of ICT in order to achieve sustainable socio-economic development at the state level in **Nigeria**. States covered under this phase are the states of Niger, Osun and Enugu. NITDA produced a *National Software Policy Document (NSPD)* comprising eight critical components, as follows:

1. Software human capital
2. Software infrastructure
3. Software products, services and markets
4. Software industry economy
5. Software legislation, regulatory and institutional frameworks
6. Software fiscal policy
7. Software strategic policy
8. Software research, development and innovation

In **South Africa**, SIYAFUNDA CTC is a civil society project that makes available *Information and Community Knowledge Centres* where people can access computers, the Internet and other digital technologies that enable them to gather information, create, learn and communicate with others while developing essential digital skills (**SDG 10**). The focus is on the use of digital technologies to support community, economic, educational and social development, thereby reducing isolation, bridging the digital divide, promoting health issues, creating economic opportunities and reaching out to young people.[2]

In **Uganda,** the *Annual Communications Innovation Awards (ACIA)* is a yearly initiative that fosters innovation through the recognition and reward of outstanding ICT innovations. ACIA provides a platform upon which outstanding ICT innovations can be showcased and propelled to further success. Since the initiative's establishment in 2010 by the Uganda Communications Commission, various innovations have been recognized and awarded in different ways. The awards serve as a platform for showcasing innovations within Uganda's ICT industry, raise awareness of the value of ICTs and recognize outstanding innovations in the development and adoption of ICTs in Uganda.

The initiative perfectly meets all the **SDG**s related to ICTs.



[2] Project nominated for a WSIS Project Prize 2015

C2. Information and communication infrastructure

In **Angola**, the *ANGOSAT-1 Space Communication and Broadcasting Satellite System of the Republic of Angola* project involves the construction and launch of the country's first communication satellite. Angola's telecommunication companies together spend some USD 30 million per month for the rental and use of satellite capacities. The project will attempt to address some of the most challenging communication access issues, including prices, and the connection of Angolan cities and provinces across a vast land mass, where copper or fibre telecommunication networks would be prohibitively costly. The progress of the ANGOSAT-1 project is currently at 64 per cent.

The launching of this project within the IC domain associates it with a number of SDGs, as it concerns ensuring healthy lives, promotion of sustainable economic growth, building of resilient infrastructure, etc. (**SDGs 1, 3, 4, 8** and **9**).

In **Angola**, the Ministry of Telecommunication and Information Technology developed the *National Plan of Rural Telecommunications (NPRT)* in order to guarantee equal access for the Angolan population to the digital society. The project aims to complement the advances made in mobile broadcasting to ensure 100 per cent coverage of the national territory in 2017. The lower demand for telecommunications in rural areas (eight times lower than in urban centres), combined with an increasing rate of urbanization, limits the achievement of economies of scale in such regions, which in turn disincentivizes investment on the part of private operators. The main objective of NPRT is to establish public access points in municipalities where there is no 3G coverage. This will lead to greater IT infrastructure centralization and to several autonomy gains through interconnection using IP routing and optical fibre connections. The geographical distribution will take place in an evolutionary way and according to a set of socio-demographic criteria.

The NPRT project takes on some of the key SDGs as it seeks to end poverty, ensure inclusive and equitable quality education, promote sustainable industrialization and lifelong learning opportunities for all, build resilient infrastructure and foster innovation (**SDGs 1, 4** and **9**).

In **Benin**, *Cotonou-Wireless* has been established to serve as a community non-profit group whose mission is to provide wireless access to users across the city of Cotonou (**SDGs 9 and 11**). It uses free software and affordable wireless equipment.

In **Benin**, ISOCEL SA launched *Le plus grand réseau WiFi de Cotonou (Cotonou's biggest Wi-Fi Network) ISOSPOT* project, its latest access network, which delivers direct Internet connection to end users with Wi-Fi-enabled devices. The name ISOSPOT is derived from the words ISOCEL HOTSPOT. Several micro-stations or hotspots were installed on utility poles every fifty metres to provide the best quality of wireless link to the end user. ISOSPOT has a bandwidth management system to provide the best QoS to subscribers by ensuring a fair share of bandwidth for every active subscriber. Furthermore, the cost-effective pricing model makes Internet connection more affordable for the mass market. The service is intended for users wishing to have Internet access at home, at work or on the move, without any volume limitation.

ISOSPOT meets several ICT for sustainable development goals by promoting sustainable industrialization, inclusive and sustainable economic growth, employment and decent work for all, the building of resilient infrastructure, the development of inclusive, safe, resilient and sustainable cities, as well as revitalization of the global partnership for sustainable development.

Botswana has numerous projects falling under the Action Line on information and communication infrastructure.

The Botswana Innovation Hub is constructing the *Carrier Neutral Data Centre at BIH Science Park* with the aim of providing multiple international connectivity under one roof for public telecom operators and businesses (**SDG 8**).

The Department of Road Transport and Safety has started work on constructing a *Computerized Driver Testing Centre* in Gaborone. The automation of practical road testing will facilitate an efficient and transparent driver testing process to produce competent drivers (**SDGs 8 and 11**). This will serve to reduce corruption, shorten the waiting period for obtaining a driving licence and handling customer complaints, and significantly improve road safety management. The project is initially being piloted in Gaborone and will then be rolled out to other parts of the country. It will be completed within a period of seven months.

The government established Botswana Fibre Networks Ltd. (BoFiNet) as a separate organization responsible for the provision of national and international telecommunication. It will also address challenges with respect to Internet connectivity, particularly bandwidth. The project entails deploying fibre to the business such that when business enterprises require services, the service providers do not need to wait too long to get service from BoFiNet. With FTTx, customers will enjoy very fast and reliable broadband services (**SDG 11**). The network will be used for integrating data, voice and video services and will be the primary transport mechanism for services to corporates, institutions, government institutions, retail users and home users. BoFiNet has started the process of rolling out *Fibre to the X* in the capital city, Gaborone. In 2015, FTTX will also be deployed in Francistown, Maun and Kasane. Initially, fibre will be deployed to commercial and civic areas, before being rolled out to residential areas. Fibre is expected to bring superfast broadband connectivity to businesses, leading to the expansion of e-business, e-agriculture, e-health and e-education, and to the further enhancement of broadband penetration in Botswana (**SDGs 1, 8, and 9**). This is an ongoing process covering various locations every year.

In August 2014, the Botswana Communications Regulatory Authority (BOCRA), in collaboration with the Ministry of Transport and Communications, reviewed and finalized the draft *National Broadband Strategy (NBS)*, developed in 2012 through stakeholder consultations (ministries, NGOs, operators and the public). Providing a holistic and coordinated approach to the country's ICT ecosystem with a view to achieving long-term strategic outcomes, its overall vision is to connect every citizen and business to high-speed broadband Internet with an appropriate quality of service and affordable prices (**SDG 11**). The NBS advocates the development of national infrastructure to enable and facilitate applications and content, which are the drivers of a digital economy. The Strategy has 40 recommendations on the demand side (national backbone, fibre networks, access networks) and supply side (capacity building, content development, access to public Internet access centres (Kitsong centres, libraries, post offices, Internet cafes)). The NBS report is awaiting approval by the Cabinet of Ministers. Operators have aligned their projects with the requirements of the NBS.

The *Establishment of the Universal Access and Service Fund (UASF)* project was established by BOCRA in 2014 to fund the development of communications infrastructure and ensure universal access to communication services in Botswana. Contributions to the fund include a levy of 1 per cent on the gross revenue of selected operators (telecom, postal, broadcasting) and surplus revenue from BOCRA (**SDGs 1 and 11**). The fund is premised around the following objectives: availability, accessibility and affordability. The first project of the UASF is the provision of wholesale broadband WiFi hotspots in strategic public areas. The same entity is working on the allocation of LTE spectrum to operators for mobile broadband use of TV whitespaces for broadband connectivity in hospitals.

In November 2013, BOCRA carried out a survey to assess the status of Internet connectivity in hospitality facilities (hotels, lodges, guest houses, motels, campsites) throughout Botswana. The study revealed a lack of or poor Internet connectivity, limited Internet coverage, a lack of secured networks and a lack of skilled ICT personnel in most hospitality facilities. The most evident finding of the study was that hospitality facilities subscribed to insufficient bandwidth, hence the poor quality of service. In response to these findings, BOCRA developed guidelines on minimum broadband Internet connectivity requirements for hospitality facilities. The purpose of the guidelines, which

were approved and issued in August 2014, is to provide a framework governing the provision of quality broadband Internet in hospitality facilities (**SDG 11**). The guidelines prescribe the following:

- Minimum bandwidth to be acquired by various facilities (bandwidth calculated on the basis of facility ranking and number of rooms)
- Network security and monitoring measures
- Network maintenance and upgrading
- Availability of trained ICT personnel
- Universal Internet coverage in facilities.

The Guidelines should be adhered to by both hospitality facilities and Internet service providers.

In **Ethiopia**, under the *National Broadband Expansion* project, telecommunication service access and coverage have been provided across the country and the existing network has been upgraded (**SDGs 8, 9, and 11**). The project aims to increase mobile telephone density to 40 per cent in 2015, to provide 3G Internet access throughout the country and to introduce 4G broadband Internet in Addis Ababa.

In **Ethiopia**, the *African Internet Exchange System (AXIS)* project aims to promote keeping intra-African Internet traffic local by providing capacity-building and technical assistance to facilitate the establishment of Internet exchange points at the country level, regional Internet exchange points and regional Internet carriers in Africa (**SDGs 11 and 17**). The project, which forms part of the Programme on Infrastructure Development in Africa, is relevant to the WSIS action line on information and communication infrastructure as an essential foundation for the information society, which calls for the optimization of connectivity among major information networks by encouraging the creation and development of regional ICT backbones and Internet exchange points to reduce interconnection costs and broaden network access.[3]

In **Ghana,** the Ghana Investment Fund for Electronic Communications has launched the *Rural Telephony* project. This is a turnkey, green-energy telecommunication solution enabling voice and data communication services in unserved and sparsely populated rural communities in Ghana. It provides a zero capital expenditure investment opportunity for mobile network operators to expand their services to the remote rural poor[1] (**SDGs 8, 9 and 11**).

[1] Project nominated for a WSIS Project Prize 2014

In **Nigeria,** the Federal Road Safety Corps (FRSC) has installed 371 *very small aperture terminals* (VSATs) connecting all FRSC command posts nationwide, allowing FRSC headquarters and the field command posts to exchange reports and upload data to update the FRSC database (**SDGs 9, and 11**). The number of VSATs makes this the largest public-sector wide area network.

Also in **Nigeria**, *wide area Internet access* has been provided in four tertiary institutions (Ladoke Akintola University, Ogbomoso; the Federal Polytechnic, Kebbi; the Federal College of Education, Gusua; and the University of Nigeria, Enugu Campus) for the teaching and learning of 20 000 concurrent users in Nigerian tertiary institutions. Thus, contributing to **SDGs 1, 8, and 9.**

[3] Project nominated for a WSIS Project Prize 2015

In **Nigeria,** the *IT Services and Connectivity* project is aimed at deploying infrastructure to support the Conditional Grants Scheme (CGS) for the Millennium Development Goals (now **SDGs 9 and 11**) in local government areas in Nigeria, and thereby achieve the MDGs. The project provides for:

- a wide area network across locations in the 36 states and the Federal Capital Territory, for end-to-end information processing and automation of operations (currently deployed to 120 operational sites);
- access to a secure virtual private network (VPN) and the Internet for personnel;
- delivery of managed messaging and collaboration services and other application platforms with high availability, security and service support;
- an extensible infrastructure to accommodate the future needs of the scheme.

In **Nigeria,** the National Information Technology Development Agency (NITDA) has initiated the deployment of IT infrastructure in about 150 tertiary institutions across the country (**SDGs 9 and 11**). The equipment includes computers, servers and Internet access. Thirty-six tertiary institutions, or one per state, benefited from the programme in 2010, another 46 units of IT infrastructure were provided in 2011, 72 more were added in 2012 and another 111 were being introduced in 2013, for a total of 265 units of IT infrastructure deployed in tertiary institutions. The idea is to *equip tertiary institutions with basic IT tools and facilities* so as to enhance the global competitiveness of graduates.

The *Nigerian Universities Electronic Teaching and Learning Platform* (NUTALP) project in **Nigeria** is an ICT-enabled interactive teaching and learning concept, whose main focus is on developing 'smart' classrooms that use technology to overcome the challenges of large classes, supporting modern methods of teaching and learning and developing content using interactive tools. The project supports **SDGs 8 and 9**, and was funded by the Tertiary Education Trust Fund (TETFund) and, under the pilot phase, 12 universities were selected as beneficiaries, each receiving 20 units of interactive whiteboards with accompanying projectors and accessories. The project is aimed at addressing the inherent challenge of large classes, as students can participate adequately in their lectures from a distance.

A few years ago, **Togo** launched a dynamic drive for development in various fields, encompassing infrastructure, agriculture, arts and culture, science and technology, the environment, education, human rights, justice and communications. However, this new dynamic cannot be optimal and sustainable if it does not involve all segments of the population. Furthermore, where education and information are concerned, the opening up to global development dynamics depends not only on development *per se*, at the local and national levels, but also on the participation of all individuals in the development process. With the aim of fostering an approach that supports the participation of women in that process and offers them equal opportunities in terms of access to modern ICT tools, a project – *Togolese women, remain connected* – was initiated for the establishment of ICT centres which will serve as a forum in which women can gather virtually to discuss issues relating to their situation and their participation in the country's development, (**SDGs 1, 8, 9, and 11**) while at the same time enjoying access to and becoming skilled in the new technologies.[4]

The *Mobile Solar Computer Classroom* programme aims at making computer skills, tools and information accessible to schools and communities at the lower end of the socio-economic scale in **Uganda**. The Mobile Solar Computer Classroom consists of an all-terrain vehicle equipped with solar panels, laptops, an Internet router and two teachers, who take computer literacy to rural and suburban schools and communities. Over a period of two years, the project offers a digital literacy curriculum that focuses on building basic computer literacy, literacy, numeracy and critical thinking skills.

[4] Project nominated for a WSIS Project Prize 2015

The programme is in line with **SDG 4** as it seeks to provide inclusive and equitable quality education in Uganda.

C3. Access to information and knowledge

Rede de Mediatecas de **Angola** initiated the *Angola Network of Media Libraries (ReMA)* programme, which seeks to address the information and educational problems of Angolan society. The programme represents an evolution from traditional libraries to libraries embodying information technologies and current digital culture. It envisages the implementation of 25 fixed and 18 mobile Media Libraries countrywide by 2017, and is of key significance since it promotes full citizen participation in the information and knowledge society, strengthening of the educational system and the economic and social development of Angola through the enhanced use of technology.

Thus, the programme falls within the scope of several established SDGs in the educational, gender and social fields (**SDGs 4, 5, 8, 10** and **16**).

In **Botswana**, the *eGovernment programme* is an initiative designed to modernize the delivery of government services to the populace by leveraging ICT solutions such as to enable the eGov office to provide optimal coverage to vast areas of the country and beyond (**SDGs 10 and 16**). Botswana's national e-Government Strategy 2011-2016 outlines seven major programmes and some 20 interrelated projects to move appropriate government services online. The programmes within the strategy include:

1. E-services Programme (ESP)
2. Multiple Access Programme (MAP)
3. Rationalization and Integration Programme (RAIN)
4. Botswana's eGovernment, Service Transformation, Organizational & Network Governance Programme (Be STRONG)
5. Skills Transformation in Support of e-Government Programme (STEP).

The services are available in the government portal.

In **Burundi**, the *Community Awareness for Diabetes Screening in Patients with TB* project, run by the Burundian Alliance against Tuberculosis and Leprosy (ABTL), serves as a pilot for raising awareness about diabetes among tuberculosis (TB) patients and strengthens the community's capacity in terms of health and of better access to treatment for the double burden of TB and diabetes in Burundi (**SDGs 3, 4, and 17**). The project:

1. Aims to study the association between TB and diabetes in Burundi in the interests of improving the treatment of patients with both diseases at the community level and

2. Increasing the diabetes detection rate among TB patients in the country's TB centres.
3. Is the first of its kind and will be a catalyst that promotes local ownership of projects targeting the double burden of TB and diabetes.
4. Will be conducted in partnership with formal healthcare initiatives involving partners such as Burundi's TB Centre and anti-diabetes associations.
5. Aims to establish care centres to address the double burden of TB and diabetes in six districts of the provinces of Bujumbura and rural Muramvya, Kayanza, Ngozi, Bururi and Bujumbura City Council.
6. Aims to provide training for healthcare providers.
7. Seeks to increase the general population's awareness of the issues in question.

In the **Republic of the Congo**, the African Forum for the Promotion of New Information and Communication Technologies launched the project *ICT space for each rural area*. Its objective is a community network for each rural area, adding TCM-TF (tunnelling compressed multiplexed traffic flow) in order to provide VoIP and other real-time services, thereby fostering ownership and expansion of ICTs in local communities, and awareness-raising and training in ICT for the development of an autonomous network together with local populations, leading to sustainable development and society-inclusive information; thus contributing to **SDGs 4, 9, 10, and 11**. TMC-FT technology is suitable for regions of sub-Saharan Africa where bandwidth is low, and offers a way of engaging people in rural areas for the years beyond 2015.[5]

In **Kenya,** the *Kenya Telecentres Network* is a telecentre-support network with the ultimate goal of sustainability (**SDGs 4, 9, 10, and 11**). The network works with various partners to deliver capacity support in the areas of telecentre management, service development and technical support for telecentres and their managers.

In **Kenya**, the United Nations Environment Programme (UNEP) launched *UNEP Live* to support assessment and decision-making processes (**SDGs 4 and 8**). UNEP is committed to providing access to richer, more extensive sets of data and knowledge flows and sustaining broader networks of expertise to provide substantiated, contextualized knowledge about how the environment is changing at the global, regional, national and local levels, and linking this to relevant policy analyses and actions. It does this through its web-based knowledge platform, UNEP Live. It also provides tools to strengthen the capacity of countries to undertake state of the environment reporting.[6]

In **Kenya**, the Kenya National Library Service (Kisumu) launched *Slop*, an outreach service aimed at providing informative material, establishing satellite libraries and dispensing training in the use of technology. The target groups are children in both rural and urban contexts (**SDGs 4, 8, 10, and 11**). The core objective is to promote a positive and lifelong reading culture among children and community members in western Kenya. Although the programme has been experiencing a number of challenges, the library has taken measures to mitigate those challenges and help the programme to continue. The programme will encourage the spread of libraries at the local level and will be replicated in other branches and communities in Kenya. It will eventually be adopted by the government.[7]

In **Nigeria,** the *Rural Information Technology Centres* (RITCs) are reliable vehicles for providing public access to ICTs and services in rural and underserved communities. They are a major means of fulfilling the Nigerian National Information Technology Development Agency's (NITDA) mandate of enhancing Internet penetration and general deployment of ICTs, especially in Nigeria's rural areas (**SDGs 4, 9 and 10**). Particular attention is paid to the rural areas in order to bridge the digital divide that exists between urban and rural areas. The centres house IT equipment (computers, scanners, photocopiers, printers, application/e-learning software and other IT support tools); power backup (inverters, batteries, solar modules and other auxiliary power equipment); and Internet access (VSAT

[5] Project nominated for a WSIS Project Prize 2014
[6] Project nominated for a WSIS Project Prize 2015
[7] Project nominated for a WSIS Project Prize 2015

dish, modem, bandwidth). It is envisaged that the project will be implemented in the country's 774 local government areas. A total of 10 RITCs were established in 2007, 17 in 2008, 58 in 2009, 111 in 2010, 60 in 2011, 93 in 2012 and 50 in 2013. About 399 have thus been established, and more are currently in progress.

In **Nigeria**, NITDA's *Virtual Library* Project, also known as *Information Resource Centre* (IRC), is a reference/research library providing comprehensive and authoritative information for researchers, students, lecturers etc (**SDGs 4 and 10**). The NITDA Virtual Library/IRC uses the e-granary digital information resource also known as "Internet in a Box" that provides an open-source digital resource comprising more than 30 million documents and educational resources, including websites/pages, books and journals, thereby providing a media-rich digital resource. These digital educational and multimedia resources, with appropriate copyright, are fully indexed and searchable and are hosted on a new-generation Intel Dual Core 4TB data drive eGranary Digital Library Appliance Server. The eGranary Digital Library Catalogue covers a wide range of subjects including computer science, ICT, mathematics, engineering, social sciences and humanities, to mention but a few.

Also in **Nigeria**, the establishment of the *Virtual Libraries in Tertiary Institutions* is intended to provide a wide variety of resources through searchable databases and databanks, audio cassettes, videos, CD-ROM and images (**SDGs 4, 10, and 11**). It is a rich repository of information (over 30 million materials in different disciplines) for students and researchers. In addition to the one at NITDA headquarters, two more have been provided at two federal universities while moves are under way to establish another four during the current financial year.

In **Rwanda**, the National Institute of Statistics of Rwanda (NISR), the country's primary data producer, generates mandatory statistics such as the gross domestic product, consumer price index, producers price index, external trade figures, population statistics and other special-purpose statistics from surveys including the demographic and health survey, household living conditions survey and census (**SDGs 8 and 16**). It also conducts specific joint surveys, namely the agriculture survey and service provision assessment survey, in partnership with the relevant institutions. The information published in the *National Statistics Portal* is available to the public.

In **South Africa**, the *Siyafunda Community Technology Centre* (CTC) project was implemented to empower, educate and connect communities. Siyafunda CTC supports information and community knowledge centres, where people can access computers, the Internet and other digital technologies that enable them to obtain information, create, learn, and communicate with others, and develop essential digital skills (**SDGs 4, 8, 9, and 10**). The focus is on the use of digital technologies to support community, economic, educational and social development, thereby reducing isolation, bridging the digital divide, promoting health issues, creating economic opportunities and reaching out to youth.

In **Sudan**, the Gedaref Digital City Organization (GDCO Sudan) has set up *telecentres*, as a means of connecting the unconnected, providing ICT support, and empowering the establishment of strong communities through skills development in order to facilitate lives in marginalized, underserved and disadvantaged areas (**SDGs 4, 8, 11 and 17**). Telecentres serve as a tool for bridging the digital divide and reaching everyone, based on a "win-win" public-private partnership. GDCO has shared its knowledge, experience and best practices with others, and telecentre networks can bring best practices from other parts of the world to Sudan. GDCO Sudan has developed many initiatives with its partners to help the government speed up the provision of e-services to the community. This project includes e-agriculture, e-education, telemedicine, children not attending school, and people with disabilities.

In **Uganda**, 75 per cent of the population survives on smallholder farming, yet many poor farmers have limited or no access to the information and capital that could improve their livelihoods. Grameen Foundation works with government, the private sector and civil society to empower farmers through relevant, timely and actionable information and financial services (**SDGs 8, 12, 15, and 17**). These resources are delivered through tailored mobile solutions and networks of trusted intermediaries, in the form of the *Community Knowledge Worker* project. By combining mobile technology solutions

with a methodology for leveraging local change agents, we are able to catalyse behaviour change that leads to sustainable improvements in the economic lives of the poor.[8]

[8] Project nominated for a WSIS Project Prize 2015

C4. Capacity building

The *RAFT (Réseau en Afrique Francophone pour la Télémédecine)* network was established to provide continuing education for healthcare professionals and access to specialized advice for improving the quality, efficiency and accessibility of health systems (**SDGs 3, 4, and 17**).The network offers services in the following countries: **Algeria, Benin, Burkina Faso, Burundi, Cameroon**, **Republic of the Congo**, **Democratic Republic of the Congo**, **Côte d'Ivoire, Madagascar, Mali, Mauritania, Morocco, Senegal** and **Tunisia**. In developing countries, this type of healthcare education and advice is usually limited to capitals, and remote professionals do not have access to such opportunities, or even to didactic material adapted to their needs. This can limit their ability to remain active in the periphery, where they are most needed. The core activity of RAFT is webcasting interactive courses targeting physicians and other care professionals on topics proposed by the network's partners. Courses are webcast every week, freely available, and followed by hundreds of professionals who can interact directly with the teacher. No fewer than 70 per cent of the courses are now produced and webcast by experts in Africa. A bandwidth of 30 kbit/s, the speed of an analogue modem, is sufficient and enables participation from remote hospitals or even cybercafés. Other activities of the RAFT network include medical tele-expertise, tele-ultrasonography, and collaborative development of educational online material.

The *ict@innovation* project is a capacity-development programme started in 2008 by the Free and Open Source Software Foundation for Africa (FOSSFA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), which is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). The support of GIZ on behalf of BMZ ended in 2012. The project was active in 18 countries of **sub-Saharan Africa** and contributes to **SDGs 4 and 17**. It helped to create a community of more than 1 200 African and international experts who are exchanging knowledge on FOSS as a key technology to drive innovation, add local value and create sustainable and affordable ICT solutions in African economies.[9]

In **Cameroon**, the Health and Environment Programme (HEP) project *Educational and communication materials for pupils in Douala, Cameroon* is providing educational materials to pupils aged between six and twelve years at a school in Douala in order to educate them in the use of ICTs (**SDGs 1 and 4**). Through its founder, Mrs Ebaï, and director, Mrs Ntung, the school convinced Madeleine Scherb, founder and president of HEP, to support the noble ideals of morality, neutrality and bilingualism for this school (bilingual school emergence). In November 2013 (date of implementation of the project), Ms Scherb distributed many gifts such as educational materials, books on ICT and intellectual property, comic strips, etc. We are undertaking this project over a period of five years, from 2013 to 2017.[10]

In **Cameroon**, the Health and Environment Program initiated the *Materials education to pupils in Douala, Cameroon for December 2016* project, which aims to educate pupils on ICT and promote the concept and mechanisms for managing safe Internet practices and intellectual property concerns by training some 150 pupils of a primary school in Douala, Cameroon. This will enable the popularization of ICT tools within the framework of better information management using databases. The reason for creating such an initiative is the lack of knowledge about Internet access and corresponding educational materials. We therefore thought that it was the right time to implement a project to help schools by giving them such education materials.

Given its aim of strengthening pupils' capacity, the project is associated with numerous SDGs relating to capacity building by dealing with such issues as poverty, healthy lives, gender equality, quality education for all, economic growth, etc. (**SDGs 1, 3, 4, 5, 8, 9, 11, 16** and **17**).

9 Project nominated for a WSIS Project Prize 2014
10 Project nominated for a WSIS Project Prize 2015

In **Kenya**, the *African Leadership Development in ICT and the Knowledge Society (ALICT)* programme is an eight-month professional blended learning course (online and face-to-face) designed to equip mid-to-senior level officials in government ministries with a commanding understanding of the key elements in policy-making for knowledge society development in Africa (**SDGs 4 and 16**). Strong demand for the course, now provided to 16 African countries, reflects the relevance and need felt by African governments and institutions for new tools, leadership skills and knowledge for effective policy development and implementation strategies for science and technology-driven social and economic development. In Kenya we also find the *Know Eat Hub*, a capacity-building tool designed to capture and share local indigenous knowledge, new practices and the latest technology and infrastructure with respect to the value chain at the pre-production, production, logistics, processing and trade and consumer levels.[11]

In **Mauritius**, the Ministry of Technology, Communication and Innovation highlights such problematic issues as the "gender divide", characterized by, among other things, the low numbers of women accessing and using ICT compared to men. Similarly, the ICT sector employs fewer women than men. To ensure that women benefit fully from ICT, the National Computer Board (NCB), under the aegis of the Ministry of Technology, Communication and Innovation, promotes *Gender Equality and Mainstreaming through ICT Access and Literacy in Mauritius* by catering for equal access to ICT tools and the Internet for women under the Community Empowerment Programme, and fosters ICT literacy for women through the Cyber Caravan project (**SDG 5**).

In **Nigeria**, *capacity-building programmes* are being mainstreamed for all citizens in the country on an inclusive basis (**SDGs 4, 16, and 17**). They provide training to students, young people, unemployed graduates, experts, government officials, etc., in order to improve their ICT knowledge and skills, as follows.

a) *Training of government officials*: Various training programmes have been organized for government officials in the three branches of government (directorate officials from federal government ministries, departments and agencies, National Assembly members and the judiciary).

b) *Training of unemployed graduates*: In all, 6 100 unemployed graduates have been trained in ICT-related jobs.

c) *Training of university lecturers*: This programme was initiated by the National Information Technology Development Agency (NITDA) to provide IT training for lecturers at tertiary institutions, especially university lecturers. Over 900 lecturers have been trained in 36 universities under the "train-the-trainer" programme.

[11] Project nominated for a WSIS Project Prize 2015

d) *Training of graduates*: In all, 1 200 engineers and IT graduates in all 36 states and the Federal Capital Territory have received training.

e) *Scholarship scheme*: Scholarships are awarded for higher degrees in core IT disciplines. Scholarships were granted to 36 master's level and six doctorate level students in 2010, to 72 master's and six doctorate level students in 2011 and to 74 master's and six doctorate level students in 2012; the 2013 scholarships are in the process of being awarded. This is NITDA's initiative for students to obtain higher degrees in different universities around the world.

f) *NITDA ICT Youth Empowerment Scheme (YES) 2012*: The scheme is aimed at alerting Nigerian young people to ICT career opportunities and developing ICT human capital and entrepreneurship skills among young people. In 2012, about 230 young people were trained in web technology (design, management and marketing), and the best 30 were equipped with basic start-up tools to launch a business.

g) *Establishment of IT parks*: NITDA has established two information technology parks, one in Calabar, Cross Rivers State, the other in Lagos, Lagos State. These parks are intended to provide a free trade zone and outsourcing opportunities, and to promote rapid growth of start-ups – small and medium-sized enterprises (SMEs) – as well as job creation, skilled manpower development and improved foreign exchange earnings.

In **Nigeria,** the *Network Administration and Management Training* project for IS/IT support staff in ministries, departments and agencies and public-sector agencies was put in place to build public-sector capacity and enhance a maintenance culture with reference to IT-related investments (**SDG 4 and 16**). The project has provided:

- Training for personnel from more than 50 separate agencies, equipping them to manage their internal networks and make better use of shared IT services provided through Galaxy
- An extensible infrastructure to accommodate the future needs of the scheme.

In **Sierra Leone**, the B-Gifted Foundation of Sierra Leone is implementing the *Second Chance* project, which provides an effective system of second chances through B-Gifted's ICT-related programmes, giving young people the hope that they can make up for bad luck or bad choices and empowering them through skills training in multimedia technology. The aim is to build the young people's life skills and self-esteem, as well as making them productive citizens. The project will further ensure that young people have access to ICTs for socio-economic development and can influence policy development, and will facilitate the mainstreaming and integration of young people and gender into development and promote empowerment (**SDGs 1, 4, and 16**).

In **South Africa**, the *OSCARnet project* is an ICT project to empower disadvantaged and underprivileged citizens in the country's KwaZulu Natal communities, who already struggle to gain access to basic necessities such as healthcare, education and employment (**SDGs 1, 2, and 3**). The idea was born out of the realization that ICT plays an important role in the lives of young people, especially girls and young women, in terms of facilitating community engagement with civil society. Technology inspires people to maximize their full potential and establish positive connections with the communities, and enables achievement of the WSIS targets through the connection of villages and rural areas with ICTs and establishment of community access points.

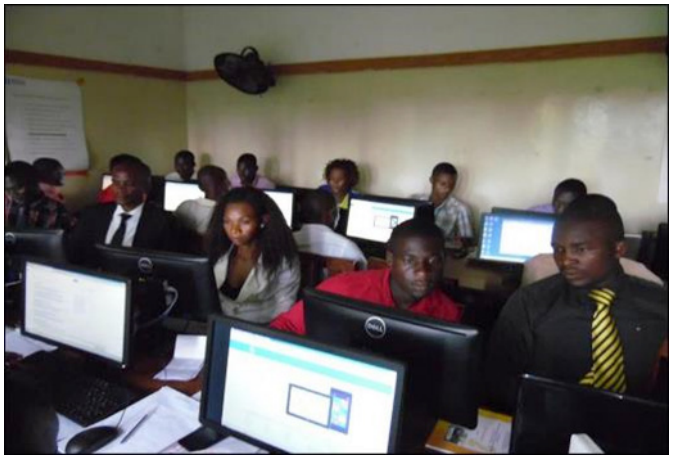
In **Uganda**, Zimba Group Ltd initiated the *Zimba Women-Enabling Market Access for Women Using ICT* project which seeks to build strong small and medium-sized enterprises. The aim of Zimba Group Ltd is to build a community of female entrepreneurs to support and inspire one another. They are provided with:

- business education and ICT resources for women
- opportunities to connect, learn and be inspired by mentors, role models and each other

- tailor-made technical support that is adapted to the innovation needs of each individual female entrepreneur.

The initiative relates to **SDGs 1, 5** and **8** by encompassing gender and economic issues, as well as to **SDG 17** – global partnership for sustainable development – through its focus on international collaboration.

In **Zambia**, *Connecting Learning Institutions* is a project running under the Universal Service and Access Fund (USAF) of the Zambia Information and Communications Technology Authority. The *Connecting Learning Institutions Project* focuses on narrowing the digital divide by making ICTs available and accessible to schools throughout the country. In collaboration with the Ministry of Education, 150 computer laboratories have been set up in 75 primary schools, 75 secondary schools and 50 tertiary institutions countrywide that meet the basic conditions for "ICT readiness".



The project's goals coincide with most of the SDGs as they have to do with combating poverty and inequality within the country, ensuring quality education and gender equality, promoting inclusive and sustainable economic growth and inclusive societies, and building resilient infrastructure (**SDGs 1, 4, 5, 8, 9, 10, 11, 13, 16** and **17**).

C5. Building confidence and security in the use of ICTs

Within the framework of a joint ITU-European Commission project to create *harmonized ICT policies* and an *efficient regulatory environment* in **African**, **Caribbean** and **Pacific** countries, model policies on cybercrimes, electronic transactions and data protection have been developed and are now being transposed into domestic legislations.

Under the project known as HIPSSA (*Support for the Harmonization of ICT Policies in Sub-Saharan Africa*), input was provided to the African Union to develop a continent-wide Convention on Cybersecurity.

Twenty-five African countries have benefited from ITU-IMPACT assessments of their cyberthreat preparedness and response capabilities (**Botswana, Burkina Faso, Burundi, Cameroon, Chad, Cote d'Ivoire, Democratic Republic of the Congo, Ethiopia, Gabon, Gambia, Ghana, Lesotho, Mali, Niger, Nigeria, Kenya, Senegal, Sierra Leone, Swaziland, Tanzania, Togo, Uganda, Zambia** and **Zimbabwe**). Since 2010, four of them (**Burkina Faso, Kenya, Uganda** and **Zambia**) have set up CIRTs and four others (**Burundi, Côte d'Ivoire, Ghana** and **Tanzania**) are in the process of doing so, with ITU-IMPACT support.

Various other cybersecurity initiatives are foreseen in Africa, including the *Regional Cybersecurity Centre* referred to above, to be set up in Nigeria under the MoU concluded between with ITU and the Nigerian Communications Commission in July 2013. . This regional centre will facilitate collaboration on combating cyberthreats at the regional and national levels, with an emphasis on activities related to protecting children online.

An ITU-led Africa *Child Online Protection* summit is also planned, in order to identify risks and vulnerabilities for children in cyberspace, to develop practical tools to help minimize risks and to share knowledge and experience. In 2013, the First Lady of **Nigeria**, Dame Patience Goodluck Jonathan, graciously agreed to be ITU's Champion for Child Online Protection.

A *CIRT assessment workshop*, organized by the ITU Telecommunication Development Bureau (BDT), in collaboration with IMPACT, was held in **Addis Ababa**, Ethiopia, from 10 to 14 March 2014, with the participation of **Zimbabwe**, **Swaziland** and **Liberia**. ITU-IMPACT pledged its support to the countries attending that workshop, as well as to **Democratic Republic of the Congo** and **Ethiopia**, in setting up their national CIRTs and more broadly in defining national cybersecurity strategies for the countries that do not have one. The attendees received the surprise visit of ITU Secretary-General, Dr Hamadoun Touré, who in his brief speech recalled the importance ITU attaches to assisting its Member States in assessing their national cybersecurity preparedness and cyberthreat response capabilities.

KioSol aims to create a set of *sun-powered Kiosks* in the capital city of **Burundi** (Bujumbura), running on solar energy to recharge electronic phones or other devices for a small amount of money, as electricity is lacking in Burundi. The purposes of the Kiosks are also to resell newspapers and air time and serve as advertising centres. Kiosks might be in universities, hospitals, not far from residential apartments, suburbs, in the Burundian markets (souks), and ultimately even in rural areas.

The project thus ties in with poverty issues and economic growth of the country, and ensures access to information and affordable and sustainable modern energy (**SDGs 1, 7, 8** and **16**).

In **the Democratic Republic of the Congo**, the *Cellule Anti–Cybercrminalité* has implemented *NET PLUS SUR ("A safer Net")*, a project aiming to teach people how to manage their electronic reputation on social network sites in DR of the Congo, where the use of social media networks is increasing; thereby related to **SDGs 4 and 9**.

In **Mauritius**, the Ministry of Technology, Communication and Innovation launched the *Implementation of Child Safety Online Action Plan* to address an issue that has attracted global attention and which

prompted a call for action by Member States during the Tunis phase of the World Summit on the Information Society. The Plan, developed by the National Computer Board and endorsed by the Cabinet in 2009, is currently being implemented. The policy measures it embodies relate to the following:

- Public awareness campaign
- Safety measures for schools and public Internet access points
- Child safety online legislation
- Enforcement and reporting measures
- International cooperation

In **Nigeria**, Luqcom Informatics' *Lifelong Learning EdTech Series: Cyber Safety and Cybersecurity Training* is a training tailored to build a young generation of digital citizens who will surf the Internet for purposeful and educational reasons, living online and interacting safely, aware of ethical behaviours that will safeguard their online presence (**SDGs 4, 8, and 11**). As part of the training, speakers gave detailed presentations on the following topics: Intruders Invasion: When cyber friends become a menace; Cyber Storm in Cyber Space; My Digital Identity; Staying Safe Online; and Social Media: A virtual home for all. These were accompanied by many contributions from industry professionals.[12]

In **Zambia**, the Zambia Information and Communications Technology Authority (ZICTA) has developed the *First African Cyberdrill, for Africa!* Cyberspace, with all its inherent delicacies, introduces with it a further, more complicated dimension to security (**SDGs 11, 16, and 17**). Cyberattacks are increasing in number, complexity and effectiveness and pose a threat to people's livelihoods. Having identified the dire need for collaboration among African countries, ZICTA, in collaboration with ITU-IMPACT, hosted the first ever cyberdrill for Africa. The main goal of the cyberdrill was to build and develop the capacity of other partner countries in order to facilitate further development within the area of national critical information infrastructures protection.[13]

[12] Project nominated for a WSIS Project Prize 2015
[13] Project nominated for a WSIS Project Prize 2015

C6. Enabling environment

The African ICT Consumers Network (RéCATIC) is an initiative run in **Benin** by the Benin Consumer Defence League. In 2008, the George Soros Foundation and the Government of Benin funded the creation of *RéCATIC for consumer rights in telecommunications in Africa* (**SDGs 8, 11, 16, and 17**). This network aims to create an interface between governments, regulators, operators and ICT service providers, as well as consumers, on concerns regarding the quality and safety of services, transparency in pricing, the handling of complaints, and the information and education of African consumers about ICT services.[14]

The *Sustainable Land Management for Young Farmers* project from **Gambia** is designed to cover six regional agricultural directorates (RADs) of the low and high lands that are used in agricultural production in the country. It seeks to address the interlinked problems of rural poverty, food insecurity and land degradation, and this ties it in with certain SDGs, namely **SDGs 1, 2** and **15**. The main outputs of the project include national and regional operational Sustainable Land Management Project (SLMP) clubs comprising a multilevel partnership of stakeholder institutions.

In **Nigeria,** the *Legal Framework for the establishment of ICT systems* was put into place. The Nigeria Computer Society (NCS) identified and examined the various legal instruments to establish the required legal framework, with recommendations for achieving the desired legal environment for e-trade; thereby related to **SDGs 8, 11, and 16**.

In **Nigeria,** the *Business process engineering and data harmonization for the trade supply chain* project yields multiple benefits (**SDGs 4, 8, and 17**):

i) Development of information standards for the documents and processes associated with import/export/transit goods, equipment and conveyance management for stakeholders

ii) Harmonization of the process requirements for import/export/transit/goods, equipment and conveyance

iii) Gap analysis to identify where Nigeria's current best practices are similar to and/or different from international best practices, highlighting areas where standard, international, harmonized data sets that meet governments' requirements for international cross-border trade could be adapted for an automated environment

iv) Provision of a detailed description of data elements and sets needed for international trade transactions, including justifications for why different data sets are needed and in what format.

In **Nigeria**, in recognition of the dynamism of ICT and the multifaceted effects of its applications, the National Information and Technology Development Agency (NITDA) has embarked on laudable projects/programmes aimed at creating an *enabling environment for both local and foreign investment* in the sector, and hence for the information society, including, *inter alia* (**SDGs 4, 8, 10, and 17**):

i) Collaboration with the Nigerian Internet Registration Authority (NIRA) for effective and efficient management and supervision of the Nigerian country code *top-level domain name* (ccTLD), in order to enhance Nigerian identity in cyberspace

ii) Launch, on 24 May 2012, of *Consumers Contact Centres*, of a platform through which complaints about sub-standard or inferior products or services can be made

iii) Continuous collaboration with stakeholders in critical sectors of the economy and awareness-raising on the *effectiveness of ICT deployment* in these sectors.

In **Nigeria**, *Internet exchange points* (IXPs) were established to keep local Internet traffic local and reduce bandwidth usage. This will foster greater accessibility at reduced price, and will enable additional

[14] Project nominated for a WSIS Project Prize 2015

applications with a considerable multiplier effect on the economy. Centres already established include Lagos, Abuja, Kano and Enugu. This project thereby contributes to **SDGs 4, 9, and 10**.

Following the approval of a national broadband policy by **Rwanda**, citizens have the right to access high-quality services at an affordable cost (**SDGs 4 and 8**). The Ministry of Youth and ICT, in collaboration with the Rwanda Development Board, the Ministry of Local Government, telecom companies, financial institutions and ICT service providers, started rolling out an *ICT and Literacy Awareness Campaign* that will cover 3 million beneficiaries, especially citizens in remote areas. The programme aims to increase ICT skills and usage for better productivity and efficient service delivery. This five-year programme is increasing the population's awareness of the benefits of digital society and reducing barriers linked to skills development.

Elaborated by the German Society for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH), the *Promotion of Mini-grids for Rural Electrification* project is to be implemented in **Uganda**, where 70 per cent of the population live outside the cities, and where only 7 per cent of the rural population have access to electricity. The Mini-Grids project focuses on the development of framework conditions at the regulatory level and develops a tendering approach for the selection of a private-sector concessionaire for the implementation and operation of mini-grids. Productive use of electricity in the electrified villages is promoted to ensure affordability of electricity connections for households as well as rural economic development and access to ICTs (**SDGs 7** and **8**).

C7. ICT Applications

E-government

In **Botswana**, the *Botswana Government Bookshop* project developed by the Government Printing and Publishing Services, is one of the programmes emanating from the e-Government Strategy. The project is intended to facilitate online sales of government publications (**SDG 16**). The online bookshop is operational and has a complete shopping cart.

The *Local Optical Fiber Reticulation* project, developed by Botswana Fiber Networks (BoFiNet), envisages measures intended to make the country globally competitive and provide connectivity to the national broadband infrastructure (**SDGs 8 and 10**). BoFiNet will be deploying optical fibre in strategic areas within villages and towns in Botswana.

In **Burkina Faso**, the *Projet e-Conseil des Ministres* (PeCM) developed by the Ministry of Digital Economy was designed to optimize, through ICT, the process of preparing meetings of the Council of Ministers (**SDGs 8 and 16**). The PeCM must:

1. Allow better preparation of Council of Ministers meetings.
2. Allow Ministers and others actors to work electronically, thus gaining time, efficiency and confidentiality.
3. Improve communication and collaboration between members of the Government and the Council of Ministers.
4. Reduce significantly the use of office supplies and computer consumables including paper, and thus save money and contribute to environmental protection.
5. Improve and facilitate document searches through electronic archiving.[15]

Burkina Faso also has the *Circuit informatisé de la dépense* developed by the Ministry of Economy and Finance. Since 1996, the Ministry has been engaged in a major project to modernize the management of public finances. In this ambitious project, information technology was a strategic and crucial element in achieving that goal. Thus in 1996 the first major applications of the Ministry of Economy and Finance were emerging. Among these applications, the computerized expenditure circuit (CID) had a central place. Other equally important applications include integrated government accounting (ICE) and the Integrated External Funding Circuit (CIFE). The latter project was designed by the Ministry of Economy and Finance (**SDGs 8, 16, and 17**). The main goal of this project is to develop an effective system of monitoring external financing. The system must:

1. Establish an information exchange circuit for monitoring the management of external funding.
2. Implement a computerized external funding management system based on the new organizational scheme

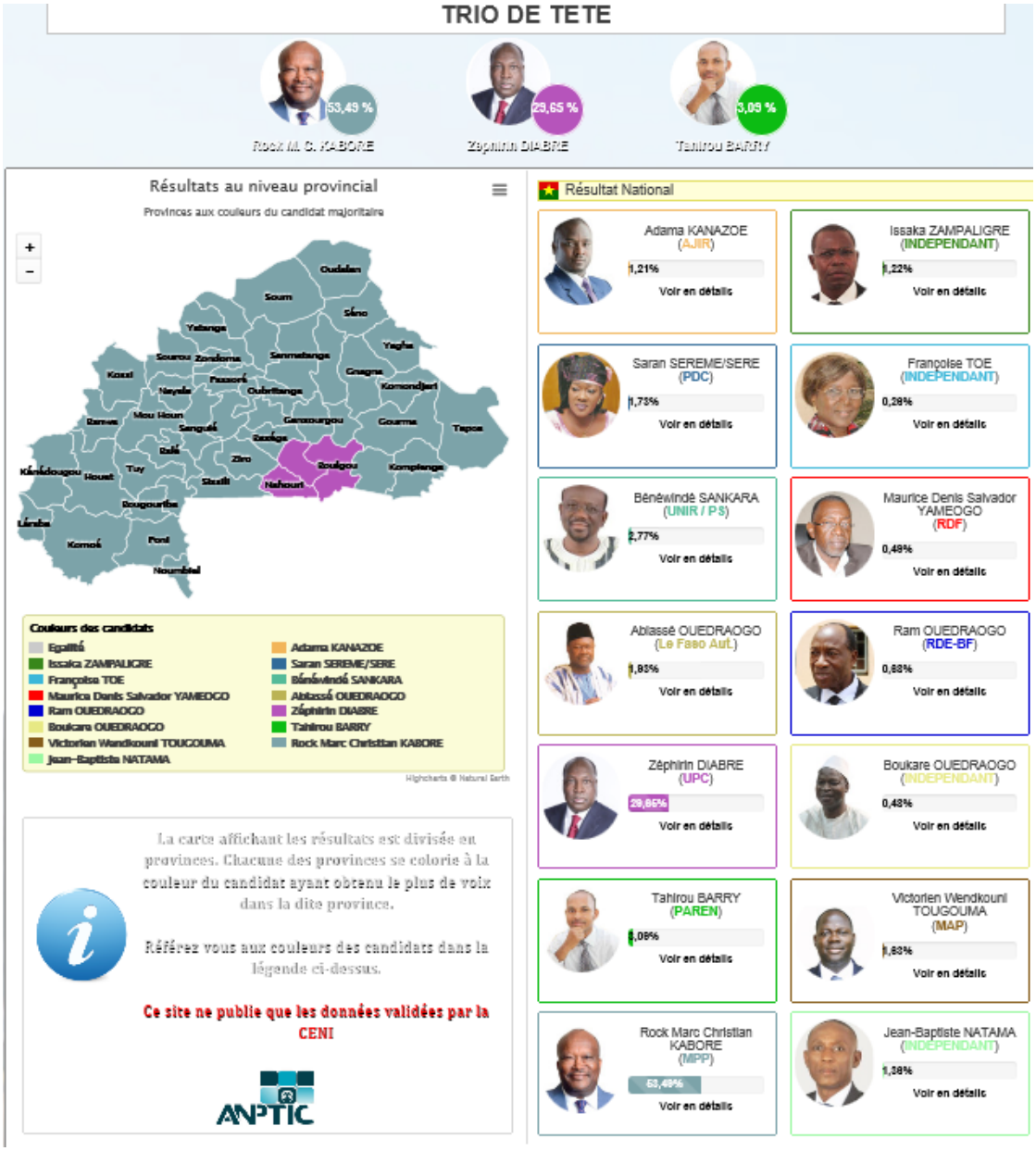
Integrate existing systems with the new external funding management system.[16]

In **Burkina Faso**, *"Open Election* is a project that the Burkina Open Data Initiative (BODI) initiated with a view to supporting the presidential and legislative elections in Burkina Faso by facilitating the publication of election results in real time. It involved the development of a responsive web application (that fits any screen) and an app for Android smartphones. In partnership with CENI, the

[15] Project nominated for a WSIS Project Prize 2015
[16] Project nominated for a WSIS Project Prize 2015

entity responsible for organizing elections, BODI worked to publish the results in a transparent manner through the Open Election application.

The project has also helped to demonstrate the usefulness and importance of open data, especially in the African context, and relates to **SDGs 11** and **17**.



Also in Burkina Faso, *the System for Recording Births and other Civil Registry Events by SMS (Système d'Enregistrement des Naissances et Autres Faits d'Etat Civil par SMS) – iCivil* programme is an integrated solution based on a mobile application (Android). It allows birth records to be created from an encrypted SMS, and hence for a child's birth certificate to be issued on the day of its birth. This birth certificate is authentic and can be verified. The system automatically records a child's details in the civil registry at birth. It can also be used to record all other civil registry events (deaths, marriages, divorces ...). It is a simple and reliable system. The message, sent by an authorized officer, arrives on the civil registry server, within a coherent ecosystem and in an ultra-secure manner.

In this way, the programme promotes well-being for the population and reduces inequality within the country (**SDGs 3** and **10**).

Ethiopia has launched the *e-government strategy* to facilitate effective delivery of government services to different customers (**SDG 16**). The strategy focuses on establishing 219 e-services (77 informational and 134 transactional services) over a period of five years, from 2011 to 2015. It includes core projects, namely: national payment gateway, enterprise architecture framework, public key infrastructure, national data set, national enterprise service bus and national integrated authentication framework.

The **Ghana** *Open Data Initiative (GODI)* is an initiative to make government data available to citizens in a reusable format. The objective of the project is to create a vibrant open data community through community and capacity building in regard to government, civil society and a developer community, to create applications that are user-friendly. The ultimate aim of this project is to achieve transparency, accountability and efficiency within government.

Thus, the project's goals meet several SDGs, by promoting economic development of the country and a peaceful society, ensuring public access to information, reducing corruption and promoting the rule of law at the national level (**SDGs 8, 16, 16.3, 16.5** and **16.10**).

In **Kenya**, Entreconne Global Ltd elaborated the *Integrated Electronic Data System (IEDS),* an online software developed by a dedicated team to revolutionize police stations around the world. Besides being a reporting tool, it is also an analytical tool for policy makers. The project focuses on e-governance in the police security sector. IEDS is able to report crime faster and also to protect witnesses through an anonymous portal. The system can be replicated anywhere to protect lives and bring justice (**SDGs 3, 9, 10** and **16**). The plan for IEDS is to partner with governments and private sectors in regard to deployment in order to make a change by fighting crime within communities, where witness profiling is evident (**SDG 17**).

In **Mauritius**, in 2005, the *Government Online Centre (GOC)* was set up as the only data centre of the government providing government services to citizens, business people, government officers and non-citizens abroad. The Government Web Portal is the gateway to access applications online through one of its sub-portals, the Citizen Portal. Among the services integrated in the citizen portal, the e-services represent the main component whereby the citizen may interact with the government anytime, anywhere and in real time. All online transactions are encrypted and secure. These e-services allow citizens to carry out a number of government online applications without any physical displacement. The e-services have a larger impact in terms of both volume of transactions and functionality. To strengthen ICT as a fifth pillar of the economy, the strategy of putting a number of e-services online through the Government Portal supports business development and is an important step towards the ultimate goal of providing a hassle-free, easily accessible single point of contact for all information and services required by both potential and existing members of the Mauritius business community.

The Government Portal thus relates to the economic growth of the country, ensuring a peaceful society for sustainable development (**SDGs 8** and **16**).

In an effort to improve service delivery and ensure the effective administration of business registration, the Business and Intellectual Property Authority (BIPA), has developed a *web-based integrated company registration system* in **Namibia**. The new system is fully interconnected to the existing, Windhoek-based, registration system. Namibia is geographically a large country with a relatively small number of citizens. The new web-based solution brings public service to the people and enables much faster processing times to register businesses. It significantly reduces travel time and cost for citizens – which also helps the environment.

The project thus relates to a number of SDGs by contributing to economic growth, reducing inequality, combating climate change, etc. (**SDGs 8, 9, 10** and **13**).

Nigeria is implementing the *Government-wide Messaging and Collaboration* (GWMC) project (**SDG 9**). The purpose of this project is to provide government employees with a platform for e-mail and collaboration that is official and tied to their respective ministries, so as to discourage the use of free, web-based e-mail systems for official communications. Once completed, the system will cater for 40 000 users and more.

Also in **Nigeria**, the *Electronic Documents Management System/Council Chambers Automation System* (EDMS/CCAS) has been created for the following purposes (**SDG 9**):

a) Deployment and operation of a robust and secure electronic document management workflow solution, and automation of Federal Executive Council memo submission and distribution

b) Establishment of an integrated solution with an enhanced audiovisual conferencing system for seamless and increased collaboration between government officials

c) Digitization and back-scanning of archives (Federal Executive Council memos, notes, conclusions, etc.).

Still in **Nigeria,** IP phones and videoconferencing facilities have been deployed, with the following results (**SDGs 9 and 16**):

a) The Galaxy backbone supports a multivendor/protocol unified communication system working seamlessly to deliver audio and video calls, videoconferencing, a conferencing bridge, directory services and other value-added services

b) Deployment of seamless intra- and inter-agency communication, improved accessibility to government offices and data, telephone cost savings for the government, and improved responsiveness by government agencies

c) Secure sharing of documents and opinions, regardless of location or platform

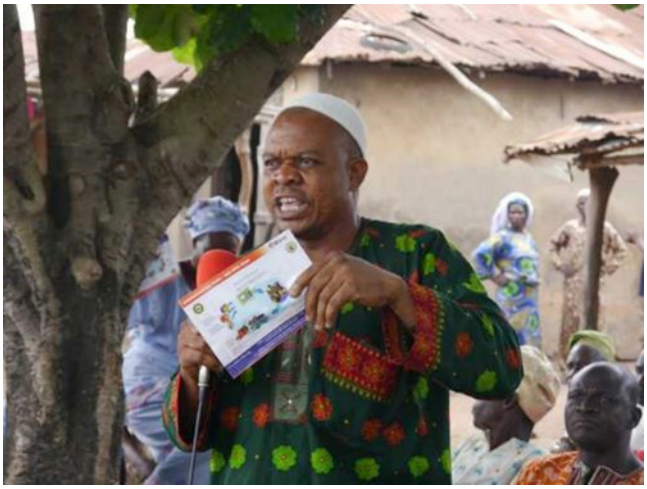
d) Enhanced security of government information and data

e) Improved efficiency and effectiveness of archival systems across government ministries and agencies.

In **Nigeria,** the *Government Contact Centre* and *Single-Window Portal* projects (**SDGs 16 and 17**) were implemented, involving:

a) deployment and operation of a central government contact centre (including technology, processes and operation);

b) deployment of a national e-government single-window portal to provide citizens and other stakeholders with access to the information and services being provided by various ministries, departments and agencies through websites.



The Society for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Gmbh of **Germany** has created the *Trade Route Incident Mapping System (TRIMS)* that provides a tool to tackle corruption in the public sector, specifically among security agencies and other public sector actors involved in road management in **Nigeria**. It allows traders and transporters of goods (target group) to anonymously report bribes, harassments and delays faced at mostly illegal checkpoints while transporting legitimate goods. The system uses SMS, a mobile app and a website to illustrate the problems faced by traders in a structured way. Aside from quantitative data, qualitative data such as interviews with traders and security agencies have been collated. TRIMS uses media such as radio and so-called "market storms" to incorporate both traders and security agencies and to create broad awareness of the problems.

Thus, the project contributes to the economic growth of the country (**SDG 8**).

E-business

The United Nations Economic Commission for Africa (ECA) implemented a project on *e-commerce facilitation* for SMEs to enhance the implementation of ICT policies and plans in **Ethiopia** and **Gambia**.[17]

In **Ghana**, EKO ICT has introduced a *Mobile/Remote Revenue Collection and Payment System*. This *m-transact* system consists of mobile revenue collection and payment software and devices that will be used for remote revenue collection, balance enquiries and customer registration in real time (connected to reports or communicating transactions to the office software and database server immediately) (**SDGs 8 and 17**). The system automatically prints real-time receipts for each transaction.

[17] The 2013 Report of the United Nations Secretary-General: Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

Customer balance enquiries and account statements can be printed from the system without visiting the office. Customers will be able to see the amounts they currently have on deposit at the office.[18]

Two projects from the Ministry of Technology, Communication and Innovation of **Mauritius** aim to develop quality and resilient infrastructure as well as to increase access to ICTs in the country (**SDG 9**).

The **Mauritius** *eRegistry Project (MeRP)* was launched to scale up to e-services by harnessing the latest technologies and solutions that can provide integrated workflows and options for businesses, professionals and members of the public to conduct business with the Registrar General Department over the Internet. MeRP allows for the e-submission of documents, e-payment of duties and taxes, e-registration, e-search and e-delivery of registered documents. The Registrar General Department is the winner of the 2014 edition of the Public Service Excellence Award.

An integrated web-based *e-Procurement System (e-PS)* destined for the public sector will improve its procurement processes, enhance transparency and stimulate competition in **Mauritius**. The project is designed to be implemented in three phases with progressive roll-out, namely:

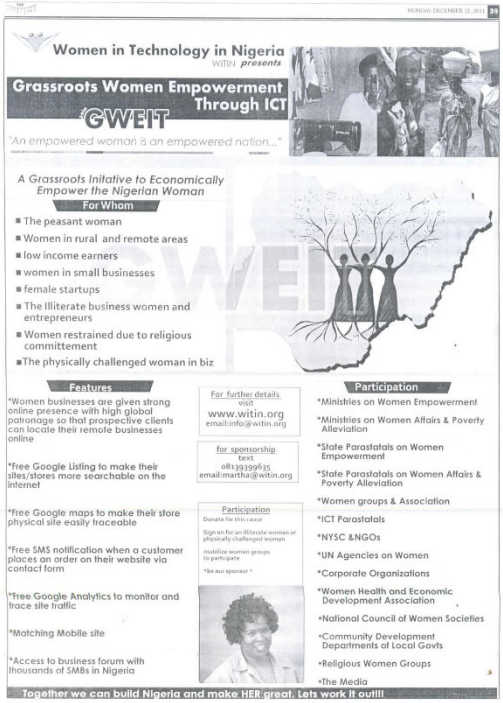
1) E-PS enables the floating of tenders and on-line opening of bids for nine selected public bodies by November 2015. E-PS will progressively roll out to encompass other public bodies and their counterpart suppliers in using the e-procurement portal;

2) E-PS development progresses to include the remaining stages in the procurement cycle and setting up of a complete procurement management information system (MIS);

3) E-PS enables framework agreements and electronic reverse auction.

Women in Technology in **Nigeria** (WITIN) initiated the *Inclusion and Integration of Disadvantaged Groups and Marginalized Women into the Global Digital Economy* project. It relates to the most disadvantaged groups including marginalized women entrepreneurs, especially those in rural and remote communities, thus meeting a number of SDGs by fighting against poverty and hunger and ensuring healthy lives and gender equality (**SDGs 1, 2, 3, 5 and 10**). All beneficiaries' local businesses were properly branded and put online with google maps showing the physical locations of their stores. All have at least a basic mobile (feature) phone with which they communicate with clients and transmit business, overcoming all barriers and benefiting immensely from the Internet. Launched since December 2011, and with resounding success stories, the project is being expanded in order to reach more beneficiaries and groups in Nigeria, promoting economic development and a peaceful and inclusive society, revitalizing collaboration and ensuring sustainable consumption and production patterns (**SDGs 12, 16** and **17**).

[18] Project nominated for a WSIS Project Prize 2014



In **Nigeria**, governments and other agencies have contributed to **SDGs 8, 9, and 17,** and to the development of business and trade data centralization and to the establishment of efficient mechanisms for reducing expenses:

- The *single-source for foreign trade information* (VUCE) project is the offshoot of a strategy for progressing to a single system for foreign trade information. It includes a feasibility study and analysis of the requirements for determining the potential scope of the future single source for foreign trade information, the level and nature of demand, the data and other information required, the legal aspects, the implementation strategy (including definition of possible stages), the possibility and nature of a pilot study, the cost of various implementation scenarios, the human, technical and other resources needed, the likely risks and benefits, the timing, other aspects of the implementation strategy and details of the operating strategy. The basic legal framework has also been mapped out, involving laws and regulations to ensure information can be exchanged confidentially and securely.
- The *Nigeria Trade Hub* web-based trade information portal was developed to provide timely trade information and is supplemented by mobile apps for the various platforms. The hub ensures that the trading community has access to timely information on Nigeria's trade processes, anytime and anywhere. It aims to facilitate trade by making the supply chain more transparent, with all the information relating to trade from all the various agencies collected under one roof and readily available for searching and viewing. The portal provides information and guidance for international trade.
- The Central Bank of Nigeria (CBN) has developed the *Nigerian Financial Services Network* (NFSN), a project to provide shared network infrastructure for the Nigerian banking system in order to reduce the annual operating expenses the banks incur in providing and maintaining communication infrastructure. The annual aggregate cost of network and communication infrastructure was found to constitute the most significant recurrent IT expenditure for banks, and ultimately these costs are passed on to customers in the form of high fees, charges, commissions and rates. Generally, the infrastructure will provide an efficient and effective platform for CBN's drive to transform the national e-payment landscape. By leveraging multiprotocol label-switching (MPLS) technology to provide for bandwidth pooling, the proposed shared network infrastructure will securely connect all common financial entities in the country. It will be robust

and secure, resilient and cost-effective. It will offer high availability and support voice, data, videoconferencing and application traffic.

- A *review of the ICT readiness* of the various trade-related agencies and user community for trade processes was conducted. This included assessment of the current organizational and infrastructure status (ICT network, facilities, hardware and software), to ensure that the system to be introduced will be incorporated into the existing infrastructure in such a way as to preserve existing investments in an efficient and appropriate manner. The review included an examination of user operating systems and interoperability, their data-handling capacity, request capacity, transaction/staff capacity, etc.
- The *cash policy project* was launched to facilitate the growth of electronic payments by increasing the availability, reliability and security of electronic channels in the country. The policy's main purpose is to reduce the amount of physical cash circulating in the economy, thereby encouraging more electronic transactions. Some of the policy objectives include modernizing Nigeria's payment system, reducing the cost of banking services, driving financial inclusion through various e-payment channels such as mobile money, improving the effectiveness of monetary policy, reducing high security and safety risks, fostering transparency, and curbing corruption and leakages in the system.

The *African Alliance for e-Commerce*[19] is a regional framework promoting the concept of national and regional ICT systems in compliance with international recommendations for cross-border trade (**SDGs 8 and 17**). It is also a framework for exchange and sharing on trade facilitation. It aims to promote the concept of a national and regional single window complying with international recommendations. The single window boosts the development of inter- and intra-regional trade in **Africa**, making businesses more competitive and ready to meet the challenges of globalization.

The *Ishyiga software lines* project from Algorithm Inc. in **Rwanda** has a very peculiar story. Quoting the words of its developer: "After finishing my undergraduate studies in Canada, I decided to come back to work in Rwanda because it had more IT needs and shortcomings than Canada (**SDGs 1, 8, and 9**). When I arrived in 2007, I found that all aspects of business management were being handled manually. I decided to help by automating business processes. Ishyiga Software was the name of the solution. Ishyiga is a Kinyarwanda word meaning three stones which were used to cook on. We used that concept to emphasize the three elements needed to succeed: developer understanding of business management strategies, the design of software to enable those strategies, and user-friendly end-user solutions.''[20]

Also in Rwanda, the *Electronic Single Window* system is boosting business. Trade-related information and/or documents required are only submitted once at a single entry point. The system allows traders to fulfil all import- and export- related regulatory requirements through a single portal (**SDG 8**). So far, the system has been used to computerize customs management operations processing, exemption processing by the Rwanda Development Board, quality inspections for imported goods, warehousing and cargo handling and health regulatory procedures for imported medicines and medicine equipment. An interface between Rwanda, Kenya and Uganda allows for faster clearance of goods and ensures seamless and real-time exchange of information at the port of Mombasa.

SMEs make up 90 per cent of the private sector in **Uganda**. Business records management software will enable SMEs in Uganda to move from using rudimentary paper methods of record-keeping to a more accurate record-keeping method. This will be achieved by encouraging SMEs to adopt *Business Records Management software*, which has been locally developed and engineered by Victorium Holdings Ltd. Affordable software will improve the record-keeping practices of small businesses within Uganda and limit their potential exposure to tax and compliance problems (**SDGs 1 and 8**). The software enables SMEs to prepare financial statements and print out their income statements.

[19] http://www.aace-africa.net/
[20] Project nominated for a WSIS Project Prize 2015

In **Uganda**, *Bizcust* is a mobile web-based application system for expanding the customer, market and transport accessibility base for both businessmen and farmers. Bizcust runs on all mobile devices and computers. The problem resides in the fact that farmers lack information on updated commodity prices offered by different agro-businessmen. Due to this, some businessmen exploit farmers by offering lower prices. Much as farmers have tried to search for better prices from different agro-companies, they have encountered difficulties in reaching them. This is because the agro-companies are far from the farmers and there is also a communication gap between them. Moreover, it is hard for both farmers and businessmen to access quick and affordable transportation.

This project is therefore extremely useful, as it relates to poverty, food-security and gender-equality issues (**SDGs 1, 2, 5**).

A further project from **Uganda**, the *Money mobile counter (M-Count)* is a mobile application for automatically counting large amounts of money. A number of people in the business sector in Uganda deal with transactions involving large sums of money. These include supermarkets, petrol stations, mobile money shops and banks. Little has been done to ensure safety, transparency and efficiency in their operations. The use of counterfeit money detectors is one of the methods employed to ensure safety. Under this, money is screened to check it for the watermark. This is also done manually, but entails considerable loss of time and inconvenience, and the liability of money laundering and fraud.

Hence, M-Count represents a real possibility for enhancing security with regard to money, the efficiency of the people handling it, for example bank tellers and supermarket attendants, transparency in providing the actual amounts of money available, and time-saving in regard to counting large numbers of notes (**SDGs 8** and **9**).

In **Zambia**, Nchitonet Dot Com Ltd establishes the *e-Mentorship Programs for Local Entrepreneurs,* a mentoring programme for 1,500 local entrepreneurs to help local enterprise development that will create jobs and sustainable business. Ten local industries that have business potential to improve socio-economic and environmental challenges faced by young people, women and the nation at large are targeted. The goals of this project are to:

- Establish partnership with at least fifty organizations and companies based locally and abroad to support the mentor programme with at least 500 experts taking up roles as mentors in 2016
- Enroll 150 entrepreneurs as mentees in 10 key business industry categories established for the (3 month, 6 month, 9 month and 12 month) mentorship programme
- Manage and support the mentorship programme with an easy-to-use, secure and user-tailored electronic mentoring platform that engages mentor and mentee in a win-win mentor relationship
- Organize monthly/weekly mentor meet-up events with a target of 500 mentor relationships at each event in 2016.

This ambitious project reaches the majority of the **SDGs (1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 15, 16 and 17**) related to this WSIS action line.

E-health

In **Kenya**, the Ugunja Community Resource Centre has implemented the project *Mobile Phones for Integrated Health and Early Childhood Care and Development* (**SDGs 3 and 9**). The project uses CommCare, an open-source application installed on mobile phones that community health workers use to register households, counsel pregnant mothers and children, and make referrals to health facilities. The phones enable the community health workers to be effective and efficient, create greater access to content and offer quality health education. They make the community health workers

accountable for data integrity. Thanks to the use of sound and images, the counselling sessions offer a deeper understanding and conceptualization of the tips provided.

Without connectivity, the use of ICT applications is impossible. In order to increase health system efficiency, hospitals, health centres and rural areas have to be connected. Supporting **SDGs 3, 10, and 17**, in **Nigeria**, for example, a *connectivity project* was implemented that:

- provided Internet, voice, data and videoconferencing facilities to the National Primary Health Care Development Agency (NPHCDA) head office, 40 general hospitals, six zonal offices and one strategic cold store;
- provided Internet and voice services to 160 primary health centres;
- provided portacabins with an Internet connection and desktops to zonal offices in places such as Benin, Kano, Ibadan, Enugu, Bauchi and Minna;
- connected all 208 locations via virtual private network (VPN);
- trained a staff member at each location, on customer premises, to use the equipment deployed, and provided portal and first-level support staff for the six zonal offices for three months each.

In **Rwanda,** Jembi Health Systems has launched the *Rwanda Health Enterprise Architecture* (RHEA), which aims to improve maternal health by strengthening ante-natal service provision (**SDGs 3 and 9**). Clinical patient data are entered into an electronic point-of-care records system (OpenMRS or RapidSMS) and stored centrally in a shared health record. The next time the woman is seen at any clinic or the district hospital, the clinicians can retrieve her data from the shared health record. The data they receive will be the same, no matter where they are located.

In **Rwanda**, in response to regular threats of disease outbreaks, the Ministry of Health developed and deployed *electronic Integrated Disease Surveillance and Response* (eIDSR) in all public and private health facilities in order to enhance surveillance of epidemic-prone diseases and respond promptly to outbreaks (**SDG 3**). The system is built on the District Health Information System (DHIS-2), which comprises a weekly aggregate data reporting component and an immediate case-based reporting component. The case-based immediate reports are complemented by laboratory requests and confirmations. The system detects suspected outbreaks, sends a variety of e-mail or SMS reporting reminders and issues alerts of possible outbreaks.[21]

E-employment

In **Nigeria**, the National Universities Commission (NUC) as part of its mandate ensures the orderly development of university education in Nigeria and aims to produce globally competitive graduates for the labour market (**SDGs 4, 8, and 10**). One of the NUC's goals is to match university graduate output with national manpower needs, and it is with that in mind that the commission instituted the *Labour Market Observatory* (LMO) project to generate data and information for the formulation and implementation of plans and policies at all levels of government, leading to the establishment of the LMO and the *Labour Market Information System* (LMIS).The objectives of the LMO project are:

- To regularly collect, process, store, analyse, use, share and disseminate labour-market data and information among stakeholders in the Nigerian economy
- To guide national policy and programme development on labour-market issues, e.g. national decisions on higher education programmes
- To match university graduate output with national manpower needs (one of NUC's goals)

[21] Project nominated for a WSIS Project Prize 2015

- To create among stakeholders an awareness of LMIS and its benefits, and of the need for a coordinated Nigerian national labour-market information system
- To identify labour-market information needs of stakeholders.

E-learning

The *Virtual Institute for Higher Education in Africa* (VIHEAF) is a collaborative project between the UNESCO Harare Cluster Office in **Zimbabwe** and the National Universities Commission (NUC); thus supporting **SDGs 4, 10, and 17**. It is an online (Internet-based) institute that targets basic and higher education teachers in **sub-Saharan Africa**, to train them on several components of dire needs like HIV/AIDS education, modern methods of teaching and learning (pedagogy), modern research skills for higher education teachers, entrepreneurial education, writing grant award proposals, and development of materials for open and distance learning. VIHEAF is a free online training programme that runs in modules.

VEduc is a learning application developed by the International Institute of Tropical Agriculture of the **Democratic Republic of the Congo**, which enables instructors and students to use an application that organizes and keeps track of educational materials such as courses or training programmes, specifically in an online learning environment (**SDG 4**). There are a number of benefits to using it. It provides:

1. Online registration and payment for courses
2. Outline building tools
3. Content delivery and multimedia capabilities in a variety of formats, including support for audio and video, pdf files and PowerPoint presentations
4. Online tests and exams
5. Customizable, downloadable, automatically e-mailed certificates for course completion.[22]

The *Talking Book* service from **Ghana** significantly improves health, income and quality of life for the world's most underserved communities by providing life-changing knowledge through innovative technology (**SDGs 1, 2, 3**). The Talking Book is a low-cost audio computer designed for the learning needs of illiterate populations in the poorest areas of the world. Through partnerships with local government and non-government agencies, relevant, timely and practical audio lessons on sustainable farming methods, gender issues and key health practices are produced and recorded. The messages (in the form of interviews, songs, dramas and stories) are then loaded on to Talking Books and distributed.

Thus, the programme meets a considerable number of SDGs in ensuring quality education, gender equality, contribution to economic development, etc. (**SDGs 4, 5, 6, 8, 10, 13, 15-17**).

[22] Project nominated for a WSIS Project Prize 2015.

IAM School Manager is a software application that addresses management of information for kindergarten, primary and secondary schools in **Malawi,** thus relating to **SDG 4.1**- complete free and quality primary and secondary education for future perspectives. *IAM Solutions* aims to reach every institution with simple and affordable IT solutions that matter, starting with the education sector. IAM School Manager will therefore comprise modules requiring a licence, such as fee management, and others, such as student assessment, free of charge. Examples of the modules in IAM School Manager include fee management, student assessment, hostel management, library, etc. Free modules are developed under the project "My Country My Solution (MCMS)", which is aimed at identifying problems in Malawi and providing solutions free of charge.

The *Nigerian University System Management Portal* (NUSMAP) is an online application, designed for use by universities in **Nigeria** to process, share and communicate data on enrolment statistics, graduate output, academic programmes, physical facilities, geographic information systems (GIS), budgets, expenditure, staff, student information, research and innovation with the National Universities Commission (NUC), the public and other government agencies, for the purpose of proper planning and management (**SDG 4**). It captures the activities of all NUC directorates, which include university programme accreditation, university academic standards, university system annual review meeting (USARM), university research and innovation, finance and budget.

E-agriculture

In **Kenya**, **Uganda** and **Tanzania**, FAO's *Rural Knowledge Network* (RKN) pilot project for East Africa has supported the emergence of commercially viable market-access services for building effective and efficient rural marketing chains for the benefit of all (**SDGs 2, 4, 8, 9, 12, and 17**). The RKN helps smallholder farmers access market intelligence and linkages with key value-chain players. It was developed using a people-centered knowledge-management process that is built on an understanding of farmers' needs. It comprises a range of entrepreneurs, including information board managers operating a frontline market-intelligence service at producer level; market-access companies operating a local market-brokering service at district level; and national marketing companies and their regional managers. An associated initiative, the *First Mile,* has been conducting rental trials to test the affordability, usefulness and appropriateness in rural areas of solid-state laptops that use a SIM-card enabled modem to access the Internet. The pilot project ran from 2007 to 2010, and the programme's most well-established and active offspring is *AgriNet Uganda* (www.agrinetug.net).

In southern Africa (**Angola**, **Malawi**, **Mozambique**, **Namibia**, **Tanzania** and **Zambia**), an *Animal Disease Surveillance System* has been introduced that uses digital pen technology and mobile phones. The data collected are fed into the animal disease information systems used by each country, such as the Livestock Information Management System (LIMS) and the Transboundary Animal Disease Information System (TADinfo), and are sent to external organizations such as the Southern Africa Development Community (SADC) and the World Organization for Animal Health (OIE); thereby supporting **SDGs 3, 4, 9, 12, and 17**. A web-based back-end server facilitates data editing and validation, the confirmation process and reporting flows. A major benefit has been regional harmonization of the disease form and the data-collection methodology. The use of digital pen technology has also been rolled out in **Kenya, Uganda** and **Ethiopia**.

In **East** and **Central Africa,** a *disaster risk reduction platform* has been developed under the regional European Community Humanitarian Office (ECHO) programme to provide a platform for learning groups and for sharing knowledge of innovations in drought risk reduction (**SDGs 4, 13, and 17**). The programme is ongoing (www.disasterriskreduction.net).

The Regional Emergency Office for Africa (REOA) has developed the *Water Inventory and Monitoring System*, a mobile data-collection application that has been provided to NGOs and extension staff in **Kenya**, **Uganda** and **Ethiopia** in order to compile an inventory on water sites in dryland areas

(**SDGs 4, 13, and 17**). Since its launch in October 2010, data on over 4 000 water sources have been captured. The survey forms have been harmonized with national water information systems. FAO provides training and technical support. Mobile phones have been supplied to multiple partners and exchanged when collection was completed. Oxfam GB piloted the mobile data-collection application for the monitoring of key boreholes in **Ethiopia** and **Kenya**.

In East and Central Africa (**Tanzania**, **Uganda**, **Burundi**, **Rwanda**, **Democratic Republic of the Congo**, **Central African Republic** and **Gabon**), the *Regional Cassava Initiative* used digital pen technology to collect six monitoring questionnaires for the project, covering post-planting, pre-harvest, quality-management protocol, beneficiary list, post-distribution and output assessment. The initiative thus contributes to **SDGs 4, 9, 12, 13, and 17.** The quality-management protocol was developed by the International Institute of Tropical Agriculture (IITA). Catholic Relief Services (CRS) and FAO harmonized the post-planting and pre-harvest forms**.**

In several African countries (**Djibouti**, **Kenya**, **Uganda**, **Tanzania**, **Rwanda**, **Burundi, Central African Republic**, **South Sudan** and **Sudan**), *SMART FISH Post Harvest Fish Loss*, a mobile-phone application, is being used by enumerators to capture and transmit data on fish losses to a centralized database (**SDGs 4, 13, and 17**). The data are then made available via a website to end users such as policy-makers, fisheries departments, NGOs, fishermen, processors, traders and development agencies. The information shows where losses are occurring, how large the losses are and why they are occurring. All this information is important when it comes to planning where and how to reduce losses and therefore how to make the best use of development resources.

In **Eastern** and **Southern Africa,** the *LinKs* project – Gender, Biodiversity and Local Knowledge Systems for Food Security – works in partnership with grassroots organizations to collect and disseminate information on the linkages between gender, local knowledge and agro-biodiversity (**SDGs 4, 13, and 17**). The project provides partner institutions with opportunities to document and share what they have discovered about farmers' knowledge and practices.

The *Global Fire Information Management System* (GFIMS) is a global FAO initiative that delivers almost real-time fire information to support natural resource management around the world. The satellite-derived data are delivered to natural resource managers, stakeholders and the general public (www.fao.org/nr/gfims).

FAO Dimitra is a participatory communication and information project that highlights the role of women in agriculture. The project is being implemented in **Niger**, **Burundi**, the **Democratic Republic of the Congo**, **Ghana**, **Senegal** and **Mauritania.** It strengthens leadership by women and provides a platform for the most marginalized to improve their livelihoods and food security (**SDGs 2, 4, 5, 8, and 17**). The project is being carried out through participatory communication, more specifically community listeners' clubs. Mobile phones, rural radios and an online database are used to improve information exchanges and network creation (www.fao.org/dimitra).

The *SIS semences* project was established in line with the **Côte d'Ivoire** government's national strategy for the production of rice focusing on quality seed (**SDGs 8, 12, and 17**). FAO, the *Fonds interprofessionel de la recherche et de conseil agricoles* (FIRCA), the *Agence nationale d'appui au développement rural* (ANADER) and the *Association nationale des semenciers de Côte d'Ivoire* (ANASEMCI) have agreed to put in place a low-cost system for the production and commercialization of quality seeds. FAO has provided the know-how and trained local staff from different institutions to handle and manage the information system. The system uses mobile technology, in particular smartphones, to report on the quality of seed production and to facilitate access to markets. The project is ongoing.

The economy in **Ghana** is mostly agrarian, with agriculture, the largest sector, accounting for 40 per cent of GDP and the national government earning huge amounts in foreign revenues from agricultural products and produce. The sector employs a large swathe of the Ghanaian population and is of great

importance to the entire country. Foresight Generation Club has implemented the *eAgri Transport Go Network* (**SDGs 2 and 8**), the main benefits of which are as follows:

- Farmers have access to a viable means of transporting produce from their farms to villages and selected market centres, boosting the economic standing of farmers and residents in the project's catchment communities.
- Design and implementation of an innovative solution driven mainly by the lack of accessible means of transportation for farmers.
- A project methodology motivated by the non-availability of direct and indirect marketing channels for farming and agricultural produce in most farming and agricultural areas in Ghana.[23]

A database was created and the data stored at the Data Centre. The data consist of registration details and contact numbers for individual members, farming associations and transport owners and drivers who are responsible for transporting the farm produce from the farms to the villages and from the villages to the marketing centres. Requests are sent via text or SMS to members' mobile phones, and a confirmation is sent to the short code. Field agents who are responsible for collecting such data are specially trained to serve also as mobile data centre agents sending information and details of registered members to the head.[24]

In **Kenya**, the *Agriculture through Technology* project aims to ensure that each household within Nyando Sub-County has at least one greenhouse farm where they can practice horticulture. The project is to run for a period of three years (**SDGs 1 and 8**). Innovative interventions aim to facilitate improved access to farm inputs, reducing transaction costs to allow smallholder farmers better access to markets and using information technologies to disseminate agricultural information more efficiently.

In **Kenya**, Anglican Development Services – Western Region (ADS-WR) promotes farmer entrepreneurship through the value chain development approach. The main objective of the *ICT in Agriculture* programme is to promote fair economic development among participating chain actors especially in the tomato, onion and passion fruit value chains.

In the first phase, the project focused on equipping the three existing collection centres with ICT tools. The collection centres act as business hubs and central places where the ICT tools are operated by the farmers with guidance from ADS-WR. This has accrued benefits to the farmers through the provision of production and market information. In order to deliver this objective, ADS-WR employed the following communication tools:

- Setting up computer labs
- Provision of radio listening sessions
- Development of multimedia and video learning sessions
- Forming a strategic alliance with M-Farm Company

The project objectives meet **SDG 8** on the achievement of high levels of economic productivity for the country and the promotion of sustainable economic development.

Madagascar is among the pilot countries of the *World Agriculture Watch* (WAW) initiative. The various phases to inventory the available database on farming activities, establish a zoning plan based on stakeholder interests and put in place the mechanism for collecting, analysing and spreading information having been completed, an adapted device is being introduced specifically for the observatory (**SDGs 3, 4, and 9**). The indicators used have been rigorously tested, an effort that will be pursued until 2014. These indicators will be input into the electronic device, which will be loaded at both local and national level by each partner involved in the collection of information. The WAW

[23] http://www.fao.org/fsnforum/protracted-crises/re-addressing-food-insecurity-protracted-crises-resilience-building-programming-14

[24] Project nominated for a WSIS Project Prize 2014

initiative helps bolster the capacity of local and national structures to implement an information system and use ICT. It seeks to monitor and analyse structural transformations of farming systems and their impact on development, food security, poverty reduction and natural resource management, in order to inform policy dialogue and formulation. It intends to develop an international platform for knowledge generation and exchange, based on a network of existing local observation units sharing common objectives and approaches.

Also in **Madagasca**r, a *Food Security and Vulnerability Information System* (SISAV) was set up. This information system aims to follow up food security and vulnerability indicators and to warn all those concerned when localities approach a high level of vulnerability (**SDGs 3, 4, 12, and 13**). It is based on the principles of simplicity and low-cost charges in order to ensure its viability. SMS messages are in this case the best option for circulating short items of information quickly, and help improve local farmers' knowledge of the technology. The programme will run from 2013 to 2015.

In **Niger**, *Smart Irrigation* by Tech-Innov is capable of fostering a process to control and manage farmer irrigation systems using mobile phones and solar energy, with the possibility of collecting weather indicators (temperature, rain fall, wind and humidity). The initiative was launched in 2013 and will run until 2018 in partnership with the Niger Government, Orange Niger and MTP-Editions France (**SDG 8**). More information can be found on the Tech-Innov web page at: http://www.tele-irrigation.net.

In **Nigeria**, the Smallholders Foundation launched the *FarmBracket: an Online open collective market for cash crop farmers* project that will establish and develop an online open collective market source for farmers (specifically young farmers) in Nigeria who farm cash crops. This system enables potential buyers to easily access their profile and the quantity and quality of their produce. The system uses an SMS to web platform to inform and educate farmers with current daily markets tips. Through the SMS to web package, poor young rural farmers can update their status in terms of the quantity of goods available for sale by simply dialing a code which is provided for them on their phone.

The project's goals meet **SDG 2, 3, 4** and **8**, promoting sustainable agriculture, lifelong learning opportunities for farmers and well-being for all. It also ties in with economic development and employment in the agricultural sector of the country.

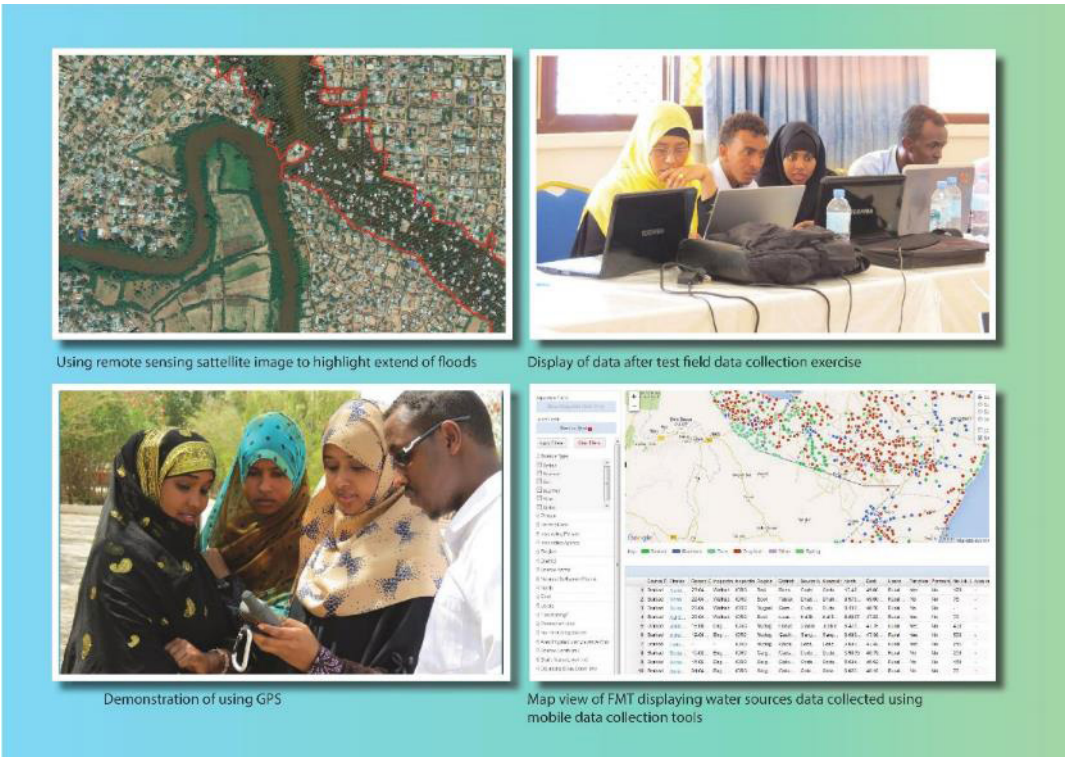
In **Rwanda**, in the *Smart Accountability in the Rwandan Coffee Sector* project, Smartphone and open source technologies are used by trained young people to collect the voices of smallholder coffee producers (including women producers), transform their voices into text, and categorize the issues raised by uploading them onto a virtual server (**SDGs 8, 9, and 12**). Clustered and visualized issues in the form of tag clouds have been made available to district coffee task forces to inform the agenda of these multistakeholder platforms, provide feedback on planned activities and improve the effectiveness and relevance of task force decision-making in order to increase the productivity and incomes of smallholder coffee producers.[25]

In **Somalia**, a *Biometrics Information Transfer System* (BITS) has been developed to improve service and product delivery for various sectors, including livestock, agriculture, fisheries and cash-based activities (**SDGs 4, 9, 13, and 17**). The biometrics-based databases allow FAO to register and verify beneficiaries in order for them to receive products and services in a more secure, timely and efficient manner.

The **Food and Agriculture Organization of the United Nations (FAO)** initiated the *Somalia Water and Land Information Management (SWALIM)* programme that serves Somali government institutions, non-governmental organizations (NGOs), development agencies and UN bodies engaged in assisting Somali communities whose lives and livelihoods depend directly on water and land resources. The programme aims to provide high-quality water and land information, crucial to relief, rehabilitation and development initiatives in **Somalia**. The use of ICTs to accelerate, improve and multiply the effects of this work has been a hallmark of the programme since the beginning and remains a key component.

[25] Project nominated for a WSIS Project Prize 2015

The project is linked with a considerable number of SDGs, fighting against poverty and hunger, ensuring healthy lives and access to water, promoting economic growth and sustainable industrialization, etc. (**SDGs 1, 2, 3, 5, 6, 8, 9, 13** and **15**).



In **Uganda**, Nokia mobile data gathering is being used to collect three-monthly surveys by parish chiefs in order to provide input for the *Drought Early Warning System* (**SDGs 4, 9, and 13**). The mobile data application streamlines data collection by automatically centralizing all data in the district database, decreasing the number of paper questionnaires that need to be collected from the parishes and manually captured.

The *Technologies and Practices for Small Agricultural Producers* (TECA) programme is a global FAO initiative based on an interactive web-based platform. It aims to improve access to validated practical information on agricultural practices specifically for smallholders, extension and advisory services, development practitioners, producer organizations and producers themselves, in different languages (**SDGs 4 and 13**). TECA has two functions: first, it provides access to FAO's web-based interactive knowledge repository of applied technologies and practices on different agricultural themes, and second, it has two online forums where registered users can exchange information on challenges, experiences and possible solutions (www.teca.fao.org). The communication knowledge brokers of the Grameen Foundation in **Uganda** use TECA to provide farmers with information on practices via mobile phones and a call centre.

E-environment

Relating to the **Africa, Asia and Pacific regions**, the international *Mobilizing Arab-Wide Action for Reliable Environmental Data (MAWARED)* is an online platform that allows users at any time and location to upload their environmental observations to a central server using smartphones. The system also provides information about environmental observations around the user's current location. The users can upload observations through a user-friendly interface by selecting the type of observation and status. The app directly identifies the location (latitude and longitude) and the time, then sends it

to the server to be stored. The user can also take a photo of the observation using the phone's camera and upload it to the server. All observations are shown directly on an interactive web mapping system.

Relating to global partnership, the application promotes well-being and contributes to safety of cities, sustainable use of oceans as well as the fight against desertification, etc. (**SDGs 3, 11, 13, 14, 15** and **17**).

E-science

In **Rwanda**, as a way of extending broadband networks, one of the main activities of the project *Connecting all Higher Learning Institutions and Secondary Schools to Broadband via WiFi to promote Science and Technology* (RCIPRW) is to extend broadband connectivity to institutions in rural areas (**SDGs 4 and 9**). In this regard, the Rwanda Development Board intends to use part of the funding to install WiFi equipment for higher learning institutions as well as providing WiFi equipment and computer labs in secondary schools in Rulindo and Gisagara districts as a pilot for a project to provide Internet broadband access for secondary schools.[26]

[26] Project nominated for a WSIS Project Prize 2015

C8. Cultural diversity and identity

The *NatiV* project is an e-learning application for a low-cost Android tablet to enable children in rural **Zimbabwe** to learn to read using their own languages (including Shona), as well as to engage children with learning disabilities. NatiV is an Android application under development for e-learning infrastructure that will teach children how to read Shona (Zimbabwean language). NatiV is designed to improve a child's syllable-to-sound (letter-to-sound) association. It implements simple, core Android2 application development concepts, with a UI3 and gestures that are child-friendly and engaging. The aim of NatiV is to become an application used nationwide, catering for all local languages in Zimbabwe (Ndebele, Tonga, etc.) and operating via a central data centre which works on improving the learning software and offering parents data analysis and tips on how they can also help their children improve their reading. NatiV is being made with special consideration for children with reading disabilities such as dyslexia, with the aim of helping them learn to read by implementing technical solutions for special methods prescribed by professional dyslexia researchers.

The project meets several SDGs as it provides quality education, contributes to economic growth and promotes a peaceful and inclusive society and lifelong opportunities for Zimbabweans (**SDGs 4, 8** and **16**).

C9. Media

In **Ethiopia**, *Infotech TV Show* is aimed at disseminating ICT knowledge through media. A 40-minute weekly magazine-style show broadcast nationally on ETV 3 and globally via Nilesat is dedicated to helping the Ethiopian audience use and understand technology so as to simplify their lives thanks to ICTs[1] (**SDG 4**).

[1] Project nominated for a WSIS Project Prize 2014

In **Nigeria,** the National Broadcasting Commission (NBC) continues to bear the responsibility for *managing the Nigerian broadcasting industry*. This includes, among other things, licensing, monitoring and regulation. In order to increase the Nigerian population's access to international broadcast channels, thereby widening their horizons in terms of information and knowledge, NBC has licensed new entrants for direct-to-home (DTH) satellite operators, breaking the over a decade-long monopoly of broadcasting on this platform (**SDGs 9 and 12**). The commission is deploying major efforts to ensure that the operators are fully operational, and a provision to this effect has been inserted in the new edition of the Nigeria Broadcasting Code. Other activities NBC has embarked (or is embarking) upon are listed below:

- Additional network licensing
- Community broadcasting
- Digital broadcasting
- Local content quota
- Production of Nigerian adverts
- Monitoring and regulation using ICT.

In **Uganda**, Farm Radio International (FRI) led a serialized radio mini-drama project in 2013 to improve knowledge and increase consumption of OSP, a type of sweet potato, in Uganda. In collaboration with Harvest Plus staff, extension workers, farmers' groups, writers, radio drama experts and radio station staff, and TRAC FM, FRI developed, wrote, produced and broadcast an entertaining and educative radio mini-drama series called "My Children" (**SDGs 9 and 12**). The 30-episode drama was aired on ten stations in six languages. It used an entertaining plot of love, domestic strife, money and power to draw in listeners and educate them on the many benefits of OSP. Each five-minute episode was followed by a short discussion and an interactive element of SMS polling, led by TRAC FM through the partner radio stations. The series created more demand for OSP by engaging listeners and raising awareness on how to grow and prepare this nourishing crop. This ambitious project succeeded in raising awareness of OSP among 350 000 households across 13 districts of Uganda. Demand for OSP vines has increased and vines are now moving around the country and being shared by farmers.

C10. Ethics

In **Rwanda**, some 100 news websites represent more than the total number of newspapers, radio and TV stations combined. The Rwanda Media Commission (RMC), which is responsible for media self-regulation, has developed strategies for dealing with professional and ethical issues related to online media with the project *Tackling Ethical Dimensions of Online Media Content through Self-Regulation* (**SDGs 12 and 16**). Five key activities are identified: regular monitoring to identify ethical and professional gaps; conversations with editors where ethical gaps are identified; regular group meetings with web owners and editors; handling complaints from the public; and disseminating the principles of the Code of Ethics. Common issues identified include violations of privacy, nudity and graphic depiction of violence. RMC has already handled around ten cases so far.[1]

[1] Project nominated for a WSIS Project Prize 2015

C11. International and regional cooperation

Supported by the European Commission (EC) and the African Union Commission (AUC), *IST-Africa* is a strategic collaboration between the International Information Management Corporation (IIMC) in **Ireland** and ministries and national councils responsible for the information society, ICT and innovation adoption, policy and research in 18 countries of **Africa** (**SDGs 16 and 17**). Founded by IIMC in 2002, and co-funded under the European Framework Programme since 2005 (Current Contract 611795), IST-Africa has gradually introducing new partner countries on a phased basis, which are often at different stages of research capacity, technology adoption and socio-economic development. IST-Africa facilitates and supports development of the information society and knowledge economy in Africa through:

- International innovation, research and policy cooperation
- Knowledge-sharing and skills-transfer between IST-Africa partners
- Collaborative innovation, entrepreneurship and adoption of living labs
- Information society, ICT and innovation aspects of the Africa-EU Strategic Partnership. [27]

The **Commission of the African Union (AU)** has recognized the potential of ICTs for improving citizens' living conditions (**SDGs 8, 10, and 17**). With the assistance of the Government of **India**, it has implemented a satellite and a fibre-optic network to provide tele-education, tele-medicine and diplomatic communication services to African Member States (the Pan African e-Network for Telemedicine and Tele-education or "PAeN"). The project objectives are to (1) use the potential of ICTs to develop the health and education sectors; (2) exploit the opportunities of ICTs to support economic and social development; and (3) facilitate the growth of e-applications. By the end of 2014, a total of 48 African Member States were benefiting from PAeN services and more than 16 000 students were enrolled.[28]

Kenya, Rwanda, Uganda and **South Sudan** jointly adopted a regional telecommunications framework for a *One-Network-Area* (**SDG 17**). This was the result of resolutions adopted by the Fifth Heads of State Summit for Northern Corridor Integration Projects held in May 2014 in Nairobi, Kenya. It applies to telephone calls from and terminating within the region, and provides for:

- exemption of regional calls from surcharges applied by Member States on international incoming calls
- no additional charges to subscribers for roaming within the region
- no roaming charges for receiving calls within the region, and subscribers travelling within the region charged as local subscribers in the visited country's network.

In **Nigeria**, the *International Single Window* conference is an experience-sharing forum on the "single window" concept. The aim is to bring together different regions of the world, with contributions from countries which have a lot of experience in this field, the participation of countries wishing to set up their single window project, and inputs from organizations that support the implementation of single window systems, as well as international experts (**SDGs 16 and 17**). A single window is a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export and transit-related regulatory requirements. If information is electronic, then individual data elements need only be submitted once. [29]

EDUganda is a south-south cooperation project in the form of a joint venture developed by **Egypt** and **Uganda** and implemented by the Information Technology Institute (ITI). It targets sectorial capacity development for IT-enabled services, and specifically the business process outsourcing (BPO) industry

[27] http://www.ist-africa.org/home/default.asp?page=initiative
[28] Project nominated for a WSIS Project Prize 2015
[29] http://www.nigeriatradehub.gov.ng/News/tabid/98/entryid/39/international-single-window-conference.aspx

(**SDG 17**). The aim is to train 3 000 Ugandans in the BPO skills required by the industry in a bid to accelerate its growth. The project also aims to build Ugandan middle management capacity to operate, plan and manage training programmes. It is an ongoing project that started with a TNA phase and a pilot training programme that yielded 100 per cent employability rates.[30]

Conclusion

The International Telecommunication Union (ITU) remains committed to the World Summit on the Information Society (WSIS) process, and to implementation of the WSIS goals beyond 2016. ITU recognizes and highly appreciates the extremely valuable contributions made by stakeholders to enable the continuation of WSIS monitoring and reporting. There can be no doubt whatsoever that, in today's fast-moving world, innovation and efficiency are vital to success. Accordingly, the WSIS Stocktaking Report in Africa Region 2014-2016 shares with you the most recent updates and success stories in the WSIS stocktaking process of this region.

The Web 2.0 WSIS Stocktaking Platform continues to foster implementation of the WSIS outcomes and to facilitate exchange of information among 200.000 members representing governments, the private sector, international organizations, civil society and other stakeholders. As the Web 2.0 platform continues to flourish, so does the promotion of social development and economic growth through ICTs. We continue to maintain and improve the WSIS Stocktaking Database, which contains around 8 000 entries this year. This encouraging outcome reinforces stakeholders' belief in and commitment to the WSIS Stocktaking process and their desire to share best practices.

In addition, the WSIS Overall Review called for close alignment between the WSIS process and the 2030 Agenda for Sustainable Development, highlighting the crosscutting contribution of ICTs to the SDGs. In this context too, WSIS Stocktaking is evolving to become the unique global process for the collection of information on actions carried out within the framework of WSIS, while underlining their contribution to implementation of the 2030 Agenda for Sustainable Development.

We are also pleased to announce the recent launch of a new and innovative interface, which will make it easier to search all WSIS-related activities. All stakeholders benefit from the sharing of interesting case studies, as this undoubtedly facilitates the transfer of knowledge, experiences and models for project implementation. The WSIS platform helps to create partnerships, provide greater visibility and add value to ICT projects all around the world. The many and varied stakeholders who have implemented innovative projects and contributed to the success of the WSIS Stocktaking process deserve our sincere gratitude.

ITU announces an official call for updates and new entries and urges these stakeholders, along with all Member States, international organizations, the private sector and civil society, to continue submitting such contributions in the future as WSIS pursues the ongoing stocktaking process. We trust that readers will find this report insightful, and sincerely hope that it will inspire them to participate in the construction of a broader and more inclusive information society for all.

[30] Project nominated for a WSIS Project Prize 2015

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