THE REPUBLIC OF UGANDA

Semi-Annual Budget Monitoring Report

Financial Year 2014/15

ICT Sector

April 2015

Ministry of Finance, Planning and Economic Development
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ABBREVIATIONS AND ACRONYMS

AIA	Appropriation in Aid
BPO	Business Process Outsourcing
CCTV	Closed Circuit Television
CERT	Computer Emergency Response Team
DIS	Directorate of Information Security
FY	Financial Year
GB	Giga Byte
GCIC	Government Citizen Interactive Centre
GDP	Gross Domestic Product
GIS	Geographical Information System
GoU	Government of Uganda
HDD	Hard Disc Space
IAC	Information Access Centre
ICT	Information, Communications Technologies
IMSO	International Maritime SateliteOrganisation
IP	Internet Protocol
ISACA	Information Systems Audit and Control Association
ISF	Information Security Forum
ISP	Internet Service provider
IT	Information Technology
KCCA	Kampala Capital City Authority
KIBP	Kampala Industrial and Business Park
KOICA	Korea International Cooperation Agency
LG	Local Government
MAN	Metropolitan Area Network
MDA	Ministries, Departments and Agencies
MFPED	Ministry of Finance, Planning and Economic Development
MoES	Ministry of Education and Sport
MoH	Ministry of Health
MoICT	Ministry of information and Communications Technology
MoU	Memorandum of Understanding

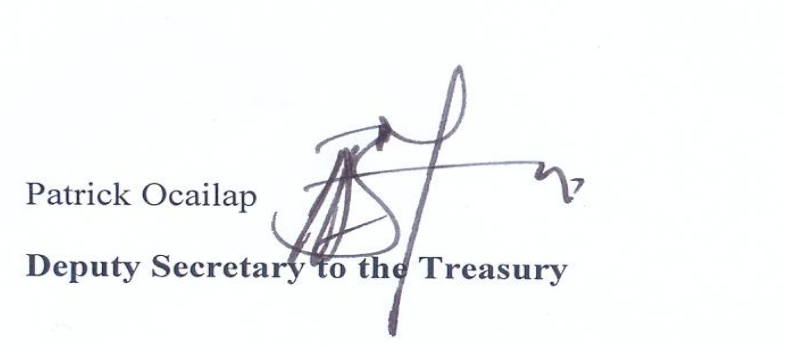
MoWT	Ministry of Works and Transport
NBI/EGI	National Backbone Transmission Infrastructure/E-Government Infrastructure
NGO	Non GovernmentOrganisation
NISAG	National Information Security Advisory Group
NISF	National Information Security Framework
NITA-U	National Information Technology Authority
NOC	Network Operating Centre
NSIS	National Security Information System
NSSF	National Social Security Fund
OFC	Optical Fibre Cable
OPM	Office of the Prime Minister
PKI	Public Key Infrastructure
RAM	Random Access Memory
RCDF	Rural Communication Development Fund
TV	Television
UCC	Uganda Communications Commission
Ugshs	Uganda Shillings
UMCS	Unified Messaging Communication System
UNBS	Uganda National Bureau of Standards
UNODC	United Nations Office on Drugs and Crimes
UNRA	Uganda National Roads Authority
UPOLET	Universal Post O-Level Education and Training
UPU	Universal Postal Union
US$	United States Dollars

FOREWORD

The government has increasingly channeled resources into implementation of public programmes aimed at enhanced service delivery. Effective implementation of these programmes is critical and this calls for monitoring and evaluation.

The Budget Monitoring and Accountability Unit in the Ministry of Finance, Planning and Economic Development makes semi-annual performance assessments on the progress of implementation for selected programmes. This report reviews the half year performance in the priority areas of: Agriculture, Education, Energy, Health, ICT, Industralization, Public Sector Management, Roads, and Water and Environment for FY 2014/15.

The findings therein should inform implementation decisions in the last half of the year. I urge all institutions to follow up on the related implementation issues that have been identified. The implementation challenges and recommendations made will guide the relevant sectors to ensure enhanced effectiveness of programme implementation.



EXECUTIVE SUMMARY

BACKGROUND

The overall report reviews selected key vote functions and programmes within the sectors, based on approved plans and significance of budget allocations to the votes. The focus is on nine sectors, including: agriculture, education, energy, health, industrialization, ICT, public sector management, roads; and water and environment. Attention is on large expenditure programmes with preference given to development expenditures, except in the cases of education, health, ICT, public sector management and roads where some recurrent costs are tracked.

Projects selected for monitoring were based on regional sampling, level of capital investment, planned quarterly output, and value of releases by the second quarter of FY 2014/15. The methodology adopted for monitoring included literature review of quarterly progress and performance reports; interviews with the respective responsible officers or representatives of programmes; and observations at site.

FINDINGS

Introduction

The monitoring in the ICT sector focused on the National Information Technology Authority (NITA-U) and the Uganda Communications Commission.

Performance

The overall sector performance was fair. In spite of the average performance, the access to ICT services is greatly improving, and the sector has shown commitment towards improvement of government service delivery through e-education, e-health, e-governance and e-commerce. However, the quality is still low and services still expensive.

The BPO project and NITA-U programmes registered good performance while the National Backbone Infrastructure project was below average. The RCDF projects under UCC registered fair performance.

National Information Technology Authority: Six selected programmes and two projects were monitored under the NITA-U. These were; National Transmission Backbone Infrastructure (NBI) and Business Process Outsourcing (BPO).

About 80% of the semi-annual targets for the Business Process Outsourcing (BPO) project were achieved. A number of planned activities were ongoing and implementation was scheduled to be finalized in the final two quarters. However, the key deliverable under the National Backbone Infrastructure (NBI) project (laying 757 km of Optic Fibre Cables (OFC) and installation of transmission sites) had not started; performance of this project was generally below average (30%) and behind schedule.

Under the **Uganda Communications Commission**, the overall performance of operationalising the school ICT laboratories and Tele-medicine equipment installed in health facilities was rated as fair (50%). A number of ICT instructors/teachers were re-tooled, some schools and health facilities were connected to the internet and the uptake of ICT services was gradually increasing.

However, 46% of the sampled schools and 50% of the health facilities had not received the internet connectivity which was affecting content delivery. The projects were further affected by lack of sustainability plans, comprehensive user training among health workers and inadequate equipment.

Challenges

The sector is faced with challenges of unfunded priorities alongside inadequate private investment, delayed implementation of key projects such as phase III of the NBI, low volume and double taxation of BPO services, inadequate ICT complimentary services such as electricity, poor implementation of projects/programmes such as telemedicine, limited local and relevant content/instructional materials, lack of sustainability plans for initiated projects and low affordability of ICT services.

Recommendations

- The NITA-U should fast track the implementation of phase III of the NBI project.
- The MFPED/NITA-U/MoICT should reprioritize the ICT sector funding.
- The NITA-U and the BPO association should popularize the availability of BPO services and market the country as a BPO destination.
- The Office of the Prime Minister, URA and MFPED should address the issue of double taxation of BPO services.
- The UCC should procure and supply Internet bandwidth to schools and health facilities.
- The MoES should procure and supply ICT instructional materials to schools.
- The UCC should organize hands -on training for key hospital personnel (medical officers, clinical officer and nurses) and link lower health facilities to referral hospitals to enable them appreciate the telemedicine technology, its relevance and significance in health service delivery.
- The MoES, Schools, MoH, Regional Referral Hospitals and District Local governments should budget for operation and maintenance costs of the projects initiated by UCC for sustainability.

CHAPTER 1: BACKGROUND

The mission of the Ministry of Finance, Planning and Economic Development (MFPED) is *"To formulate sound economic policies, maximize revenue mobilization, ensure efficient allocation and accountability for public resources so as to achieve the most rapid and sustainable economic growth and development"*. It is in this regard that the Ministry gradually enhanced resource mobilization efforts and stepped up funds disbursement to Ministries, Departments, Agencies and Local Governments in the past years to improve service delivery.

Although significant improvements have been registered in citizens' access to basic services, their quantity and quality remains unsatisfactory, particularly in the sectors of health, education, water and sanitation, agriculture and roads. The services being delivered are not commensurate to the resources that have been disbursed, signifying accountability and transparency problems in the user entities.

Although there are several institutions in the accountability sector mandated to monitor and audit public resources, they have not provided comprehensive information for removing key implementation bottlenecks to enhance transparency and accountability and consequently improve service delivery. It is against this background that the Budget Monitoring and Accountability Unit (BMAU) was established in FY 2008/09 in the Ministry of Finance, Planning and Economic Development, under the Budget Directorate, to address this challenge.

The BMAU is charged with tracking implementation of selected government programmes or projects and observing how values of different financial and physical indicators change over time against stated goals and targets. This is achieved through regular field monitoring exercises to verify receipt and application of funds by the user entities. Where applicable, beneficiaries are sampled to establish their level of satisfaction with the service.

The BMAU prepares semi-annual and annual monitoring reports of selected government programmes and projects. The monitoring is confined to levels of inputs, outputs and intermediate outcomes in the following areas:

- Agriculture
- Infrastructure (Energy and Roads)
- Industrialization
- Information and Communication Technologies
- Social services (Education, Health, and Water and Environment)
- Microfinance; and
- Public Sector Management

CHAPTER 2: METHODOLOGY

2.1 Process

This report is based on selected programmes from the sectors mentioned in chapter one apart from microfinance. The selection was based on a number of criteria;

- Programmes that submitted progress reports by the end of quarter two, FY 2014/15 were followed up for verification as they had specified output achievements.
- Priority expenditure areas in the budget strategy and ministerial policy statements for FY 2014/15 with focus being on large expenditure programmes.
- Regional representation to ensure that coverage of programmes is from varying parts of the country
- Programmes/projects with previously identified critical implementation problems.

2.2 Methodology

The key variables monitored were targets of inputs and outputs; implementation processes and achievement of intermediate outcomes and beneficiary satisfaction where feasible.

2.2.1 Data Collection

Data was collected through a combination of approaches;

- Review of secondary data sources including: Ministerial Policy Statements for FY 2014/15; National and Sector Budget Framework Papers; Sector project documents and performance reports in the Output Budgeting Tool (OBT), MFPED Budget Documents, Budget Speech, District Performance Reports; Q1 and Q2 Sector Quarterly Progress Reports, Work plans, and Public Investment Plans.
- Review and analysis of data in the Integrated Financial Management System (IFMS) and legacy system; progress reports (Performance Form A and B) and bank statements from implementing agencies.
- Consultations and key informant interviews with project managers in implementing agencies both at the Central and Local Government level.
- Field visits to project areas involving observations and discussions with beneficiaries. Photography was a key data collection tool during the monitoring exercise. In some cases call-backs were done to triangulate information.

2.2.2 Sampling

The projects/programmes monitored were purposively selected from information provided in the FY 2014/15 Ministerial Policy Statement and Quarterly Performance Reports for Q1 and Q2. Priority was given to outputs that were physically verifiable especially those categorized under GoU development expenditure.

Districts in different regions were selected so that as many regions of Uganda as possible are sampled throughout the year. Emphasis was also placed on programmes not monitored in previous quarters. For completed projects, monitoring focused on utilization, quality and beneficiary satisfaction.

2.2.3 Data Analysis

This was mainly simple descriptive statistics of comparing set targets and observed levels of achievement. Physical performance of projects and outputs was assessed through comparing a range of indicators and linking the progress to reported expenditure. The actual physical achievement was determined basing on (weighted) number of activities accomplished for a given output.

2.3 Limitations of the report

- Overstated absorption of some projects due to transfers to subventions being reflected as payments on the Integrated Financial Management System (IFMS).
- Assumption that warrants on IFMS are equal to the release. This also provides misleading information on financial performance.
- Difficulty in ascertaining financial performance of some donor projects due to unavailability of information from project managers. It was also equally difficult to ascertain financial performance of projects off the IFMS.
- Lack of clear indicators, in some programmes, hence difficulty in rating overall performance.
- Unavailability of some critical information. For example, a number of project recipients had limited information on scope of civil works, costs and contract period.
- Sampling of some projects/programmes was affected by misleading information from ministries. Some projects that were reported as implemented in FY 2014/15 had been done in FY 2013/14.

2.4 Assessment Criteria

For purposes of this report, the guide below is used to assess and rate performance.

Physical and financial performance was rated in percentages according to achievement of the planned set targets and the overall utilization of funds for multi-year projects. Table 2.1 shows the assessment criteria for measuring the achieved targets and expenditures.

Table 2.1: Assessment criteria for measuring achieved targets

SCORE	***COMMENT***
80% and above	*Excellent (All set targets achieved and funds well utilized)*
70% - 79%	*Very good (Most of the set targets achieved and funds absorption is 70% and above)*
60% - 69%	*Good (Some core set targets achieved and funds absorbed to 60%)*
50% - 59%	*Fair (Few targets achieved and funds absorption is average-50%)*
Less than 50%	*Below average (No targets achieved and funds absorption is less than 50%)*

Source: BMAU

CHAPTER 9: INFORMATION AND COMMUNICATION TECHNOLOGY

9.1 Introduction

The Information and Communications Technology (ICT) sector is comprised of the telecommunications, broadcasting, postal, information technology, and library and information services sub sectors. It is structured into three functional levels namely: policy, regulatory and operational. The Ministry of Information and Communications Technology (MoICT) heads and coordinates all the ICT sector activities in collaboration with other stakeholders.

The key regulatory bodies are Uganda Communications Commission (UCC) and the National Information Technology Authority (NITA-U), while the operational level is composed of: Telecommunications, Postal, Information Technology (IT) and broadcasting operators with Uganda Posts Limited and Uganda ICT Training Institute as agencies affiliated to the Ministry[1].

According to the National Development Plan (2010/11-2014/15), ICT was placed among the primary growth sectors. Uganda's Vision 2040 emphasizes that ICT shall greatly contribute to the national Gross Domestic Product (GDP) and create new employment opportunities.

The overall sector strategic objectives include:

- Enhance access to quality, affordable and equitable ICT services country wide;
- Enhance the use and application of ICT services in business and service delivery;
- Enhance access to quality, affordable and equitable broadcasting services country wide;
- Enhance access to quality, affordable and equitable library services country wide, and
- Rejuvenate the application of postal services country wide[2].

The mandate of the ICT Ministry is ''*to provide strategic and technical leadership, overall coordination, support and advocacy on all matters of policy, laws, regulations, and strategy for the sector for sustainable, effective and efficient development, harnessing and utilization of ICT in all spheres of life to enable the country achieve its development goals*''[3].

Financing

The ICT sector is primarily financed by GoU in FY2014/15. The sector budget excluding external financing, Non-Tax Revenue (NTR) and Appropriation in Aid (AIA) for FY 2014/15 is Ug shs 17.01 billion of which Ug shs 6.21 billion is for the MoICT and Ug shs 10.80 billion for the NITA-U. By 31st December 2014, a total of Ug shs 8.62 billion (50.6%) had been released and Ug shs 8.18 billion (95%) spent. Both release and expenditure performances were excellent.

9.1.1 Scope

The report reviews progress of selected programmes, policies and projects implemented by the NITA-U and UCC. Under NITA-U six programmes and two development projects were

[1] MoICT,
[2] Nationa Development Plan (2010)
[3] MoICT

reviewed the development projects were: i) National Transmission Backbone Infrastructure (NBI), ii) Business Process Outsourcing. Under the UCC, The Rural Communication Development Fund (RCDF) projects for establishing ICT laboratories in secondary schools and telemedicine in health facilities were monitored.

9.2 National Information Technology Authority (NITA- U)

9.2.1 Introduction

The agency's mission is to coordinate, promote and monitor the development of Information Technology (IT) in the context of social and economic development of Uganda. The vote has two development projects that is, the National Transmission Backbone Infrastructure (NBI) and Business Process Outsourcing (BPO).

Objectives

The objectives of the agency are to:

- Establish a national backbone infrastructure (high bandwidth data connection) in major towns of Uganda.
- Connect all ministries in a single wide area network.
- Establish a government data centre.

Monitoring covered the two projects and six recurrent programmes.

Findings

Financial performance

The GoU approved budget for Vote 126, for FY 2014/15 is Ug shs 10.804 billion of which Ug shs 5.952 billion (55%) was released and Ug shs 5.503 billion (92%) of released funds expended by 31st December 2014. Both release and expenditure performances were excellent. Table 9.1 shows a summary of the half year financial performance of NITA-U.

Both budget and absorption of funds was highest under the recurrent-wage component, with Ug shs 2.726 billion (99.8%).

Table 9.1 NITA-U Half year budget performance by category, FY 2014/15 (million shillings)

Category	Sub category	Approved Budget	Release	Expenditure	% Expenditure
Recurrent	Wage	5.464	2.732	2.726	99.8
	Non wage	3.508	2.305	2.190	95.0
Development		1.831	0.916	0.606	66.1
Total		**10.804**	**5.953**	**5.521**	**92.7**

Source: NITA-U

9.2.2 Business Process Outsourcing (BPO): Project 1055

Background
Business Process Outsourcing (BPO) is defined as the strategic use of third party service providers to perform activities traditionally handled by internal staff and resources. The BPO is categorized into back office outsourcing (which includes internal business functions such as human resources or finance and accounting) and front office outsourcing (which includes customer-related services such as call centre services).

In 2008, the Ministry of ICT developed a BPO strategy and model for Uganda. It proposes that for sustainability of the BPO industry, there is a need for government to partner with the private sector and provide support in areas of: infrastructure, human resource and enterprise development, marketing and creating an enabling environment for BPO to flourish.[4] The project commenced on 1st July 2008 with an end date of 1st July 2014. The project is funded by GoU.

Objectives
The objectives of the project are to:

- Setup infrastructure that can support the BPO industry.
- Market Uganda as a preferred BPO destination.
- Establish partnerships with the private sector to enable the sustainability of the industry.

The annual planned outputs for the project in FY 2014/15 are:

i. BPO centre managed and maintained
ii. TOT training (EDUganda programme) undertaken
iii. Uganda BPO Association supported
iv. BPO framework disseminated (strategy, standards and incentives)
v. BPO marketing strategy developed

Findings

Financial performance
The approved budget for the project excluding Appropriations in Aid, taxes and arrears for FY 2014/15 was Ug shs 210 million of which Ug shs 116 million was released and Ug shs 47million spent by December 2014. Release of funds was therefore excellent (55.5% of the budget by half year) and expenditures were below average (41%). Expenditures were largely on procurement of bandwidth under the line item for Information communication technology as shown in Table 9.2.

Table 9.2: BPO expenditures by line item by 31st December 2014 (Ug shs)

Item	Approved Budget	Release	Expenditure
Information Communication Technology	180,000,000	110,000,000	41,232,354

[4] Business Process Outsourcing Strategy

Electricity	20,000,000	6,600,000	6,599,430
Fuel lubricants & oils	10,000,000	0	0
Total	210,000,000	116,600,000	47,831,784

Source: IFMS

Physical performance

The BPO incubation centre at Statistics House was managed and maintained (bandwidth and electricity provided to the three operators). A BPO stakeholder workshop to assess the existing sector strategies and identification of export related priorities was conducted.

The dissemination plan for the BPO strategic documents was developed. The BPO website was re-designed and website content updated in accordance with the BPO strategy.

A total of 50 BPO trainees were interviewed and selected. The Training of Trainers (EDUganda programme) was awaiting confirmation of the training dates from the Egyptians.

NITA-U partnered with the BPO association and the Netherlands Embassy to strengthen marketing of BPO services.

The BPO centre staffing level fluctuated between 250-350 during the first six months of the FY 2014/15 due to low volumes of work.

Challenges

- **Inadequate sensitization of the public on the availability of BPO services in Uganda:-** The operators are yet to tap into the local market due to public ignorance about the potential of BPO services in Uganda.
- **Double taxation:** Uganda revenue Authority (URA) levies a non claimable 18% Value Added Tax (VAT) on the importation of IT and BPO services into Uganda and another 18% VAT on sales income billed for IT and BPO services provided in Uganda. This makes the BPO sector uncompetitive as compared to neighboring countries (Kenya and Tanzania) where VAT charged on importation of the services is claimed back by the operators.

Analysis

Link between financial and physical progress

At least 85% of the BPO project budget focused on provision of ICT services including internet bandwidth, 10% on electricity and 5% on fuel, lubricants and oils. By 31st December 2014, most of the release (94.3%) and expenditures (86.2%) were on ICTs. The physical performance was commensurate to the finances provided.

Achievement of set targets

About 80% of the semi-annual targets for the BPO project were achieved by 31st December 2014. A number of activities were ongoing. The centre was maintained and marketing of the services was enhanced in conjunction with stakeholders.

Conclusion

The overall performance of the BPO is rated as excellent. By 31st December 2014, release performance was excellent and expenditures were below average because some of the procured services during the second quarter had not been paid for but funds had been committed. BPO services experienced a slump in volumes during the first half of the financial year.

Recommendations

- The NITA-U and the BPO association should popularize the availability of BPO services and market the country as a BPO destination.
- The Office of the Prime Minister, URA and MFPED should address the issue of double taxation of BPO services.

9.3.3 NITA-U programme activities

Six programmes (Table 9.3) were selected for monitoring during the semi-annual monitoring.

Planned outputs for NITA-U programmes FY2014/15

Table 9.3: Annual planned outputs for NITA-U sampled programmes

Programme	Planned output FY 2014/15
Headquarters	Preparatory activities of the Namanve ICT Hub (land acquisition, surveys and architectural design) completed;
Technical services	*Last mile connectivity* to 80 MDAs within the greater Kampala and Entebbe extended; bulk internet bandwidth procured and distributed to eighty (80) MDAs over the NBI; five (5) MDAs hosted and / or provided disaster recovery services at the data centre; Information Access Centre (IAC) established
Information security	At least three (3) information security sensitization sessions undertaken; two (2) sensitization sessions about components of the National Information Security Framework conducted; structures to provide national guidance on information security matters established; basic component of the Computer Emergency Response Team (CERT) operationalised (security alert and security incident alerts).
E-government	A government Citizen Interaction Centre (CIC) establish; technical support for promotion of e-Government helpdesk provided; maintain the e-Government web portal; arrangements for consolidation of software licences in government completed and at least 5 key users enrolled; open source applications promoted; M-services platform developed and integrated with existing e-government services; national databases integrated; design of IT parks completed and finance partner identified; awareness creation and sensitization activities for change management about ITES/e-Government services conducted; open data readiness assessment conducted and draft national action plan developed.
Regulation and Legal Services	Fifteen (15) awareness sessions about cyber laws and four (4) compliance assessments carried out, online forms for licence registrations prepared and

	made available to the public; support towards drafting of data protection and privacy law provided; national databank regulations completed and enacted; e-Government regulations completed and enacted; NITA-U (arbitration of disputes) regulations finalized; the first draft of the accreditation regulations reviewed a second draft prepared.
Planning, research and development	One impact assessment of at least one key IT initiatives is undertaken; standards implementation guidelines and manuals prepared for the already gazetted IT standards; at least five (5) new priority IT standards developed; government and government service providers sensitized about the IT certification and accreditation framework; certification authorities designated; certification and accreditation of IT piloted for government ICT service providers; IT Surveys conducted to inform development of IT strategies and an enterprise architecture framework/blueprint for government developed.

Source: NITA-U

Physical performance

Acquisition of land for NITA-U headquarters and ICT hub

The lease agreement for the allocated five acre piece of land in Kampala Industrial and Business Park (KIBP)-Namanve was prepared by Uganda Investment Authority (UIA) and submitted to the Solicitor General for approval. The process of valuing the land by the Government Valuer commenced and NITA-U was expected to pay US$ 80,000 per acre. However, the funds had not been provided for in the NITA-U budget FY 2014/15.

Last mile connectivity: In FY2013/14, 36 MDAs were connected. In FY2014/15, the agency identified 56 sites for connectivity including; 15 MDAs, seven (7) public universities, 16 Local Governments, 12 Police institutions and six(6) land offices. By 31st December 2014, implementation of connectivity for 40 sites had commenced.

Delivery of bulk Internet to MDAs: Three MDAs (Special Economic Zones Authority, Ministry of Water and Environment, and External Security Organisation) were added to the entities supplied with bandwidth through the NBI. This brings the total number of MDAs utilising bandwidth over the NBI from 27 in June 2014 to 30 in December 2014.

Technical support to MDAs: NITA-U provided IT support to the Ministry of Foreign Affairs (MoFA) on Unified Messaging Communication (UMCS), National Drug Authority on Human Resource System, and Office of the President on the proposed one stop centre.

Supervise construction of the Information Access Centre: The business case (justification on basis of commercial benefits) for the construction of the Information Access Centre was reviewed to assess its viability. The requirements for the Information Access Centre Network upgrade were identified and approval of the upgrade plan obtained. By 31st December 2014, the Terms of Reference (TOR) had been drawn and the procurement process for the contractor commenced.

Fully commercialize the Data Centre: The rate card (document showing prices for different services) for commercializing the Data Centre was developed and approved by the NITA-U Executive Committee (ExCo).

Information Security awareness creation: Six (6) sensitization sessions were conducted and these were: Information Systems Audit and Control Association (ISACA) continuous professional development programme, Criminal Intelligence and Investigative Directorate (CIID), Makerere University Masters students, Management Rectification Launch, Capital Markets Authority (CMA), Uganda Media Centre (UMC) and Judicial Service Commission (JSC).

Rollout of National Information Security Framework (NISF) to MDAs: Three MDAs that include: National Social Security Fund (NSSF), Special Forces Command (SFC) and Makerere University (MSc IT) were engaged on piloting of the National Information Security Framework (NISF) that will inform the roll out. The National Information Security Advisory Group (NISAG) was inaugurated on 30th October 2014 and the templates for the risk register developed.

Public Key Infrastructure implementation: The strategy for implementing Public Key Infrastructure (PKI)[5] through the outsourcing process was developed, awaiting ExCo's approval.

Establishment of the Computer Emergency Response Team (CERT): The recruitment process for the National CERT administrator and CERT analyst was completed by December 2014.

Technical support provided to MDAs: NITA-U provided e-Government support towards e-Procurement to Public Procurement and Disposal of Public Assets Authority, e-health to Ministry of Health, National Security Information Systems (NSIS) to Ministry of Internal Affairs, One Stop Centre to Office of the President, and e-Passport to Immigrations department and e-Permit to Ministry of Works.

Integration of National Data Bases: The contract for integration of National Databases was awarded to M/s Ernest and Young and approved by the Solicitor General (SG) at a contract sum of US$196,076.27, for a period of six months with effect from 30th December 2014. Actual implementation was expected to start in February 2015.

Consolidation of licences: The contract negotiations for consolidation of Microsoft licences were concluded and due diligence undertaken. The implementation plans for consolidation of Microsoft licences were developed. The negotiations for consolidation of Oracle licences were ongoing.

e-Services portal developed and maintained: The design of the e-services portal was completed. Analysis of the services for integration onto the e-services portal was provided by the sectors that were identified in the e-government board retreat.

[5] A **public key infrastructure** (**PKI**) is a set of hardware, software, people, policies, and procedures needed to create, manage, distribute, use, store, and revoke digital certificates. In cryptography, a **PKI** is an arrangement that binds **public keys** with respective user identities by means of a certificate authority (CA).

Conduct feasibility study for IT parks: By 31st December 2014, activities related to this output were at procurement stage. The pre-bid meeting was held and a report prepared, the responses to the queries raised were compiled and sent to the bidders.

Development of regulations/bills/laws: The stakeholders' consultative workshop for data protection and privacy bill was held on 27th November 2014. Comments were received from stakeholders and are being incorporated into the revised Bill to be submitted to cabinet for approval.
NITA-U provided support to the Ministry of Internal Affairs (MoIA) in the drafting of the Registration of Persons Bill.

NITA-U (e-Government) Regulations were approved by the Board on 22nd December 2014.
The Focus Group Discussions for the National Data Bank Regulations led by the consultant were held between 23rd and 25th September 2014. The Legal Analysis and Benchmarking report was submitted by the consultant and approved by NITA-U.

Awareness creation for cyber laws: Six MDAs were sensitized on Cyber laws. These are; Office of the Auditor General (OAG), Accountant General's Office (AGO); Capital Markets Authority (CMA), Judicial Service Commission (JSC), Uganda Media Centre (UMC), and National Environmental Management Authority (NEMA).

Enforce compliance to laws and regulations: Reports of the compliance assessments were completed, presented to ExCo and recommendations adopted. The assessment reports were submitted to the MDAs.

9.3.4 National Transmission Backbone Infrastructure (NBI): Project 1014

Background

The National Data Transmission Backbone Infrastructure and e-Government Infrastructure Project (NBI/EGI) is implemented by the NITA-U. It is aimed at connecting Ministries and Government Departments onto the e-Government Network. This is done to create an efficient government through simplifying procedures, bringing transparency, accountability and making timely information available to citizens.

The objectives of the project are: i) to establish a National Backbone Infrastructure (NBI) with high bandwidth data connection in major towns of Uganda, ii) connect all Government Ministries, Departments and Agencies (MDAs) in a single wide area network, iii) establish a government data centre, and iv) establish district information centres.

Expected outputs at completion of the project include: all government ministries connected; e-government implemented; an optic fiber backbone transmission cable set up across the country (2,294km); district information centres established to improve communication, improved service delivery by government ministries, and reduced cost of communications.

The project is funded by a concession loan from EXIM Bank of China with counterpart funding from Government of Uganda. In 2006, a contract was signed between the Ministry of ICT and M/s Huawei Technologies Company Limited of the Peoples' Republic of China at a contract sum of US$ 106,590,305.

The project commenced in July 2007 and was expected to be completed in July 2012. The project was divided into three phases and implementation was staggered in 27 months. However, the project completion date was revised to July 2015 due to suspension of the project by Parliament in 2011 to allow a Value for Money and Forensic Audit. By 30th June 2013, a total of 1,536.39km of optic fiber cables had been laid and US$91.2 million paid for Phase I and Phase II.

Annual Planned Outputs FY 2014/15

(i) A total of 756kms of fibre optic cable laid to connect Kampala-Masaka, Masaka-Mutukula, Masaka-Mbarara-Katuna, and Masindi-Kyenjojo under Phase III of the NBI.
(ii) Network Operations Centre (NOC) set up to monitor provision of services and ensure availability of the NBI.
(iii) Closed Circuit Television (CCTV) installed at 25 NBI sites to enhance security
(iv) Closed Circuit Television (CCTV) access control installed at the Metropolitan Area Network (MAN) centre to enhance security.

Past performance

Phase I and II of the National Backbone Infrastructure/e-Government Infrastructure (NBI/EGI) project were completed in FY 2012/13. These phases entailed laying of 1,536.39km of fibre optic cables and setting up of the NBI primary data centre and Metropolitan Area Network (MAN). The MAN network consists of the connectivity of 27 ministries and some departments through the laying of optical fiber cable onto the e-government network. Twenty two district headquarters across the country were connected and are benefiting directly from the project.

Findings

Financial performance

The approved (GoU) budget for FY 2014/15 is Ug shs 1.62 billion of which Ug shs 0.80 billion (49%) was released, and Ug shs 0.53 billion (69%) spent by 31st December 2014. The release performance was excellent and expenditure was good. Table 9.4 shows the expenditure distribution by line item. At least 25% of the expenditures went to ICT services and computer supplies, 13% on short term consultancy and 10% on subscriptions.

During the first half of FY 2014/15, the EXIM bank loan (US$ 15 million) was approved however these funds were not received as the financing modalities were not yet finalized.

Table 9.4: NBI Expenditures by 31st December 2014

Budget Line	Expenditure	% Expenditure
Allowances	32,028,314	6.1
Computer supplies and IT services	134,680,531	25.5
Telecommunication	49,215,000	9.3
Security guards	40,265,080	7.6

Consultancy short term	70,533,162	13.3
Travel inland	44,814,879	8.5
Travel abroad	38,328,816	7.2
Maintenance civil	884,500	0.2
Maintenance motor vehicle	8,330,000	1.6
Maintenance plant and equipment	16,974,247	3.2
Advertisement and PR	30,178,760	5.7
Workshops and seminars	9,108,701	1.7
Subscriptions	53,721,339	10.2
Total	**529,063,329**	**100.0**

Source: NITA-U

Physical performance

I) Implementation of Phase III of the NBI: the project governance structures for implementation was setup and the draft project implementation plan developed. However, the laying of optic fibre cables (757Kms) and transmission stations to connect Kampala-Masaka, Masaka-Mutukula, Masaka-Mbarara, Mbarara-Kabale-Katuna, and Masindi-Hoima-Kyenjojo did not commence. Physical performance on this output was therefore at 0%.

II) The process of setting up a Network Operations Centre (NOC) to monitor provision of services and ensure availability of the NBI was ongoing.

III) Installation of the Closed Circuit Television (CCTV) at 25 NBI sites and at the Metropolitan Area Network (MAN) centre had not started.

Challenges

- Delayed conclusion of the financing modalities affected the commencement of phase III of the NBI (laying of 757kms of fiber optic cable and installation of associated transmission sites).
- The relocation of the OFC from the road reserves along Kajjansi- Entebbe road, Entebbe Express Highway and Atiak –Nimule roads was not achieved due to insufficient funds.
- Unfunded priorities affected revenue generation on the commercialization of NBI.

Analysis

Link between Financial and Physical performance

Both release and absorption of funds by NITA-U were excellent (55% of approved budget released by half year) and 92% of released funds spent respectively. Absorption of funds was highest on the recurrent wage component of the budget (99.8) and least on development (66.1%).The BPO centre was managed and maintained and most of the resources (86%) were

spent on provision of ICT services. Generally, there was a link between the financial resources for BPO and programme outputs.

Achievement of set targets

The overall achievement of the half year targets was fair estimated at 55%. Under technical services programme, extension of last mile connectivity to 15 more sites and provision of bulk bandwidth to three additional sites was achieved.

NITA-U provided technical support to MDAs, six sensitization sessions on information security were held. The strategy for Public Key Infrastructure was developed and recruitment of staff for the Computer Emergency Response Team (CERT) undertaken. Some planned outputs were at initiation stage (under procurement). There was limited progress on implementation of Phase III (757 km of laying optic fibre cables and transmission sites) of the NBI. A number of activities under the NITA-U programmes were achieved. However, there was under performance under the NBI project.

Conclusion

Fair progress (55%) was realized by NITA-U during the first half of the financial year especially on the recurrent activities under different programmes and the BPO project; however, there was limited progress on the development outputs under the NBI.

Recommendations

- The NITA-U should fast track the implementation of phase III of the NBI project.
- The MoWT, UNRA and KCCA should improve road designs to include service ducts to avoid costly re-locations of utilities.
- The MFPED/NITA-U should reprioritize the funding for agency/projects to ensure smooth implementation of planned activities.

9.4 Uganda Communications Commission (UCC)

9.4.1 Background

The Uganda Communications Commission (UCC) established under the Uganda Communications Act 2013 is responsible for overseeing the development of a modern communications sector comprising of telecommunications, broadcasting, postal services, data communication and infrastructure[6].

The commission's mission is to ''effectively regulate the communications sector in order to facilitate growth of communications services for sustainable development''.

The semi-annual monitoring focused on the implementation of the Rural Communication Development Fund.

[6] Uganda Communications Commission Act, 2013

9.4.2 Rural Communication Development Fund (RCDF)

The RCDF projects are implemented in local governments under the following program areas; Internet Points of Presence (POP), public payphones, research projects, postal support projects, Multipurpose Community Tele-centres (MCT's), school ICT facilities, health care ICT facilities, and call centres.

Previous monitoring reports (FYs 2010/11-2013/14) highlighted implementation progress on establishment of ICT facilities in selected government institutions, particularly School ICT laboratories and support to health centres for establishing telemedicine facilities. By July 2014, implementation was at various stages in 1,027 schools and 126 hospitals.

Establishment of ICT facilities in selected government institutions

Background

In 2007, Uganda Communications Commission (UCC) took a decision to support the establishment of ICT facilities in selected government secondary schools, tertiary institutions, district health facilities/centres, and other vanguard institutions with funding from the RCDF.

The RCDF program provides sustainable access to ICT services to people in rural areas. The projects are strategically located in more populated centers with relatively more commercial activity to ensure that the projects are self-sustaining.

ICT projects are established as key partnerships between UCC and a private or public partner. UCC provides technical support and initial funding. The ICT facilities are wholly owned by the partner who is obliged to ensure that the facility is available to UCC at all times for a given period of time (one to five years). By the end of this period, it is expected that the facilities would have developed capacity for self-sustainability and other people are able to replicate them within the area in order to satisfy a bigger demand.

Planned projects for 2014/15

According to the MoICT Ministerial Policy Statement for FY 2014/15, UCC planned to complete initiated projects in previous financial years with Internet connectivity reaching 1,056 RCDF projects, 116 ICT community training, extend telemedicine equipment to 30 hospitals and operationalise the equipment in the original 126 health facilities, and support digital broadcasting infrastructure among others.

The semi-annual (FY 2014/15) monitoring covered thirteen (13) school ICT laboratories and four (4) Tele-medicine facilities in selected districts.

9.4.3 School ICT laboratories

This program provides support to the Ministry of Education and Sports (MoES) to increase access and usage of ICT in schools. Priority is given to government aided secondary schools,

Primary Teachers' Colleges (PTCs), National Teachers' Colleges (NTCs) and Technical, Business and Vocational Training Institutes.

This programme is intended to enable schools to undertake the following among others:

i. Teach computer studies as a curriculum subject at Ordinary and Advanced Levels.
ii. Teach general purpose computer applications such as Microsoft Office packages aimed at providing computer literacy
iii. Access local learning resources such as UNEB past papers on web portals like www.uderb.org
iv. Access use of computer based learning aides such as ENCARTA programme to support the teaching and learning of conventional curriculum subjects, and
v. Access to other Internet based e-learning resources.

The programme is comprised of three main projects and these are:

i) establishment of ICT laboratories in schools
ii) providing connectivity (internet)
iii) supporting content delivery

The UCC further supports some schools to undertake ICT community training.

The Ministry of Education and Sports has an oversight role for the school ICT laboratories and all other activities including provision of budgets for servicing and maintenance of ICT facilities and providing ICT teachers to the schools.

The establishment of the ICT facilities is based on the following factors: Design, Unit cost and Selection criteria**.**

Design: There are two types of designs for different locations, that is; solar and grid powered ICT systems. Solar systems are given to schools with no access to grid power.

Unit costs: Grid (41 computer monitors, five processing units with UPS, local area network cabling. Every 10 monitors are connected to one systems unit (N-Computing); the solar systems include (11 solar computers, four solar panels, batteries, inverter, power, and wireless router; a satellite dish is given to school where connectivity is poor; In addition, the schools are provided with one year internet (128kbps) subscription.

According to UCC, each of these systems on average cost a total of USD 25,000 per school.

Selection Criteria: In conjunction with various project stakeholders, UCC/RCDF determines a specific location for each project.

Findings

This section presents physical progress under the establishment of ICT facilities in selected institutions.

This project is operating in 1,029 schools and 126 health facilities. During monitoring (January-February 2015), a total of 13 schools and 4 hospitals were visited to assess implementation progress. The findings are presented below.

Financial Performance

According to UCC, each of these systems on average costs a total of USD 25,000 per school. **Note:** Financial information for the RCDF project was not readily available for analysis by the time of compiling this report.

Physical performance

Progress in Secondary schools

Table 9.5 shows the past performance of the project in the monitored schools.

Table 9.5: Items delivered to monitored schools in previous financial years

S/No	School	Year of delivery	Items delivered
a	Busia Secondary School – Busia district	2011	The school received 41 grid powered computer monitors with 5 system units, UPS' and a local area network for establishment of a computer laboratory.
b	Buwunga Secondary School - Bugiri district	2013	The school received 41 grid powered computer monitors with 5 system units, UPS' and a local area network for establishment of a computer laboratory.
c	Chahi Seed Secondary School – Kisoro	2012	UCC delivered and installed a total of 11 solar powered computers.
d	Itanda Secondary School –Iganga district	2012	The school received 11 solar powered computers with a complete set of solar system for establishing an ICT laboratory.
e	Kaliro High School-Kaliro district	2013	11 computers and a solar power system were delivered and installed at the school.
f	Kigezi High School - Butobere	2012	41 monitors, 5 system units with UPS' (grid powered) and a local area network for establishment of an ICT laboratory were delivered and installed.
g	Kyamuhunga Secondary School – Bushenyi district	2011	The school received 11 solar powered computers with a solar system for establishment of a computer laboratory.
h	Lyantonde Secondary School, Kasambya-Lyantonde district	2011	The school received 11 solar powered computers with a set of solar power system.
i	Mother Kevin Secondary School – Jinja district	2012	The school received 41 grid powered computer monitors with 5 systems units, UPS' and a Local Area Network for establishment of a computer laboratory.
j	Nakyenyi Secondary School- Lwengo district	2013	The school received 11 solar powered computers with a complete set of solar system.

k	P.M.M. Girls Secondary School – Jinja	2013	The school received 41 grid powered computer monitors with 5 system units, UPS' and a local area network for establishment of a computer laboratory.
l	Sacred Heart Secondary School Najja- Buikwe district	2013	The school received 10 solar powered computers with a solar power system.
m	St Paul Mutolere SS- Kisoro district	2012	11 solar powered computers were delivered and installed at the school.

Source: Field findings

a) Busia Secondary School – Busia district

The school is located in Kisenyi A village, southwest parish, western division, Busia municipality. By the end of term III 2014, enrollment was at 1,840 students of which 827 were female. The average stream size for O-level was 120 students and 75 students for A-level.

Condition of items delivered: By February 2015, only 20 of the delivered 41computers were in good working condition. The head teacher reported that in 2013, students rioted and vandalised school facilities including computers.

Internet connection: The one year Internet subscription was delivered and it expired in November 2014. The school had not renewed the subscription by February 2015.

Community training: A community training which attracted 150 people was arranged in 2013. The trainees were allowed to return for further skills enhancement during the weekends and holidays.

Servicing and maintenance: The school does not have any service level agreement but out sources any service work to technicians.

Presence of ICT teachers: The school did not have an ICT teacher on the payroll. A temporary instructor is hired to support the teaching of the subject. The instructor was re-tooled in May 2014 by UCC and MoES.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- High student to computer ratio; 4:1 at A-level and 6:1 at O-level.
- Lack of an ICT teacher on the school payroll was affecting proper content delivery.
- The costs of maintaining the computer laboratory operations were too high yet the USE grants do not take care of computer accessories, servicing and repairs.
- The internet bandwidth from UCC (128 kbps) was too weak for all the monitors.
- The school lacked a computer laboratory. The room where the computers were installed lacked furniture and proper burglar proofing for computer safety.
- There were no instructional materials for ICT. The teacher and students largely relied on the notes from the instructor.

Recommendations

- The MoES and ESC should recruit and post ICT teachers to the school.
- The MoES should plan to provide the school with a computer laboratory block and instructional materials.
- The school should prioritise internet subscription for ease of content delivery.
- The UCC should provide the school with more computers.

b) Buwunga Secondary School - Bugiri district

The school is located in Buwunga village, Buwunga parish, Buwunga sub-county. By the end of term III 2014, enrollment was at 459 students of which 187 were female. The average class size for O-level was 110 students and 12 students for A-level.

Grid powered computers delivered to Buwunga SS

Condition of items delivered: It was observed that the school is not connected to the national electricity grid and the 41 delivered computers were not in use. It was reported that the school Board of Governors resolved to retain the grid powered computers instead of exchanging them with the solar powered package.

Internet connection: The one year Internet subscription was not delivered.

Community training: This was not possible as the computers are not in use.

Servicing and maintenance: There was no urgent need for servicing given the status of the delivered computers.

Presence of ICT teachers: The school had one ICT teacher posted by MoES.

Challenge

- Inappropriate consignment: The equipment received did not meet the needs of the school and the Board made matters worse by refusing to exchange the grid powered computers with the solar powered.

Recommendation

- The UCC should exchange the delivered equipment with the appropriate technology.

c) Chahi Seed Secondary School – Kisoro district

The school is located in Muganza village, Nyakabingo parish, Chahi sub-county. By 30th November 2014, the school had a population of 921 students of which 313 were female. The average stream size was 70 students for O-level and 35 students for A-level.

Condition of items delivered: In September 2014, UCC delivered an additional 21 (N-Computing) grid powered computers, and a satellite dish. All the delivered computers and solar system were functioning properly except one computer monitor and a network switch which the supplier withdrew for repair and had not returned.

Computer laboratory at Chahi Seed SS

Internet connection: The school was connected to the Internet in January 2014; however, the connection failed in September 2014 and was not rectified by February 2015.

Support to neighboring community: The community members are allowed to access the school computers during holidays.

Servicing and maintenance: The school does not have any service level agreement for the equipment. Basic troubleshooting and servicing is undertaken by the ICT teacher and the laboratory attendant hired by the school.

Presence of ICT teachers: The school had one ICT teacher on the government payroll. The teacher participated in the ICT re-tooling exercise organized by UCC and MoES in May 2014.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- Inadequate staff to teach the subject as the school had one teacher for all classes.
- The weather was affecting the generation of adequate energy to power the solar system.
- Low computer to student ratio. The ratio per stream was at 1:3 yet the school enrollment was on an increasing trend.
- Inadequate laboratory space to accommodate additional computers.
- The teaching of some modules was constrained by the unreliable internet connectivity.
- A number of learners were reported to have a negative attitude towards theoretical teaching of ICT and were consistently missing theory classes.

Recommendations

- The MoES/ESC should recruit and post an extra teacher for ICT and provide more computers to the school.

- The UCC should engage the internet service provider to rectify and re-instate the service.
- The UCC should compel the supplier to return the monitor and network switch which were taken for repair.
- The school administration should sensitize the students on the importance of the theoretical aspects of the course.

d) Itanda Secondary School –Iganga district

The school is located in Itanda village, Itanda parish, Nabitende sub-county. By the end of term III 2014, enrollment was at 776 students of which 355 were female. The average class size for O-level was 150 students and 42 students for A-level.

Computers in library/staff room at Itanda SS

Condition of items delivered: By February 2015, all the 11 delivered computers were in good working condition.

Internet connection: The one year Internet subscription had not been delivered.

Community training: It was reported that every end of first term holidays, the school organizes a training program for the youth at operations cost recovery basis.

Servicing and maintenance: The school does not have any service level agreement but out sources the work to technicians.

Presence of ICT teachers: The school had privately hired an ICT instructor.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- Delayed delivery of internet was affecting imparting of knowledge to students.
- The school lacked a computer laboratory. The room where the computers were installed doubled as a staff room and library room.
- The computers were too few for the population at the school. The computer to student ratio was recorded at 1: 4 at advanced level and 1: 14 for O-level.
- The school did not have an ICT teacher on the payroll. It was expensive to sustain a private instructor on the capitation grant which the school receives.
- There were no instructional materials for ICT. The teacher and students largely relied on the notes from the instructor.

Recommendations

- The MoES and the Education Service Commission should recruit and post ICT teachers to the school.

- The MoES should plan to provide the school with a tailor made computer laboratory block.
- The MoES should procure and supply ICT instructional materials to secondary schools.
- The UCC should deliver the Internet promised in the Memorandum of understanding.

e) Kaliro High School-Kaliro district

The school is located in Nakiyanja village, Buyunga parish, Kaliro Town Council. The school had a population of 2,803 students of which 1,130 were female. The average stream size across the school is 120 students.

Condition of items delivered: All the delivered computers were reportedly functioning and in use except one which did not have a processing unit. The school procured 20 additional computer sets from locally generated revenue and support from parents to address the high computer to student ratio. However, the number is still inadequate.

Internet connection: The school had not received the Internet connectivity from UCC.

Community training: As one of the project objectives, the supplied equipment is intended to benefit the neighboring communities. In order to achieve this output, the neighboring community is allowed to access the computer laboratory for training during school holidays.

Servicing and maintenance: The school does not have any service level agreement for servicing and maintenance of the equipment, however, a technician from Jinja is engaged on case by case basis.

Some of the equipment received at Kaliro high school

ICT teachers: the school had three ICT teachers of which one was on the government payroll.

Re-tooling of teachers: One teacher was re-tooled by the MoES and UCC during the month of May 2014 at Kololo SS , Kampala.

Sustainability: The school did not have sustainability plans for the equipment received.

Challenges

- High computer to student ratio. The computer to student ratio per stream was at 1:4. This was affecting effective delivery of practical lessons as students have to share computers and therefore do not get the desired hands on training.
- Lack of a proper computer laboratory. The computer room was inadequate for the population, lacked proper furniture and environment for teaching ICT.
- Delayed delivery of internet connectivity was affecting proper teaching of internet based modules.

- High maintenance costs. The school reported that maintaining the computers was expensive.
- Inadequate human resource capacity. Only One teacher was re-tooled in the teaching of ICT by the Ministry of Education and Uganda Communications Commission.
- The computers were not networked. This made printing of the ICT practical examination answer sheets during UNEB examination tedious.

Recommendations

- The MoES should give more priority to construction of computer labs in USE schools.
- The MoES should re-tool more than one teacher per school. In addition, teachers should receive training in basic repair and computer maintenance to enable them carry out emergency servicing, trouble shooting and repairs. This will enable the schools to reduce on the costs related to operations and maintenance.
- The UCC should deliver and install the wireless network equipment and provide the school with the one year internet connectivity.

f) Kigezi College Butobere- Kabale district

The boys' school is located in Butobere village, Butobere ward, Central Division, Kabale Municipality. By close of term III 2014, the school had a population of 400 students with an average stream size of 40 students.

Condition of items delivered: By February 2015, all the 41 computer monitors and five system units were in good working condition.

Internet connectivity: In 2014, UCC delivered Internet connectivity to the school with a one year subscription.

Support to neighboring community: In August 2014, the school with support from UCC organized a two weeks ICT training for the community which attracted 200 participants. The school designed a policy to regulate use of the facility by both students and the community.

Servicing and maintenance: The school does not have any service level agreement for the equipment. The school administration reported that they had not experienced any major service or maintenance related requirements.

Presence of ICT teachers: The school did not have an ICT teacher on the government payroll. Two instructors were locally hired to teach the subject in both O and A- levels.

Sustainability: The school designed a user policy to partly ensure that all users contribute to the sustainability of the project on operational cost recovery mechanism.

Furnished ICT lab at Butobere

Challenges

- The school lacks an ICT teacher and laboratory attendant on the government payroll.
- The teaching of some modules was constrained by the unreliable internet connectivity.
- The N-Computing system had weaknesses for example, once one systems unit is affected the ten monitors connected to it become unavailable. In addition, students can easily replicate each other's work during practical exams since the system unit (hard disk) is shared.

Recommendations

- The MoES and ESC should recruit and post trained teachers for ICT to the school.
- The UCC should engage the internet service provider to improve on the service and increase on the bandwidth to the schools from the current 128kbps to at least 512 kbps.
- The UCC should supply a spare systems unit.

g) Kyamuhunga Secondary School – Bushenyi district

The school is located in Kyamuhunga village, Kyamuhunga parish, Kyamuhunga sub-county, Igara County, Bushenyi District. By the end of term III 2014, the school enrollment was at 998 students of which 502 were female. The average stream size for O-level was 85 students and 60 students for A-level.

Condition of items delivered: In December 2014, the school received another consignment of 41 grid powered computer monitors with 5 system units, UPS' and a local area network running N-Computing application. By February 2015, all the delivered computers were in good working condition.

Internet connection: The one year Internet subscription was delivered in January 2014 and expired in December 2014. By February 2015, the school had not renewed the subscription.

Community training: In May 2014 and May 2013, UCC supported the training of over 200 community members in ICT for a period of two weeks.

Inside the ICT lab at Kyamuhunga SS

Servicing and maintenance: The school does not have any service level agreement but out sources the work to technicians in Bushenyi and Mbarara districts.

Presence of ICT teachers: The school has three ICT teachers of which one is on the government payroll. One of the teachers had participated in the re-tooling exercise organized by UCC and MoES at Kololo SS in May 2014.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- High internet subscription costs: The service provider (M/s Orange) had issued the school with a quotation of Ug shs 300,000 for 512 kbps per month.
- The computer laboratory did not have adequate space for big classes especially in lower secondary.
- Maintaining part time teachers was expensive for the school as it was affecting the quality of learning.
- The supplied equipment did not have antivirus software.
- The N-Computing was problematic because sometimes the system units fail and all the ten connected monitors go off and students can share data during examinations.
- The package did not include printers.

Recommendations

- The MoES and ESC should recruit and post ICT teachers to the school.
- The MoES should plan to provide the school with a computer laboratory block.
- The school should budget for internet subscription and antivirus software, and prioritise payment for the same.
- The MoES and UCC should review the package and include printers and projectors to enhance content delivery.
- The UCC and the MoES should institute access controls to increase efficiency in the use of N-computing system.
- The UCC should provide the schools with N-Computing software.

h) Lyantonde Secondary School, Kasambya-Lyantonde district

The school is located in Kasambya village, Kaliro Ward, Lyantonde town council. By the end of term III 2014, the school enrollment was at 521 students of which 259 were female. The average stream size for O-level was 70 students and 40 students for A-level.

Condition of items delivered: According to the school head teacher, by February 2015, three of the delivered computer monitors had broken down due to mis-handling by students and inappropriate furniture.

Solar panels for the computers to Lyantonde SS

Internet connection: The one year Internet subscription was delivered in February 2014 and expired in January 2015. The school had not renewed the subscription.

Presence of ICT teachers: The school did not have an ICT teacher on the payroll. An instructor was privately hired by the school. The instructor was re-tooled in May 2014 by UCC and MoES.

Servicing and maintenance: Basic troubleshooting and servicing and maintenance are undertaken by the Instructor.

Support to neighboring community: During holiday, community members are invited for training at cost recovery mechanism.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- The computers received are inadequate for the enrollment. The computer to student ratio was low at 1:5 which made practical teaching ineffective.
- Lack of an ICT teacher on the school payroll was affecting proper content delivery.
- The solar computers did not have CD-ROM drives yet UNEB ICT examination instructions require students to save their work on CDs.
- Lack of ICT instructional materials from the MoES affects the teaching of the subject.

Recommendations

- The MoES should deliver to schools ICT instructional materials, projectors and antivirus software licences.
- The MoES and ESC should recruit and post ICT teachers to the school.
- The school should budget and pay for internet subscription.

i) Mother Kevin Secondary School – Jinja district

The school is located in Walukuba village, Walukuba-Masese division, Jinja municipality. By the end of term III 2014, enrollment was at 668 students of which 340 were female. The average class size for O-level was 130 students and 25 for A-level.

Condition of items delivered: All the 41 delivered computers were in good working condition.

Mother Kevin SS ICT lab

Internet connection: The one year Internet subscription was delivered in October 2014. The connection was however said to be too slow (128kbps) and could only connect two or three users at a time.

Support to neighboring community: The school designed a holiday ICT program for students and the community, over 50 people had received training under the program.

Servicing and maintenance: The school does not have any service level agreement for servicing and maintenance of the equipment. Major breakdowns are referred to technicians in Jinja Town.

Presence of ICT teachers: The school had two ICT teachers and one of them is on the government payroll.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- Low computer to student ratio especially in the O-level. The computer to student ratio in S1 and S2 was at 1:3.
- Intermittent and inadequate internet connectivity.
- The school only had one ICT teacher on the payroll. It was reported that the school required a minimum of three teachers.
- The teachers reported that N-Computing was problematic as sometimes the system units fail and all the ten connected monitors go off. During UNEB exams, students can easily copy from each other since they share the storage drives.

Recommendations

- The MoES and ESC should recruit and post more ICT teachers to the school.
- The MoES and UCC should review the package and include printers and projectors to enhance content delivery. Controls should be instituted to avoid sharing of data on the same drive.
- The school should pay for more bandwidth to improve content delivery.

j) Nakyenyi Secondary School- Lwengo district

The school is located in Nakyenyi village, Nakyenyi parish, Lwengo sub-county. By the end of term III 2014, enrollment was at 612 students of which 272 were female. The average stream size for O-level was 110 students and 35 students for A-level.

Condition of items delivered: By February 2015, two of the delivered computers were faulty. UCC and the supplier had been informed about the faults and no action had been taken.

Internet connection: The one year Internet subscription was yet to be delivered.

Servicing and maintenance: The school does not have any service level agreement but out sources any service work to technicians. Basic troubleshooting is handled by the ICT instructor.

Presence of ICT teachers: The school did not have an ICT teacher on the payroll. An instructor was hired to support the teaching of the subject. The instructor was re-tooled in May 2014 by UCC and MoES.

Community training: The facility was not accessible to the public because the computers were few and there was no dedicated staff for community training.

Sustainability: The school did not have a sustainability plan for the equipment received.


A section of solar powered computers delivered and solar panels at Nakyenyi SS

Challenges

- Two computers were faulty which reduced the available workstations especially for O-level.
- Lack of an ICT teacher on the school payroll was affecting proper content delivery.
- The solar computers did not have CD-ROM drives yet UNEB examination instructions require students to save their work on CDs.
- The internet connectivity had not been delivered from UCC.
- The delivered computers lacked antivirus software.

Recommendations

- The UCC should engage the suppliers to rectify the defective computers or replace them since the defects happened during the warranty period.
- The MoES/ESC should recruit and post ICT teachers to the school.
- The UCC should deliver the promised one year internet subscription and provide antivirus software to schools.

k) P.M.M. Girls Secondary School - Jinja

Satellite dish at PMM Girls SS Jinja

The school is located in Madhvan village, Magwa Parish, Central Division, Jinja Municipality. By the end of term III 2014, enrollment was at 632 students. The average class size for O-level was 65 students and 55 students for A-level.

Condition of items delivered: By February 2015, all the 41 delivered computers were in good working condition.

Internet connection: The one year Internet subscription was delivered in January 2014. By February 2015, the subscription had expired and the school was yet to renew it.

Community training: In 2014, the school in conjunction with UCC organized a community training which attracted over 200 participants. The trainees are allowed some time in the laboratory for continuous skills development.

Servicing and maintenance: The school does not have any service level agreement but out sources the work to technicians in Jinja and Kampala.

Presence of ICT teachers: The school has two ICT teachers and one instructor. One of the teachers had participated in the re-tooling exercise by UCC and MoES in Kololo in May 2014.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- High internet subscription costs: According to the head teacher, the service provider (M/s Orange) had issued the school with a quotation of Ug shs 300,000 per month for 512 kbps.
- The computer laboratory space was not adequate for big classes especially in lower secondary.
- Maintaining part time teachers was expensive for the school as it was affecting the quality of learning.
- The supplied equipment did not have antivirus software.
- The N-Computing was problematic because once the system unit fails, all the ten connected monitors go off.

Recommendations

- The MoES and the ESC should recruit and post ICT teachers to the school.
- The MoES should plan to provide the school with a tailor made computer laboratory block.
- The school should budget for internet subscription and antivirus software, and prioritise payment for the same.
- The MoES and UCC should review the package and include printers and projectors to enhance content delivery.
- The UCC and the MoES should institute controls to avoid sharing of data on the same drive under N-computing.
- The UCC should provide the schools with N-Computing software to avoid reliance on suppliers who are said to be expensive.

l) Sacred Heart Secondary School Najja- Buikwe district

The school is located in Najja village, Kisimba parish, Najja sub-county. It had a student population of 508 students of which 227 were female. The average class size for O-level was 130 students while for A-level were 25 students.

Condition of items delivered: All the 10 delivered computers were in good working condition. The solar system however was said to be weak and sometimes could not power the computers.

Internet connection: The school was yet to receive the Internet connectivity from Uganda Communications Commission. The wireless router delivered was not activated to serve the users.

Support to neighboring community: Community members are allowed to access the school computers in the evening, weekends and during the holidays.

Servicing and maintenance: The school does not have any service level agreement for servicing and maintenance of the equipment. Major breakdowns are referred to UCC and the suppliers however, the response time is usually long. Minor troubleshooting is undertaken by the teachers.

Inside the Sacred Heart SS Najja computer lab

Presence of ICT teachers: The school did not have an ICT teacher. The Physics and Fine Art teachers were designated to teach the subject on top of their usual schedule. The Fine art teacher participated in the ICT re-tooling exercise organized by UCC and MoES in May 2014.

Sustainability: The school did not have a sustainability plan for the equipment received.

Challenges

- Poor quality of learning due to low computer to student ratio. The computer to student ratio in some classes was at 1:13.
- Partial delivery of key components.
- The project did not provide for printers yet UNEB examinations guidelines require the students to print the work done during practical sessions.
- The solar power system was reportedly weak and the batteries could not store adequate power especially during the rainy seasons. UCC and the suppliers were contacted and the problem had not been resolved.
- Lack of an ICT teacher at the school: the subject was being partly taught by a Fine Art and a physics teacher whose core work was to teach their respective subjects.
- The school did not have a designated computer room. The computers were installed in the library which at times serves as a classroom.

Recommendations

- The MoES and ESC should recruit and post an ICT teacher to the school.
- The MoES and UCC should review the package and include printers and projectors to enhance content delivery. The school should be considered for supply of more computers to address the big computer to student ratio.

- The UCC should urgently follow up on the delivery of internet connectivity and rectify the mal-functioning solar system.
- The MoEs should consider constructing a specialized computer room for the school.

m) St Paul Mutolere Secondary School-Kisoro district

The school is located in Mutolere village, Gasiza parish, Nyakabande sub-county. It had a student population of 450 boys. The average class size was 70 students.

Condition of items delivered: At least ten of the eleven delivered computers and solar system were still functioning properly. One workstation was reportedly stolen in 2013.

Internet connection: The school was yet to receive the Internet connectivity from Uganda Communications Commission. However, the school privately acquired a modem for internet connectivity.

Received computers at St Paul Mutorele

Support to neighboring community: Community members are allowed to access the school computers on weekends and during the holidays.

Servicing and maintenance: The school does not have any service level agreement for servicing and maintenance of the equipment. However, a technician from Mbarara is hired to repair and maintain the computers.

Presence of ICT teachers: The school had one ICT teacher on the government payroll. The teacher participated in the ICT re-tooling exercise organized by UCC and MoES in May 2014.

Sustainability: The school did not have a sustainability plan for the equipment received. During the UACE exams in November 2014, the school borrowed 9 laptop computers from the neighboring primary school to increase on the number of students per shift as 56 students had registered for the subject.

Challenges

- Low computer to student ratio. The computer to student ratio per stream was at 1:3.
- Teaching of the subject was constrained by the partial delivery of key components for example; Internet connectivity was yet to be delivered.
- The project did not provide for printers yet UNEB examinations guidelines require the students to print the work done during practical sessions for marking.
- The costs of maintaining the equipment was said to be high given that there are very few technicians with the skills to maintain solar powered systems and computers in the district and region. The school hires technicians from Mbarara at a high cost.
- Inadequate teachers for ICT at the school: there was one teacher for the entire school.

Recommendations

- The MoES and the Education Service Commission (ESC) should recruit and post an extra teacher for ICT to the school.
- The MoES and UCC should review the package and include printers and projectors to enhance content delivery.
- The UCC should urgently follow up on the delivery of internet connectivity to the school.
- The school should enhance its physical security by improving the burglary proofing in the ICT laboratory windows and doors.

Overall benefits:

- The furnishing of the computer laboratories enabled learners to access ICT training in the schools and in most cases for the first time.
- The deliveries motivated some school to procure more computers to increase on available equipment for hands on training, for example, Kaliro High School procured an additional 20 computers.
- Several members of the teaching staff are able to typeset their own reports and enter examination results into the school databases thus making the processes more efficient.
- As a teaching aid, the computers were being used in the instruction of other subjects especially sciences and literature. The equipment was integrated into the cyber school programme.
- The solar powered computers provided students with full access to practical learning except during cloudy days when adequate solar cannot be generated.
- The student performance in ICT at A-level in most schools was improving with some school able to register several distinctions in the subject.
- The project had contributed to ICT literacy amongst students, teachers and the neigbouring communities.
- The equipment reduced expenditures on hiring computers for examination purposes in some schools.
- Since the introduction of ICT as a subject and delivery of equipment from UCC, enrollment in most of the schools visited increased for example Lyantonde SS and Mother Kevin SS enrollment was said to have doubled.
- Given the skills received, a number of former students were said to have started small IT related businesses in the communities and towns while others were gaining employment in SMEs.

Analysis

Achievement of set targets

Implementation of the project was at various stages; some schools which had received the computers and solar systems between 2011-2013 were connected to Internet in 2014, while others (Chahi SS and Kyamuhunga SS) received additional equipment to address the high

computer to student ratio. At least 120 schools were reportedly reached in 2014 in addition to 907 which had received the equipment for establishing ICT laboratories in the previous years. Therefore, UCC was in the process of attaining the project objectives, however achievement of the target for operationalising the equipment delivered was fair (54% in the sampled schools).

Link between financial and physical performance

All the schools visited had received equipment from UCC for setting up ICT laboratories and based on the market prices; the unit cost for the equipment delivered (US$ 25,000) was put to good use. However, detailed financial information was not readily available for analysis.

Comparative analysis

Some schools with no access to grid power received grid powered computers for example Buwunga SS in Bugiri district, where as schools with access to grid power such as Nakyenyi SS in Lwengo District received solar powered equipment. In addition, the provision of equipment did not take care of enrollment, for example, schools with very high population such as Kaliro High School (2,800 students) received 11 computers just like St Paul Mutolere in Kisoro with 450 students. Seven out of the 13 schools visited had received internet connectivity. However, all schools received the same amount of bandwidth (128kbps) regardless of work stations. Only one school (Kigezi High School) had a plan to sustain the operations of the ICT equipment

Conclusion

The overall physical progress on operationalising delivered ICT equipment was fair at 54%.The UCC intervention had increased the uptake of communication services especially in rural areas. Some of the visited schools had not received the internet connectivity which was affecting content delivery especially for modules that required internet.

The recipients expressed gratitude for the intervention, however the computer to student ratio was observed to be low across schools. Over 50% of the schools visited did not have ICT teachers on the government payroll and over 90% did not have sustainability plans for the equipment received. It was common for schools to fail to pay internet subscription immediately after the expiry of the one year paid for by UCC. The Solar computers supplied to schools did not have CD – ROM drives yet UNEB examination instructions require students to save their work (output) on CDs.

Recommendations

- The MoES and ESC should recruit and post ICT teachers to the schools.
- The MoES should plan to provide the schools with computer laboratory blocks and furnish them.
- The schools in conjunction with UCC should develop sustainability plans and budget and prioritise internet subscription and antivirus software.
- The MoES and UCC should review the package and include printers, CD-ROM drives and projectors to enhance content delivery especially in schools where the enrollment is high.

- The UCC and the MoES should institute access controls to increase the efficiency of the N-computing system.
- The UCC should provide the schools with N-Computing software for reloading incase of any malfunction.
- The MoES should procure and supply instructional materials to schools.

9.4.4. Establishment of ttelemedicine in health facilities

Background

Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance. It helps eliminate distance barriers and can improve access to medical services that would often not be consistently available in distant rural communities.

The Uganda Communications Commission under The Rural Communications Development Fund identified telemedicine as a mechanism for accessing expert services using ICTs by both patients and health workers in rural and urban hospitals. This program is meant to support the Ministry of Health (MoH) to enhance usage of ICTs in health service delivery.

The project enables health facilities and practitioners to among others access the following health related services:

- Support to e-consultation at national and international level
- Support e-health management information systems (HMIS)
- Access to selected e-libraries
- e-continued medical education
- Access to online medical journals.

Design: Each hospital is equipped with a solar power system; six computers with web cameras and headsets; a digital camera, a local area network, and a scanner. In addition, a one year internet subscription and user training were meant to be delivered and conducted respectively.

Planned outputs for FY2014/15

- UCC planned to activate/operationalize the 126 telemedicine sites initiated between 2011 and 2013
- Set up 30 more telemedicine sites.

Operationalization involves installation of equipment in any of the following unit's: Maternity ward, Pediatrics unit, Pharmacy, Operating theatre, Out Patients' Department, Director/Medical Superintendant's office, ART clinic and Record's office.

During the half year monitoring, operationalisation was sampled in four health facilities (Moroto Regional Referral Hospital in Moroto district, Iganga hospital in Iganga, Anaka hospital in Nwoya district and Kawolo hospital in Buikwe district).

Physical performance

Two (50%) of the four sampled health facilities had received internet connectivity, however only one hospital (Anaka) had been linked to Mulago National Referral hospital for telemedicine services. The link was however broken due to ongoing rehabilitation works at the hospital. All the visited health facilities cited inadequate training of critical users (clinical officers and nurses) as a key impediment to the operationalisation of the programme.

Telemedicine was generally non functional. Table 9.6 provides the semi-annual performance of the four sampled health facilities.

Table 9.6: Implementation status of Telemedicine in health facilities by February 2015

Health facility	Items delivered	Number of items	Operationalisation status and challenges
Anaka Hospital	Computers Digital camera Webcams Scanner Solar Batteries Solar panels	6 1 5 1 2 4	In 2013, the hospital received the equipment and they were installed in the different hospital units. However due to the rehabilitation works (ongoing in January 2015), the items were transferred to stores for safe custody except one in the Medical Superintendant's office. Prior to the rehabilitation works, Internet had been delivered and the facilities were used for six months. The hospital was linked to Mulago National Referral hospital and the support received was useful in health service delivery. Computers were equally useful in document processing and populating the Health Management Information System (HMIS). **Challenges** • The solar system was struck by lightning and the suppliers and UCC were informed but had not communicated back on the way forward. • The training given to the users was inadequate and only three users were trained.
Iganga Hospital	Computers Digital camera Webcams Scanner Battery Solar panels	6 1 5 1 2 4	In 2011, the hospital received the equipment and they were installed in the different hospital units that is: Pediatrics ward, Maternity ward, General office, Office of Medical Superintendent, and Operating theater. In 2013, the 128 kbps Internet connectivity was secured from M/s Uganda Telecom Ltd. The hospital is not linked to any other referral for technical support.

Health facility	Items delivered	Number of items	Operationalisation status and challenges
			Challenges • During the rainy seasons, the solar system fails to supply adequate power to the users • The hospital did not have a technical person to support the system infrastructure. • User training was not adequate and most of the key users (clinical officers and nurses) were not trained. • There was lack of clear interaction between the hospitals and lower health centres. • One computer installed in the pediatrics ward was stolen. The hospital reported to police. • The system was not linked to referral hospitals. In addition. Some referral hospitals lacked the medical staff with specialized skills. • All computers were not engraved.
Kawolo Hospital	Computers Digital camera Webcams Scanner Batteries Solar panels	6 1 5 1 2 4	In 2011, the hospital received the equipment and they were installed in the: Pharmacy, Pediatrics ward, Maternity ward, Office of Medical Superintendent, Board room, Stores and Operating theater. By 9th February 2015, Internet connectivity had not been delivered. The computers were being used for document processing and data management. The telemedicine is not functional. **Challenges** • Lack of internet connectivity. • Inadequate end user training.
Moroto Regional Referral hospital	Computers Digital camera Web cams Scanner Batteries Solar panel	6 1 5 1 2 4	In 2011, UCC delivered and installed the equipment at the following hospital units: Office of the Director, Surgical Ward, Theater, Children's Ward, Maternity ward, and Records/Stores. By 15th January 2015, Internet connectivity had not been delivered. The computers were being used for document processing and data management. The end user training was not conducted pending internet connectivity. The telemedicine was not functional

Health facility	Items delivered	Number of items	Operationalisation status and challenges
			Challenges • Lack of internet connectivity. • Inadequate end user training.

Source: Field Findings

Key implementation challenges

- Lack of internet connectivity to enable communication between hospitals
- Some referral hospitals lacked the medical staff with specialized skills to guide users in lower health units.
- Inadequate hands-on training for hospital personnel to effectively use the equipment.
- Lack of sustainability plans for operations and maintenance of the system.

Analysis

Achievement of set targets

Two of the four sampled hospitals (50%) had been connected to the internet and only one hospital was linked to a referral hospital for consultation services. However no specialised end user training had been conducted to ensure that the key project personnel use telemedicine. The target of operationalising telemedicine in health facilities was generally not achieved.

Link between financial and physical performance

Financial information on operationalisation of the project was not available for analysis.

Conclusion

The overall performance of operationalising telemedicine was below average (25%). All equipment to use the service was ready except at Anaka hospital where they had been stored to allow renovation of the hospital. Internet connectivity had enabled medical facilities with limited staff to access expert consultation services.

However, UCC had not provided broadband internet to some of the facilities, and target users had not been adequately trained. The objectives of this project cannot be achieved until the key components of internet connectivity and end users training are delivered. Therefore, the received equipment in most of the hospitals will largely remain under utilized and in some cases lost with no Value for Money.

Recommendations

- Health facilities should ensure that all supplied equipment is engraved to mitigate risks of theft/loss.
- The UCC should organize hands -on training for key hospital personnel (medical officers, clinical officer and nurses) to enable them appreciate the technology, its relevance and significance in health service delivery.
- The UCC should urgently procure and supply Internet services to all beneficiary health facilities to achieve key project objectives of telemedicine.
- The MoH, Regional Referral Hospitals and District Local governments should budget for operation and maintenance costs of the facilities for sustainability.
- The UCC should plan and budget for protection of the solar systems from lightening to avoid losing the equipment.

GENERAL CONCLUSIONS

The overall conclusions are derived from the field findings and analysis in the previous chapters.

The overall physical performance of the ICT sector was fair. The key deliverable under the National Backbone Infrastructure project (laying 757 km of Optic Fibre Cables and installation of transmission sites) had not started; performance of this project was generally below average and behind schedule. About 80% of the semi-annual targets for the Business Process Outsourcing project were achieved.

Operationalising the school ICT laboratories and Tele-medicine equipment installed in health facilities was rated as fair. A number of ICT instructors/teachers were re-tooled, some schools and health facilities were connected to the internet and the uptake of ICT services was gradually increasing. However, 46% of the sampled schools and 50% of the health facilities had not received internet connectivity which was affecting content delivery. The projects were further affected by lack of sustainability plans, lack of comprehensive user training among health workers and inadequate equipment.

In spite of this average performance, access to ICT services is greatly improving, and the sector has shown commitment towards enhancement of government service delivery through e-education, e-health, e-governance and e-commerce. However, the quality is still low and services still expensive. The agencies monitored were contributing to the provision of strategic and technical leadership on matters of policy, laws, regulations and strategies for utilization of ICT in all spheres of life to achieve the country's development goals.

RECOMMENDATIONS

Implementation of programmes can be improved if corrective measures are taken by the various MDAs. The key recommendations are:

- The NITA-U should fast track the implementation of phase III of the National Backbone Infrastructure project.
- The MFPED/NITA-U/MoICT should reprioritize the ICT sector funding.
- The NITA-U and the Business Process Outsourcing (BPO) association should popularize the availability of BPO services and market the country as a BPO destination.
- The Office of the Prime Minister, URA and MFPED should address the issue of double taxation of BPO services.
- The Uganda Communications Commission (UCC) should procure and supply Internet bandwidth to schools and health facilities.
- The MoES and Education Service Commission should recruit and post ICT teachers to schools and provide the schools with furnished computer laboratories.

- The MoES and UCC should review the ICT package to schools and include printers, CD-ROM drives and projectors to enhance content delivery especially in schools with high enrollment.
- The MoES should procure and supply ICT instructional materials to schools.
- The UCC should organize hands-on training for key hospital personnel (medical officers, clinical officer and nurses) and link lower health facilities to referral hospitals to enable them appreciate the telemedicine technology, its relevance and significance in health service delivery.
- The MoES, Schools, MoH, Regional Referral Hospitals and District Local governments should budget for operation and maintenance costs of the projects initiated by UCC for sustainability.

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