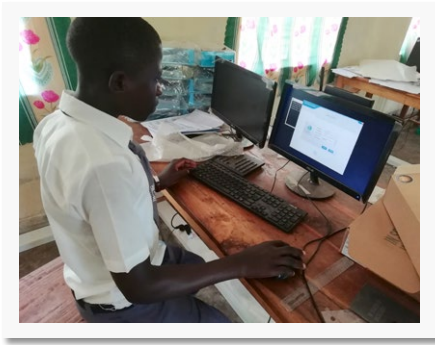# Samanga Solutions Limited Deploys ICT Solar Powered Laboratories In 15 Educational Institutions

Project Reference Number: UCC/SUPLS/17-18/00020)

Samanga Solutions Limited was contracted by Uganda Communications Commission to Supply, Deliver, and Install Equipment for Establishment of ICT Solar Powered Laboratories in 15 Educational Institutions that are located across Uganda. Through a competitive bidding process, Samanga Solutions Limited offered a unique solution that provides connectivity and access to ICT services affordably.

BACKGROUND

The project is being implemented under the RCDF (Rural Communications Development Fund) established in 2003. It is being statutorily administered by UCC under the Uganda Communications Act (2013) one of the sub-objectives being; (g) Establishing and administering a fund for the development of rural communications and information and communication technology in the country.

RCDF VISION

A Uganda where all People can Harness ICT Enabled Opportunities for Prosperity.

RCDF MISSION

To facilitate universal access to high level capacity broadband for all Ugandans through targeted interventions addressing location, physical inability, gender and cost barriers.

THE RATIONALE

The Project falls under the **Broadband Connectivity & Access Programme**, where the potential intervention is to: Equip all secondary schools (both government and private) with school ICT Labs.

The programme seeks to impart technological skills to students in the rural areas of the country which are important for participation in the global economy and society.

There was an urgent need for the improvement on the quality of teaching and learning. The schools experienced a lot of difficulty in teaching computer lessons as they were being taught theoretically especially ICT being a subsidiary subject at A-level. In addition, it was very difficult to carry out research as there was no access to online applications and services. Therefore access to information was limited and often outdated. There was also a need to provide the students with a platform for connectivity.

THE SOLUTION

Samanga Solutions Limited deployed equipment from its partners below;

- ASUS
- GreenBridge Computing
- IBC Solar
- Appliansys

The solution comprises of 15 Solar Powered Laboratories located in various remote areas of Uganda. Each Laboratory has:

The Power Source:

A total of 7 kW of solar power was installed per school. Each Laboratory includes; Six (IBC moll special 520010086 gel battery 12V 235AH), Seven roof mounted panels (IBC 200 Monosol), four charge controllers (Stecca 30AH/12V) and one Victron inverter 12V.

The batteries are mounted within special metal case. Mounting structures were locally designed and constructed by Samanga Solutions Limited and its subcontractors. The aim of the mounts is to provide some additional security for the panels and batteries. The metalwork included a cuboid structure which allowed assembly and servicing the panels and batteries where need be. Necessary wiring and conducting was done to provide power to the computers.

ICT Hardware:

11 ASUS E420 Mini PC system units with peripherals (Keyboards, Mice, ASUS cerbrus headsets) 10 ASUS VS197DE 18.5 monitors with virtualisation software, i.e. GreenBridge HUB 400 Zero Client and the necessary networking cables were installed. Thin client computers, which do not consist of stand-alone computers, have to be connected via network cables to a desktop computer, known as a server, that provides all computing functions and stores all content and software that the "clients" need to function.

A thin client system consists of a cluster of GreenBridge Computing devices that are connected together by cables to a server to create a network. Each device is also connected to its own keyboard, mouse, and screen.

ICT Software:

The computers run Windows multi point server 2012 and have licensed software bundle installed. Licensed Microsoft Office, deep freeze, anti-virus (Kaspersky) were also installed for better functionality and user-friendly experience.

ICT Network

The computers are linked by a wireless network and are all able to access and share information through the network. Internet connectivity equipment available in each school enables this. Wireless routers connect student devices to the network. Caching appliances store e-learning content locally and serves it to students directly over the network, without them having to access the internet each and every time.

Security:

Anti-virus (Kaspersky) and deep freeze software were installed on the computers for software security purposes and metal encasing was done on the solar batteries and solar panels for the security of the power source also lighting was provided inside and outside the laboratory to serve the same purpose.

Training:

Necessary training was done to the personnel availed by the school during supply and installation of the equipment.

THE BENEFIT

The Solution, through the Cyber Learning App installed on the computers has eased the teaching and learning of science. Because it has pre-recorded lessons, practicals and demos for science and maths, students are able to access previous lessons to be able to understand concepts better. The teaching of science subjects such as Physics, Chemistry, Biology has changed from a more theoretical abstract approach to a practical easy to understand model which stimulates critical thinking and active learning.

" Cyber Learning has interested students in science subjects. "

Judith Chepkwoti – Headmistress
(Kwosir Secondary School, Kween District).

The Future

The government seeks to provide video conferencing lessons through the ICT labs and Digital Libraries to connect the rural schools to urban schools. The goal is to even the playing field by providing the same opportunities to rural and urban schools. For example a teacher in Kampala can teach a class that can also be accessed by students in Karamoja.

The ICT labs in the various schools have made it possible for students and teachers to have access to various online applications which has eased the research process.

The **CACHE**BOX appliances enable more students to access the online applications wherever connectivity is low or intermittent, even offline.

The teachers and students now have the opportunity to access unlimited information in various subject areas.

Furthermore, accessibility to the internet has enabled the students to access social media which has improved the involvement of students in computer learning, and improved communication skills while allowing them to stay connected. With guidance from the teachers, students are learning how to use social media platforms properly and create a safe online culture.

Prior to installation of the ICT labs, computer lessons were done theoretically and learners had only seen computer equipment in text books and some in their imaginations. However, right now learners have practical computer lessons and can physically interact with the equipment. They can identify the different parts of the computer and their respective functions. Therefore, the students now enjoy the subject (ICT) more than other subject which has improved attendance compared to other subjects.

" The school could not introduce computer lessons as a subject and yet there was an urgent need for it for the students since ICT was introduced as a compulsory subsidiary subject in A-level. "

Lydia Nangira – ICT Laboratory Attendant
(Kateta Hill View Secondary - Serere)

The solution has enabled ICT services to be availed to students without limitations such as location, accessibility to electricity, level of literacy or technology knowledge. It has fostered an all inclusive mechanism that allows students that are in the remotest parts of Uganda to access ICT. With **CACHE**BOX, this is made possible even where connectivity is strictly limited or unreliable. In areas that have no access to grid power, the solar component enables the ICT laboratories to be operated.

Previously, The community in which the schools were computer illiterate However, programs have been designed for them to receive training in ICT skills during school holidays.

" I hereby thank the Government of Uganda for allocating the school with 21 computers to aid the teaching of computer lessons and introducing students to dotcom demands. "

Godfrey Chebet – Deputy Head Teacher - St. Michael Girls Secondary School Kaproron, Kween

Our thanks to our partners:

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