

Giakonda Solar Schools Report on visit to Zambia September 2017

Personnel:

Howard Kirkman: project lead and lead trainer
Wendy Kirkman: liaison with local partners/ assistance with data gathering
Sian Pentecost: primary teacher, assistance with training/ liaison
Luke Brereton: IT technician
Malcolm Boorer: videographer
Jason Brown; Software engineer
Adele Stuart: linguist and teacher of English as a second language (TESL)

Project Overview

Our main aims were the following:

The installation of solar panels, batteries, controllers, fuse boxes solar cables etc in Kawila school
Installation of Raspberry Pi Server , a projector and four laptop computers with WiFi Intranet access (also at Kawila School)

Continual Professional Development CPD Days for teachers and support staff

Topics:

- Introduction to solar power for rural Communities
- IT Security for Schools
- Hardware maintenance and trouble-shooting
- Set up and Management of a Synology Server
- Using RACHEL(Remote Area Community Hotspot for Education and Learning) offline resources across the curriculum
- Basic Excel in Primary Education
- English Composition in Primary Education

Installation of donated Synology Server in Chilanga Primary School and networking of existing PCs to share files

Installation of Synology Server in Kariba Secondary School and networking of existing PCs to share files

Installation of Synology Server in Matuwa Secondary School and networking of existing PCs to share files

Installing Raspberry Pi server in Siavonga Primary Resource centre.

Setting up community resource area for Siavonga Nutrition Group

Installation of solar power in SNG community sewing workshop

Meetings / report sharing with our local partners DEBS / SNG / Office of Chiefs

Investigating future educational needs

On site trouble shooting in previously visited primary schools

Details of Project

Solar installation

We bought the solar panels and batteries and other essential kit from Muhunya Solar in Lusaka with whom we have established a good working relationship over the last three years. They routinely advise us on technical matters and have donated cables and connectors to help us. They have also facilitated work we have done for other organisations.

We installed the system in Kawila School. It is not far from two of our previous schools, (Sianyoolo and Dambilo) and forms part of our developing-self-help cluster of schools. The Head Teacher of Dambilo School came over to assist along with school staff and the local community. We used this as an opportunity to provide hands on training.

The Head Teacher of Kawila School arranged for pick-up of the solar equipment and its transportation to the school; and also identified available transport from Siavonga.

Our system is powered by 2 x 350 Watt solar panels through a 50amp solar controller to 2 x 220 Ah deep cycle batteries. This will power 5 LED arrays (enough for 2 classrooms and an office), the Raspberry Pi server with RACHEL (Remote Area Community Hotspot for Education and Learning), a Router, plus an LED projector. The projector is a new component of our solar package as we have come to realise what a useful addition it is where teachers are working with few resources with class sizes in excess of 50 pupils. We bought material for blackout curtains in the local market to use with the projector.

The system will also have enough energy to charge the four Laptops we provided.

The estimated life expectancy of the solar system is 15-20 years, depending on appropriate maintenance of the battery.

Training

The training days were attended by a total of 42 teachers, many of whom came to them all. Practical sessions such as the network cabling one were particularly well received as teachers felt that they could apply the skills learnt to ensure the smooth running of their IT systems.

Synology DiskStation

We supplied Synology DiskStation servers to three large schools. (Two bought with the grant plus a third paid for by ourselves). We cabled existing computers to the server via a switch. This meant that these computers could all access the offline learning resource RACHEL. In addition, we helped the systems administrator set up users so that information can be securely accessed and stored.

Raspberry Pi Servers

We installed a Raspberry Pi server with the offline RACHEL learning resource in Siavonga Resource Centre. This is situated in the grounds of Siavonga Primary School and serves a dual purpose. In the day it is used for teacher training sessions and district meetings on educational topics (it is designated a zone hub by the district education board). In the evenings individuals from the

community come in to study, often bringing their own laptops. A log is kept of books borrowed from the small library.

The centre administrator was very enthusiastic about the learning resource and thought it would be very extensively used. He immediately put up signs with the wifi details and set up a new book to log users.

During the course of the project we have supplied Raspberry Pi servers to each of the solar schools. On this visit, we supplied them to Bbakasa, Dambilo and Kabbila Schools which we were not able to get to in January for logistical reasons. We gave an updated version to Matuwa Secondary School to use in the staff area. Our aim is to supply RACHEL to all schools in Siavonga.

Siavonga Nutrition Group

We set up solar panels (donated by Swansea Siavonga Partnership) in the sewing workshop area of SNG. They provide power for three sewing machines as well as improved light via LED lighting. This is part of a project to train women in new skills and enable them to have an income.

SNG also has a small area which we set up with offline elearning resources. The aim is to provide educational resources for disadvantaged youths and the many children in Siavonga town who are at present outside the school system.

Onsite trouble shooting

Generally speaking, the schools we had previously worked with had met with very few problems since our last visit. They were still in need of more resources and would benefit from more laptops and projectors.

Kariba and Matuwa schools had just been upgraded to Secondary schools which meant that they were sitting Grade 9 Computer Science practical exams for the first time. They managed to cope with the large numbers by doing this over a period of three days. For the future they would each benefit from a second suite of computers.

Meeting with our partners

We liaised on a daily basis with Charlie Mangilazi, (British Council Digital Ambassador and ICT Coordinator for Siavonga. He is based at the High School). In particular we looked at the exam requirements to ensure that our training is appropriately focussed.

This visit, we arrived at a time when the District Education Board Secretary with whom we have been working for the last three years had just been transferred to another district. We met with his acting deputy, but were not able to meet the new DEBS as she had not yet taken office. Since our return, we have been introduced to her by one of SNG Board members who is also Chair of the District Education Board. We are sending her a full illustrated report of our project.

We had a formal meeting with the SNG Board where we outlined our aims in the district and discussed joint projects.

Lessons Learned and Challenges Encountered

Transport to rural schools in Zambia remains a challenge in terms of cost and, at certain times of the year, accessibility. We intend to trial the hiring of a 4-wheel drive vehicle for use throughout the duration of our next visit.

Although the school term had started, we found that pupils had not returned in full numbers and teachers were busy with administrative tasks in preparation for Grade 9 national exams (The children had not attended school because the government feeding programme was behind schedule). Nevertheless our training courses were well attended and we were able to provide timely assistance with ensuring IT systems ran as smoothly as possible for the Computer Science Practical exams.

Feedback from all courses was positive and teachers found the practical sessions on making network cables and building their own network infrastructure particularly valuable.

We are especially grateful to Sian who pitched her introductory course on Excel at a perfect level for the attendees. The majority had never used it before but went away feeling confident that they would find it useful. They were delighted with the visual aids she had produced to take away.

Promotion

During our visit we publicised our project by regular tweets, uploading photos to Giakonda Solar Schools FaceBook page, and by news posts on www.giakonda.org.uk/news/

Malcolm, our videographer, took many hours of video footage for us. He has put together some of this and the playlist can be seen on Youtube.

<https://www.youtube.com/watch?v=DTvlu2Di5GA&list=PLzhoSr-4ejaWwM14PWC6iuTLA5H2GbFOe>

Over the next three years we aim to provide solar power, network infrastructure and computers/laptops to at least a further twelve schools.

We aim to supply the RACHEL learning resource to all 35 schools in the district. We have asked teachers to feed back to us on their use of the resource so that we can identify the most useful units for lesson planning, class demonstration and personal research. We hope to use this data to help create learning pathways for them.

We hope to develop our program for hard-to-reach youths and children in Siavonga town.

We intend to enhance each of 6 zone centre schools by providing e-learning resources and laptops.

We will develop sustainable school agricultural programs.

We will continue our training program for teachers, school administrators and systems managers.

We have a program to provide PCs and laptops to schools, aiming to supply about 500 in total over the next year. The equipment has been donated to us and the success of this program will depend on acquiring hard drives for the computers and transporting them to Zambia.

So far we have secured a grant of £10,000 which we will use to supply solar power to three schools in Spring 2018. We have made three other applications for smaller amounts of funding.