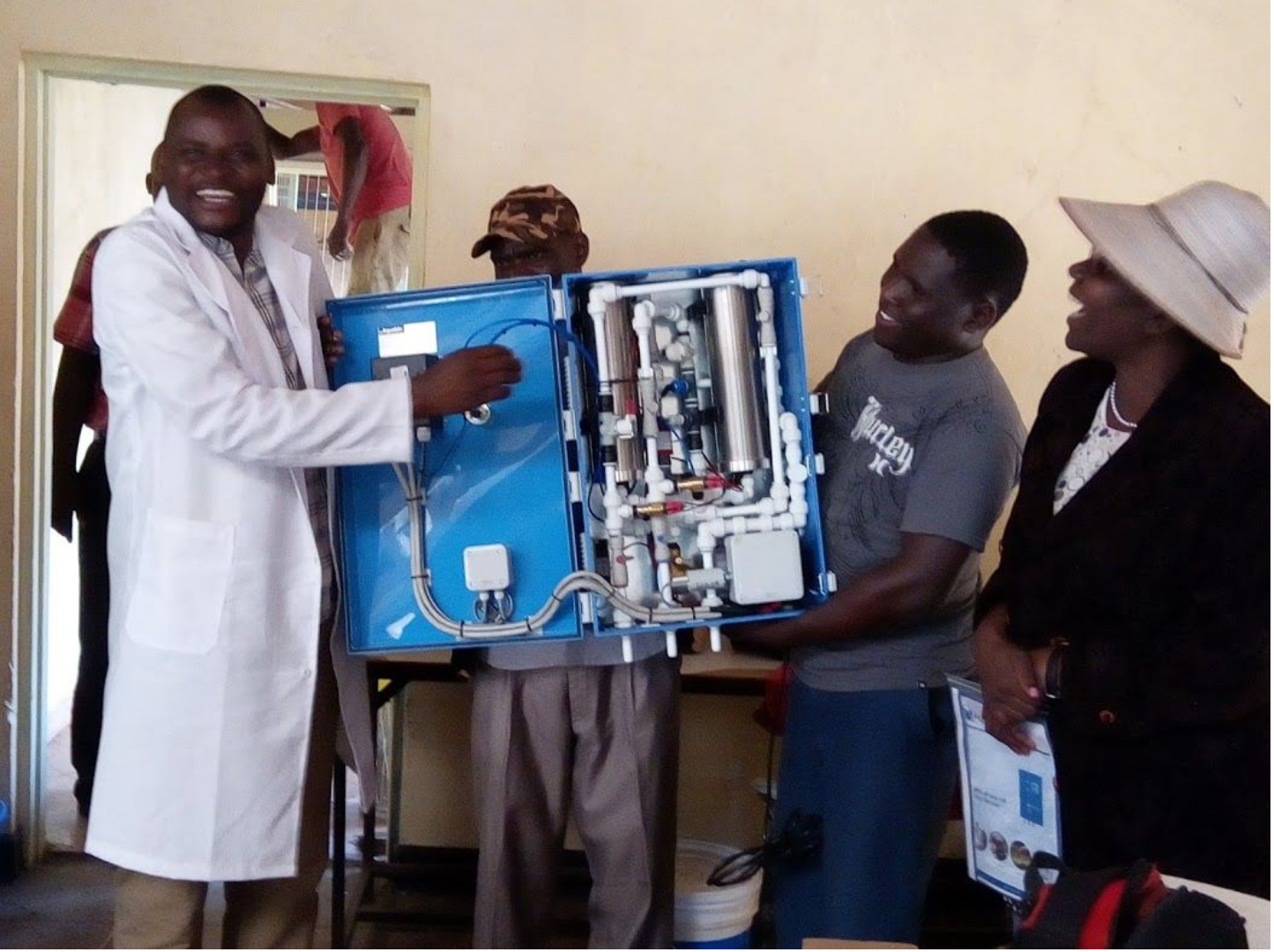


report 2018

Aqua Water for Schools

Water Purification Project for Schools in Kenya
&
establishment of
Water Training Centre

Content

1.Introduction

The goal of the project was to install a NRO100 water purification system including required tanks and piping,

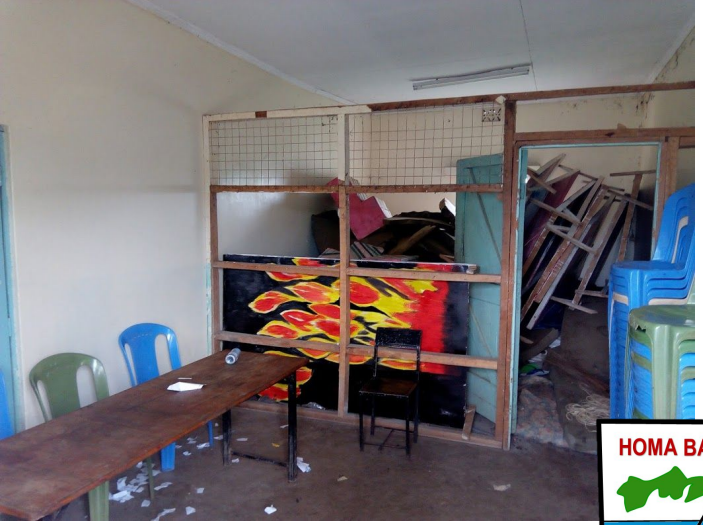
a) to create a training centre; training technicians, school staff members and the communities
b) to provide safe and clean drinking water to a secondary school, primary school and doctors post

securing maintenance of the NRO's and sustainability through local engagement and empowerment of the people.

The project has been implemented with success in collaboration with the local partner KPAG in Kenya. The Aqua Water for Schools and Training project contributed to the empowerment of local communities. The project enabled the transfer of technical skills and knowledge and contributed to the creation of the proposed Training Centre.

Before the project started we did crowdfunding activities to highlight our project in the Netherlands and to raise funds to fill the gap in our budget. We also shared our experience of the ongoing water project in schools in Kenya with counterpart schools and communities in the Netherlands. We took part in the European Green Week kick-off in Utrecht as part of awareness raising about our work progress in Kenya.

The implementation of the project in Kenya started in February 2018. In this report we are reflecting on the process, the results and future perspectives of the project. The project was implemented in preparation to the implementation of the NRO100 in 12 schools.



2.From storage to Training Centre

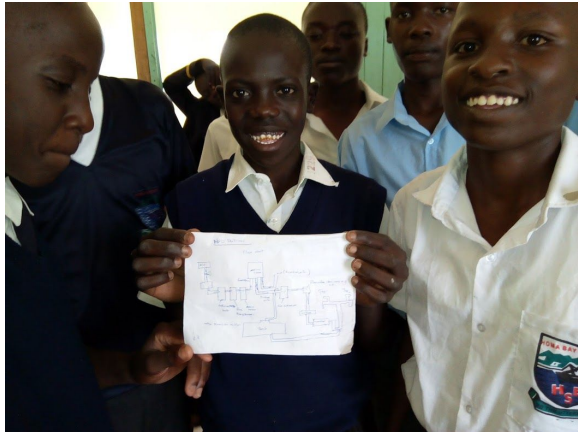
The initial location we sighted as the ideal location for the Training Centre was the Doctors Plaza in Homabay Town which was also central in terms of serving Homabay High school and Homabay Primary school. Due to practical factors like availability of permanent water and the water infrastructural development Homabay High school was better suited to host the Training Centre. Homabay High school was as well central to the three locations.

Another determining factor was the idea of Homabay High school being a STEM school (Science Technology Engineering and Mathematic school) hence the government offered to support the initiative through provision of the space and appoint a caretaker in charge of the maintenance of the equipment and coordinate provision of water to the other partners engaged. The government also made the training Centre a designation as a Study Centre for STEM for students, teachers and the community at large. More about STEM schools: http://www.cemastea.ac.ke/

For the University students from Doctors plaza this was also an opportunity to connect with the community outside of the “University Building” as one of them said.

Pictures showing: The room in Homabay Secondary school transformed into the training centre with assistance from


Aqua-etiam



3.Opening of the Training Centre

We had a superb opening of the training centre in Homabay at Homabay High school during the Education Day. With a student capacity of 2200 and with Homabay Primary and Doctors Plaza present, parents, teachers and the students witnessed at hand how raw water from the lake, which is their direct source of water, is purified to clean drinking mineral water. The day had the theme ‘hygiene and health’. For the students the learning process and the role of the STEM school became apparently very vivid through seeing, doing and tasting the water.

Picture: principal Mr. Vincent Mayienga talking to parents and students


HOMA-BAY
PRIMARY SCHOOL

4.Training and capacity building
engagement and empowerment of local people

Training and Capacity building has been the key to the success of this project. Especially when you talk about equipment which needs to be serviced frequently, technical know how has to be a point to be looked at in depth for sustainability of such project. It all boils back to services of these equipments and that requires people and a team who are fully trained and able to do repairs and maintenance. Same can be said of capacity building especially on clean and safe drinking water knowing that people, especially in the setting of rural Africa where we are still used to fetching water and drinking directly from the river or borehole. And even if there is tap water this is still prefiltered and not purified. So capacity building for clean and safe drinking water, hygiene and the importance of proper maintenance of equipment is very fundamental and important. The success story of engaging people creates lesser demand for ‘after sales services’.

We developed an educational magazine, flyers and a training/installation manual. The magazine shows images of the project, people engaged and introduces people to good environmental practices in guaranteeing better water quality and it gives information about the requirements for installing a water purifier. The training/installation manual is an extensive booklet with lots of information about environment, the equipment, installation and service and maintenance. It was developed in collaboration with partner Aquablu and used for the trainings.

The project reached over 2200 students and teachers from Homabay Secondary, 836 pupils and teachers from Homabay Primary and 500 people including students and doctors engaged in Doctors Plaza. The location provides clean and safe drinking water and functions as the training centre.

The science teacher of Homabay Secondary School, has been offered extra hours (paid via the STEM school Ministry of Education) to be in charge of the maintenance of the NRO100 in the training centre, organise the provision of the water to the 3 partner locations involved. He is also the contact person for the training centre for the other STEM schools in Homabay area with Water Purification.

Schools also use the distilled water for their educational activities in the laboratories in the school.

Where KPAG had 1 electrician to maintain one system 1,5 years ago, the team has now expanded to 7 people. Apart from technicians the team expanded with people engaged in communication and logistics.

The KPAG team has been advanced through intensive training and gained practical experience through participation in the capacity building workshops, field trips, trainings and installations. KPAG technical team is now capable to install a whole purification system, do maintenance and repairs.

One of these 7 people is Mark Oyoo. He is trained in Plumbing, Piping, Sewage connections and has diploma in Water Engineering from Nairobi Water Sewers. He is the main technician in charge of installation, maintenance and repairs. He is the contact person to all the schools where water purification is installed.
Further Mark is busy setting up a consultancy office where he can advise people about water purification.

In the picture: Mark Oyoo checking the system at Highlands Academy.

Like Mark, other young people got engaged and see opportunities to create businesses. Victor Ochieng saw the opportunity to market the water purification project in other areas. He is trained in website design and branding and has been assisting in printing the t-shirts and booklets for the project and the organisation of the trainings.

Gordon Achola studied Business Commerce in the University of Nairobi. He started his own company in strategic business planning development and administration. He is assisting in exploring and developing strategic local partnerships, e.g. with local and national government and schools.

More than 40 capacity building workshops and a lot of field trips to diverse locations in the area have been implemented reaching per location averagely 50-60 students, teachers and supporting staff members. This resulted in the installation of NRO's in other schools as aimed for.

In the picture: Top right: Clinton Oloo - trained in Masonry at Oyugis Centre. Below: Albert Otieno (left) and Victor Ochieng (right); on their way to Blue Economy Conference Nairobi.

For the installation of the NRO's the trained team engaged all kinds of local people per location with for example building and construction skills, plumbers and electricians. School staff members and students were engaged in capacity building workshops in preparation to the installation. Teachers, local young people with technical background, plumbing and masonry took part in the training programme specifically focusing on a clean and hygienic environment and the maintenance of the system.

Each and every school location has its own maintenance assistant. These are mostly STEM teachers. They keep the records about the running of the system and know for example how to clean / replace filters. They use these activities as part and parcel of the STEM education and therefore actively engage the students.

Top picutre: Oscar Mbaka (on the left) is a graduate from Electrical engineering School of Mawego. In KPAG he is in charge of the electrical side of the installation and maintenance. Mark Oyoo (on the right).
Picture below: (from left to right) Clinton, Oscar and Jack (science teacher Asumbi Girls High School).

5.Training & certification

After the capacity building workshops at the diverse school locations we came to the last part of the training process and capacity building for the teachers, plumbers, local government officials and technicians. We organised a major day at the training centre in Homabay High School and a few similar trainings in six other venues in which we offered participation certificates for the in depth training plus the nitty gritty of the machine. Our field trips paid off in terms of the number of the people who sincerely showed interest to participate. But above all it offered an excellent moment of networking and exchanging knowledge and experiences so far with one another. In total the project has trained 33 people of whom we have certified 15 people with certificate for in depth training.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KPAG WATER
PURIFICATION


KPAG WATER
PURIFICATION


KPAG WATER
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PURIFICATION


REFILL NO LANDFILL

6.Schools and the community

Definitely the schools are our source of inspiration and we are convinced that we made the right decision in terms of looking at water provision from an educational perspective. It has acted as a source of catalyst in terms of empowerment to girl child but also a good source of water harvesting cause these schools have enormous roofs whose water if collected/ harvested can help in long run water security for this institutions themselves and the community.

For students it is a unique opportunity to connect what they learn from class to how it works in the real field. It has become an eye opener to a lot of students and every school does pick it in their own way. https://www.nation.co.ke/news/High-school-students-start-thriving-water-bottling-plant/1056-4782780-ty36bx/index.html)

Every school in rural area in Kenya is part of a community. A school can be a source of water for the community owing to the fact that 60% of the country living on off grid water system like boreholes, rivers and dams. (From: Research Paper Kenya Vision 2030) So for a school to own a water purifier the school will be the immediate beneficiary of such venture. Like we have seen in our pilot project where the community is sending kids to school with a hope that they bring water back home instead of the reverse where children have to stay home to fetch water before they go to school or don't go to school at all.

Schools, both primary and secondary, receive annual funds from the Ministry of Education for water and sanitation. The size of the budget depends on the number of pupils / students in the school. This annual budget guarantees the service and maintenance costs involved for e.g. replacement of filters and/or spare parts.

https://www.nation.co.ke/news/High-school-students-start-thriving-water-bottling-plant/1056-4782780-ty36bx/index.html

Innovative students mint water money

Migori learners set sights on millions from their thriving bottling plant project. Page 2

SATURDA

September 29, 2018 KSh60/00 (TSh1,700/00 : USh2,700/00 : RFr900/(

2 | National News

Innovative> The learners got Sh1.5 million seed money from school

High school students start thriving water bottling plant

They make more than Sh100,000 per month selling water to their colleagues

BY VICTOR BABALLA

Ulanda High School students put stickers on water bottles. They currently produce 3,600 half-litre bottles per month.

From the modest achievement of overcoming maths and science anxiety, some students at St Alberts Ulanda Girls High School in Migori County have launched a thriving water bottling business and are now looking forward to raking millions from the venture.

The plant, operated strictly by students, currently produces 3,600 half-litre bottles per month. They plan to expand its capacity to tap into the commercial market.

As the institution awaits certification by the Kenya Bureau of Standards (Kebs), the drinking water is internally sold to members of staff, administration and the more than 2,400 students at the school.

The water is sourced from the nearby River Oyani before undergoing a series of purification processes, after which it is released for consumption.

"By selling each bottle at Sh30, we are able to get over Sh100,000 per month," said Ms Sharon Akinyi, who is the team leader of the group.

Other than using the revenue to maintain the equipment and buy packaging bottles among other expenses, the students are also servicing a Sh1.5 million 'loan' they received from the school to start the venture.

The first of its kind investment was inspired by the government move which earmarked Ulanda Girls as one of the 102 schools to run Science, Technology, Engineering and Mathematics (Stem) programme.

The innovative way of teaching maths and science subjects is implemented by the Centre for Mathematics, Science, Technology, Education in Africa (Cemsatea) on behalf of the Ministry of Education.

The school received Stem equipment which include a set of EV 3 robotic kits for teaching and learning, two laptops and a carriers to facilitate the lessons.

Under the guidance of Stem co-ordinator Sister Lillian Oyala, the 10 volunteer students have been organised in shifts of two and work for one hour every weekday and two hours over the weekends, with the assistance of some few other students.

"Other than the 10 volunteers who are allowed to operate the machine, the plant also serves as a demo site for other students to learn practical lessons which allows them to establish a connection between school, workplace, community and the global economy," she said.

Ms Amy Prudence, one of the volunteers and a form two student, said members of the team also work for one or two weeks during school holidays.

"We also have to balance our work with academics to be able to catch up with our classmates," she said.

Some of the attributes considered for one to join the group include those who observe proper hygiene, discipline and good performance in class.

Through the venture, the students offer support to bright but needy students who provide their services to the school-based factory.

The school administration is the biggest customer as they buy the water for use for practicals at the laboratory and other functions like the annual general meeting.

Upon approval by Keba, Sister Oyala said they hope to double their production and supply the mineral water to external entities like the county government and other clients in the region.

Sister Jane Mutai, the school's principal, said the Stem programme has enabled more students to develop interest in maths, physics, chemistry and biology subjects, which are shunned by many girls.

"The practical nature of the Stem programme goes beyond the mere transfer of knowledge and equip learners with problem-solving, creative and collaborative skills," she said.

Cemsatea director Stephen Njoroge last month announced that the government will incorporate 568 schools from the current 102 at a cost of [illegible] 200 million.

7.Sustainability

The sustainability of the water purification equipment depends on so many factors and all of them seem to be interconnected. E.g if you pick the water quality it is important to maintain certain standard of raw water used for the purification and to keep the source of water as less contaminated as possible. Environmental and human activities such as farming, which involves the use of fertilizer, and addressing the importance of planting (indigenous) trees are part and parcel of our endeavour.

Thinking about the use of plastics. Kenya banned plastic bags but plastic bottles are still a major problem to the environment. Within the project we have been promoting the use of reusable drinking bottles as a long term solution considering the environmental impact of bottling water.

Every school in Kenya in the rural setting is part of a community and most of the communities run on off grid water sources. This brings us to education on water harvesting in schools using roof tops to engaging communities in all sphere of social, cultural and entrepreneurial aspects which in the long run create sustainability.

The SDG's show however the interconnectivity of diverse aspects and never can you tackle one without being confronted by another. Water being a social commodity makes our endeavour a social endeavour under SDG goal number six.

8.Conclusion and acknowledgement

We have adjusted to the need of the people in terms of what they are able to grasp and the state of art in water technology, innovations and development helping us to come with what is a realistic and practical solution to the water problem. It means our design of the purification system begins from where the water is. This involves and embraces tailored designed process from end to end purification process and this becomes a specific product. This seems to make our initiative unique in the East-African region, combining analog form of water piping to the ultra modern form of water purification in combination with research, education and capacity building. In simple term we have created a ‘Devolved Water Service’.

Though the project has come to close, the initiative is far from ended. In The Netherlands we are exploring possibilities for a Start-Up / Scale-Up of the initiative to equip more schools and communities with Water Purification. We are doing this in collaboration with young people from The Netherlands with backgrounds in the area of sustainability, climate change and business.

Odak Onyango coördinates the required activities between the local team, Aquablu and partner organizations involved. So far the local team acts independent and is able to solve arising issues on the ground.

We could never be more thankful to our partner AquaBlu who shipped the water purification systems without an upfront payment, their support and sharing of their technical knowhow. It enabled different schools to participate and order for installation on installment based agreement.
What started with the installation of a single system and a series of symposiums about the importance of drinking safe water in schools has now grown into a Training Centre and the installation of NRO100 in other schools too and providing safe and clean drinking to more than 10.000 children so far.

We thank Rabobank, Royal Haskoning DHV, Utrecht4GlobalGoals for their financial support and believing in our project. We thank family and friends for their financial support but above all for their moral support and assistance in making it all a reality.

9.Colophon:

Project initiator: Stichting Jongerentheater Link in collaboration with KPAG (Kenya)
Implementing partner: KPAG (Kenya)
Odak Onyango - coordination and organisation of implementing the project in Kenya, documentation and writing content report
Johan Ottenhoff - technical and financial management of the project
Saskia Ottenhoff - assistant in overall logistics, project planning and communication, compiling and design report

Team in Kenya:
Mark Oyoo, Oscar Mbaka, Clinton Mboya, Albert Otieno, Victor Ochieng, David Odhiambo, Puriety Nyajon

Partners in Kenya:
Aquablu, Reign Interactive, Homabay High School, Homabay Primary School, Doctors Plaza Homabay, Ministry of Educuation (STEM).

This project has been made possible by the financial contribution of Rabobank Employee Fund, Royal Haskoning DHV Employee Fund, Utrecht4GlobalGoals, family and friends.


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6 CLEAN WATER & SANITATION
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Ensure availability and sustainable management of water and sanitation for all