

## Editorial

Dear members, dear friends and dear facilitators of **Technology without Borders**,

The new year starts well! In both Rwanda and Uganda, young people have come together to get involved with Technology without Borders (TwB). In both countries 15 - 20 people were found wanting to found a regional group. The constitution has meanwhile been adapted to this situation of the countries and therefore it is a good time to found NGOs like ours.

The initiative in Rwanda is based on the acquaintance of Danny Owusu, RG leader of RG Sunyani, with Vestine Ingabire during her two visits to Germany at the invitation of *engagement global* in Düsseldorf.

In Uganda, Olivia Sigmund and Nina Schäfer of the Rottenburg Regional Group has initiated the first regional group in Uganda as part of her project "Inventory of local drinking water supply" in cooperation with Ndejje University. (see below)

We wish both young regional groups a lot of success on the part of the Management Board and will gladly support them when needed.

Your board of directors

F. Neumann	F. Regler	R. Schullan	N. Nguyen	M. Stephan	V. Birk	D. Schaffert
			Ch. Zeidler		M. Huber	J. Fasnacht

## Filter System for the Treatment of Eater with High Fluoride Content

**The groundwater in several villages in Northern Ghana is contaminated by an extended fluoride concentration causing diseases. Our Ghanaian members tested the applicability of different materials for the filtration or coagulation of fluoride out of the water. It is planned to implement a filter system made from Moringa plant in the village of Kabonwule soon.**

The village Kabonwule in Northern Ghana suffers from extended fluoride content in the groundwater, especially during the dry season. A fluoride content far above the WHO guideline of 1.5 mg/L was determined in all boreholes during a previous field study of Ghanaian members. Too high fluoride exposure can lead to several diseases, such as metabolic disorder, lung disease and damage of teeth by dental fluorosis. Dental fluorosis could be proved in several children in Kabonwule by the brown coloration of their teeth. Fluoride content was particularly critical in two of the five boreholes. For this reason, these boreholes are not fitted with pumps so they are currently not in use. Consequently, the village suffers a heavy shortage of water during the end of the dry season and the village inhabitants dug holes with hoes to get access to water.



Joseph in the lab

Our aim is the removal of fluoride ions from the water by appropriate filter systems. It is known from the literature that plant materials, such as coconut fibers and moringa seeds, are suitable as fluoride filters. For this reason, Joseph from RG Accra visited Kabonwule again in February 2019 to take water samples and to test different plant materials on them. He conducted the tests at the Kwame Nkrumah

University of Science and Technology in Kumasi together with John from RG Kumasi. Moringa seed was found to be the most appropriate material whilst other plant materials also have potential and are still under investigation. Fluoride analysis, before and after coagulation and filtering with Moringa seeds, showed complete or over 90% removal of fluoride depending on the quantity of moringa used. Furthermore, the pH value could be reduced from a critical value of 8.7 to around 7. As known from WHO drinking water is harmless in a pH range from 6.5 to 8.5. Our Ghanaian members plan to apply the filter concept with Moringa in Kabonwule soon. The two closed boreholes shall be equipped with pumps and commence operations to enhance the availability of drinking water, especially during the dry season.

Additionally, Joseph regenerated one borehole by using the ecofriendly chemical Wessoclean during his visit in Kabonwule to remove clogging by iron, manganese and chalk sediments. Previously observed brown particles in the borehole and in the pipes were completely removed and the water yield per time noticeably increased.

We would like to particularly emphasize that this project is almost completely planned and implemented independently by members from Ghana. Moreover, our Ghanaian members are now very experienced in applying the Wessoclean for the regenerating of clogged wells. Finally, we would highly express our acknowledgement to the rotary club Göttingen-Hann. Münden and our third board Robert Schullan for the financial support.

*Joseph Maudjorm, RG Accra, and Jannik Mechau, RG Bayreuth*

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## Exploration Trip of the Project "Clean Water for Everyone" in Chiro, Cambodia

**Many villages in Cambodia suffer from water shortages during the dry period. The RG Hamburg has the aim to improve the situation of the inhabitants in Chiro and travelled to the village to implement a field study.**

The "Clean Water for Everyone" project has the aim to stabilize the water supply in the village of Chiro, in eastern Cambodia. During the dry season, the 700 inhabitants of Chiro currently suffer from acute water shortages, because the existing wells regularly dry up. The project's partner organization, Organisation for Basic Training (OBT), offers children from the village free schooling, and amongst their many activities to improve the residents' livelihood, operates the water system.

At the end of 2018, the first phase of the project was successfully completed. In October, the project members travelled to Cambodia to gather information on the local conditions and to evaluate the technical possibilities for adapting the existing system. In the course of the trip, the water quality, soil conditions and locally available resources were evaluated. In addition, several workshops on water quality and water consumption were conducted with the inhabitants of Chiro. In one of the workshops, digital cameras were distributed to the villagers, so that they could present their views on the daily use of "clean water". This not only provided valuable information on water use in everyday life, but was also a lot of fun for everyone involved. The travelers could stay privately with families in the village, and had the chance to know the community on a very personal level.



Clean water in daily

Currently, the project group is working on the evaluation and follow-up of the results from the exploration trip. The assessment of the previous alternatives devised was conducted using the information acquired. In the future, the demand pressure on the wells in Chiro will be relieved by including the river Mekong as an additional source of water. A new filter system is needed to treat the river water. The final technical design is currently in progress. The project team is looking forward to further cooperation with OBT and to the practical implementation of the current plans.

*Pauline Kaminski and Pascal Rath, RG Hamburg*

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## Pilot Project for the TwB Swift App

The RG Erlangen developed an app to make an inventory for the equipment of hospitals to support the local staff. In Nepal, at the DHOS, this app should be introduced and tested as a pilot project.

1600 meters above sea level and a one-hour ride away from Kathmandu there is the beautiful city of Dhulikhel. It is not the first time we had the joy of collaborating with the Dhulikhel Hospital, short DHOS.

Hence the DHOS is one of the most advanced hospitals in all of Nepal, we have chosen it for a special pilot project.



Maintenance of hospital equipment

Countless of hours went in to the development of our inventory app, which aims to simplify the hospitals maintenance-crews workflow. A SQL database combined with a barcode scanner app, which is able to run on almost every Android device, enables mechanics to access and submit reports in a central database. The barcodes on the devices allow fast and specific access to any registered device.

Roughly 100 devices are currently in the database and it is still growing. In our four weeks in Nepal we were able to assist repairing devices ranging from incubators, OT tables, patient monitors and even the food plates in the canteen. We have learned a lot regarding user-oriented programming and currently are adding many desired features to the app. The project is still going on and we are still improving the usability with the help of our impressions we gathered in Nepal. On our website [teog.ngo](http://teog.ngo) you can find a very detailed blog about our mission which also contains many beautiful pictures.

Finally, we wanted to thank all of the DHOS Staff, our donors, the developer team, our dutch friends and the German Rotary Volunteer Doctors! They all helped to establish a new element for our hospital support missions.

*Andreas Vierling, RG Erlangen*

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## Urine-Diverting Dry Toilet for a Primary School in Ghana

In February 2018, the construction of a Urine-Diverting Dry Toilet (UDDT) at the Susan Griesbach Education Center in Have, Ghana were largely completed by two members of the RG Ulm. In addition to the installation, training for children and teachers was successfully carried out and the responsible "caretaker" was instructed. An important part of the project is to provide important documentation for future toilet projects.



The whole team in front of the toi-

lets.

The sanitation situation at the Susan Griesbach Education Center in Have (Volta Region), which consisted of two open latrines and the jungle, was almost a reason for closure at the school. This was the reason the headmaster asked for help. Once the RG Ulm had been founded, we took this chance to help. The project was to include two toilets (boys and girls) as well as 3 composters (for faeces) and a urine tank. Further training and workshops for teachers, students and the "caretaker", as well as a manual was part of the project. Construction began in October 2017. The shipping of composters to Ghana was unexpectedly fast and without any prob-

In February 2018, we, Hannah Simon and Philipp Leppert, flew to Ghana to implement the project at the Education Center. The building did not meet our expectations. One of the reason were communication problems and cultural barriers. Some reworking combined with improvisation needed to be rectified. Also, the atmosphere with the local workers was initially a bit cold, which was resolved very quickly due to our prudent approach. Experience and know-how was exchanged. Together with the workers we could solve some of the problems. The children were very excited and interested from the first day on and the training of the teachers, the caretaker and students went well. The caretaker will be paid by the parents of the students, as they will pay a slightly higher school fee to enable the sustainable use of the toilets.

The project has shown that for a successful implementation a reliable local contact is essential, especially in very rural Ghanaian areas. Despite the difficulties on the ground, the toilets were successfully put into operation, which not only pleased the children very much.

We are happy that the children now have their own little toilet. We hope very much that our materials can provide useful information and support for further projects.

*Hannah Simon, Philipp Leppert, Bernd Hillerich, RG Ulm*

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## Electricity and Flowing Water – All the time

**The institute „Notre Dame de la Medaille Miraculeuse“ in Cap Haitien, in the north of Haiti, is a facility, where 80 orphans live and where 500 poor children go to school. The main sponsor is „Action Five e.V.“ from Bonn in Germany. The RG Cologne installed solar panels for the institute to guarantee a stable power supply.**

High costs didn't allow big investments for a long time. There was no flowing water and only 2 hours of electricity a day, by means of a diesel generator, the cost of which did not allow a longer running time. Then they found the first donors for renovation. They planned to build new additional buildings, a fresh water system, a drainage and a solar system.

We, as the regional group Cologne, received the order to plan and realize the solar system in the beginning of 2016. The biggest challenge was to finance a 20kW (peak) system. We collected donations for 1.5 years and got 20.000€, mostly private ones. Then we were really relieved that „Bild hilft“ agreed to pay for all the materials we needed. We got big discounts from our distributors, but in the end the whole project still costed 50.000€. There were many other challenges and delays. For example, 10 weeks were needed to get the container through customs. Another time they had to wait 9 months to get new wood for the construction of the buildings.



Nils Roszbach, Marcel Späth and me, Sebastian Rijkers, met at the central station in Cologne in the evening of the 12th of January 2019. After 3 years of preparation, we could start our adventure. We went to Brussels by train, then 10 hours flight to Dominican Republic and finally 8 hours to Cap Haitien by bus. But the warm welcome of the children let us forget the long journey.

It took only 5 days to install 108 panels on four roofs, to do a lot of digging and connecting the batteries, which weigh 2.6 tons. In the following days we laid 700m of cables and installed and configured the inverters. After 2 weeks of work, the launch of our new system went smoothly. Our plant was loaded with irons and even construction machines and there were no more failures.

Now they have not only electricity 24/7; another big effect is that now the water pump of the new fresh water system can work all the time. So they have also flowing water round the clock. A big Thank You to the guys of the RG Leipzig, who realized this water project in 2016.

A child cleaning the solar panels  
pers. They did a great job and had fun as well. The electrician  
institute for a few years already. He will support our solar system  
in future.

*Sebastian Rijkers, RG Cologne*

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## New RG established in Uganda in cooperation with RG Rottenburg

**As part of the project "Challenges in water supply: Problem areas and solutions for a sustainable and safe drinking water supply" at the Hochschule für Forstwirtschaft in Rottenburg (HFR), a new RG will be established at the Ndejje University (NDU) in Uganda**

Supplying the population with drinking water of good quality and sufficient quantity is a main problem in Uganda. Women and children, who are traditionally responsible for providing drinking water, are the main victims. Since October 2018, students and lecturers from both universities have been dealing with the water supply in the respective partner country as part of the cooperation project. In addition to

financial resources, the Ugandan water sector suffers from a lack of human resources and expertise to implement the national requirements to improve the water sector as well as sanitation. A main goal of the cooperation project is to support the partner university in developing local skills - for example by establishing a new TwB regional group at Ndejje University.



Members of the RG Rottenburg and staff members of the HFR visiting

Crosslinking the RG Rottenburg with the new RG in Uganda will enable both regional groups to develop, finance and successfully implement joint projects.

At the inaugural event in November at the Ndejje University in Uganda, TwB was presented to the project team and future project ideas were outlined. As a result, two members of the RG Rottenburg travelled to Uganda in January and February as part of a university project and on behalf of TwB. A workshop for students and a lot of publicity for TwB will help to establish a new RG by mid-March as well as to distribute the most important positions and tasks. In the future, regular joint TwB meetings via Skype will be held to plan and carry out self-financed cooperation projects in the field of drinking water and sanitation.

*Nina Schäfer, RG Rottenburg*

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## Short Messages

### Invitation to the Annual General Meeting 2019

Every year again, we meet for the General Assembly. On Saturday, 11 May 2019 it will take place in Rottenburg with the following agenda.

- Welcoming and determination of the quorum
- Report of the Management Board
- Report of the Treasurer
- Report of the cash auditors
- Discharge of the treasurer and the executive committee
- Election of the 1st chairman
- Outlook for the association year 2018
- Miscellaneous

Any questions about the organization on site please contact the deputy RG deputy head Julia Güntherodt, [jule1096@icloud.com](mailto:jule1096@icloud.com)

All members are cordially invited and the executive board would be pleased about numerous appearance.

*Executive board*

### Handing over of the wastewater manual to Wasser ohne Grenzen e.V.

Since the beginning there has been a very good cooperation between Technik ohne Grenzen (TeoG) and the Rotarian organization Wasser ohne Grenzen (WoG). Both associations have already realized several projects in cooperation and so WoG suggested that TeoG develop a wastewater handbook. On the basis of a bachelor thesis at the University of Applied Forest Sciences Rottenburg, which was supervised by the local RG director, Prof. Matthias Friedle, and our board member, Dr. Frank Neumann, Verena Vedder and our board member developed a waste water handbook, which was handed over to the board member Axel Schöpa of Wasser ohne Grenzen on 8 March 2019 in its first edition in Leipzig. The handbook is structured as a "loose leaf collection" and is to be constantly improved and expanded by new findings. The handbook will be issued as part of an associated training course. In the medium term, the wastewater manual will be administered by the Water & Wastewater Working Group. If you are interested in the training, please contact [Frank.Neumann@teog.ngo](mailto:Frank.Neumann@teog.ngo) or [Verena.Vedder@teog.ngo](mailto:Verena.Vedder@teog.ngo).

*Frank Neumann*

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## Currently running and completed projects:

[www.teog.ngo](http://www.teog.ngo)

V.i.S.d.P. Dr.-Ing. Frank Neumann, Ina Reichmann

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