

## Editorial

Dear members, dear friends and supporters of Technology without Borders,

Today we have to say **thank you** - on the one hand to a 6-member team and on the other hand to all the generous supporters who have donated 120,000 € in less than a month.

What has happened? Many of you already know that Franziska and Monja have been working on and designing an Agroforestry Demonstration Farm in India since 2016. Both were in the context of this mission in total almost / more than a year on the ground in India. During this time friendships developed and so it is not surprising that our Indian fellow campaigner Vinay Kumar, against the background of the catastrophic conditions caused by Corona in India, asked the two for help and asked them to procure oxygen concentrators. At that time, there were over 350,000 new Corona infections and more than 4,000 deaths daily. Within a little more than a week, the two, along with their friend Christin Hollweck, and together with Mr. Marvin Zierau from Gase-Partner and Ms. Nicole Bach from DHL, achieved incredible things. Although the German market of oxygen concentrators is almost empty, they managed to procure 117 concentrators worth 106,546.82 €. The airfreight shipment, sponsored by DHL, made it possible that 3 days after the 17 pallets were picked up by DHL from Gase-Partner, the first people could be helped with oxygen from the concentrators.



In the meantime, we have sent another pallet with oxygen masks and pulse oximeters to India.

The currently still surplus donations, which were not absolutely earmarked for the oxygen concentrators, will now be used for medication at Vinay's request and then the project will be completed.

A fantastic achievement of all involved - many thanks to the actors and the donors!

Sincerely

Your board

F. Neumann	F. Regler	R. Schullan	M. Graf	L. Hachmann	J. Schlund	D. Schaffert
			N. Nguyen		A. Fenn	J. Fassnacht
			Ch. Zeidler		A. Vierling	A. Bruns

## Oxygen Concentrators for India

**In the recent weeks and months, India was hit by a catastrophic wave of covid cases and deaths. Unfortunately, there were not nearly medications and ventilators, as well as oxygen, available to help the affected people.**

The Munich regional group has been active in India since 2016 with the "Toranam" project. This project has set itself the goal of establishing a method of agroforestry cultivation in rural regions of India that are heavily affected by drought and poverty, and thus sustainably improving the income situation of small farmers on site. Vinay Kumar, the contact person in India and many friends and acquaintances from India have therefore turned to the three of us (Franziska, Monja and Christin) with the request to find oxygen concentrators and send them from Germany to India. Our defined goal was to acquire 100 of such concentrators.

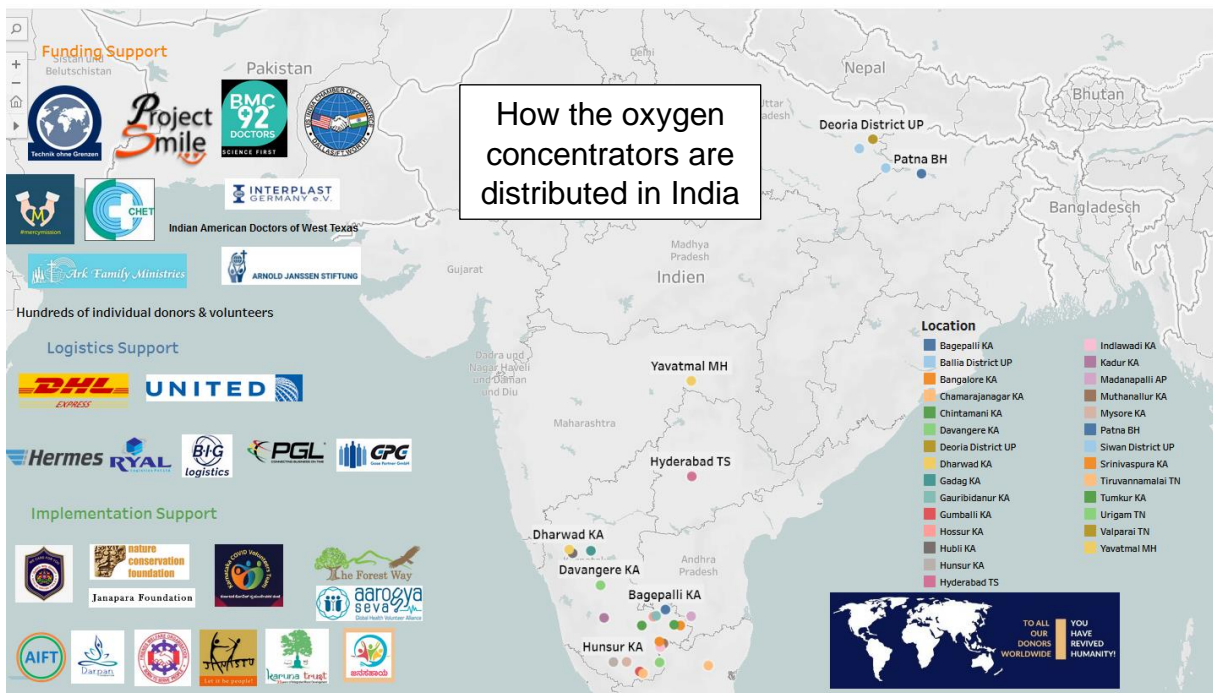
We took on this mammoth task, which at first glance seemed almost impossible. Thanks to great support from the board of TwB, we were able to start the project within one day and put an appeal for donations on betterplace.org. At the same time, we started looking for the equipment we needed. After a lot of negative feedback from manufacturers with delivery times of three to four months, we actually found a company that did everything in its power to help us find the oxygen concentrators we needed. We would like to take this opportunity to thank GPG Gasepartner and Marvin Zierau once again. Through the incredible cooperation of everyone involved, we actually managed to raise over 100,000 euros from 500 donors in just two weeks, organize the transport, which was donated by DHL Express, and distribute the oxygen concentrators and other medical equipment in India.

After this unbelievable feat of strength was accomplished in such a short time, we were first of all exhausted and incredibly relieved. But at the same time we were aware that this delivery should not be the end of the project. The people in India still urgently need our help, day after day. Therefore, we are currently setting up a long-term project work, not only for Corona, in order to be able to continue to help as many people as possible.



Representing all the generous donors, we would like to thank in particular CARE, the Janssen Foundation, Rotary with many Rotary Clubs and Rotarians, DHL, Interplast, Berrymead Evangelical Church, Grace Endeavors, Naturland-Zeichen GmbH and many, many other donors.

Distribution of O2 Concentrators & Pulse Oximeters as on 10 Jun 2021



Franziska Weißörtel, RG München

## A Multipurpose Shed and Educational Trail for the Agroforestry Project in Brazil

The Agroforestry Project in Brazil has achieved another of its goals: the conversion of an existing shed into a multipurpose workshop on the Agroforestry System (AFS) site at the "Sítio Orgânico Serra e Mar" organic farm in Arroio do Silva, southern Brazil.

The new building will be an educational space for courses, lectures and trainings focused on agroecology and environmental education. In the future, the shed will host a tree nursery and seed bank that will fulfill the requirements of the "guardian of seedlings" program of the



Brazilian organic farmer network "EcoVida". The goal of the latter is to provide its members access to organic seeds and the ability to buy or exchange seedlings from the tree nursery and not have to rely on partially genetically modified seeds from large corporations.

Some of the materials used in the construction of the shed came from the old existing structure, reusing everything that was still in good condition. The main material was

eucalyptus tree trunks from industrial reforestation. The rest of the material used was

purchased from local hardware stores. The master builder Richard Pereira was responsible for the construction.

With the completion of the building, the other goal of the project was also realized: the agroforestry nature trail. Six weather-resistant educational panels will support the planned educational activities and explain to visitors how show dynamic agroforestry systems (AFS) work, what species have been planted, and how they interaction with nature. Images and text will be accompanied by QR codes that link to videos and websites with additional information. After the completion of the graphic designs and planning the positions of the educational panel structures, which are also built from recycled material, the path was finalized. At the beginning of the second half of the year, the last activity of the project will take place: a practical workshop on AFS and digital marketing for farmers of the EcoVida network, in order to motivate more small-scale farmers to implement their own AFS. In these important steps, the landowner Ubaldo Rosa was supported by our TwB-members Lutz Michaelis, João Barchik and Jonathan Damasceno.

*João Barchik, Lutz Michaelis, RG Araranguá*

## **Visit of agroforestry farms in Sankofa and Boaso, Ghana**

**On invitation of Dr. Christian Andres we made an information trip to two agroforestry farms to gain experience for our upcoming project of a cocoa agroforestry demonstration farm. We visited the Sankofa project in the Sankore area, which is supervised by Christian, as well as the research farm in Boaso, which is supervised by Dr. Issaka Abdulai.**

The term "agroforestry" describes the combination of agriculture and forestry. This involves the planting of tree crops such as mahogany, teak, etc., which, among other things, provide shade for other crops. Agroforestry is a dynamic system with many advantages, for example, fertilizers are obtained directly from biomass, so there is a closed nutrient cycle. When establishing agroforestry farms, temperature and humidity should be considered as important parameters.

Dr. Christian Andres, who is a full-time farmer and holds a PhD in agro-ecosystem science, is currently the scientific, cultural and physical advisor of the Sankofa project, which is funded by the Swiss Platform for Sustainable Agriculture. The project targets 400 farmers in the traditional Sankore area. 400 hectares of arable land are to be covered by smallholders through agroforestry systems by 2023; so far, this has been achieved for about 150 hectares. The system does not allow bush burning or the use of pesticides, unlike traditional Ghanaian cropping systems. It was piloted in 2018 with 16 lead farmers who are now teaching other farmers.

Christian has completed several research papers on cocoa, among others, with the Ghana Cocoa Research Institute and the Cocoa Board. He is currently conducting post-doctoral work in collaboration with the University "KNUST" in Kumasi.

In addition, Christian is an experienced farmer based in Ghana and is well skilled in the dynamic system of agroforestry. He owns about 50 hectares of mixed cropland and tree plantations in Mankesim Central Region of Ghana, 4 hectares of oil palms in Busua Ahanta West in the Western Region, where he is currently building a vocational school. The leftovers from palm oil production are used to make local Ghanaian soap. He also operates research farms in Ahafo and the Western North Region, where students conduct on-site studies for research purposes. Another area of activity is mushroom production.

Currently, Christian is building a school complex that will serve as a training center for agroforestry techniques from the end of 2022. Activities such as a social business incubator, agro-tourism and education at various levels (primary, secondary and tertiary) will begin in 2023. Accommodation for students and staff, as well as a guest house for visitors will be fully functional by then.

On the first day, we (Dr. Christian Andres, Nina, Laura and I) met with the Sankofa committee in Gauso, Ahafo region, where Laura, a student of the Swiss Federal Institute of Technology Zurich (ETH), gave a presentation on her bachelor thesis on "Productivity and profitability of dynamic agroforestry systems". After the presentation, Dr. Andres drove us to Sefwi Wiawso, where we stayed overnight.

On Saturday, after breakfast, we drove back to Sankore Alavanyo, where we visited Christian's research farm and received a lot of interesting information about agroforestry during his guided tour. Back from the farm we were treated to plantains and Kotombrie stew.

We left Laura in the care of the community so that she could continue with her research. The rest of us went back to Gauso for the night. On Sunday morning, we left Gauso for Boaso, also in the Ahafo region, to visit the research farm that Dr. Issaka Abdulai oversees. On this cocoa farm, productivity is increased through the use of charcoal. On the way to the cocoa farm, Issaka's brother Ibrahim and his family prepared a classic local meal for us and we were able to enjoy Ghanaian hospitality. After everything, I returned to Sunyani and Christian and Nina continued on to Kumasi.



Front from left:: Anthony, Laura, Christian

*Anthony Hunkpe, RG Sunyani*

## Carbonization of plant residues for soil improvement

**A simple pyrolysis furnace will be loaded with cocoa shells, which are waste from cocoa plantations, to produce carbon rich carbonisate. This vegetable carbon will be used as a soil conditioner in agriculture. A first project in Ghana is now demonstrating the material utilization of plant residues.**

The soil in tropical Amazonas area is well-known for his dark colour and is called Terra Preta (black soil). The soil is, compared to adjacent areas, characterized by a high carbon share of anthropogenic origin and is up to 8000 years old. This Terra Preta has been established mainly from biogenic waste, faeces, char coal, ash and bones. Based on this, Technology without Borders intends to improve the soil quality in countries of the global south by building simple pyrolysis stoves to produce biochar from biogenic plant residues. For instance,



Figure 1: Terra Preta in Brazil.  
([https://www.researchgate.net/figure/Anthropogenic-Dark-Earth-or-terra-pret-a-in-the-archaeological-site-of-Hatahara-on-the\\_fig1\\_283297221](https://www.researchgate.net/figure/Anthropogenic-Dark-Earth-or-terra-pret-a-in-the-archaeological-site-of-Hatahara-on-the_fig1_283297221))

the peel of the cocoa bone can be used initially.

The (slow) pyrolysis is an endothermic thermo-chemical conversion, where through heat supply under oxygen-poor conditions volatile compounds and water been extracted from solids (particles). Hence a carbon-rich carbonate is remaining. With increasing reaction temperature up to 500°C and residence time (up to one hour) the carbon share increases, too. Important is, that the substrate was dried before charging the pyrolysis stove. The stove as depicted in the image is then ignited on top whereas the partial combustion of the biomass delivers the required heat for the pyrolysis in the lower sections.

After the pyrolysis, the remaining carbonate must be charged with, e.g., with chicken faeces, Urea (ammonia), compost, mulch or diluted fertilizer. Depending on the type of charging (solid, liquid), the charging times and the composition of the mixtures vary.

After charging, the biochar can be deployed on the field. When using the superficial plo The soil in tropical Amazonas area is well-known for his dark colour and is called Terra Preta (black soil). The soil is, compared to adjacent areas, characterized by a high carbon share of anthropogenic origin and is up to 8000 years old. This Terra Preta has been established mainly from biogenic waste, faeces, char coal, ash and bones. Based on this, Technology without Borders intends to improve the soil quality in countries of the global south by building and implementing simple pyrolysis stoves to produce biochar from biogenic plant residues. For instance, the peel of the cocoa bone can be used initially.

w technique, the amount of biochar varies between 10-50 Mg/ha. Other techniques like the root-zone application, Top-Dressing and trenching are conceivable as well.

The substantial use of biochar entails an increase of revenue. It adsorbs nutrients in the soil like ions of potassium, calcium, and magnesium, through its negative charged surface. Moreover, the biochar captures water which makes it application suitable for arid regions, too. On the surface of the porous biochar, micro-organisms can spread perfectly and therefor the humus establishment is strengthened.

Finally, an accompanying phenomenon of the biochar is the absorption of greenhouse gases like CO<sub>2</sub>, N<sub>2</sub>O und CH<sub>4</sub> from the atmosphere.

*Jonas Waghäusl, RG Erlangen*

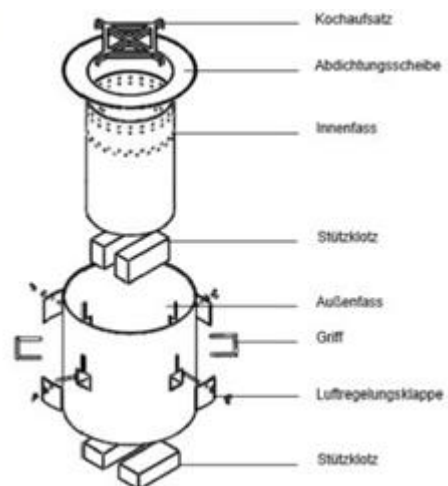


Figure 2: Principle sketch of the pyrolysis furnace Source: Cologne Institut for Renewable Energies (CIRE)

## Construction of an Incinerator in Butwal, Nepal

**RG Amberg assists the construction of an incinerator for infectious hospital waste for the Siddhartha Children and Women Hospital in Butwal, Nepal as a remote project. Furthermore, the employees are trained in waste separation and recycling to establish a functional system.**

The charitable Siddhartha Children and Women Hospital is situated in the city of Butwal, which has 140 000 citizens. Up to 250 ambulant patients and 100 emergency patients can receive medical care. The infectious waste is currently smoldered by the hospital because

the previous incinerator isn't working properly anymore. For new staff members, this was an important concern. Consequently, the hospital got in touch with our group.

Currently the temperature is too low to sterilize the waste. Besides, the smoke emission and generation of toxic waste gas is a health burden for the residents, patients, and employees. The seeping of Microbes and bacteria to the groundwater poses further danger. Additionally, the high risk of infection with Covid-19 due to the open and freely accessible dumping of the waste in the adjacent forest area must not be disregarded.



The plan is to construct a new incinerator for the hospital. Because of the travel restrictions, the RG Amberg will execute this project remotely. Thereby, the hospital staff is in charge of supervising the construction, which increases the sustainability of the project considerably. We will conduct an online training to make everyone familiar with the principle of operation, usage and maintenance of the incinerator. Additionally, a functional waste management system in cooperation with the hospital will be designed. For instance, it comprises of the separate collection of recyclable waste to make the employees aware of the importance of waste-related issues.



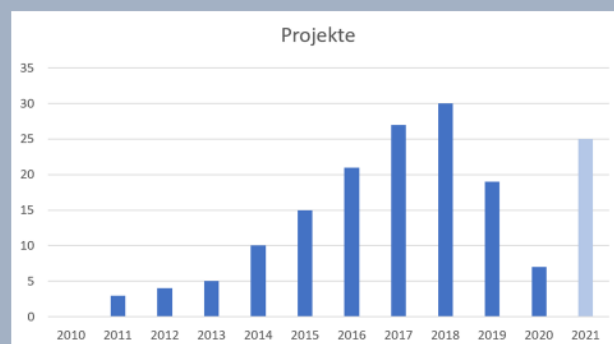
*Sabrina Schweigerl, RG Amberg*

## Short Messages

### Report from the 2021 General Meeting

41 members participated in this year's online general meeting. Due to the corona pandemic, the activities of TeoG were also slowed down. Nevertheless, 7 projects could be completed in 2020 and with some astonishment all participants noticed that 25 projects are currently planned for 2021. After the treasurer's report, both he and the board were unanimously exonerated and then Markus Reinhard was elected as the new 2nd chairman. Frank thanked Franz in the name of the board and all members for the many years of joint work in the board and welcomed Markus to the board and wished him much success for the future.

Projekteinsätze - Entwicklung bis heute



21

This year's General Assembly devoted a lot of time to the proposed amendment of our Articles of Association, which was sent to all members on 29 April 2021, as all the proposed amendments were gone through point by point on the screen. Individual points were briefly explained and in the end the proposed amendment to the Articles of Association was unanimously accepted, as no objections or

amendments to the proposal had been received by the statutory deadline for objections (one week before the General Assembly).

The general meeting was concluded with an outlook on the current year, the date for the next general meeting (22 May 2022) and impressions from past general meetings.

*Executive Board*

## **Data protection in the association**

In order for us at TeoG to be able to fulfil our association's purpose, it is necessary in some places to process members' personal data. The collection of membership fees and project coordination are examples. In these activities, care is always taken to ensure that processing is as confidential as possible and only for the specified purposes. If you have any questions, suggestions or requests regarding data protection, please contact your data protection coordinator at any time at [datenschutz@teog.de](mailto:datenschutz@teog.de).

*Maximilian Martin, data protection coordinator*

---

## **Currently running and completed projects:**

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

V.i.S.d.P. Dr.-Ing. Frank Neumann, Annika Mücke, Stefan Leimbach

---

**Technik ohne Grenzen e. V.** - Richard-Strauß-Straße 38 - 91315 Höchststadt a. d. Aisch

**Vorstand:** Dr.-Ing.Frank Neumann(Spokesperson), Dipl.-Ing.Franz Regler, Dipl.-Ing.Robert Schullan, Michael Graf, cand. Ing. Nhat Nguyen, Dr.-Ing. Christian Zeidler, B.Sc. Lara Hachmann, M.Sc. Jonas Schlund, B.Sc.. Annika Fenn, M.Sc. Andi Vierling, M.Sc. D. Schaffert, M.Sc. Jakob Faßnacht, M.Sc. Arne Bruns



**Vereinsregister:** Fürth: VR 200 486 - **Steuernummer:** 216 / 111 / 00 865  
**apoBank** **IBAN:** DE29 3006 0601 0007 5832 90 **BIC:** DAAEDEDXXX