# IngOG

Engineers Without Borders Switzerland (IngOG+)

## Annual report 2020



## **Imprint**

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# **About IngOG+**

"We support geographically, politically or out of poverty isolated and disadvantaged communities to meet their basic needs in a sustainable way."

Engineers without Borders Switzerland (IngOG+) is a non-governmental organization that searches for engineering solutions to humanitarian problems. Our goal is to improve the living conditions of communities disadvantaged by poverty, geographical or political isolation and lack of support. With intensive involvement of the local population, appropriate measures are developed for the communities. IngOG+ follows a holistic approach to problem solving, which ensures that the projects improve the living conditions of the affected people in a sustainable way.

Our fields of activity in Switzerland and abroad include direct involvement in the planning, execution and maintenance of infrastructure projects as well as the exchange of knowledge and the support of other organizations in specific engineering tasks.



Figure 1: Project assessment in Suswa, Kenya

## Gradačac, Bosnia and Herzegovina (BIH001)

Purpose	Construction of a social housing community for socially disadvantaged
	women
Location	Gradačac, Bosnia and Herzegovina
Since	May 2016
IngOG+ team	Nora Mühlberger, Christian De Maddalena, Dominik Burkhart, Eric Carrera

Despite the Corona crisis, the project reached an important milestone in 2020 - the start of construction! At the beginning of the year, the foundation «Naš Izvor» (in English: our source) was established in Bosnia. Together with our lawyers, all necessary founding documents were signed in Tuzla, certified by a notary and submitted to the ministry for approval. The foundation will be responsible for running the housing community. Three IngOG+ members were accepted into the board of trustees. Thereby IngOG+ remains closely connected with the project and its continuity will be assured. The foundation also acts

as the client during the construction phase. However, the ministry only gave the green light to found the foundation seven months after submission (in July) - due to the global crisis and the highly formal Bosnian authority system.

Thereafter, the documents for the construction permit were revised and submitted to the municipality of Gradačac on behalf of the newly established foundation. Thanks to the speedy processing of the documents by our architecture team and the constructive cooperation with the office of civil engineering of the municipality of

Figure 2: Establishment of the Foundation «Naš Izvor»

**FONDACIJA** 

GRADAČAC, BIH

Gradačac, the construction permit was granted in early autumn.

At the same time, several quotes were obtained from potential construction companies and a preselection was made. A detailed list of specifications was sent to the best-ranked companies and the quotes were adjusted. After approval, the contract for the shell construction work was discussed with the contractor, finalized and signed. The remaining services for the interior and the facilities will be awarded in 2021.



Figure 3: Start of construction

Finally, after three long years of project development and planning, the construction phase could finally start. On November 15th, the first excavation rolled onto the construction site. Until the end of the year, the existing house had been demolished, the necessary clearing work had been carried out and various utility lines had been relocated. Shortly before the onset of winter, the excavation for the floor slab took place. Shell construction work will resume in spring 2021.

## Paraguay (PRY001)

Purpose	Drinking water supply	
Location	Hugua Chini, Paraguay	
Since	December 2015	
IngOG+ team	Lukas Allemann, Carina Doll, Lukas Dössegger, Dorothee Kunz, Katharina	
mgo o r toum	Schulthess, Carmen Steinmann	
Team in Paraguay	Ana Lucia Giménez, Federico Varas Lehner, Citnhia Fleitas□	

Like many other projects and plans in 2020, our Paraguay project was also slowed down by the global pandemic. In collaboration with the national university in Asunción, we want to analyze the drinking water problem in different regions and develop solutions. An in-depth baseline-study would have been planned for this year with several field visits to local communities. Despite the difficult situation, we always kept in touch with our local partners and were able to achieve some successes:

- + Via videoconference, an exchange about our project took place with interested students and lecturers of the University of Asunción
- + The results of the previous field studies were presented at an international congress in Argentina.
- + As part of a master thesis at the University of Asunción, a biosand filter was reconstructed and analysed.

In 2021, we would like to resume field work and data analysis together with the University of Asunción, as well as maintain exchange on technical issues. In addition, we are evaluating the possibility of initiating a student exchange with ETH for Development (ETH4D).

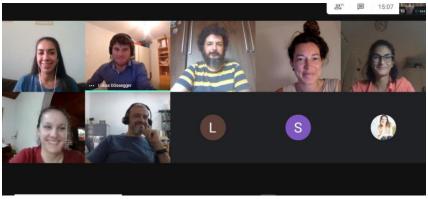


Figure 4:Videoconference for exchange on the project

#### Nepal (NPL004)

Purpose	Hospital extension for gynaecology and obstetrics	
Location	Ratnanagar, Nepal	
Since	September 2019	
IngOG+ team	Andreas Wende	
Limmattalspital Team	Thomas Brack, Simone Kamm, Lorenzo Marazotta, Beat Hoststettler, Bernd Classen, Mathias Leopold	
Architecture Team	Alfred Paul, Riccardo Barrio	

In the rural regions of southern Nepal, on the border with India, a large part of the population lives without access to medical care. The rapidly increasing birth rate is already pushing the hospital to its limits. In order to counteract the negative effects and to specialize as well as equip the existing hospital in this field, the project Ratnanagar "Hospital extension for gynaecology and obstetrics was initiated by the association Spital Limmattal. The aim of the project is to create a competence centre for gynecology and obstetrics for the existing hospital in Ratnanagar. IngOG+ supports the association since 2019 and will provide technical support in planning and construction as well as financial support.

In February 2020, we went on a trip to Ratnanagar together with our project partner, the Limmattalspital Association. There, discussions and workshops took place with local doctors, authorities, entrepreneurs and other stakeholders. The aim was to define the project requirements together and to initiate the further planning process of the hospital extension. Thereafter, we started a collaboration with the architectural office Marazzi+Paul Architekten in Zurich. The office implements our ideas in a concrete planning project. A two-storey extension is planned, which will add approximately 1'500 m² of usable space to the existing area. The aim is to finalize the planning in 2021 and start the construction.



Figure 5: Hospital in Ratnanagar, Nepal (February 2020)



Figure 6: Impressions from Ratnanagar, Nepal (February 2020)

## Water for IAPS (KEN002)

Purpose	Improving water supply of school to enable all year operation		
Location	Suswa, Suswa county, Kenia		
Since	October 2019		
IngOG+ team	Jean Randhahn, Reto Michel, Patrick Eberle, Michael Benz, Samira Cabdulle,		
	Fabian Achilles, Simon Schegg		
Team IAPS	Joel Korir, Michael Muntet		

At the end of 2019 the IAPS (Ilkeek Aare Primary School) in Suswa, Kenya approached us with a request for technical support with their water problem. As semi-nomads, school children have to travel up to 30 kilometers with their parents in the dry season to find food for their animal herds. The conversion of the IAPS into a boarding school allows the children to stay in school when the parents move on. The children can study in the boarding school all year round and pass the final exams successfully. A necessary precondition to enable the school's operation is a secure water supply. This is a great challenge in this area of Kenia. In spite of an existing rain water system, the supply is low and does not last the whole year. Neither does it permit the growth of the school.

Together with IAPS and their support (the Lions Club Münster Landois and Tika Chania Falls) the scope of support was defined as:

- + Engineering consulting to evaluate the current water pipeline proposals,
- + Propose alternative options if needed,
- + Include neighbors to the pipeline to avoid future conflicts,
- + Detail planning of water pipeline,
- + Overseeing or organizing overseeing by third party of construction of said water pipeline,
- + Support in fundraising to finance the water pipeline with an anticipated amount of CHF 10k,
- + Provide knowledge transfer to enable and secure maintenance of the water pipeline.



Figure 7: Meeting with the stakeholders

Since the start of the project, thanks to the resources available, we have been able to organize an evaluation on site. To do this, we traveled to Suswa in February 2020 and prepared a first technical report, which helped the school management enormously to understand the technical problems more precisely and to receive initial recommendations for action. Our main contact on site, Michael Muntet, organized

this trip on the Kenyan side very well and made sure we could meet and discuss potential solutions with locals as well as officials. We found the site to be in a mostly well-built state, yet hardly maintained and many additions not aligned with existing installations.

Since the evaluation trip we have been working on a master plan for the long-term positioning of the school in terms of water and sanitation. More detail engineering and practical work is planned for 2021 as this has been postponed due to Corona. On behalf of IAPS, we thank our donors for your project-independent support to IngOG +, which enabled us to start this project!

#### Pier at Lake Victoria (KEN001)

Purpose	Pier at Lake Victoria
Location	Mbita, Kenya
Since	January 2019
IngOG+ team	Michael Meili, Marco Lolli, Cinzia Reihnard, Keith Wilson, Katharina Schulthess

The project in Homa Bay County, on the eastern shore of Lake Victoria in Kenya, was proposed by Biovision in autumn 2018. The Swiss organization has worked together with the Mbita campus of the ICIPE [International Centre of Insect Physiology and Ecology] for many years already, and were planning the construction of an improved new landing pier for small to medium-sized boats on their campus. In the recent past, the research centre has built several piers along the lake's shoreline for themselves, local communities, and other NGOs, but all were eventually damaged by the rough waters of the lake. As there is currently no useable pier on the ICIPE campus, their researchers and other local NGOs use a pier in the nearby town of Mbita. This means the ICIPE researchers must travel further, greatly increasing the time needed to access the eastern islands of Lake Victoria where research on Tse Tse Flies and Malaria transmission is carried out. For the NGOs which provide basic health care and work to prevent and treat HIV and other sexually transmitted diseases in isolated island populations, the increased logistic efforts are stretching their already tight budgets.

The project has been temporarily paused within the past year - initially to allow more time to define the roles of the external stakeholders. The continuation of the pandemic unfortunately

halted this important step over the summer. At the time of the evaluation in 2019, the usage and maintenance of the pier was expected to be split between ICIPE (who will provide the land needed for the project) and several local NGOs. This partnership was considered the best for sustainable maintenance of the pier - as the research activity involving the nearby islands had been reducing compared to previous years. a shared interest in the project would justify greater investment in the new pier.



Figure 8: Old pier at lake Victoria

At the time of writing this update (February

2021), research which had been ongoing during our initial evaluation has ultimately led to a breakthrough discovery related to microbes which suppress malaria in mosquitoes. This means that follow-on research activity at the Mbita campus should now receive a significant boost for years to come. At the same time, the number and frequency of trips to the nearby islands in Lake Victoria will increase; and the significance of the research centre as a stakeholder in the new pier should also grow.

Since the last project update, ICIPE has received a first major donation towards this new research program from the philanthropic organisation of one of the Facebook co-founders. We expect the new research program to significantly change the background of our IngOG+ project over the coming months and years.

#### Nicaragua (NIC001)

Purpose	Construction of a bridge over a flooding river	
Location	Cusmaji, Nicaragua	
Since	January 2020	
IngOG+ team	Emmanuelle Sallin, Dionysis Statha	
EWB USA-Nicaragua	Edrulfo Rodriguez	

Together with the partner organization Engineers without Borders USA - Nicaragua Office, IngOG+ is evaluating a vehicular bridge project in Cusmaji, Nicaragua. Cusmaji is a community located in Palacaguina municipality, department of Madriz, in Northern West Nicaragua. It is a community of around 600 inhabitants, whose main economic activity is agriculture.



Cusmaji, along with two more neighboring communities Figure 9: Impressions from Nicaragua



Figure 10: Measurements of the river

have issues with the road, since during rainy season they are isolated because of the river overflow. The river that crosses the village and that flows into the Esteli River is called Los Vertientes. In the rainy season, Esteli River flows back to Los Vertientes, causing the flooding of the road and blocking the traffic for many hours or days. The inhabitants of Cusmaji use the road for transporting their production to the neighboring cities. The road therefore has a major economic impact on the locals. In the dry season, about 10 to 15 vehicles, 25 motorcycles and 200 pedestrians cross the river daily. There is a public transportation service during dry season but in rainy season there is no transportation and the locals must take other routes, spending 3 extra hours and more money.

The vehicular bridge will mainly serve the 3 communities of Cusmaji, El Tamarindo and Los Lirios. These communities belong to 4 bigger municipalities that are San Juan, Quilali, Wiwili and Telpaneca. When built, the proposed bridge will benefit more than 3000 people including students.

#### Water supply Khema (IND002)

Purpose	Improvement of water supply during winter months	
Location	Khema, Region Ladakh, Indien	
Since	October 2020	
IngOG+ team	Dorothee Kurz, Johrina Cron, Carola Bänziger, Churchill Agutu, Samuel Balula, Katharina Schulthess, Simon Matter	

In October 2020, the Luxembourg organization "Himalaya Help and Care" solicited IngOG+ to support them in a water supply project in Khema. The village of Khema is located in the Himalayan mountains at an altitude of 4'200 m.a.s.l. in the until 2019 autonomous region of Ladakh, which is characterized by Tibetan culture and is only sparsely populated. For a long time the region was little developed, but today the inhabitants are heavily dependent on tourism. Around 150 inhabitants live in Khema, distributed into 22 households. They do agriculture in summer and livestock farming all year round.

In summer the water supply is good, but in winter months it is insufficient, because the glacier water does not reach the village. The situation is worsening from year to year not only in Khema, but in the whole region, which is affected by glacier recession and lack of precipitation.

We are in contact with two villagers of Khema, to clarify the local situation and fix the first project steps. About 2 km below the village, there is a water source that is used in winter. At this point there is a pump installed to transport the water to the village. The pump is operated by a diesel generator, but due to the limited fuel, it can only be operated for half an hour per day and the water is therefore only sufficient for drinking water supply. For other water uses, the villagers have to make the arduous hike to the source, and in addition, the pump frequently breaks down and animals must also be brought to the river during snowfall.

Possible solutions to improve the water supply that are investigated in more detail at the moment are groundwater exploration or an installation of a more reliable solar powered pump.



Figure 11: Animals in Khema

We are also in contact with the French organization "Niyamdu-Dro", which has been active in the region for 15 years and has already carried out various projects for the electrification of villages. The organization has a lot of experience in the region and can help us with logistics as they conduct trips with students every year. In 2021 a trip is also planned to the region, including Khema, to identify the problems in the village. It is considered useful to conduct the evaluation trip together with the students, as both sides could benefit a lot from each other.

An evaluation trip this summer is seen as enormously important, but it is hard to predict if such a trip will be possible due to the Corona-related situation. Until the evaluation trip, our IngOG+ team will continue to exchange information on a regular basis with the villagers.

#### Heating system Lahaul (IND003)

Purpose	Implement an efficient heating system in a himalayan school building	
Location	Lahaul-Spiti district, Himachal Paradesh, Northern India	
Since	autumn 2020	
IngOG+ team	Christoph Schärli, Johrina Cron	
Helping Humans team	Mohammad Nafil, Yowan Williams	

In summer 2020 we got in touch with a young team of Engineers from northern India, which founded a non-profit organization called "Helping Humans". They try to implement infrastructure projects to support the people of Himachal Paradesh in the Western Himalayas. They want to implement a project in a local school in Lahaul, a village located at higher altitudes (>3500 m) of Lahaul-Spiti district. Every winter the school burns a large amount of wood in old fireplaces with inefficient combustion partly emitting harmful exhaust gases directly into the school classrooms. In addition, the school remains closed for several months each winter due to the harsh winter season. Now they would like to isolate the building and try to implement a heating system, which burns less wood and keeps the building warm during the cold months. This could give the villagers the possibility to run the school for the whole year and enable the children traveling from remote places to stay overnight as some of them have difficulties to manage the way to the school due to heavy snowfalls. Further, the goal is to create a carbon efficient infrastructure that can be replicated in other schools in the Himalayan area, because about 95 % of the people in the district generate heat by firewood.

Until now, we, the IngOG+ team, had several online meetings with the team from "Helping Humans", in which the type of cooperation was discussed and how to proceed further in the projects. We are trying to get in closer contact with the village population to check if the conditions for a sustainable project success are given. If it turns out successfully, in the coming spring the people from Helping Humans will try to collect various data on the school building with support of the local government to make further decisions for the technical possibilities. We are looking forward to supporting them with our technical knowledge and perhaps with financial support in a later project stage.



Figure 12: Classroom of the school



Figure 13: Himachal Pradesh

## Puente Tierra, Chile (CHL001)

Purpose	Construction of a community center for the indigenous Mapuche community Millanao Ancaten		
Location	Puente Tierra, Chile		
Since	December 2020 (in evaluation)		
IngOG+ team	Lena Birkhäuer, Andrea Blanco, Christian Aguayo, Cleophea Michelsen		
ISF Chile	Santiago Mallagray, Gabriela Quintana		

The aim of this project is to build a new community center for the Mapuche community of Puente Tierra. The Mapuches form the largest group of indigenous people of south central Chile. They fought against the foreign invaders such as the Spanish conquerors and before those the Incas. Nowadays the Mapuches are segregated and even stigmatized from Chilean society and they struggle to keep their land and culture alive in modern Chile. Due to this reason, they don't have the same opportunities as the rest of the Chileans.

Living in communities and being connected to nature and past times represents the main way of living of the Mapuches. The intersocial exchange between them and their elders forms a key pillar of their society. In this context, their community center is a place where they can gather to discuss internal affairs, celebrate ceremonial traditions and other matters. For the last 40 years the targeted Millanao Ancaten community has been gathering in a small place which is not any longer suited for this purpose.

Christian Aguayo, a Swiss-Chilean architect based in Zurich started the project and is in close contact with the president of the Millanao Ancaten community. However, the project is too large to run by himself, so he reached out to IngOG+ Switzerland. As we require a local contact and the Chilean construction laws are very strict due to earthquakes, we approached our pendant organization in Chile, the ISF Chile, to support us locally with this project.

Hence, we are currently building up a partnership with the very motivated ISF Chile and await the legal confirmation of the land where the building will be built.



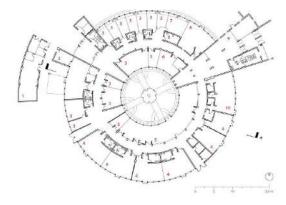


Figure 14: Example of a modern interpretation of the Mapuche architecture, similar to what is envisioned for the community center in Puente Tierra.

#### Assets

By the end of 2020, we had total assets of 113'810.30 CHF, which are divided between our three cash accounts at Postfinance, PayPal and the cash desk.

Assets	2019	2020
Liquidity cash accounts	183.00 CHF	98.00 CHF
Liquidity Postfinance	163'902.05 CHF	106'519.34 CHF
Liquidity PayPal	4'965.34 CHF	7'192.98 CHF
Total Assets	169'050.39 CHF	113'810.30 CHF

#### Income

The income consists of donations and membership fees. 13'070 CHF have been received as unspecific donations, 29'106 CHF are specifically for Bosnia and almost 10'000 CHF as membership fees. Our largest contributors with 1'000 CHF and more were:

- Rapp Management AG
- Dr. Vollenweider AG
- Holinger AG Liestal

- Bosshard + Geiser GmbH
- Reformierte Kirche Rüschlikon
- Various private donations

Income	2019	2020
Donations		
Unspecific donations	16'400.00 CHF	13'070.00 CHF
Donations for project BIH001	55'746.44 CHF	29'106.00 CHF
Donations for project KEN002	-	2'184.00 CHF
Donations for project NPL004	-	1'600.00 CHF
Membership fees	7'910.81 CHF	9'845.27 CHF
Total income	80'057.25 CHF	55'805.27 CHF

## **Expenses**

The expenses in 2020 are as follows. The largest expense was 100'000 CHF for the construction start in Bosnia.

Expenses	2019	2020
project expenses		
project expenses BIH001	8'733.18 CHF	104'052.90 CHF
project expenses PRY001	2'434.77 CHF	1'200.00 CHF
project expenses KEN002	-	6'024.44 CHF
project expenses NPL004	-	1'766.57 CHF
other internal projects, evaluations and activities	5'510.15 CHF	4'007.01 CHF
administration cost	1'393.75 CHF	1'322.18 CHF
Total Expenses	18'071.85 CHF	114'366.09 CHF

#### Return

In summary, a loss of 58'560.82 CHF was recorded. This was predictable, as the construction started in BIH001 this year.

Return / Loss	2019	2020
Total Income	80'057.25 CHF	55'805.27 CHF
Total Expenses	18'071.85 CHF	114'366.09 CHF
Total Return/Loss	61'985.40 CHF	- 58'560.82 CHF

## Return distribution / starting balances

• The Bosnia project (BIH001)

BIH001 Starting balance 2020	142'874.23 CHF
BIH001 Expenses	- 104'052.90 CHF
BIH001 Revenues	+ 29'106.00 CHF
BIH001 Starting balance 2020	67'927.33 CHF

• The Paraguay project (PRY001)

PRY001 Starting balance 2020	6'923.06 CHF
PRY001 Expenses	1'200.00 CHF
PRY001 Starting balance 2021	5'723.06 CHF

#### • The Nepal project (NPL004)

NPL004 Starting balance 2020	0 CHF
NPL004 Expenses	- 1'766.57 CHF
NPL004 income	+ 1'600 CHF
Cover losses from evaluation costs	+ 166.57 CHF
NPL004 Starting balance 2021	0 CHF

#### The Kenya water supply (KEN002) project

	<u> </u>
KEN002 Starting balance 2020	0 CHF
KEN002 Expenses	- 6'024.44 CHF
KEN002 income	+ 2'184.00 CHF
Cover losses from evaluation	+ 3'840.44 CHF
costs	
KEN002 Starting balance 2021	0 CHF

#### Overview of uncommitted reserves

Starting balance 2	2020	22'373.85 CHF
Membership fees		9'845.27 CHF
Unspecific donation	ns	13'070.00 CHF
Administrative cost	S	- 1'322.18 CHF
Internal projects		-
Evaluation trips	(NPL004,	- 4'006.57 CHF
KEN002)		
Starting balance 2	2021	39'959.93 CHF

The amount of around 40'000 CHF as an uncommitted reserve exceeds the expected target of around 20'000 CHF for uncommitted reserves. IngOG+ is in a comfortable financial situation. However, we expect an increase in activities in 2021, as many activities have been postponed due to Covid-19. Also, the BIH001 project has not yet raised funds to cover all the projected expenses. Due to the pandemic, the board will decide in June 2021, if additional funds will be allocated to the BIH001 project. By then, the expenses for evaluation trips and possible Swiss projects can be better estimated.

The allocations (opening balance sheets and liabilities) correspond to the total assets.

	2020	2021
Starting balance BIH001	142'874.23 CHF	67'927.33 CHF
Starting balance PRY001	6'923.06 CHF	5'723.06 CHF
Starting balance NPL004	0 CHF	0 CHF
Starting balance KEN002	0 CHF	0 CHF
Starting balance uncommitted reserves	22'373.85 CHF	39'959.93 CHF
Liabilities	4'879.25 CHF	200 CHF
Total Assets	169'050.39 CHF	113'810.32 CHF

## **Organizational Changes**

After the successful consulting project with the Graduate Consulting Club (GCC), we are now striving to make some changes to our web presence such as webpage, Instagram and Facebook. We are also revising our IT systems and processes to simplify the management of projects and members.

## **Events 2020**

#### **Events**

Due to the current global situation, unfortunately there were no "physical" events for our members and other interested people this year. Also, the numerous meetings on the various projects were held virtually (or sometimes outside in the summer).

In order to keep up the motivation, commitment, solidarity and good mood of the volunteers, we organized a virtual game evening via Zoom in spring. Firstly, the participants were able to guess exciting and funny facts about the board members and thereafter get to know each other better through objects lying at their homes.

We hope that we will be able to hold more events and celebrations in the coming year – because exchanging ideas and being together on site is of course much more fun!



Figure 15: Teamevent through videoconference

**Acknowledgements** 

Thank you

First of all, a big thank you goes to all our motivated **active members**. Although it has been a

challenge this year to move projects forward and stay in contact with our partners, we have

made some great progress. Thanks to the commitment of all of you, we are still working on a

purely voluntary basis, which allows us to use the donations and grants almost completely for

our projects! Thank you very much for your commitment!

Another big thank you goes to all **donors** who make our work and projects possible through

generous financial contributions. Special thanks go to:

**RAPP Management AG** 

Dr. Vollenweider AG

Holinger AG Liestal

Bosshard + Geiser GmbH

Reformed Church Rüschlikon

Many thanks also to our numerous passive members and donors, on whom we can always

count and who ensure our association work through their regular financial contributions!

We would also like to thank the Graduate Consulting Club (GCC) for a successful joint

project.

On behalf of the entire board,

Dorothee Kurz

President

Zurich, March 04, 2021

Dordhee Kuz