EU—WOP PROGRAMME

GWOPA Global Water Operators Partnership Alliance

UN HABITAT FOR A BETTER URBAN FUTURE

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HSY

Back to Office Report:

Bahir Dar Water Supply and Sewerage Service, Ethiopia 8-.16.6.2023

10.8.2023

SUMMARY

The task was to get to know the conditions of the district metered (DMA) area and to prepare a plan, cost estimate and schedule for implementing the DMA. The plan and cost estimate were made. The implementation schedule was agreed with Bahir Dar Water Supply and Sewerage Service (BDWSS).

The DMA will be implemented by the utility in September 2023. It was agreed that HSY will deliver the magnetic flow meter to the borehole and the other parts will be procured on site.

The water balance calculation will be started immediately after the construction works are completed, but no later than the beginning of 2024.

HSY makes initial NRW-reduction plan for BDWSS. It will be agreed separately whether the training will be organized by Addis Ababa Water & Sewerage Authority (AAWSA) or Helsinki Region Environmental Services (HSY) in March 2024.

HSY has a three-year cooperation with the BDWSS. Bahir Dar is the capital city of Amhara region. The city is located approximately 560 km north-northwest of Addis Ababa. The population in city of Bahir Dar is more than 700 000.

The main task for the mission was to start the implementation of district metered area (DMA) measurement and get to know the local water supply and water sources. The HSY participants were Anssi Yrjölä (specialist) and Hanna Yli-Tolppa (specialist). The plant now takes water from boreholes and springs, but there is a need to build a surface water plant on the shore of Lake Tana so that enough water can be supplied.

The construction of a sewer network and wastewater treatment plant is also in the future plans. BDWSS has built public toilets in the city area. Residents of the city can use shower and toilet services for a small fee.

Getting financing for projects has proven to be a big challenge.

BDWSS's board has 7 people who are politicians and managers of other institutes. The board meets once a month. The utility reports on its activities quarterly.

The utility is a partner in a company whose purpose is to produce water meters. Yirga represents the utility on the company's board.

The utility has an average of 7 water main leaks per day. Small pipes are repaired with fittings and large PE pipes by welding. The utility has 2 welding machines.

DAY 1: Thursday 8.6.2023

Agenda of the day: Travel day

Participants: Anssi Yrjölä, Hanna Yli-Tolppa

The journey towards Bahir Dar starts from Helsinki.

DAY 2: Friday 9.6.2023

Agenda of the day: Second travel day and getting to know the DMA area

Participants: Anssi Yrjölä, Hanna Yli-Tolppa, Yirga Alemu (General Manager), Dires Asmare (Vice manager and Head of water supply and Sanitation), Fekadu Abebaw (Fasilo Branch Manager)

Topics: Getting to know the DMA area together with the representatives of the water utility.

Our DMA-area ‘Hidasie‘ is located 6 km west from the city center. The borehole is located 1 km from Hidasie. There is some connections between the borehole and Hidasie. There are 600 connections / water meters in the area. The oldest ones are about 10 years old. The average family size is 5 people. So there are around 3,000 inhabitants in Hidasie.

The water network in Hidasie can be divided into two sub-areas with valves and further into three, as planned.

Customers have their own ground and roof watertanks. Size is from 3 to 5 m3. Normally water is heated with electiricity.

The following was agreed with the representatives of the Bahir Dar waterworks:

Initially we planned to renew the well borehole meter as a master meter and build a DMA. In addition, the possibility of building own sub-meters in 2-3 areas is being explored. This could refine the water balance calculation.

DAY 3: Saturday 10.6.2023

Agenda of the day: Getting to know the operation of the water utility

Participants: Anssi Yrjölä, Hanna Yli-Tolppa, Yirga Alemu, Etalmhau Bayeh, Dires Asmare, Berihun Alemu, Fekadu Abebaw

Topics: General presentation of BDWSS, division of labor between headquarters and bases, network construction and network renovations

BDWSS was established 1958 with 15,000 inhabitants. Utility has now 410 employees. The total assets is 4.5 M€. Average domestic tariff is 0.25 €/m^3.

Utility has 52,000 connections / meters. The water supply connection fee is around 10,000 Birr ($190).

Challenges at the utility are:

- water shortage
- power interruption
- pumps failures
- high NWR
- shortage of finance
- lack of infrastructure integrity (pipe breakages)

- lack of automation services.

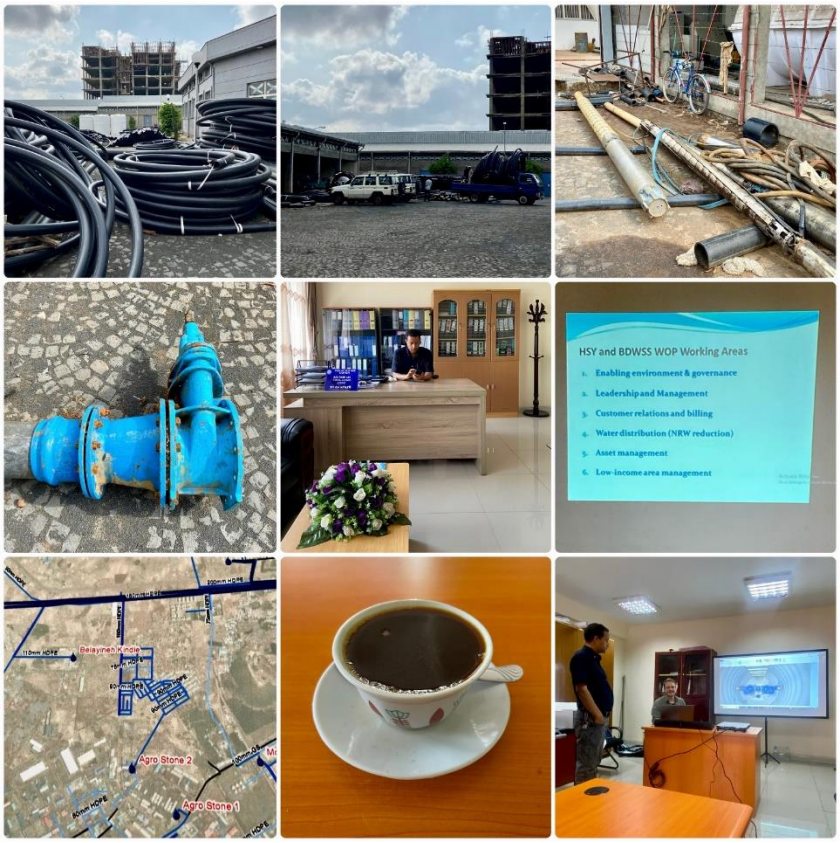
Yirga's presentation is attachment number 1.

The facility also has a toll-free service number to which issues can be reported, e.g., water pipe leaks. For now, the information is forwarded manually with 'sticky notes' and calling. The utility hopes to acquire a simple, electronic system.

The following was agreed with the representatives of the Bahir Dar waterworks:

It was agreed that, based on the information received and the discussion, draft plans for the DMA and other measurements will be made by Monday.

Yirga also promised that they will make the time sheets by the end of June. They will also give us before our departure the bank statements (copies of receipts, account permissions).



DAY 4: Sunday 11.6.2023

Agenda of the day: Getting to know Bahir Dar (day off)

Participants: Anssi Yrjölä, Hanna Yli-Tolppa

We got to know the city of Bahir Dar and prepared for the upcoming week's program.

DAY 5: Monday 12.6.2023

Agenda of the day: Utility tour

Participants: Hanna Yli-Tolppa, Yirga Alemu, Endalkachew Girma

Topics: Atse Tewodros branch, water sources, water intakes and pressure increases

We visited branch in Atse Tewodros, which was around 4 km northeast from the city center. This base includes 6 villages and about 13,000 subscribers / 100,000 inhabitants. The connection rate is around 50 %. The diameter of pipes in the area varies 50 mm... 400 mm in size. The oldest are about 20 years old.

Meter sizes are from 1/2" to 2". As a general rule, each property has its own meter. However, it is possible that several families (relatives, tenants) live in one property. This branch has 11 meter readers and 1 meter technician. Old meters are inspected, refurbished, or sold as scrap. Meters are replaced every 20 years on average. The branch has its own meter bench (only for small meters). The meter may have a maximum of 5 % errors. If the bill has not been paid, the meter will be removed. When the bill is paid, the meter is returned and a fine is charged. If someone has an illegal connection, s/he will have to pay a fine the first time. The second time may lead to inprisonment.

Normally, customers pay their water bills to the bank, but some come to pay their bills at the branch office. The contracts are still in the paper archive in folders, but the goal is to get the archive into an electronic format. The branch sells plastic water purifiers (Tulip) to customers for 1,200 birr.

The main water tanks are located 7 km east of the city center. There is an old 1,000 m^3 tank, where chlorination is done manually. The chemist checks the amount of crust every 6 hours. The new water tank is 4,000 m^3 equipped with automatic chlorination. There is a separate 700 m^3 tank for chlorine. The measurement of the surface in the new tank is also automatic. The new tank has been in use for about 2 weeks.

The well area is located about 5 kilometers northeast of the center. There are 6 wells in the area. They produce about 250 l/s of water, or about 20,000 m^3 per day. The plant is still in trial use and will be ready for production in 7/2023.

Both the tanks and the boreholes and the pressure booster station have been fully implemented with Japanese funding.

In the future, approximately 50% of the investments must be covered by fees collected from residents within 20 years. The aim is to cover the other 50% with external funding or grants.

The utility also has backup power, but it is only used in an emergency because fuel is expensive.

Yirga, the Management Committee and 4 branch managers meet every other week at headquarters. A memorandum is prepared from the meeting. We discussed the possibility of going through the benchmarking-related issues presented by Peter Dane at the meetings as well.

The following was agreed with the representatives of the Bahir Dar waterworks:

In the future Yriga will put benchmarking on the agenda of the management team meetings. First, they have to decide on the indicators to be benchmarked. It is good to use the same ones with other utilities.


TW 3

DAY 6: Tuesday 13.6.2023

Agenda of the day: Office day

Participants: Hanna Yli-Tolppa, Anssi Yrjölä, Yirga Alemu

Topics: FFL training, benchmarking, CT-meeting

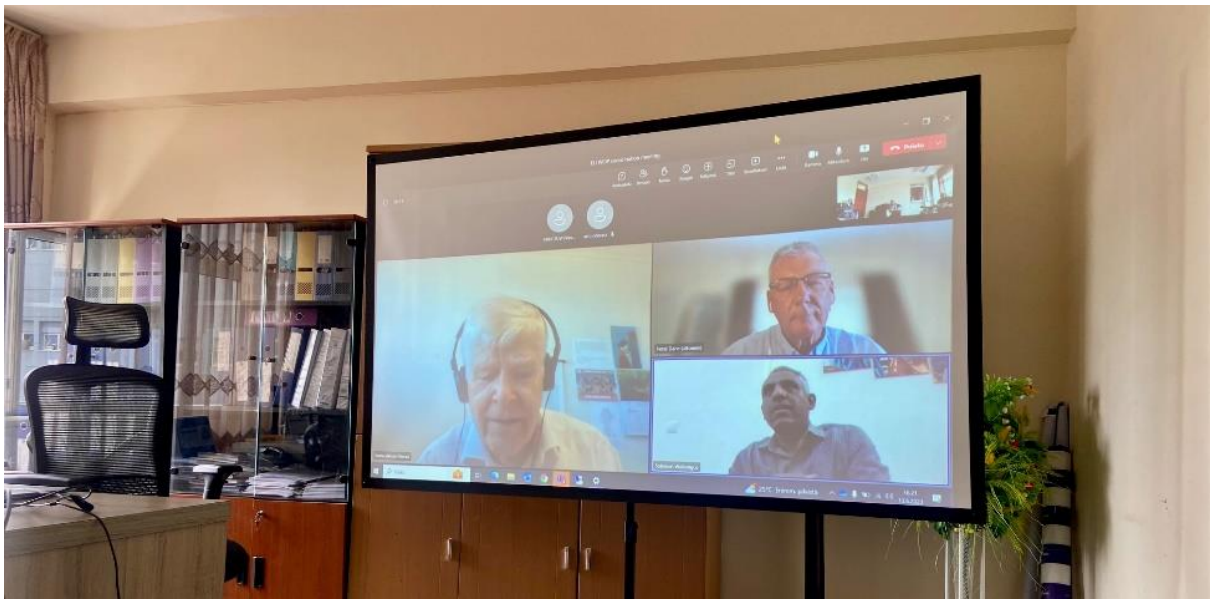
We discussed FFL training, which is the leadership training. The training is organized by VEI and and paid by EU/WOP, and 60 people from the utility have attended the training in Addis Ababa. The trainers are from Addis Ababa Water and Sewage Authority (AAWSA). The success of the training is monitored afterwards. People who have received training share the knowledge they have received in their own work community. The training has achieved, e.g., improvement of attitude and willingness to change and develop. The purpose is to continue training for 30 more people in Bahir Dar.

In regard to future leak detection training, the NRW engineer of BDWSS could first come to Finland to study leak detection. According to the schedule, training will be held in Bahir Dar in March 2024 given by AAWSA or HSY. Before that, suitable ways to identify leaks should be sought and short work instructions given.

The following was agreed with the representatives of the Bahir Dar waterworks:

The DMA plan is coordinated with the VEI project. The projects aim to use the same or similar parts. Cost estimates are made in cooperation. We discussed the use of mWater and the implementation schedule. We agreed that mWater will be the first to be put into use in the DMA test area. mWater's trainings are about to start and the program itself will be implemented during the fall. This leaves at least one year to calculate the water balance.

mWater is a digital platform collecting data for water balance.



DAY 7: Wednesday 14.6.2023

Agenda of the day: Office day and small site tour

Participants: Hanna Yli-Tolppa, Anssi Yrjölä, Yirga Alemu, Solomon Waltenigus, Dires Asmare

Topics: DMA, water metering, use of mWater in the project, summary of agreed matters, Back to Office Report (BTO)

We reviewed the DMA plan, material list and cost estimate. The purpose is to install a magnetic meter on the well. The well is located about a meter away from the test area. The DMA is built at the end of the trunk line before the DMA area. In addition, 2-3 main meters will be built in the area.

Illustration of the installation of the master meter and the Bill of Quantities (BOQ) of the DMA are shown in Attachment 2.

VEI will import the meters and valves from Holland. The materials for our DMA are primarily purchased from Ethiopia. Only not available in Ethiopia will be delivered from Finland.

The training of the use of mWater is ongoing. It is not yet certain whether mWater will be in use in the DMA area by the end of the year. This should be a priority so that information for the entire year can be obtained for the water balance calculation. The information is supposed to be stored in the cloud with a backup on a computer.

We went again through the timetable together. We will return to the schedule with Solomon in Addis Ababa on Thursday. The construction of metering stations and the installation of meters in the test area should be done in September 2023.

After a short site tour to the branch and water tanks we had another meeting about DMA with Dires. It turned out that there are few connections between the borehole and the test area. The problem is that connection information is collected at the branch and the information is transferred to the network information system once a year. Dires promised that data will be provided monthly in the test area.

We checked the technical drawing of the DMA measurement. T-branches to the bypass pipe are added to the plan. An air release valve must also be installed in the borehole.

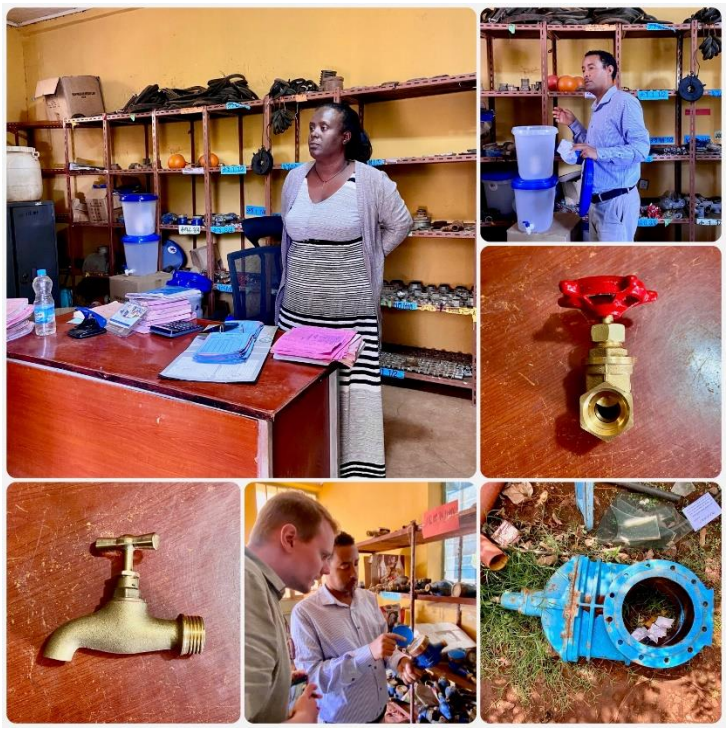
The borehole produces water an average of 266 m^3/d (13.3 m^3/h) for the DMA area. The pump is working 20 hours per day.

We agreed that we will proceed according to the timetable.

Timetable is attachment number 3.

The following was agreed with the representatives of the Bahir Dar waterworks:

The BOQ of the DMA, including the cost estimate, will be completed within a week, and if it will be decided whether the parts will be procured from Ethiopia or delivered from Finland.



DAY 8: Thursday 15.6.2023

Agenda of the day: Morning flight to Addis Abeba, meeting with Solomon and evening flight to Doha

Participants: Hanna Yli-Tolppa, Anssi Yrjölä, Solomon Waltenigus

Topics: DMA, mWater, timetable

The DMA plan was reviewed and agreed on behalf of VEI. It was agreed that the extra parts would be left out so that the plant would have as little maintenance and service as possible. VEI's / Solomon's prices are considered in DMA's cost estimate.

mWater user training for BDWSS meter readers will take place during June 2023. 11 meter readers are being trained. The use of mWater can be started in our DMA area. The goal is to

get the system into use during the fall of 2023. mWater provides the necessary information for the water balance calculation. There is no need to make a separate table. It is possible to get consumption information from the billing system.

mWater Portal is attachment number 4.

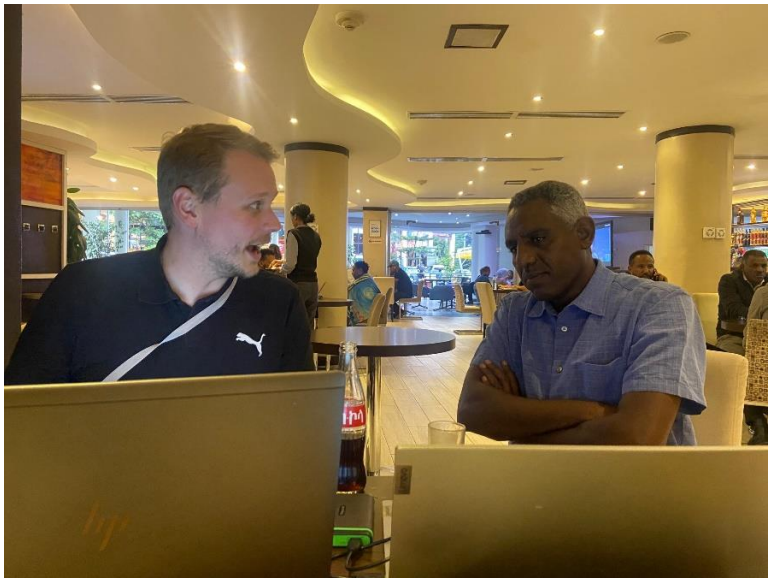
We went through the schedule. Procurements must be completed within 2 months. DMA will be built in September 2023.

The World Bank is currently making a plan for NRW. This can be utilized in BDWSS's NRW strategy. However, the utility must have its own, separate DMA instructions.

Leak detection instructions must be issued to BDWSS. It is possible to get leak detection training at the Addis Ababa water utility. The utility already has various leak detection devices in use.

The following was agreed with the representative of VEI:

The priority is to get all possible parts from Ethiopia. Possibly only the magnetic meter for the borehole will be delivered from Europe. The aim is to complete the construction work by the end of September 2023. Things are done in cooperation.



DAY 9: Friday 16.6.2023

Agenda of the day: Travel day

Participants: Anssi Yrjölä, Hanna Yli-Tolppa

The journey to Helsinki.

ATTACHMENTS (not available on website)

1. Yirga's presentation of BDWSS
2. DMA proposal and BoQ DMA pricelist
3. Timetable
4. mWater portal