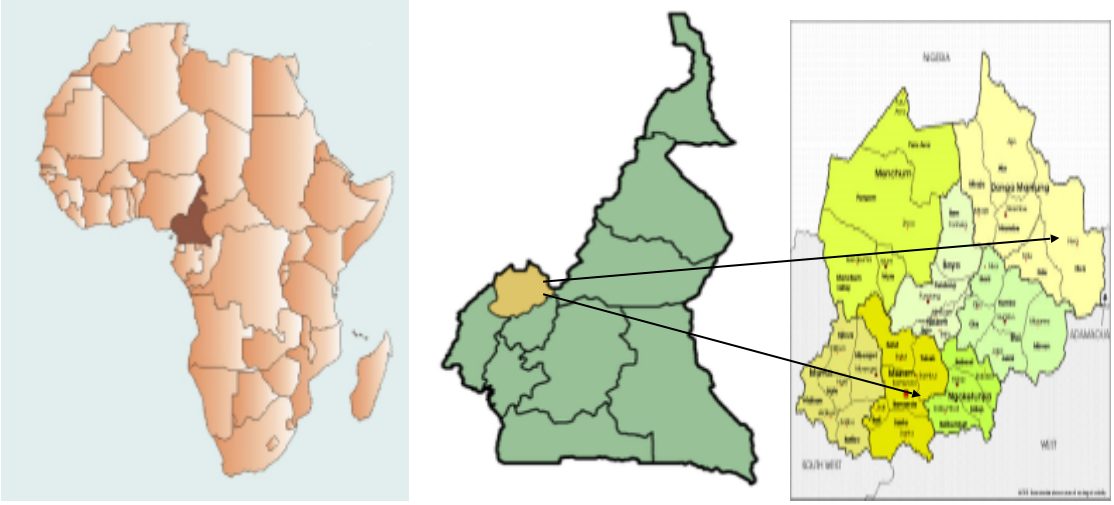
1) NAME OF PROJECT: Rehabilitation of two wells and building of a water tanks of 20000 liters and 2000 liters in three villages.

2) LOCATION OF THE PROJECT:

The project is located in three villages of the North West Region of Cameroon. The two wells are in Bamendankwe neighborhood near Bamenda city and Bawock village 20km from Bamenda city. The water tanks to be constructed is located in Rong village 200km from Bamenda city. The North West Region can be found on google maps using the coordinates **6° 19' 60" N / 10° 30' 0" E**



3) DESCRIPTION OF THE PROJECT: The main goal of the project is to rehabilitate two existing wells that has been serving the communities with water in order to improve on the quality of the water and also to build water tanks of 20000 liters and 2000 liters in Rong village..

3.1) The first well is in Bamendankwe neighborhood. This well was dug manually in the 70's. When public taps are not flowing especially at the peak of dry season, this well becomes the only source of portable water to the community. Currently, the well is serving a population of about 3000 people, including a nearby primary school called Catholic School Ntenefor with a population of 700 pupils. Because the well is exposed, it is very risky to children playing around. The well also risks being contaminated very easily because of its exposure. In order to rehabilitate the well, it entails cleaning the well to the depth of 12 m deep, installing concrete rings to prevent the walls from collapsing, pouring gravels at the bottom, raising concrete pillars up to 6m tall, installation of plastic tank of 5000 liters and an electric pump to pump water from the

well to the tank. By gravity, two stand taps shall be built to serve the primary school and the community. The community is ready to provide electric pump, pay for the electric bills and above all provide labour as their own contribution while SYFA provides the rest of items.

Farmer Tantoh and Mrs Julia near the well in Bamendakwe

The mother of the project is Mrs Ngiiniform Julia who has been very concerned about the development of this well. She organized young people to dig this well more than 30 years ago and since then, she has been monitoring every activity around the well to ensure it is clean, and safe from kids playing around. Because women are the highest users of water in households, she stands the better person to supervise the rehabilitation works.

3.2) The second well is in Bawock village 20km from Bamenda city. This well is in Bawock Fon's palace (the Fon or Chief is the King of the village). This well serves the whole palace and the immediate surrounding population of more than 2000 residence. The well is 14 meters deep, very dangerous and exposed to pollutants. Rehabilitation works entails cleaning the well to the depth of 14 m deep, installing concrete rings to prevent the walls from collapsing, pouring gravels at the bottom, raising concrete pillars up to 6m tall, installation of plastic tank of 5000liters and an electric pump to pump

water from the well to the tank. By gravity, three stand taps shall be built to serve the whole palace and the community. The Fon and community have bought an electric pump and shall provide sand, gravel and labour as their contribution to the project.

Farmer Tantoh and HRH The Fon of Bawock village around the well

The Father of the project is HRH Fon Nana Theodore III of Bawock village. He is very proactive when it comes to village development and is ever ready to coordinate villagers to participate in the project.

3.3) The third project started already last year in Rong village with harnessing of the spring. To continue with it, it entails construction of two water tanks (20000liters and 2000liters) that shall provide clean water to the whole village of about 7000 residence. The first water tank of 2000 liters shall be constructed at the spring source located 400 meters away from the settlement down the valley. This will help to store water from the spring and a provision shall be allocated for a solar pump to be installed that shall pump water to the bigger tank of 20000 liters that shall be constructed 400m above the spring source. The bigger tank will be constructed out of cement and stones. The tank will have a lid so that people can have access to the inside of the tank to wash it and inspect it every two months. . Water from the reservoir shall be channeled through pvc pipes over a distance of 1 km to 5 **stand-pipe and taps**. Water collected in excess of the reservoir capacity will be diverted via a drainage pipe from the reservoir.

The spring catchment was already constructed last year where villagers are walking down slope to carry water. I used my Ashoka stipend and worked with the community to realize this first phase of the project. **The spring catchment** is the structure that harnesses the water at the point where it is drained from underground. This cylindrical structure was three meters deep. The outside was built with cement and stones, and then the inside filled with gravel of different size gradients. The water was piped through two pvc pipes 60mm and a retaining wall built to support the pipes so the community could carry easily. At this point, the smaller tank shall be built to store water that shall be pumped using solar energy to the bigger tank.











NB: Upon construction of the two tanks and pipes installed, the solar pump shall be brought to Cameroon by ESW (Engineers for a Sustainable World) a student group from the University of San Diego USA. They have chosen Cameroon as a test bed for solar pumps and plan to be in Cameroon in summer 2017. They shall train community members on installation and maintenance. They are currently doing research on the type of pump to be used and shall raise funds in USA to purchase the pump and bring to Cameroon as their own support to the project.

Water catchment protection is a vital and integral part of this project; without it, the groundwater could easily become contaminated and/or depleted, rendering the construction of a catchment/reservoir useless. The first step is to build a **wooden fence strung with barbed wire** that encompasses a circular area of 50 meters radius around the catchment site. The purpose of this fence is to keep out human and domestic animal intruders who could pollute, defecate on, or otherwise damage the catchment area. In conjunction with the wooden fence, a **live fence** (a fence created from densely planted trees) will be planted alongside the wooden fence to support it. As the wooden fence decays, the live fence will strengthen it and replace it over time.

In order to protect the catchment from contamination and erosion, the **surrounding land must also be properly landscaped with plants that purify the aquifer without depleting it, and that prevent soil erosion and runoff**. Carefully selected trees and shrubs will be planted to prevent erosion and runoff while simultaneously conserving water in the catchment. For example, Vertiva grass will be planted for erosion control because the roots grow deep (three meters) but conserve water. Calandria, Acacia, and Leucaena will all be planted in the water catchment

because they attract bees. Many of these plants will provide vegetables, fruits, and medicinal plants.

Finally, a signpost will be placed at the roadside next to the entrance to site. This signpost will include the name of the site, project donor(s), partners, and water slogans such as “Water is Life,” “Water: Two billion people in dire need of it every day,” and “Let’s plant more trees to protect spring water catchments for future generations.”

Project Father of Rong project

The project father is HRH The Fon Kennedy Nganjo II of Rong village. He is very active in village development projects and has pledged that his village shall provide all the stones, sand , gravel and local labour to dig pipeline, carve stones etc as their own contribution to the project.

The project Coordinator is Farmer Tantoh Nforba, Ashoka fellow working in Cameroon (Ashoka being the largest organization for social entrepreneurs in the world) to educate the communities on water catchment conservation, building of springs and water tanks to provide clean water for all..

5) HOW THIS HELPS THE ENVIRONMENT:

Firstly, the two wells constructed shall be covered and free from pollution. A green lawn shall be pnated around to prevent against erosion and above all, the wells shall be safe from accidents.

Secondly, the Rong water project will protect the aquatic ecosystem of Rong spring. It will also improve community treatment of the environment by educating the rural community about proper watershed management. This project will encourage organic lawn creation and indoor flower gardening with children and youths in the rural community.

Planting agroforestry trees protects the water catchment and the greater aquatic ecosystem in several ways. Firstly, trees shade the area, helping to minimize evaporation of water and a consequential drop in the water table. Secondly, shallow tree roots help to stabilize the water table. Thirdly, large, dense tree leaves help to trap water during precipitation events, allowing the water to infiltrate into the aquifer instead of running off. Fourthly, trees prevent erosion and runoff, which in turn recharges the aquifer and maintains the topsoil that is vital for plant growth and ecosystem function. For example, Vertiva grass helps to prevent erosion because the roots grow deep (three meters) but conserve water, making this plant ideal for water catchment areas. Fifthly, trees promote biodiversity, which strengthens the resiliency of the ecosystem. For example, Calandria, Acacia, and Leucaena attract bees, which are vital to maintaining a healthy, biodiverse ecosystem (bees pollinate plants within *three kilometers* of their hive!). Sixthly, trees act as a carbon sink, helping to reduce the atmospheric concentration of carbon dioxide that causes climate change.

7) DURATION OF THE PROJECT:

Upon receiving funding, this project will take a maximum of twelve weeks to complete. Upon receiving funding, we will purchase all the materials needed to complete the project during the first two weeks and transport them to the sites. We will also hold a meeting with the community leaders so they can prepare community labor. During the third week, the various Father and mother of the projects shall engage the villagers to start cleaning the wells, masons shall be installing the rings while stones shall be carved at Rong village. During the fourth week, the pillars for plastic tanks shall be built while construction of tanks at Rong village shall commence. I shall be at Rong village to coordinate the project from start to end and every two weeks shall visit the site for wells to coordinate as well. Meanwhile I will also keep in touch via phone with the Father and Mother of the well project.

ESTIMATE COST:

Bamendankwe well project:

COST ESTIMATES TO REHABILITATE WELL AT BAMENDANKWE

No	DESCRIPTION	UNIT	UNIT PRICE	AMOUNT IN XFA	Amount in Euroes
1	Water tank	1	600.000	600.000	916
2	Sand	1	150.000	150.000	229
3	Gravels	1	150.000	150.000	229
4	Materials to build pillars -planks -rods -binding wires -nails -cement	 20 20 2 2 50	 6000 5000 2000 5000 5000	 120.000 100.000 4.000 10.000 250.000	 183 153 6 15 383
5	Concrete rings for walls of well	24	17000	408.000	623
6	Transportation of materials to site	1	100.000	100.000	153

7	Plumbing materials -pipes from tank to stand taps -pipes to pump water up to the tank -tangit gum	 16 4 2	 3.000 7.000 2.500	 48.000 28.000 5.000	 73 43 7
8	Building of stand taps	2	100.000	200.000	305
9	Technical supervision	1	500.000	500.000	763
	Total			2.673.000	4081
10	Unforeseen (20%)			534.000	815
11	**Final Total**			**3.207.600**	**4897**

Final amount to rehabilitate well at Bamendankwe is Three million, two hundred and seven thousand, six hundred frs XFA (4897 Euroes)

Bawock well project

COST ESTIMATES TO REHABILITATE WELL AT BAWOCK VILLAGE

No	DESCRIPTION	UNIT	UNIT PRICE	AMOUNT IN XFA	AMOUNT IN EUROES
1	Water tank	1	600.000	600.000	916
2	Concrete rings for walls of well	24	17.000	408.000	623
3	Materials to build pillars -planks -rods -binding wires -nails -cement	 20 20 2 2 50	 6000 5000 2000 5000 5000	 120.000 100.000 4.000 10.000 250.000	 183 153 6 15 383
4	Transportation of materials to site	1	100.000	100.000	152
5	Plumbing materials -pipes from tank to stand taps -pipes to pump water up to the tank -tangit gum	 50 4 2	 3.000 7.000 2.500	 150.000 28.000 5.000	 229 43 7
6	Building of stand taps	3	100.000	300.000	458

7	Technical supervision	1	500.000	500.000	763
	Total			2.475.000	3779
8	Unforeseen (20%)			495.000	756
9	**Final Total**			**2.970.000 XFA**	**4534**

Final to rehabilitate well at Bawock Village is two million, nine hundred and seventy thousands XFA (4534 Euroes)

Cost Estimate for Rong water tanks						
Item	**Description**	**Unit**	**Quantity**	**Price (CFA)**	**Total (CFA)**	**Total (euroes)**
1	20m^3 (20.000 L) storage tank	No.	1	2.000.000	2,000,000	3053
2	Stand-pipe with 5 taps	No.	5	100,000	500,000	763
3	2000 L tank	No.	1	500,000	500,000	763
4	Pipes and fittings	L.S.	133	7,000	933.000	1424
5	Wood, nails, and barbed wire for fence	L.S.	1	250,000	250,000	382
6	Signpost	No.	1	100,000	100,000	153
Subtotal					**4.283.000**	**6539**
7	Unforseen / transport	%	20	n/a	856.600	1308

	Technical supervision/design	%	10	n/a	500,000	783
Final cost					**5.639.600**	**8623**

Total for Rong project is 8623 Euroes

Grand Total for all the projects is 18.054 Euroes.

LOCAL SPONSORS:

- Local masons will donate their time to carve stones
- Pipes, and water taps will be purchased from Bamenda city by the project technician
- Young people will carry stones that will be used to construct the tank and they will mix concrete, carry the wood for the fence from the road to the site
- Wood and stones and cement will be carried by truck to the roadside, then carried by hand to the site..
- Women, youths, men will provide manual labor to dig sites for the construction of water tanks.
- Technical expertise provided by Farmer Tantoh a water project technician native to the Northwest Region.

Project conceived by Farmer Tantoh Nforba,

Ashoka Fellow-Cameroon

Forest Nation Ambassador-Cameroon

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