CLUB DES AMIS DU VILLAGE

Project: «Improving access to water for the communities of Alibi II and Tchèkèlè-Peulh in the Tchamba prefecture, Adam-Kôkôrô-Peulh, Bowounda, Tchavadi and Kparatao in the Tchaoudjo prefecture »

Réf. : ONG CAV / GG / Projects 2023 / 003

NOVEMBER 2022

« UNE ORGANISATION DE PROMOTION DE LA FEMME ET DE PROTECTION DE L'ENFANCE »

SIEGE SOCIAL : RUE DE KOULOUNDE, MAISON T.T. ISSA, SOKODE – TOGO, BP. 238 SOKODE, TEL. (+228) 25 50 11 92 / 90 11 25 02 / 98 33 09 99

Antenne de TCHAMBA : TEL (+228) 70 44 71 48 / Antenne Région des Plateaux : Tél. (+228) 91 96 11 76

E-mail : ongcav@gmail.com / Site web : http://www.ongcavtogo.org / Page facebook : https:/www.facebook.com/ONGCAVTOGO /

Profil facebook : www.facebook.com/ong.cav / Twitter : https://twitter.com/ong_cav

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SUMMARY

I - PROJECT OVERVIEW

Informations of the project	
Localisation (s)	Togo, Central Region, Tchaoudjo and Tchamba
Duration	Nine (09) months
Target population	18,612 inhabitants distributed as follows Alibi II (3,599), Tchèkèlè-Peulh (2,339) Adam-Kôkôrô-Peulh (127), Bowouda (3,180), Tchavadi (2,494) and Kparatao (6,873) in 2022 (2022 enumeration based on the 2010 national census with a growth rate of 0.31% by the General Directorate of Statistics and National Accounting)
Budget	**49 788 726 CFA F** or **79 030 $ US**
Partenaire technique de mise en œuvre du projet	NGO CAV
Partenaire financier	GlobalGiving

II - CONTEXT AND JUSTIFICATION OF THE PROJECT

The improvement of drinking water supply for the population is a very important issue for Togo in the context of the fight against poverty and the achievement of the Sustainable Development Goals. In Togo, disparities in coverage in rural and urban areas remain very high: 80% of the rural population has no access to improved water sources compared to 14% in urban areas. This imbalance further marginalizes rural areas such as the communities of Alibi II and Tchèkèlè-Peulh in the prefecture of Tchamba, Adam-Kôkôrô-Peulh, Bowouda, Tchavadi and Kparatao in the prefecture of Tchaoudjo. The difficulties faced by these communities are not the same. Generally speaking, however, the water used in these areas is often non-potable well water, infected river water and pond water, which causes water-borne and parasitic diseases such as malaria (the leading cause of morbidity and mortality recorded in health records), diarrhea and typhoid fever.

In the community of **Adam-Kôkôrô-Peulh**, in the canton of Kparatao, the inhabitants have a recurrent problem of lack of drinking water, not only for food, but also for their livestock, especially in the dry season when the water dries up in the only borehole constructed a dozen years ago by the religious sisters of the Koloware leprosarium. This borehole, it seems, did not benefit from a serious geophysical study, hence the drying up of the water in the dry season. Two other open wells exist, but also dry up in the dry season, making it difficult for the women of the farm to collect water. The only alternative for survival in the dry season is to share an inexhaustible supply of water with their livestock and the nomadic Fulani.

It is in view of all the above that a request for support for a borehole was sent to the NGO CAV in order to reduce the water chores of the women and children of this locality.

The community of **Tchèkèlè - Peulh** with a scattered habitat, has three (3) boreholes for a population of 1,128 inhabitants. In addition, the need for a fourth borehole has been expressed by part of this population living almost one kilometer from the nearest borehole.

In **Alibi II in the canton of Alibi I and Bowouda in the central canton of Sokodé,** the needs expressed concern school boreholes, respectively at the college and high school. In both cases, the problems experienced are identical. In these schools, the children are forced to go to the neighboring houses to quench their thirst, with all the consequences that this could entail. The two schools are a bit far from the concessions, which makes it difficult for the students and the teaching staff to have access to drinking water, hence the need for drilling projects in the said school and high school in order to bring the water points closer to the students.

For the **community of Tchavadi**, the need for water was expressed in terms of the lack of this commodity in their health center. Indeed, the Tchavadi Peripheral Health Unit has been fortunate to have a human-powered borehole since its creation about ten years ago. Unfortunately, the promoter was not able to provide the means to channel the water from the well to the housing of the health personnel and to the different health services, especially to the delivery room.

In relation to deliveries, it is very difficult for women who come to give birth to be able to shower, to wash their cloths and for the maternity services to "empty" the blood from the emptying pot, to clean themselves after having delivered the women. In addition, for health workers, it is important to wash their hands regularly after each treatment to prevent infections.

In light of the above-mentioned difficulties, it is essential to set up a project to extend the water supply from the existing borehole to the Tchavadi health center in order to save human lives.

From February to July 2022, an impressive work was carried out on **the market gardening site of the women's group of Kparatao**. A photovoltaic borehole was drilled with the installation of a solar pump with a power of 750 Watts with its modules and accessories. The pipe was made on a hectare delimited on the site. The sprinkler system has also been installed.

It is now essential to protect all these systems by fencing the site on a perimeter of one hectare. It should be noted that oxen, sheep and goats roam around and on the site because it is located on the outskirts of the village.

In response to this context and in order to contribute to the populations of its intervention zone, the NGO CAV proposes to implement this **support program for the construction of boreholes in the communities of Alibi II and Tchèkèlè-Peulh in the prefecture of Tchamba, Adam-Kôkôrô-Peulh, Bowouda, Tchavadi and Kparatao in the prefecture of Tchaoudjo**.

This project falls within the framework of result 4 of the 2021 - 2025 strategic plan of the NGO CAV entitled "**The populations in rural areas have quality water, in sufficient quantity and in all seasons by the end of 2025**".

The implementation period of this project is **nine (09) months.** Implementation will start in **January 2023 and end in September 2023**. Its total cost is **Forty-nine million seven hundred and eighty-eight thousand seven hundred and twenty-six (49,788,726) CFA francs, or seventy-nine thousand thirty (79,030) US dollars $ US[1].**

III - PROJECT DESCRIPTION

The project consists of the installation of four (4) boreholes including two (2) school boreholes, two (2) community boreholes and a water extension in a health center. It will also protect a market gardening site that previously benefited from a borehole and its irrigation equipment.

[1] **1$ US = 630 CFA Francs**

3.1 General objective of the project :

The main objective of the project is to contribute to the improvement of the health of the populations of the villages concerned by providing them with quality drinking water, in sufficient quantity and in all seasons.

3.2 Specific objectives of the project :

More specifically, it is to:

1. To build two (2) school boreholes, one of which is a human-powered borehole at the Collège d'Enseignement Général d'Alibi II and a photovoltaic borehole at the Lycée de Bowounda;

2. Install two (2) human-powered community wells in the villages of Tchèkèlè-Peulh and Adam-Kôkôrô-Peulh;

3. Protect the market gardening site of the Kparatao women's group with a wire fence.

4. Extend water supply to the various health services and to the housing of the health personnel of Tchavadi from an existing well.

3.3 Expected results of the project

- **Result 1**: Two (2) school boreholes are completed at the Collège d'Enseignement Général d'Alibi I and the Lycée de Bowounda;

- **Result 2**: Two (2) community wells with human power are installed in the villages of Tchèkèlè-Peulh and Adam-Kôkôrô-Peulh;

- **Result 3**: A wire fence protects the market gardening site of the women's group of Kparatao;

- **Result 4**: The existing borehole in Tchavadi supplies the health care services and staff housing of the Tchavadi Health Center.

3.4 Main activities planned by the project

Result 1: Two (2) school boreholes are constructed at the college of Alibi II and high school of Bowounda :

- **Activity 1.1** - Raise awareness of the project among children, teaching staff and parents' committees. This will help to better understand the stakes and risks of the project and to massively adhere to it in order to anticipate the success and the durability of the works to be built;

- **Activity 1.2** - Establish the drilling site and carry out the geophysical studies. This would reduce the risks of unproductive drilling;

- **Activity 1.3** - Undertake drilling activities and water analysis by the selected company;

- **Activity 1.4** - Supply the equipment and install the mechanical and photovoltaic power system;

- **Activity 1.5** - Construct the superstructure and scaffolding of the boreholes with a metal door to protect the boreholes;

- **Activity 1.6** - Support the community to set up Water Committees, in charge of monitoring and managing the boreholes;

- **Activity 1.7** - Train the Water Committees on the maintenance, management and monitoring of boreholes;

- **Activity 1.8** - Proceed first to the technical, then provisional and finally final acceptance of the works.

Result 2: Two (2) community wells with human power are installed in the villages of Tchèkèlè-Peulh and Adam-Kôkôrô-Peulh:

All of the 8 activities in Outcome 1 will also be carried out for these community wells.

Result 3: A wire fence protects the market gardening site of the Kparatao women's group:

- **Activity 3.1** - Sensitize the members of the group on the maintenance of the fence;

- **Activity 3.2** - Making concrete posts;

- **Activity 3.3** - Undertake the drilling activities for the establishment of the posts around the site;

- **Activity 3.4** - Supply the fence and install it around the stakes.

- **Activity 3.5** - Proceed first to the technical, then provisional and finally final acceptance of the works.

Result 4: The existing borehole of Tchavadi supplies the health services and the housing of the staff of the Tchavadi Health Center:

- **Activity 4.1** - Raise awareness among the staff and the management committee of the Tchavadi health center about the facilities to be built and how to maintain them. This will help to better understand the stakes and risks of the project and to massively adhere to it in order to anticipate the success and sustainability of the facilities to be set up;

- **Activity 4.2** - Organize the piping and plumbing work in the departments and premises;

- **Activity 4.3** - Build the castle to support the solar panels and the polytank;

- **Activity 4.4** - Supply the equipment and install the system;

- **Activity 4.5** - Train the Water Committee on the maintenance, management and monitoring of the borehole and the new facilities;

- **Activity 4.6** - Carry out first the technical, then the provisional and finally the final acceptance of the works.

IV - MONITORING, FOLLOW-UP AND EVALUATION

Baseline Study: Baseline data collection will focus on updating the current situation of the project populations. This study will be both quantitative and qualitative, and will provide data on indicators that will be used to measure the immediate effects and long-term impacts of the project.

Monitoring of the project by the Financing Partner:

Monitoring by the Financing Partner will be done in several ways:

- Assessment of monitoring reports, periodic reports produced by the NGO CAV in the implementation of the project;

- Field visits by the partner and/or through an intermediary that it has chosen;

- Other monitoring systems desired by the partner.

Monitoring by the Regional Directorate of Water and Village Hydraulics:

To ensure that the boreholes are constructed according to the standards and rules of the trade. This Directorate represents, within the framework of this project, the Ministry of Water which must have an eye on any hydraulic work built on the national territory. The technical follow-up of the project will be carried out by this institution. This Directorate is also the guarantor of success and will ensure that their monitoring visits are frequent and effective.

Monitoring by the Regional Directorate of Education:

As with all schools, whether private or public, the Regional Directorate of Education represents the Togolese state and should be informed of the project. The borehole to be built and which will become a heritage of the Ministry of Education, must have the authorization of the Regional Directorate of Education. It will therefore monitor the project, as will the teaching staff.

Community monitoring:

Community monitoring will be carried out by the local authorities, the Village Development Committees, the Water Committees for community boreholes, the Parents' Committee for school boreholes and the Health Structure Management Committees for health boreholes.

The steering committee:

To ensure effective management of this project, a steering committee will be set up. This committee will be composed of seven (7) people: one (1) member of the Regional Directorate of Hydraulics, two (2) from the NGO CAV and four (4) from the community (local authority, Village Development Committees, Water Committees, teaching staff) at the level of each project locality.

Project capitalization workshop:

A workshop will be organized at the end of the project. This workshop aims to capitalize on good practices and define mechanisms for the sustainability of the project's achievements with all project stakeholders. It will be a question of sharing the results achieved by the project, identifying the strengths, weaknesses, difficulties encountered and lessons learned during the implementation of the project.

V - SUMMARY OF IMPLEMENTATION

5.1. Planning of activities

Activities	Period of execution (in months)									Responsible
	1	2	3	4	5	6	7	8	9	
1 – Launch the calls for tender for the recruitment of companies specialized in drilling and solar systems										NGO CAV
2 – Sensitize the communities about the project										NGO CAV
3 – Establish the drilling site and carry out the geophysical studies										NGO CAV / Company / Regional Directorate of Hydraulics (RDH)
4 – Undertake the drilling activities by the selected company and the water analysis										NGO CAV / Company / RDH
5 - Supply the equipment and install the mechanical and photovoltaic power systems; - Construct the superstructure of the human powered boreholes; - Construct the water tower that will support the polytank and the solar panels										NGO CAV / Company / RDH
6 - Fence the market gardening site of the women's groups of Kparatao										NGO CAV / Grouping of Women
7 – Extend the water supply to the health center of Tchavadi										NGO CAV / RDH / Health Authorities / Management Committee

Activities	Period of execution (in months)									Responsible
	1	2	3	4	5	6	7	8	9	
8 – Support the community to set up Water Committees, in charge of monitoring and managing the borehole and train them on the maintenance and sustainable management of boreholes										NGO CAV / RDH
9 – Proceed with the technical and provisional acceptance										NGO CAV / Company / RDH / Communities
10 – Organize the final acceptance of the work										NGO CAV / Company / RDH / Communities
11 - Follow up and monitor the project activities										NGO CAV / Company / RDH / Communities / Financial partner / GlobalGiving
12 – Organize the capitalization workshop										NGO CAV / RDH
13 – Produce the reports and make the final evaluation of the project										NGO CAV / Company / RDH / Communities / Financial partner / GlobalGiving

5.2 Roles and responsibilities of project stakeholders

Five (5) actors will be mobilized in the implementation of this project. These are the NGO CAV, the financial partner and/or GlobalGiving, the Togolese State represented by the Regional Directorate of Hydraulics, the Regional Directorates of Education and Health and the beneficiary communities.

1. Financial partner / GlobalGiving

- Mobilize and allocate the necessary funds for the implementation of the project;
- Appraise project financial reports and statements.

2. NGO CAV

- Ensure proper functioning and transparency in the management of the project;
- Participate in the implementation of all project activities;
- Ensure the respect and application of governmental norms and policies in force in the field of hydraulics;
- Ensure the regular and timely payment of suppliers and companies to be recruited;
- Facilitate the follow-up by the hydraulic and health authorities;
- Participate in meetings of the project steering committee;
- Produce financial statements of the project to the financial partner and to GlobalGiving.

3. Regional Water and Health Departments

- Provide technical support to the project;
- Monitor the implementation of the project;
- Participate in meetings of the project steering committee;
- Ensure capacity building of the Water Committees;
- Participate in monitoring/supervision, evaluations and technical control missions as they relate to the project.

4. The Steering Committee

The steering committee that will be set up will have the following roles

- Ensure effective coordination of project activities;
- Monitor the project activities;
- Evaluate the difficulties encountered during the implementation, and seek appropriate solutions;
- Develop and adopt the process plan;
- Organize meetings for planning and monitoring activities and decisions;
- Act as an interface between the various stakeholders in the project;
- Ensure the mobilization of the population around the process;
- Analyze all options proposed for the success of the project.

This committee will contribute to the definition of learning issues in order to support and organize learning alongside the implementation of the project. Learning will focus on outcomes, strategies, and best practices that improve project implementation.

5. Beneficiary Communities

- Participate in the identification of project sites;
- Ensure community mobilization around project activities;
- Participate in the establishment of the various management / monitoring committees;
- Participate in the meetings of the project steering committee;
- Participate in the monitoring and evaluation of the project;
- Mobilize local resources for the maintenance of the works.

VI - OVERALL PROJECT BUDGET

N°	DESIGNATION OF ACTIVITIES	TOTAL AMOUNT (F CFA)	GLOBAL AMOUNT (Dollar)
1	Launch the calls for tender for the recruitment of companies specialized in drilling and solar systems	29 610	47
2	Sensitize the communities about the project	31 500	50
3	Fencing of the market gardening site of the Kparatao women's group	2 042 890	3 243
4	Extension of the water supply to the health center of Tchavadi	5 540 020	8 794
5	Human powered school borehole at the Collège d'Enseignement Général d'Alibi II	7 100 000	11 270
6	Human powered community well of Tchèkèlè - Peulh	7 100 000	11 270
7	Community borehole with human power in Adam-Kôkôrô - Peulh	7 100 000	11 270
8	School borehole equipped with a water tower and a photovoltaic pump at Bowounda high school.	9 355 000	14 849
COST OF THE PROJECT		**38 299 020**	**60 792**
SUPPORT FOR THE OPERATION OF THE NGO CAV (30% OF THE PROJECT COST)		**11 489 706**	**18 238**
TOTAL AMOUNT OF THE PROJECT		**49 788 726**	**79 030**

VII - RISK ASSESSMENT AND RISK AVOIDANCE MEASURES

Risks	Risk mitigation measures
Wrong choice of sites leading to confiscation of works after their completion	Requiring communities to provide a donation certificate to secure structures
Geophysics carried out in a traditional and random way, which leads to negative drillings or drillings with low yield (flow)	- Perform geophysics using groundwater detection devices to a depth of 200 m, 300, or 500 m with a rate of 90%. - To have the knowledge of geology and geomorphology
Unsatisfactory results of bacteriological analyses	Treat the borehole water with chlorine, disinfect the borehole before any water consumption or resume drilling in case of nitrate excess
Frequency of failures of installed structures	Set up and train local repairers
Shortage and breakdown of spare parts for drills and installed pumps	Provide spare parts in large quantities to the communities
- The non-adherence or negligence of the beneficiaries. - The abandonment of the works in favor of wells and rainwater	To sensitize the beneficiaries on the importance of making the borehole water their drinking water
If three negative drillings after three attempts	- Continue research at a later date. - Take this aspect into account in the contract with the hired company for arrangements to be made
- Inadequate monitoring of project activities due to poor stakeholder involvement and lack of a permanent framework for stakeholder consultation during project implementation could lead to non-compliance with technical requirements, - embezzlement of funds, waste of resources, delays in the execution of project works, poor quality of work and equipment leading to loss of donor confidence and finally termination of project funding.	- Increasingly involve the Regional Directorate of Hydraulics in monitoring the implementation of the project - Increase communication between stakeholders. - Create a framework for permanent dialogue throughout the duration of the project. - Strengthen the monitoring and control of project activities by a quality controller of the works.
The low information exchange between community actors regarding the selection of the drilling site, which would lead to misunderstandings, intra- and inter-related conflicts of interest and the emergence of land conflicts and undermine social cohesion and ownership of the project by the beneficiaries, which would lead to the failure of the project	- Strengthen communication and exchange between stakeholders on the choice and the site of community acquisition - Ensure the support of the acquisition of the site by legal documents (sale, topography, plan reference approved by the departments concerned)
Non-compliance with management procedures by the project management committee would lead to poor project management and ultimately a negative impact on the sustainability of the project.	- Strengthen the capacities of the project management committee (Water Committee); - Establish procedures for community management by consensus; - Strengthen the monitoring of the project.
Non-compliance with the clauses relating to the management of the project by the water committees	- Develop and sign a clear framework for project collaboration - Plan and organize periodic review/evaluation of the partnership between communities and CAV and other project stakeholders

APPENDICES

DETAILED PROJECT BUDGETS

1. Cost estimate for the construction of a human powered borehole
2. Estimates for the construction of a photovoltaic borehole
3. Estimate of the fence of the market gardening site
4. Estimate for the extension of the water supply to the health center of Tchavadi.

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ESTIMATE FOR THE CONSTRUCTION OF A HUMAN POWERED WELL						
N°	**DESIGNATION**	**UNITY**	**QUANTITY**	**UNIT COST**	**AMOUNT (F CFA)**	**AMOUNT (Dollar)**
I	**STUDY OF THE IMPLANTATION OF THE DRILLING**					
1.1	Hydrogeological and geophysical investigation	U	1	250 000	250 000	397
	Sub total I				**250 000**	**397**
II	**INSTALLATION AND REMOVAL OF THE SITE**					
2.1	Preparation, general installation and removal of equipment	FF	1	750 000	750 000	1 190
	Sub total II				**750 000**	**1 190**
III	**DRILLING**					0
3.1	Installation and dismantling of the drilling workshop	U	1	60 000	60 000	95
3.2	Drilling in the air, water and foam alteration formations, including installation and removal of temporary casing with a diameter of 9"7/8	ML	25	40 000	1 000 000	1 587
3.3	Down the hole hammer drilling to diameter 6"1/2	ML	60	18 000	1 080 000	1 714
	Sub total III				**2 140 000**	**3 397**
IV	**EQUIPMENT OF THE WELL**					
4.1	Supply and installation of full PVC pipes of diameter 126/140mm including screwed PVC plug obstructing the bottom of the decanter pipe	ML	60	12 500	750 000	1 190

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Antenne de TCHAMBA : TEL (+228) 70 44 71 48 / Antenne Région des Plateaux : Tél. (+228) 91 96 11 76

E-mail : ongcav@gmail.com / Site web : http://www.ongcavtogo.org / Page facebook : https:/www.facebook.com/ONGCAVTOGO /

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4.2	Supply and installation of PVC strainer pipes of diameter 126/140mm	ML	20	14 000	280 000	444
4.3	Supply and installation of siliceous gravel calibrated to (2-4mm) above the strainers	U	1	30 000	30 000	48
4.4	Supply and installation of expanding clay over 2m	U	1	30 000	30 000	48
4.5	Isolation of the overburden by backfilling, cementing of the upper 6m of the annular space, PVC above ground of 0.7m minimum, closing of the borehole with a padlocked metal cover	U	1	10 000	10 000	16
	Sub total IV				**1 100 000**	**1 746**
V	**DEVELOPMENT OF THE WELL**					
5.1	Development of the borehole with air lift for 2 hours until clear water is obtained	FF	1	200 000	200 000	317
	Sub total V				**200 000**	**317**
VI	**PUMPING TEST**					
6.1	Displacement, assembly and disassembly of the pumping test device, pumping for 4 hours and observation of upwellings (1 hour)	FF	1	20 000	20 000	32
6.2	With driving force	H	6	60 000	360 000	571
6.3	Without motive power	H	1	60 000	60 000	95
6.4	Disinfection of the well with calcium hypochlorite	U	1	30 000	30 000	48
	Sub total VI				**470 000**	**746**
VII	**WATER ANALYSIS**					
7.1	Physico-chemical analysis in the laboratory: Collection, conservation and transport of two one-liter samples, one of which is acidified with hydrochloric acid	U	1	70 000	70 000	111

7.2	Bacteriological analysis in the laboratory: Collection, conservation and transport of one liter of water sample in a sterilized container and bacteriological analysis	U	1	70 000	70 000	111
	Sub total VII				**140 000**	**222**
VIII	**INDIA STAINLESS STEEL PMH PUMP EQUIPMENT**					
8.1	Supply and installation of a 30 meter stainless steel human powered pump of india brand	U	1	1 200 000	1 200 000	1 905
	Sub total VIII				**1 200 000**	**1 905**
IX	**CONSTRUCTION OF SUPERSTRUCTURES**					
9.1	Construction of curbstone, hedgehog slab, anti-sludge, sidewalk, gutter, cesspool and decanter	U	1	850 000	850 000	1 349
	Sub total IX				**850 000**	**1 349**
TOTAL AMOUNT					**7 100 000**	**11 270**

QUOTATION FOR THE REALIZATION OF A PHOTOVOLTAIC DRILLING OF THE HIGH SCHOOL OF BOWOUNDA						
N°	**DESIGNATION**	**UNITY**	**QUANTITY**	**UNIT COST**	**AMOUNT (F CFA)**	**AMOUNT (Dollar)**
I	**STUDY OF THE IMPLANTATION OF THE DRILLING**					
1.1	Hydrogeological and geophysical investigation	U	1	250 000	250 000	397
	Sub total I				**250 000**	**397**
II	**INSTALLATION AND REMOVAL OF THE SITE**					
2.1	Preparation, general installation and removal of equipment	FF	1	750 000	750 000	1 190
	Sub total II				**750 000**	**1 190**
III	**DRILLING**					
3.1	Installation and dismantling of the drilling workshop	U	1	60 000	60 000	95
3.2	Drilling in the air, water and foam alteration formations, including installation and removal of temporary casing with a diameter of 9"7/8	ML	25	40 000	1 000 000	1 587
3.3	Down the hole hammer drilling to diameter 6"1/2	ML	60	18 000	1 080 000	1 714
	Sub total III				**2 140 000**	**3 397**
IV	**DRILLING EQUIPMENT**					
4.1	Supply and installation of full PVC pipes of diameter 126/140mm including screwed PVC plugs obstructing the bottom of the settling pipe	ML	60	12 500	750 000	1 190
4.2	Supply and installation of PVC strainer pipes of diameter 126/140mm	ML	20	14 000	280 000	444
4.3	Supply and installation of siliceous gravel calibrated to (2-4mm) above the strainers	U	1	30 000	30 000	48
4.4	Supply and installation of expanding clay over 2m	U	1	30 000	30 000	48

4.5	Isolation of the overburden by backfilling, cementing of the upper 6m of the annular space, PVC above ground of 0.7m minimum, closing of the borehole with a padlocked metal cover	U	1	10 000	10 000	16
	Sub total IV				**1 100 000**	**1 746**
V	**DEVELOPMENT OF THE BOREHOLE**					
5.1	Development of the borehole with air lift for 2 hours until clear water is obtained	FF	1	200 000	200 000	317
	Sub total V				**200 000**	**317**
VI	**PUMPING TEST**					
6.1	Displacement, assembly and disassembly of the pumping test device, pumping for 4 hours and observation of upwelling (1 hour)	FF	1	20 000	20 000	32
6.2	With driving force	H	6	60 000	360 000	571
6.3	Without motive power	H	1	60 000	60 000	95
6.4	Disinfection of the well with calcium hypochlorite	U	1	30 000	30 000	48
	Subtotal VI				**470 000**	**746**
VII	**WATER ANALYSIS**					
7.1	Physico-chemical analysis in the laboratory: Sampling, conservation and transport of two samples of one liter each, one of which is acidified with hydrochloric acid	U	1	70 000	70 000	111
7.2	Bacteriological analysis in the laboratory: Collection, conservation and transport of one liter of water sample in a sterilized container and bacteriological analysis	U	1	70 000	70 000	111
	Sub total VII				**140 000**	**222**

VIII	**ELECTRO-MECHANICAL PUMP AND PLUMBING EQUIPMENT**					
8.1	Electric pump kit for 2.3m3/h@90m HMT complete with its command and control box including the electric system, installation of the pump and hydraulic and electric connection accessories.	U	1	1 700 000	1 700 000	2 698
8.2	Installation of polytank of 3 cubic meters	U	1	450 000	450 000	714
	Sub total VIII				**2 150 000**	**3 413**
IX	**CONSTRUCTION OF SUPERSTRUCTURE**					
9.1	Construction of a superstructure of 7,00m height. Closed base with metal door	U	1	2 155 000	2 155 000	3 421
	Subtotal IX				**2 155 000**	**3 421**
MONTANT TOTAL					**9 355 000**	**14 849**

ESTIMATE FOR THE EXTENSION OF THE WATER SUPPLY TO THE HEALTH CENTER OF TCHAVADI						
N°	**DESIGNATION**	**UNITY**	**QUANTITY**	**UNIT COST**	**AMOUNT (F CFA)**	**AMOUNT (Dollar)**
I - SOLAR SYSTEM PART						
1	Module polycristallin 250 Wc /24V		4	150 000	600 000	952
2	Pompe solaire immergée : Pro 110 m / Débit 1,1M³ / H ; P = 0,75 KW ; Tension d'entrée 72V DC + COFFRET		1	1 050 000	1 050 000	1667
3	Câble souple 3x2, 5mm²	rl	1	130 000	130 000	206
4	Câble PV 1 x 4 mm²	m	20	2 000	40 000	63
5	parafoudre		1	75 000	75 000	119
6	Piquet + barrette de coupure + câble nu + câble vert/jaune + coffret DC + sectionneur DC	ens	1	100 000	100 000	159
7	Transport matériels	ens	1	50 000	50 000	79
8	Support module	ens	1	50 000	50 000	79
9	Pose et raccordement	ens	**1**	430 000	430 000	683
SUB TOTAL SOLAR SYSTEM					**2 525 000**	**4 008**
II - PLUMBING SECTION						
1	Tuyau PE	rl	2	60 000	120 000	190
2	Embout 50		1	4 000	4 000	6
3	Raccord d'union 50		1	2 000	2 000	3
4	Té 50		2	1 000	2 000	3
5	Coude pression 63		4	2 500	10 000	16
6	Vanne à raccord 63		1	11 000	11 000	17
7	Tuyaux pression 63		2	9 000	18 000	29
8	Tuyaux pression 32		4	3 000	12 000	19
9	Raccord d'union 32		1	1 500	1 500	2

10	Embout 32		1	300	300	0
11	Coude 32		11	300	3 300	5
12	Té Φ 32		8	800	6 400	10
13	collier Φ 32		4	400	1 600	3
14	Collier 63		3	2 000	6 000	10
15	Colle 1kg		1	12 000	12 000	19
16	Gébageain		1	4 000	4 000	6
17	Filasse		1	1 000	1 000	2
18	Reducteur 63/32		1	2 000	2 000	3
19	Reducteur 32/25		2	400	800	1
20	Autres accessoires	ens	1	10 000	10 000	16
21	Main d'œuvre plombier	ens	1	250 000	250 000	397
SUB TOTAL PLUMBING SECTION					**477 900**	**759**
III - CONSTRUCTION PART OF THE WATER TOWER / POLYTANK SUPPORT						
I	**PREPARATORY WORKS**					
1	Installation et replis	ff	1	200 000	200 000	317
2	Nettoyage du site	m2	64	3 000	192 000	305
3	Installation de l'ouvrage	ff	1	90 000	90 000	143
	TOTAL I				**482 000**	**765**
II	**TERRASSING**					0
1	Fouille en puit pour semelles	m3	6,76	2 500	16 900	27
2	Fouille en tranchée pour fondation	m3	3,76	2 500	9 400	15
3	Remblai provenant des fouilles	m3	2,92	2 000	5 840	9
	TOTAL II				**32 140**	**51**

III	**MASONRY-BASEMENT CONCRETE**					
1	Beton de proprieté	m3	0,95	55 000	52 250	83
2	Beton armé pour semelle	m3	1,64	100 000	164 000	260
3	Beton armé pour poteaux	m3	0,96	130 000	124 800	198
4	Beton armé pour longrine	m3	1,84	130 000	239 200	380
	TOTAL III				**580 250**	**921**
IV	**MASONRY-CONCRETE FOR RISE**					
1	Beton armé pour poteaux	m3	1,96	130 000	254 800	404
2	Beton armé pour poutres de liaison	m3	2,4	130 000	312 000	495
3	Beton armé pour dalle pleine pour plate-forme	m3	1,78	168 500	299 930	476
	TOTAL IV				**866 730**	**1 376**
V	**METALLIC CARPENTRY**					
1	Garde corps en tube galva pour protection polytank de 1,20m de haut	ml	10,4	40 000	416 000	660
2	Echelle mobile de 4m en tube carré avec des séparations en fer cornière	ff	1	160 000	160 000	254
	TOTAL V				**576 000**	**914**
TOTAL CONSTRUCTION OF WATER TOWER / POLYTANK SUPPORT					**2 537 120**	**4 027**
GRAND TOTAL = SOLAR SYSTEM + PLUMBING + WATER TOWER CONSTRUCTION					**5 540 020**	**8 794**

ESTIMATE FOR THE FENCING OF THE MARKET GARDENING SITE IN KPARATAO

N°	DESIGNATION	UNITY	QUANTITY	UNIT COST	AMOUNT (F CFA)	AMOUNT (Dollar)
1	Purchase of reinforced concrete stakes	piquet	38	5 000	190 000	302
2	Installation of stakes all around the site	piquet	38	3 000	114 000	181
3	Purchase of the fence	m	400	3 500	1 400 000	2222
4	Labor for the installation of the fence	Forfait			338 890	538
TOTAL					**2 042 890**	**3 243**