THIRD PROGRESS REPORT

PROJECT: CASERIO NUEVO EDEN, SANTA CRUZ BARILLAS, HUEHUETENANGO.

COVERING THE PERIOD

(2020)

BY:

ASOCIACIÓN PRO AGUA DEL PUEBLO

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Asociación Pro Agua del Pueblo

INTRODUCTION

The purpose of this report is to present the progress of the project "Improvements in the water and environmental sanitation service for the Nuevo Eden community, of the Municipality of Santa Cruz Barillas, Huehuetenango," information corresponding to the year 2020. Some of the information included in said document is taken as a reference for the ROTARY CLUBS of Barillas and Iowa for their respective project files and subsequent consultations.

It is important to emphasize that part of the activities developed during the year 2020 were restricted by the COVID-19 pandemic and the measures implemented by the government. However, some actions were implemented in conjunction with the community, taking into account the respective health protocols to prevent any contagion that would put the health of the beneficiary families or ADP staff at risk.

It should be pointed out that during the project execution, certain technical changes were made, which required the authorization of the Rotarians of Barillas and Iowa, allowing the reaffirmation of conditions and commitments assumed by Agua del Pueblo and the community, in order to maintain the same order of environmental priorities assumed by the project initially.

So far the general progress of the project stands at 93%, pending the following:

a) Face-to-face training for children, women and men in the community.

b) Rehabilitation of the water system and tank. The rehabilitation of the water system will depend on the possibility of taking advantage of the water from another source that is described in the report, for the collective benefit of the community, hoping that in the short term its acquisition can be negotiated with the owners. If the negotiations to obtain the water source are positively achieved, it is expected that the project will be completed in the course of this year.

c) Installation of pipes and accessories for the collection of gray water from homes.

The project in execution is developed with three specific objectives:

a) Improvement of the water supply

b) Wastewater treatment for the proper management of human waste

c) Strengthening the community organization related to water and sanitation

The progress achieved in each area is presented below:

IMPROVEMENT OF THE WATER SYSTEM

It is important to mention that the initial proposal contemplated in the project was the construction of masonry tanks of block and concrete, with a capacity of five thousand liters of water, in order to prevent families from selling polyethylene containers, and to ensure the availability of the water supply. Subsequently, the members of COCODE proposed and requested that the beneficiaries of the project preferred cylindrical polyethylene tanks with the same capacity. The reasons given were the following:

- The construction of masonry structures to deposit water would be the cause of many wages for the transfer of materials to the point where they are required, as well as storage spaces for non-local materials and support for the master builder. Another aspect that was taken into account is

the cardamom harvesting work that each of the families carries out on their plots, a situation that prevents users from having their local labor at certain times of the project.

- On the other hand, a large part of the male population migrates seasonally to Belizean territory and Mexico to carry out work on the harvest of citrus fruits and coffee, hindering the availability of labor when required, thus prolonging the time of project execution.
- The improvement of sections of access to the community has also required various economic contributions, especially in labor.

Said reasons and proposals raised by the community, determined the need to make these changes, having to resort to a conference call held between James Peterson, Carlos Simón and Obdulio Herrera Reyes, in the month of January 2020. This conference was invaluable, for the parties involved and as a result of it was the authorization of the changes, taking into account the conditions established by the Rotary Clubs of Barillas and Iowa.

Within the established conditions, the following are mentioned:

- The implementation of regulations and sanctions for the use of polyethylene tanks, as support for the change, is registered in the minutes of the COCODE.
- The authorized changes commit the community to comply with the norms and sanctions that will be established and described in the regulations that will be elaborated later by Agua del Pueblo, hoping that they can be distributed this year.

Attached to the respective authorization, the Rotoplas brand was chosen for the acquisition of the tanks. However, prior to this, the respective quotes were made with companies in the capital city, which are direct distributors of the brand. After the quotations had been made, 44 cisterns were purchased, including their water inlet and outlet accessories and their filter.

Currently 44 cisterns are installed: 42 cisterns for the same number of beneficiaries and 1 for the school in support of school children and 1 for the tourist visiting the lagoon. Each one has its stone masonry base on which the cisterns were placed, facilitating access to water through a tap. For the protection of the cisterns and in common agreement with the community, it was established that each family would build their roof not only to capture water, but to protect them from the environment. These ceilings have their respective wooden posts and sheets, which protect the systems and extend their durability or life span. **This line is 100% completed and fully operational. See progress table and photographs in annexes.**

TANK AND WATER SYSTEM REHABILITATION

Initially, the proposal was presented to implement the construction of a typical catchment structure. Having as a supply system a water source, located in a section of the conduction line, before the separation of the water supply of Nuevo Edén and the community of Vía Lucha, which at the time was improvised to capture the vital liquid no technical guidance to collect water.

During the execution of the project, there were problems with the identified source, because the initial negotiations with the owner were at an impasse, since said owner inherited the property from his children, resulting in an increase in its price in order to acquire the property , the community manifested few possibilities of negotiation due to the lack of resources. Faced with this situation, a new

series of activities was carried out to identify technical alternatives and investigate the presence of sources that could be driven by gravity or pumping. Given this, it was determined that in the territory of Nuevo Edén, water from another source near the communitycould be considered., which which would require pumping to the 50 cubic meter distribution tank.

The committee undertook to reach agreements with the owner of said source, to see if they can buy it or if he would make a donation of a part of it so that the water can be pumped into the existing distribution tank. This will require performing bacteriological and physical chemical analyzes, as well as length and height data relative to the existing storage tank. But, in order to carry out these works, it is important that the community authorities and the population in general reach concrete agreements with the owner of the source.

Another alternative is to use the water from the source that supplies the washing tank, which is potentially technically feasible, but is used at 50% of its capacity, the intention is to use the other 50% of the structure so that the source water is deposited and converted into a suction tank, installing a maximum submersible pumping equipment of 2 Hp, which will be able to operate with a 10 kv electric power generating plant, and pump the water to a height of 60 meters and a route of 200 meters to the existing 50 cubic meter distribution tank, so that from there it is distributed to the homes.

While these processes are being monitored, it has been agreed with the community that the rehabilitation of the water system and tank would be the last to be carried out, taking into account some financial reserves of the project.

WASTE WATER TREATMENT FOR THE PROPER MANAGEMENT OF HUMAN WASTE.

1. **Relocation of the septic tank.**

The wastewater treatment system required rethinking aspects of the relocation of the septic tank for 34 families, because it was determined that in their housing areas, they had little space left for family or group septic tanks, so they proposed that said structure be installed in spaces above the current laundry tank, a motion that we consider very successful, requiring a respective topographic survey and drawing of plans. The selected area has enough space and is communal, the topographic rethinking resulted in:

- 1209 meters of central line and branches
- 491 meters for connection pipes
- Establish 4 wastewater collection sectors.
- 1 group of 34 families
- 1 group of 5 (Pablo Salvador)
- 1 Group of 3
- 1 Group of 1

2. **Process for the Execution of the Project**

It began with the construction of a septic tank of 29 m^3 of reinforced concrete with a compression strength of 210 Kg / cm^2 built with quality aggregates and clean of impurities, which will give primary treatment to the wastewater collected from the homes, serving to separate solids by gravity or sedimentation. Once this is done, the solids settle to the bottom of the tank, and the biodegradation process begins, which converts the polluting products into inert products. The walls are 0.15m thick

and have a longitudinal and transverse reinforcement of Ø3/8 ”separated every 0.20m; the floor and cap are constructed in the same way. **100% finished.**

In the month of April 2020, it was planned to start with the installation of 3 polyethylene septic tanks of the following dimensions: 2.5 m^3, 1.7 m^3 and 1.1 m^3, but due to the easement problems and the distances to and locations of these three structures, it was technically necessary to modify and substitute for these structures a single one of 10 cubic meters of stone masonry, for the benefit of 15 families considered. Fortunately, the beneficiaries facilitated the conditions to provide land for the construction of the structure, they were able to have good levels for all the pipes to reach the place, these levels were achieved with the acquisition of a jackhammer that was necessary to eliminate rocks that that were encountered when digging the trenches. Taking these opportunities into account, in June 2020 the construction of the 10m^3 septic tank that collects wastewater from 15 homes began, replacing the 3three polyethylene septic tanks initially contemplated.

Simultaneously, 23 reinforced concrete tubes of 90 centimeters in diameter and 1 meter high were built for the handholes or manholes, which are structures used to check the passage of water, at the intersection or change of direction of pipes, and as cleanouts in case of any clogging by the presence of bulky debris. At the bottom of each, a 10-centimeter reinforced concrete plate was built, which will support the weight of the tube while sealing or waterproofing.

Concrete lids were also built for the tubes, which must support the weights of light vehicles, all of the above were built in the community with metal molds borrowed from the municipality of Barillas. The work was carried out during the pandemic RESTRICTIONS period, observing the sanitary measures established by the government. Fortunately, there were no risks of infection in the region and the community kept abreast of the sanitary protocols to safeguard their health.

The collection pipe is already installed, although it was not the 1,750 meters that would have been initially proposed since with the change of the prefabricated septic tanks to a single concrete one, the amount of pipe to be used decreased, leaving only 1,209 meters installed. The surplus pipe will be used later to make the corresponding connections from the household *pilas* [wash basins] to the household manholes. The manholes and their respective connections to the system are ready for use.

Regarding the secondary treatment in the wastewater system, it is done via two artificial wetlands, secondary treatment structures of a BIOLOGICAL TYPE that promote the growth of organisms that eliminate bacteria and non-biodegradable toxins, through filtration through strata of *boluda* stone [river rock?, pea gravel?], gravel and the roots of vegetation.

The structure is made up of a waterproofed tank with a one-millimeter HDPE class geomembrane; its filter bed is made up of two layers of *boluda* stone at the entrance and exit, the third layer installed in the central part will be made of ¾” gravel.

The surface part has a layer of gravel or piedrín [small stone or gravel] with a thickness of 5 centimeters, a bed that will serve as a substrate for the cultivation of plant species that will complement the biological treatment process. Absorption ditches are structures or channels dug in the contiguous soil of septic tanks and wetlands, to discharge treated water from wetlands.

The wetlands measure of 7.3 m^3 (at the 29 m^3 septic tank), and 3.8 m^3 (at the 10 m^3 septic tank), both are finished and two species of plants were planted to start their growth and performance. Absorption ditches are structures or channels dug in the contiguous soil of septic tanks and wetlands, to discharge treated water from wetlands.

The construction of drying platforms - masonry structures that have the function of drying and treating the solids from the septic tanks – are to avoid dumping solids in any vacant place that might become a source of environmental contamination (see photos).

They are built of masonry block, with a gravel filtering bed and a *tayuyo* brick (a type of solid red brick) floor. The construction of two structures was contemplated, but since it was not possible to obtain the area of land where the small one would be built, an agreement was reached with the community to only build one, where the sludge of both septic tanks would be taken, and which is already finished in its entirety.

LATRINES

During the [preliminary] technical visits made by ADP personnel to the community in order to know the type of land for the construction of the latrines, it was verified that the soil texture is stony in the Nuevo Edén location area, making it difficult to install pit latrines. This was a reason that another organization installed family dry compost latrines (LASF), but unfortunately these have not had the proper use, therefore they now are largely abandoned or in complete disuse. **Faced with this situation, the installation of washable toilets was proposed**, since they have a sewage and treatment system, each toilet has a booth with a slab, air circulation and metal roof, its dimensions are 1.10 x 1.00 x 2.85 meters. **It was established that this type of latrine was acceptable to the beneficiary families, since they offer a combination of hygienic conditions, easy handling and are suitable for use by the children of the community.**

Process development:

The transport and installation of sheet metal booths for the toilets was carried out; prior to this materials were quoted in Barillas, but the stores did not have the material that was needed, so the quotations were obtained in Quetzaltenango. A quote was also obtained for the transport of material [to either Barillas or Santa Lucia Utatlán]. [Quotes for labor were obtained from] metalworkers from Barillas and Santa Lucia Utatlán, Sololá. As a result of these quotes, the work was done by the metalworker of Santa Lucia Utatlán since his cost was lower, and also the freight charges are lower from Quetzaltenango to Sololá, ultimately reducing the costs. Consequently, the metalworker built the 44 booths that were moved and installed in the community.

A total of 44 concrete bases were built for the installation of booths for toilets, distributed as follows: 42 bases for [domestic] users and two in the community school in order to protect the basic sanitation of boys and girls and teachers in charge of the student population.

The installation of washable toilet bowls followed in order to connect them to the drainage system; due to the low water conditions in the community, manual sanitary porcelain flush toilets were proposed, with low water consumption, the purchase of said toilets was carried out in Quetzaltenango since it was the only place where they were found, so the toilets were transferred to the community. **So far, 42 toilet bowls have been installed for the same number of families, one for the community school and one for tourists visiting the lagoon.**

Table No. 1 details the components programmed and executed in the project, taking into account that the changes that arose during the execution of the project were made in accordance with the authorization by the Rotarians of Barillas and Iowa.

SUMMARY OF CHANGES:

In the month of April 2020, it was planned to start with the installation of three polyethylene septic tanks of the following dimensions: 2.5 m^3, 1.7 m^3 and 1.1 m^3 but due to the problems of permission to pass [easement], the distance to and location of these three structures, it was technically necessary to modify and replace these structures by one of 10 m^3 of stone masonry, for the benefit of 15 families considered, optimizing time and space. **Currently 100% finished.**

Another of the modifications was the change of three wetlands of the following measures: 3 m^3, 2 m^3 and 0.5 m^3, respectively, for a 3.8 m^3, for the benefit of 15 families. **Currently 100% finished.**

As a result, of the 1,750 meters of collection pipe that was initially contemplated, only 1,209 meters were installed, this surplus would be used later to be able to make the corresponding connections from the *pilas* in the house to the household manhole.

It is important to highlight that the adaptation of the changes occurred after the technical conditions were evaluated, as well as social, environmental and economic feasibility. In terms of costs, it was determined that the changes would not alter the original budget, maintaining and respecting the same.

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TABLE No. 1

Progress of the programmed and executed of the project

No.	Planned				As-built		
	Structur	**Quantity**	**Coverage**	**Unit**	**Completed**	**Coverage**	**Unit**
1.-	Collection lines	1,700 m	43	Homes	1,209 m	44	Homes
2.-	Home hookup lines	43	43	Homes	--------	44	Homes
3.-	Latrine booths	43	43	Homes	--------	44	Homes
4.-	Septic tank, 29 m^3	1	35	Homes	Septic tank, 29 m^3	28	Homes
5.-	Septic tank, 2.5 m^3	1	3	Homes	Septic tank, 10 m^3	15	Homes
6.-	Septic tank, 1.7 m^3	1	2	Homes			
7.-	Septic tank, 1.1 m^3	1	1	Homes			
8.-	Wetland, 9 m^3	1	34	Homes		28	Homes
9.-	Wetland, 3 m^3	1	5	Homes	Wetland , 3.8m^3	15	Homes
10.-	Wetland, 2 m^3	1	3	Homes			
11.-	Wetland, 0.5 m^3	1	1	Homes			
12.-	Absorption trench	4	43	Homes	---------	----------	Homes
13.-	Manholes	23	43	Homes	22	44	Homes
14.-	Filter channels	4	43	Homes	2	44	Homes
15.-	Washable toilets	43	43	Homes	--------	44	Homes
16.-	Bases for latrines	43	43	Homes	--------	44	Homes

Source: Tecnical reports, 2020.

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STRENGTHENING OF THE COMMUNITY ORGANIZATION RELATED TO WATER AND SANITATION.

In the year 2020 the Community Development Commission -COCODE- was reorganized, because the president of the Commission had alcoholism problems, minimizing his responsibilities and commitments to the project. For this reason, it was necessary to remove him from his position before the community assembly, who appointed Matías Felipe Lucas, having his respective legalized registry before the competent authority.

It is important to note the commitment of the current president of COCODE and its members to support the project during its execution and completion, and their agreement to follow up on technical, social and environmental activities for the sustainability of the project. This will allow a good community base for the sustainability of the project.

The new president's commitment led to greater dynamism in the execution of the works, giving a new boost among the benefited families, such as the streamlining of the community contribution of local and non-local materials, which were used for the construction of bases for the washable toilets, bases for the water tanks, stone and gravel for the wetlands and part for the last septic tank; finally they supported [paid for] part of the materials for the collection of rainwater (roof of galvanized sheet, wood, stone, gravel, sand and unskilled labor). **See pictures.**

Another important aspect related to the skilled labor ("MOE" – *mano de obra especializada*) workforce was the hiring of the mason for the construction of the different structures of the systems, a person with very good experience, in addition to his command of the regional language (Kanjobal), who facilitated some translations of messages from ADP staff at scheduled meetings.

It is important to mention that Agua del Pueblo trained the mason, through tours to Santa Lucia Utatlán Sololá to observe structures related to wetlands, filter channels, species grown on wetlands, visiting manholes, household manholes and septic tanks.

In addition, the mason had people of Nuevo Edén as assistants, an important aspect for the operation and maintenance work, because they became familiar with first-hand how the main elements of the system in general were built, which facilitated the learning and permanence of the knowledge acquired within the community.

It is important to mention that part of the non-local materials were purchased in Barillas, with this we have identified and adhered to the policy of the ROTARIOS DE BARILLAS group.

TRAINING IN HYGIENE AND SANITATION:

Regarding training for children, teachers and parents, it are still pending because the Ministry of Education has suspended face-to-face classes since March of 2020 due to the COVID19 pandemic.

This aspect has delayed the development of the workshops contemplated in the project. However, the commitment is to develop these workshops in the course of these first months of the year 2021. Activities are currently being planned to cover this aspect.

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TRAINING ON OPERATION AND MAINTENANCE OF THE WASTEWATER TREATMENT SYSTEM:

In the month of December 2020, the first training on operation and maintenance of the wastewater treatment system was carried out, a representative of each beneficiary family was present: In total 42 and 6 members of the COCODE covered topics such as the importance of hygiene in the home, to motivate changes in behavior among families for a good state of health and to maintain the system in optimal conditions.

It was also important to inform the beneficiaries of the use, management and function of each of the structures built, as well as the cleaning that must be carried out in each of them.

In addition, a practical visit was made on site with some members of the committee to familiarize them with the operation of each of the structures and proper cleaning. Within the practical tour it was also important to know the types of local vegetation that could be planted in the wetlands. This aspect allowed the identification of some vegetations that exist in the community such as HORSETAIL (resistant to very humid environments) that allow the efficiency of the wetlands. It was also possible to identify other species whose technical name is unknown, but which were essential to take into account, according to the opinion and experience of the residents.

Still pending as part of community strengthening are the delivery of the SYSTEM USE AND ADMINISTRATION REGULATION, as well as the OPERATION AND MAINTENANCE MANUAL. It is expected that these documents will be delivered in the first months of 2021. **In addition, on-site practical training is planned** for each of the beneficiaries on the proper use and management of basic cleaning tools, as well as monitoring of the wastewater treatment system, said practice will be carried out two to three months after the system is fully operational so that the correct way to provide the respective maintenance can be known **(see respective photographs in annexes).**

APPENDICES

FOTOGRAFÍAS

Wastewater treatment system

Sistema de tratamiento de aguas residuales para 29 familias. Se observa de derecha a izquierda, canal de rejas, tanque séptico y humedal.

Wastewater treatment system for 29 families. From right to left, filter channel, septic tank, artificial wetland.

Solid waste drying patio

Candelas Domiciliares

Domestic cleanout manholes

Filter channel and tank for taking samples from the artificial wetland

Sistema de tratamiento de aguas residuales que servirá para 15 familias

Installation of bases, booths and washable toilets for latrines

Toilet base

Finished latrine with washable toilet bowl

Transport of cisterns to the community: Difficulties were encountered during the transport due to hurricanes ETA and IOTA that affected the country, making it difficult for the distributor to get through; ADP had to help complete the transport to the community.

Transporting cisterns to the community

Instalación de cisternas con base de mampostería y accesorios

Cisterns with their roof, with wooden uprights supporting galvanized sheet metal.

Completed artificial wetland

Training workshop with beneficiaries on the operation and maintenance of the wastewater treatment system.

Training workshop with beneficiaries on the importance of hygiene in the home, motivating changes in behavior among families for good health and for maintaining the system in optimum condition.