

Final report:

Water Supply and Sanitation Project for the community of Boca de Poteca, Municipality of Wiwilí Nueva Segovia, Nicaragua

From April 1st to August 9th, 2016



Donors:

Ann Campana Judge Foundation, Pennywise Foundation, Agua Para La Vida

Co-fundings:

Municipality of Wiwilí Nueva Segovia, Community of Boca de Poteca

Implementing organization:

Agua Para La Vida Nicaragua

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EXECUTIVE SUMMARY

This report documents the successful completion of the project **Water Supply and Sanitation Project for the Community of Boca de Poteca, Municipality of Wiwilí Nueva Segovia, Nicaragua.**

This project was implemented by Agua Para La Vida Nicaragua (APLVN) and the community of Boca de Poteca, who worked hand-in-hand over the **5 month period**, from April 1st to August 9th of 2016. The ultimate direct beneficiaries are 38 families, one primary school and one evangelical church, for a total of **153 people** (71 women and 82 men). The total budget of **U\$75,087** was funded by multiple donors as shown below:

Donor	Total	%
Ann Campana Judge Foundation	U\$ 15,800	21%
Pennywise Foundation	U\$ 10,000	13.3%
Agua Para La Vida	U\$ 29,286	39%
Municipality of Wiwilí Nueva Segovia	U\$ 9,998	13.3%
Community of Boca de Poteca	U\$ 10,003	13.4%
TOTAL	U\$ 75,087	100%

Detailed information is presented for both the physical infrastructure constructed during the project, as well as activities carried out to empower the community members of Boca de Poteca. Each family contributed **45 days of work** to earn their right to the water supply service and the following components of the project were successfully completed:

- construction of **40 water connections**
- construction of **40 latrines**
- development of the Water and Sanitation Committee
- community health and hygiene education programs
- protection and reforestation of 0.69 hectares of land around the water source

On project completion, the project activities were 100% implemented and everything was set in place in order to ensure the long-term sustainability of the project.

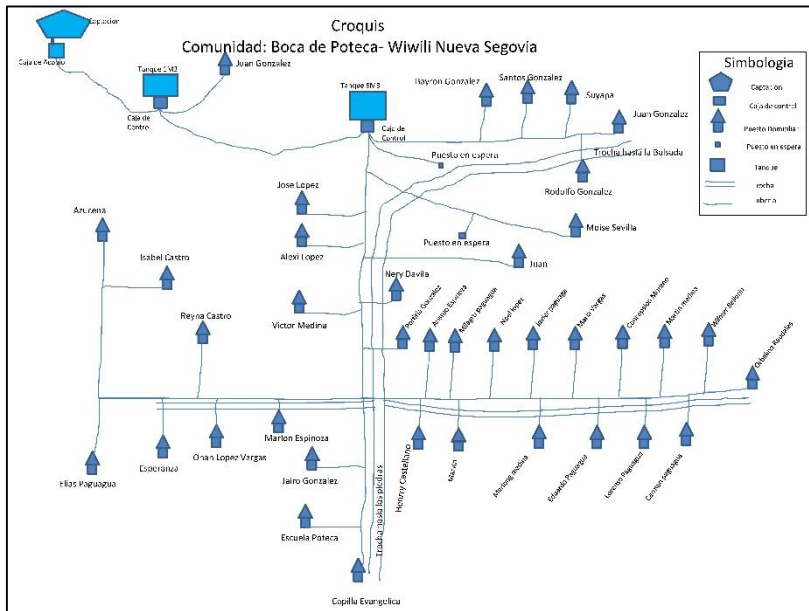
Finally, this report will provide insights on the challenges, lessons learned and a few practical recommendations regarding the project.



Photo board made by the community about the project execution, reading "A Dream Come True".

BRIEF PROJECT DESCRIPTION

Boca de Poteca is a very poor, concentrated community located 42 kilometers northwest of the municipal capital of Wiwili Nueva Segovia, at the border between Nicaragua and Honduras, which previously did not have any access to safe water. Before the project was implemented, the community's water supply came from hand-dug wells or through hoses connected to superficial sources such as gullies located along the banks of the Poteca River. In all cases, these sources of drinking water were highly contaminated with animal waste and were not treated or purified in any way, causing a real threat to the population's health.



Sketch of Boca de Poteca water system.

This project involved the construction of a gravity-flow water supply system, providing community members with the fundamental human right of water consumption in sufficient quantity and of sufficient quality. The system was designed for a life of **20 years**, which means that the volume of water carried by the system was calculated taking into consideration the needs of a projected total of **242 beneficiaries**, applying a 3% annual growth rate to the current population of Boca de Poteca. Generally speaking, the construction of the system consisted of the following: spring catchment, pipeline, storage tank, distribution network and metered household water connections. **Forty semi-elevated, double ventilated improved pit latrines** were built, with each family taking responsibility for the construction of their own latrine.

In parallel with the construction activities, the beneficiaries were provided with health education (on sanitation practices and hygiene) and training in the care and preservation of the water source. Significant effort was also put into the creation, strengthening and training of the Potable Water and Sanitation Committee ("CAPS" in Spanish), the community-run group in charge of the administration, operation and maintenance of the water system over the long term.

ACHIEVEMENTS OF THE PROJECT

1. Water system

According to the project proposal, the anticipated time for implementing the project was 6 months but the actual implementation was completed in **5 months**, from April 1st to August 9th of 2016. By project completion, each family had contributed with **45 days of work**.

1.1. Physical execution

The following table summarizes the information related to each specific component of the water system:

Work done for each component	Initial Design	Actual	Observations
Spring catchment: Construction of a closed spring catchment consisting of a retaining wall, a river-rock filter; sealed with a concrete slab, a debris collection box and a junction box.	1	1	100 % completed
Pipeline (PL): This PL has a total length of 1,577 m and was installed with ¾" SDR 17 and ½" SDR 13.5 PVC pipes. It is composed of two sections: one from the spring catchment to the first storage tank, carrying 30 liters per minute, and the other one from the first to the second storage tank, carrying 26 liters per minute. In order to protect the pipes, the pipeline was buried underground. Special protection was required at three streams crossings.	1,577 meters	1,577 meters	100 % completed
Storage tanks: The system required the construction of two storage tanks. The first one of 1m ³ can store 1,000 liters of potable water and plays the role of a pressure reducing box. The second one of 6m ³ was built to store up to 6,000 liters of potable water. Both tanks are equipped with a ventilation pipe, a line for overflow and cleaning, and an inspection cover. They also have a control box where bypass valves were installed, with inlet and outlet pipes protected by a metal lid to facilitate operation and maintenance. Each tank was protected from animals with a perimeter fence made from barbed-wire and wooden posts.	2	2	100 % completed
Distribution network: The distribution network is 2,444 m long and was constructed with 2" to ½" PVC pipes. In some places, where the terrain was rocky, and trenching was not possible, the PVC pipe was buried with mortar (sand and cement), particularly along the side of the road, thus ensuring its service life.	2,724 meters	2,444 meters	100 % completed because the difference is due to a change in the design implied by 3 families who did not want to benefit from the project
Household Connections (water tap stands): 40 reinforced concrete water tap stands were installed in the network. The tap stands have a height of one meter from the ground surface to the tap. At the base, there is a concrete slab where wastewater falls and flows through a drainage pipe where it is discharged into a filtration pit which prevents the accumulation of water and mud.	40	40	100 % completed
Meters: 40 water meters and flow restrictors (orifice) were installed in the water stations in accordance with design. Meters are used by the community to control water consumption.	40	40	100 % completed

1.2. Water quality results

On completion of the project, a bacteriological study was carried out which demonstrated the absence of fecal coliforms, which means that now, the inhabitants of Boca de Poteca are drinking safe and clean water.

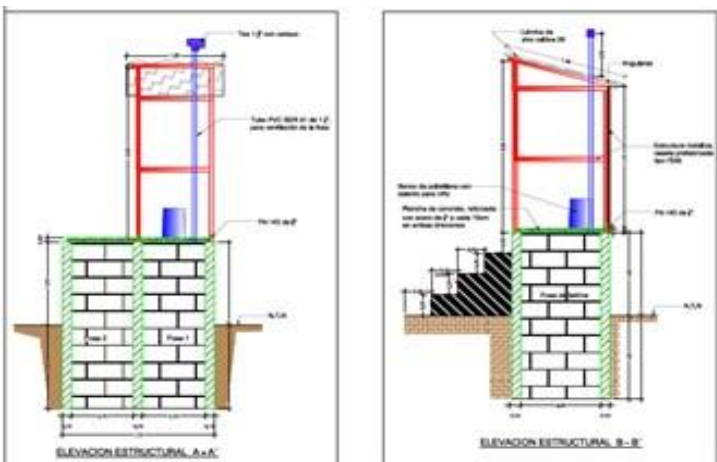
	Date	Sampling Point	Filtered Volume (ml)	pH	Presence of Coliforms
BEFORE THE PROJECT	10/15/14	Spring	100	6.8	Negative
		Hand-dug well in pasture, property of Félix Pedro Rizo		7.2	Positive
AFTER THE PROJECT	08/10/16	Spring		7.5	Negative
		Henry Abner Castellano Pineda's tap stand		7.5	

Table presenting the results of the bacteriological studies made in Boca de Poteca.

2. Sanitation

The project included the construction of **40 semi-elevated double ventilated improved pit latrines**. APLVN provided all the construction material to the beneficiaries and its technical team built two “model latrines” to teach the construction process to the community members. However, each family had to construct its own latrine, always with the technical supervision of APLVN’s technicians.

Thanks to its double ventilated improved pit, this model of latrines has **10 to 15 years of useful life** when well maintained.



Technical drawings of the latrines built.



Latrines in Boca de Poteca, before and after the project.

3. Local Empowerment

3.1. Strengthening of Water and Sanitation Committees' capacities

The **Potable Water and Sanitation Committee (CAPS)** has been established, trained and is fully operational. Upon project completion, all the training modules on the topics of Community Organization and Participation, and Administration, Operation and Maintenance of water systems had been implemented. The CAPS members are key actors of the project as they are the one responsible for the water system once the project is implemented.

3.1.1. Administration, Operation, and Maintenance of water systems

Committee members received **14 training workshops** on technical operation and maintenance of the water system. Both theory and practice were taught in the workshops, the practical aspects being emphasized during project implementation, which allowed the committee members and beneficiaries to learn more about their system. Training included pipe repair and replacement; understanding diameters and schedules of PVC pipes; installation of different kinds of valves; installation of a bypass in the storage tank; installation of meters and faucets. The objective of the CAPS training is to enable the community members to be able to solve any common issues that might come up with their water system.

3.1.2. Current Status of CAPS Organization

The CAPS of Boca de Poteca does not currently have an official legal status but the Municipality of Wiwilí Nueva Segovia is helping lead them in the legalization process. By law, all CAPS members are volunteers elected by the community and recognized by the local authorities. The CAPS only employs one worker for carrying out operation and maintenance as well as fee collection activities.

Boca de Poteca's CAPS is currently structured as follows:

Roles of CAPS members	Current elected members
Coordinator	Eliazar Onan López Vargas
Vice-Coordinator	Henry Abener Castellano
Secretary	Aracely Ortiz Centeno
Treasurer	José Noel López Vargas
Health leader	Moisés Sevilla Torres
Reforestation leader	Rodolfo de Jesús González
Operation and Maintenance leader	Pedro Isaac Moreno Raudales



Some members of Boca de Poteca's CAPS.

3.1.3. Community's Internal Regulation and Fee Collection

According to APLVN's policies regarding the self-sustainability of water supply projects, the community members of Boca de Poteca worked together to develop a set of internal regulations that was ratified during a General Assembly and includes among its principal functions:

- Establishing a monthly fee for the ongoing maintenance of the project. In the case of Boca de Poteca, the fee established was C\$ 40 (forty córdobas) per month, for an allocation of 13 m³ of water/month/family, corresponding to about 70 liters per person per day.
- Any family consuming more than 13 cubic meters of water will be charged **C\$ 10** for each additional cubic meter.
- Where there is business or industrial service, there will be a charge of **C\$ 20** for each additional cubic meter of water.
- Establishing the fee for a new residential connection. In the case of Boca de Poteca, that right will cost U\$ 250 (two hundred and fifty dollars) and the applicant will assume the cost of purchasing pipes, meter, accessories, faucets and other materials. It shall also comply with the technical specifications for design and performing trenching work and be subject to the provisions of the Internal Rules of Procedure of the project.

The CAPS members were trained on how to deal with the fee collection process and all the community was explained the rules and the monthly meter-device reading process in order to avoid any confusion.

3.1.4. Future Use of the Fee Collection Money

The money from the maintenance fund will be used exclusively for the water supply system (purchases of accessories, pipes, tools and equipment for cleaning the tank, brush, rubber boots, chlorine and other equipment). Financial compensation will also be given to the operation and maintenance leader who will perform the meter readings and collect the fees each month.

3.2. Promoting health and hygiene



This message on the wall of a community store was a result of an awareness campaign on garbage management: "Put garbage in its place".

Each and every family that uses the project's drinking water services was trained with regard to the correct use and maintenance of the drinking water and sanitation systems. The objective of those workshops was mainly to be able to reduce the incidence of water-borne diseases. The groups who were prioritized for strengthening this preventive network were the following: household heads (mostly women), children of school age, and members of the CAPS.

The dissemination of health and hygiene related information will continue to be carried out in the community through the community Health Commission. This group will coordinate the whole process of disseminating and implementing the Health and Hygiene Plan established in coordination with APLVN's team, with support from both CAPS' members and teachers.

3.3. Preserving the environment and the water resources

The sustainability of a water supply project is highly depending on the water quality and quantity available. Therefore, significant effort was made to raise consciousness among the community members of Boca de Poteca on environmental preservation and water resources management.

3.3.1. Protecting the spring and developing the micro-basin

To prevent large animals from entering the area of the spring, it has been protected with a perimeter fence made from barbed-wire and wooden posts.



Boca de Poteca's plant nursery.

Prior to the implementation of the project, the micro-watershed was used to plant basic grains (corn and beans), which is not from the perspective of water resource management practices. The APLVN team coordinate a change in land use, planting cacao and forest trees as part of an agroforestry system. This operation was carried out using organic technologies with the idea that the alternative income generated by the cacao crop could become an extra economic revenue for the CAPS, and could be invested in maintenance of the water system or agro-ecological initiatives to protect the micro-basin area.

3.3.2. Training for the community members

The local empowerment activity plan included a set of training workshops on environmental awareness and water resources management. These workshops were provided to 35 household heads. Also, a Youth Environmental Commission was created and specifically trained 22 youth and school students on land and water conservation practices. Finally, both CAPS' members and the families have been properly trained and have the suitable environmental awareness to look after and protect their water source in the area of the micro-basin identified as a fundamental element Boca de Poteca's spring conservation.

CONCLUSIONS

The project successfully fulfilled all of the initial objectives. As a result, the 38 families and two institutions in the community of Boca de Poteca, totaling 153 inhabitants, are now assured of having safe drinking water 24 hours a day. This represents a substantial improvement in the quality of life for the members of each family, especially for women and children, who will no longer have to travel or expend huge effort to retrieve drinking water. The project will also greatly reduce the incidence of water-borne diseases, especially parasitosis, and significantly improve the personal hygiene of all beneficiaries.

The evaluation process implemented at the end of the project resulted in the following observations:

- The project has helped the families of Boca de Poteca's community to acquire two fundamental human rights: access to water of sufficient quality and in sufficient quantity; and access to sanitation.
- Help has been provided to strengthen a shared understanding within the community with regard to water, sanitation and health, through the provision of both the principal basic service and the corresponding trainings.
- The project has served as a catalyst in the processes of training and health education with respect to water and sanitation.
- The project has laid the foundation for more in-depth work in promoting health and environmental education.
- Local authorities' resources have been put to use to meet the fundamental needs for water and sanitation.
- The CAPS is sufficiently trained in the correct use and maintenance of the water supply system to be able to solve any common problem that could come up.
- The project helped to raise awareness that water for human consumption is a common good which has a cost, and whose conservation involves collective duties and rights.

CHALLENGES AND LESSONS LEARNED

Even though the project was a 100% success, APLVN team had to face a few challenges during the implementation of the project:

- Due to the delay in finding funding for the project after producing the technical and feasibility studies, the population had very little faith in it at the outset. Some families felt discouraged and did not think the project would be implemented which was a difficulty at the beginning to get everyone's full commitment in the project activities.
- It is a poor region and families always work throughout the week in order to pay their bills. Some families' availability to take part in the training sessions was limited, which made it difficult for them to participate in the work groups. However, because of that situation, the beneficiary families' efforts to participate in the project, through both their labor and their contribution to the cost of their household connection is all the more laudable.
- Because of the extreme poverty of this community, a lot of families had trouble giving their contribution to provide food to APLVN technical experts, as the organization's internal policy stipulates. Fortunately, knowing the context of the community and the importance of that project to them, the Municipality of Wiwilí Nueva Segovia was kind enough to cooperate in that respect.
- Finally, as Boca de Poteca is located at the border between Honduras and Nicaragua, APLVN team had to witness once a gunfire exchange, but the security of APLVN technical experts was always ensured by the community members.

The lessons learned are that, even though it is always hard at first to get everyone's commitment to the project, when one reminds the organization's operational rules to the community members and when the team of experts also get their hands dirty, it is possible to reactivate people's motivation.

Also, even though people are conscious about their necessity to get access to clean water, sometimes they get caught in their daily life preoccupations and stop seeing it as a priority. It is then important to take the time to talk to them and make them see that it is a real opportunity to have people willing to fund such a life-changing project in their community. It is our responsibility to make sure everyone gets a chance at considerably improving their living conditions, so sometimes we need to be patient to gain people's trust and always try to keep them motivated.

PRACTICAL RECOMMENDATIONS

APLVN team gave a 12-page document to Boca de Poteca's CAPS in a list of key practical recommendations that could help them ensure the sustainability of their project. This document included some details regarding the following advices:

- Keep the regulations active, through committee meetings and community assemblies.
- Develop methods for communicating to the local authorities the importance of the sustainability of your drinking water system.
- Monitor the plans for promoting community and environmental health.
- Propose the legal recognition of the water system under its jurisdiction to the municipal authority.

APLVN will monitor the implementation of those practical recommendation during the **two follow-up visits** planned 6 months and one year after the project completion.

WORD OF THANKS



Proud children of Boca de Poteca posing next to the school's water station.

Agua Para La Vida Nicaragua would like to thank our Nicaraguan and international partners and friends; our donors, for believing in and supporting the hard work we implement with the rural communities of Nicaragua; the Executive Board of Agua Para La Vida, for their constant work and financial contributions; the Municipality of Wiwilí Nueva Segovia, for their economic and logistical support during the project implementation; the community members of Boca de Poteca, for their hospitality; and the APLVN team, without whom it would not have been possible to carry out this Water Supply and Sanitation Project for the community of Boca de Poteca, Municipality of Wiwilí Nueva Segovia, Nicaragua.