



Case Study:

Sustainable Solutions for Water Treatment in Tuchin, Colombia

Presented by:

EWTech

Supported by:





The Issue

Colombia faces significant challenges in terms of unequal access to clean water, water quality, health issues, and inadequate sanitation. 58.7% of Colombia's rural population lacks access to a reliable water source. In 2019, the report "State of Natural Resources and the Environment" from the Colombian Ministry of Environment and Sustainable Development stated that over 50% of surface water sources exhibited some level of contamination.

Impacts of climate change, including intermittent weather, increased run off of pollutants and sediment, natural disasters, and other impacts diminishing the quality of water are projected to increase the lack of access to potable water in Colombia and around the world.

Location: Tuchin Community, Tuchin, Cordoba, Colombia

Issue: The community lacks a source of clean drinking water. The only available water source is surface water from a lake or rainwater.

Population: 620 habitants (142 men, 193 women and 285 kids) in the community and 423 children (students at the school located within the community's territory who come from other communities each day)

Currently, residents are forced to obtain water directly from a nearby lake to meet their daily needs. However, this water source is not adequately treated or purified, posing a health risk to the residents. The lake water contains a variety of contaminants and harmful microorganisms that can lead to illnesses and affect the well-being of the community.

Safe drinking water, sanitation, and hygiene are crucial for human health and well-being. Safe water is not only a prerequisite for health but also contributes to livelihoods, school attendance, dignity, and helps build resilient communities that thrive in healthy environments. It's essential to implement measures to ensure access to safe drinking water in this community, thereby enhancing the quality of life and safeguarding the health of its residents.



620
habitants



423
children

Objective

The objective is to provide the community with access to pathogen-free drinking water and ensure a significant reduction in waterborne diseases. To achieve this, an affordable, self-sustaining, effective, and mobile solution will be implemented to purify water from a surface water source.

The goal is to create a mobile water treatment system capable of converting raw water into potable water. The system should offer the flexibility to be deployed in a community or any site that has experienced a natural disaster.

This will be accomplished by developing Electrochemically Activated (ECA) Technology for water purification. The ECA Technology involves generating a disinfectant (hypochlorous acid) for water treatment through an electrolysis process using only water, salt, and electricity. Hypochlorous acid is a 100% natural and highly effective disinfectant produced through the electrolysis process.

By implementing this solution, the aim is to efficiently eliminate microorganisms and contaminants present in the water, including bacteria, viruses, and protozoa, which can pose health risks to humans. Furthermore, the intention is to promote long-term sustainability by utilizing a technology that doesn't require harmful chemicals or generate hazardous waste. In summary, the objective is to implement ECA technology and hypochlorous acid as an efficient and safe solution for water purification, safeguarding the health and well-being of the community.

Key Activities



Water Quality Impact Analysis: Evaluate the impact of water quality on people's lives, considering its effects on health and community development.



Compact Water Purification System Design: Create a compact water purification system that utilizes water from a river or lake as its source. Ensure the system is mobile, easy to install in remote locations, self-sustainable, and powered by renewable energy sources.



Installation of Water Treatment System: Deploy the water treatment system in a community facing a shortage of clean drinking water.



Rigorous Testing and Analysis: Conduct thorough testing and rigorous analysis to assess the effectiveness of water treatment using ECA technology. Ensure the treatment meets the required quality and safety standards for human consumption.



Impact Analysis of Improved Water Quality: Evaluate the positive impact of enhanced water quality on people's lives, considering health improvements and community development.

These activities form a comprehensive plan to address the water quality issues in the community. They encompass understanding the existing challenges, designing and implementing a suitable solution, and conducting rigorous evaluations to ensure the solution's effectiveness and positive impact on the community's well-being.

Impact

The water treatment system has the capacity to treat 2000 to 4000 liters per day, providing treated water for an average of 1000 people per day. This has the potential to make a substantial positive impact on the community's access to clean and safe drinking water.

Scalability for the Future

With successful outcomes from the initial implementation, there is room for considering expanding the system's usage. Furthermore, the lessons learned from this project could serve as a model and catalyst for implementing similar solutions in other communities facing water purification challenges. By employing a strategic approach and collaborating with financial institutions and relevant organizations, ECA technology could be scaled up to make a significant impact on the supply of clean and safe drinking water on an international level.

The potential to scale the project not only addresses the immediate needs of the current community but also demonstrates the viability of the solution for wider adoption, fostering healthier and more sustainable living conditions for communities globally.



Municipal Water Treatment



Mobile Solution for Natural Disasters



Industrial Water Treatment

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About

EWTech & Partners



EWTech

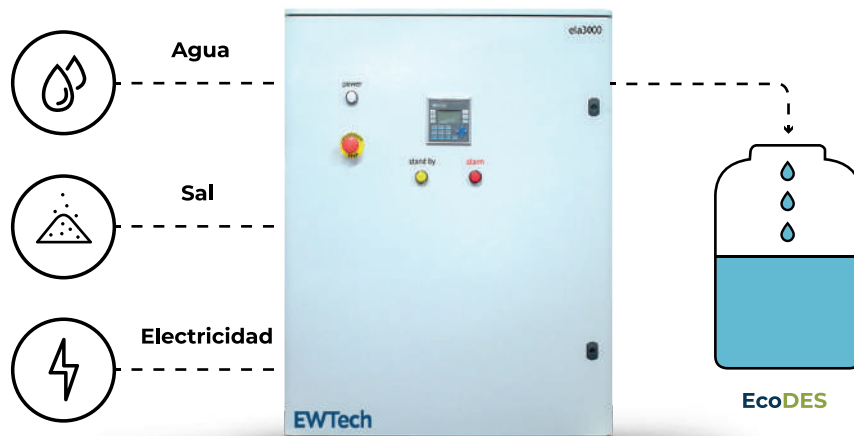
About EwTech www.ewtech.la

EwTech focuses on developing innovative technologies for water treatment, using ECA technology.

Electrochemically Advanced (ECA) technology is an innovative water purification method that utilizes electrolysis to generate natural disinfectants. Through this process, an aqueous solution containing chlorine ions and hypochlorous acid is created, which act as powerful disinfecting agents. These disinfectants effectively eliminate bacteria, viruses, fungi, and other harmful microorganisms present in the water, ensuring its safety for human consumption. ECA technology is highly efficient and environmentally friendly, as it doesn't require the use of harsh chemicals or generate toxic waste. Moreover, its application can be adapted to various scales, from small community systems to large water treatment plants.

In 2018, EwTech achieved a significant milestone by winning the 100+ Accelerator for the CIP system in Bavaria. This recognition highlighted the innovation and efficiency of the technology developed by EwTech in the field of automated cleaning and disinfection. Furthermore, the company has successfully applied its ECA technology in other sectors, such as agribusiness, providing effective and sustainable water treatment solutions in the agribusiness sector, ensuring quality, safety, and contributing to sustainable development.

Recently, EwTech has been selected to be part of the ASAP acceleration program, led by the Lightsmith Group, supported by the Global Environment Facility's Special Climate Change Fund, and endorsed by Conservation International. This program aims to support developing companies in scaling innovative solutions. As part of this initiative, EwTech will receive technical assistance to overcome key obstacles in the implementation of ECA Technology and efficiently purify water. With this project, the goal is to improve the quality of life for the Tuchin community by providing safe and reliable access to drinking water.



About Our Partners



Adaptation SME Accelerator Program

The Adaptation SME Accelerator Program (ASAP) (www.climateasap.org)

ASAP is a program dedicated to supporting small and medium-sized enterprises (SMEs) in facing the effects of climate change. It offers personalized assistance and resources to vulnerable SMEs in developing countries. ASAP focuses on building capacity, providing guidance, and facilitating access to financing, helping SMEs identify climate risks and implement resilience strategies. The project aims to integrate climate resilience into the business models of SMEs and promote sustainable practices. Through its targeted efforts, ASAP contributes to enhancing SMEs' adaptive capacity to climate challenges. ASAP is led by the Lightsmith Group, with funding from the Global Environment Facility's Special Climate Change Fund. ASAP is facilitated by Conservation International.



The Global Environment Facility (GEF) (www.thegef.org)

GEF is an international organization that provides financing for projects aimed at addressing global environmental challenges. Its focus is on supporting initiatives related to biodiversity conservation, climate change mitigation, sustainable natural resource management, and pollution reduction. Through collaborations with governments, civil society organizations, and the private sector, GEF promotes sustainable development and environmental protection. Its core work lies in facilitating international cooperation and promoting innovative solutions to global environmental issues.



Conservation International (CI) (www.conservation.org)

Conservation International (CI) is a global nonprofit organization committed to protecting nature and the diversity of life on the planet. It closely collaborates with governments, communities, and businesses to implement science-based conservation strategies. CI is dedicated to safeguarding ecosystems, promoting sustainable practices, and empowering local communities. Its mission is to ensure a prosperous and balanced future for generations to come. Learn more about Conservation International by visiting their website at www.conservation.org.

Climate Change - A Risk for the Tuchin Community





Climate Change - A Catalyst for the Potable Water Issue in the Tuchin Community

The vulnerability of the population to the effects of climate change is evident in the intrinsic relationship between their water supply and climatic variability. The only available water source for this community is a nearby lake. The prevailing climatic dynamics directly impact the availability of water for human consumption. Climate fluctuations, characterized by shifts in temperature and precipitation patterns, set off a domino effect that reverberates through the water supply the population depends on.

In response to this climatic variability, the population faces the pressing need to store water to ensure access during times of scarcity. With limited resources, individuals resort to any available container within their reach. Periods of drought intensify this need, as water scarcity deepens and families are compelled to use any available vessel to collect and conserve the precious resource. However, this untreated water storage comes with an unintended consequence: resource contamination.

The untreated storage of water carries a latent risk of contamination that affects both water quality and public health. The lack of effective treatment exposes consumers to pathogenic microorganisms and chemical compounds that potentially compromise water safety. In this context, instances of waterborne diseases, with diarrhea taking center stage, experience a pronounced increase during drought periods. The link between untreated stored water and a high incidence of illnesses is a phenomenon borne out in statistics, underscoring the need for comprehensive strategies to address the challenges that climate change imposes on water and public health.

The Tuchin Community is a rural population located in the Municipality of Tuchin, Cordoba, Colombia. Known for their distinctive turned-up hats, they have become a Colombian national symbol.

The municipality has a population of 620 habitants and over 400 school children. The lack of access to safe drinking water has had devastating consequences. Currently, the community suffers from diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid fever, and poliomyelitis due to the consumption of untreated water.

The implementation of a water purification system in Tuchin is crucial to ensure the well-being and quality of life for its residents. It's a fundamental step to address this situation and promote a healthy environment within the community.



The scarcity of water for children at school



Home water storage



Challenges for the Implementation of **Potable Water**



Challenges for the Implementation of Potable Water

Addressing key obstacles in water purification.

EwTech has developed a container equipped with all the necessary components for the water purification process. This innovative system, named STP 1, features a hypochlorous acid generator activated by solar panels. This solution efficiently addresses the need for potable water.

The container includes tanks for storing raw and treated water, advanced filtration systems, and water pumps. With the hypochlorous acid generator, water is disinfected and purified effectively, eliminating pathogens and ensuring a safe supply for human consumption.

This innovative approach aims to promote the availability of potable water in communities lacking access to conventional purification systems. Furthermore, by utilizing solar panels to power the generator, the goal is to reduce reliance on traditional energy sources and encourage more sustainable practices.

The STP 1 system can be installed in remote locations without access to a conventional water supply system, as well as in areas affected by natural disasters.



KEY Activities



Executed Activities

Key activities carried out during the project:



1. Designing a Water Treatment System:

- **Effective** - delivers safe water from an external source: a river, a lake.
- **Self-sustaining** - feeds from a solar energy source.
- **Mobile** - compact container-type water treatment for easy mobility.
- **Natural calamities** - suitable for water treatment in case of natural calamities.



2. System Effectiveness Testing:

To validate the system's efficacy, tests were conducted using wastewater from the city of Bogotá. A contract was formalized with an accredited laboratory for comprehensive water sample analysis before and after treatment implementation.

Over the course of one month, a series of tests were conducted with various batches of water, closely monitoring the results obtained in the process.



3. Stakeholder Engagement:

Developed a collaborative work plan with the community for project execution. Collaborated with two Colombian universities to support the research and development process:

- National University of Colombia
- University of Antioquia



4. Training and Implementation

Provided training to 7 individuals on the operation and use of the technology.

These activities represent the foundation of the project's progress and implementation, including system design, testing, community engagement, and capacity building.



Ejecutado por:

EWTech

Apoyador por:



NEXT STEPS



The Path Forward

Thanks to the support from ASAP, EwTech has been able to develop a sustainable solution for providing potable water to the residents of Tuchin. This strategic investment has enabled a successful and efficient implementation of ECA technology, thereby granting the ability to offer safe drinking water access to the community. The backing and collaboration of ASAP have been instrumental in realizing this crucial initiative, significantly enhancing the quality of life for the population through water purification.

Following the implementation of ECA technology in Tuchin for water purification, the following steps outline the path forward:

1 Monitoring and Evaluation:

Continuously monitor the results and effectiveness of ECA technology in water purification. This involves measuring water quality before and after treatment, as well as evaluating the acceptance and satisfaction of Tuchin's residents regarding the purified water.

2 Maintenance and Training:

Establish a regular maintenance program to ensure the proper functioning of ECA technology's equipment and systems. Additionally, provide ongoing training to those responsible for maintaining and operating the technology to ensure proper handling and troubleshooting.

3 Education and Promotion:

Conduct education and awareness campaigns about the importance of consuming potable water and the benefits of ECA technology. Promote good hygiene practices and responsible water usage among the residents of Tuchin.

4 Monitoring and Feedback:

Maintain continuous communication with the community and gather their feedback and suggestions about the water purification system. Utilize this feedback to make adjustments and improvements to the technology and how potable water services are provided.

Key Outputs



Key Outputs

1. We achieved access to drinking water for the 400 students in the community and for the people.



2. Reduction of waterborne diseases: With safe drinking water, a significant decrease in waterborne diseases is expected.



3. Improvement in the quality of life: The availability of reliable and safe drinking water will improve the quality of life of the inhabitants of Tuchín by providing them with a source of clean water to drink, cook and carry out daily activities.

4. We managed to design and build a mobile and self-sustaining system to treat water.



5. Long-term sustainability: ECA technology can be a long-term sustainable solution for the purification of water in Tuchín. By using solar panels and without chemicals, the dependence on external resources can be reduced and the continuous availability of potable water can be guaranteed.



6. Raising awareness about the importance of safe drinking water: The implementation of ECA technology can also increase awareness and education about the importance of safe drinking water in the Tuchín community, which could lead to improved hygiene and sanitation practices.

These key results will contribute to the overall well-being of the Tuchín community and lay the foundation for a healthier and more prosperous future.

Annexes



Annexes



Hypochlorous Acid Generator - 100% Natural Disinfectant



Filtration System and Solar Energy System

Annexes



STP 1 - Assembly Site



The Children of the Community

Annexes



Annexes



For project-related inquiries and collaboration opportunities, please contact us at the following email:

info@ewtech.co

website: www.ewtech.la

