



2021 Annual Report

Meeting the Challenge



TABLE OF CONTENTS

- 02 Letter from the Director
- 03 Our Water Crisis
- 05 2021 Highlights
- 07 Expanding Clean Water Access
- 09 Community Spotlight: Salitrillo
 - 11 Technical Innovation
- 13 Community Spotlight: Los Ricos
- 15 The Last 10 Years
- 17 Financials
- 19 Our Partners
- 20 Our Team





Mission

To improve human health and community well-being through adequate and affordable access to clean water.

Dear Friends of Caminos de Agua,

While the need for our work was greater than ever in 2021, so were the challenges. As we entered the second year of the COVID-19 pandemic, rural communities in Guanajuato were hit harder than ever before. Reports of cases, along with hospitalizations and deaths, started rising dramatically in rural villages during the early weeks of 2021, forcing us to shut down all community work to limit exposure of our staff as well as the communities where we work. In early March, we regrouped and called a summit with our grassroots organizational partners, who represent dozens of rural communities, to figure out how to move forward. The response was unified and deafening, COVID or not, *"communities need clean water – now more than ever."* So, we got back to work.

The second year of the pandemic also marked the first full year of our most ambitious project to date: **Agua y Salud** ("Water & Health"), a multi-year project developed in partnership with long-time collaborators INANA, A.C. and local grassroots organizations CUVAPAS, SECOPA, and the San Cayetano Community Center. Through this project, **we worked in 31 communities and built 169 large-scale Rainwater Harvesting Systems, representing nearly 2 million liters of clean water storage – nearly tripling the amount of water access we created in 2020.** Learn more about the scope of this project on page 7.

After nearly six years in development, our first **Groundwater Treatment System (GTS)** (pg. 11) went online in 2021 as well, providing clean water access all year long to a local community. This pioneering solution, developed in-house by the Caminos Tech Team, **removes arsenic and fluoride from contaminated wells at the community scale – the first of its kind in the world.**

This year we also received some important recognition for our work. Caminos de Agua was **accepted into the Ashoka Fellowship Network of Social Entrepreneurs** – a highly-respected community of humanitarian and development leaders from around the world, and we were named as one of four **National Finalists for the UBS Visionaris Award.**

Take a look at the short video UBS produced for us by visiting our website or by [clicking here](#).



We are extremely grateful to the Gonzalo Río Arronte Foundation, the major funder of our Agua y Salud Project, whose contribution helped us leverage new institutional support, allowing us to greatly expand our reach in 2022 (learn more on pg. 7). Most of all, we are incredibly grateful for, and humbled by, the contributions of our hundreds of individual supporters who made up more than half of our operating budget in 2021. We can't do it without you!

I am continuously astounded by the talent, passion, and tireless dedication of the Caminos' staff, board, and volunteers. Thank you all for making this world a better place for so many. We also can't do any of this work alone. So, on behalf of our entire Caminos' team, we sincerely want to thank our growing network of both individual and institutional supporters, academic and organizational collaborators, and our grassroots and community partners, all of whom have continued to come together this year to make this critically-needed work a reality. As we move into 2022, we are as committed as ever to expand our ability to implement solutions, always more efficiently, with dignity and in partnership with those most impacted by the severe water quality and scarcity challenges plaguing our region and well beyond.

Saludos,
Dylan Terrell

The Scope of Our Water Crisis

The Upper Río Laja Watershed stretches across seven municipalities in northern Guanajuato State in Central Mexico and is a microcosm example that illustrates many of the extremely complex water quality and scarcity challenges facing Mexico, as well as many other parts of the world, today. Almost all of the water consumed in this region comes from a large underground reservoir known as the Upper Río Laja Aquifer, which serves more than 680,000 residents across several thousand distinct communities, rural and urban alike.

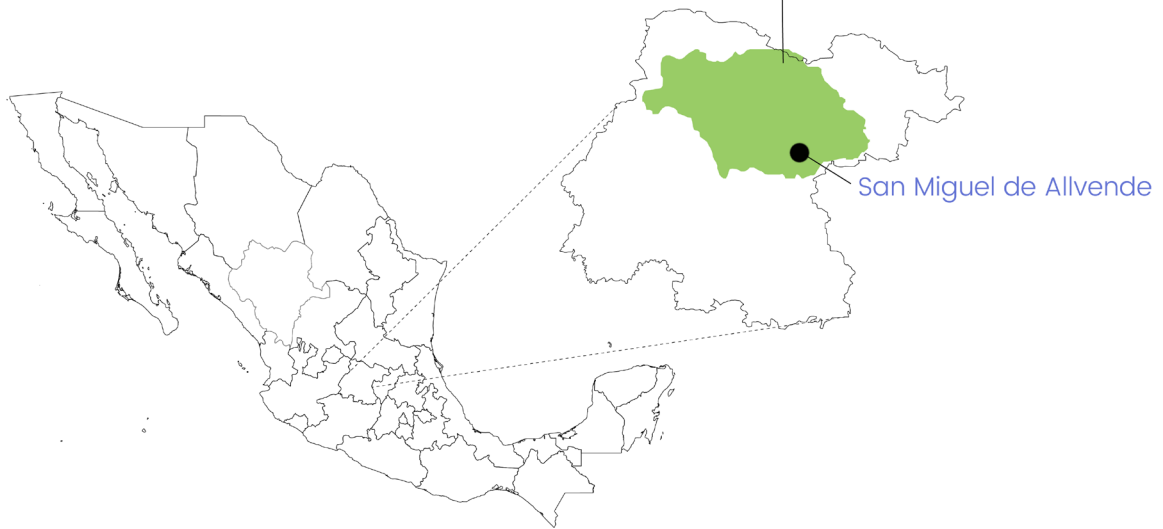
Our aquifer is declining at an alarming rate, from 2–3 meters per year – **some of the most overexploited groundwater in the world.** The primary culprit is industrial-scale agriculture, which uses close to 85% of our water supply to grow produce for export to the U.S. and other foreign markets. As a result, community wells are drilled hundreds of meters deep to reach the water table. Every year, more community wells dry up and, in some cases, literally collapse in on themselves. We have seen first hand how an entire rural community's water supply can go dry overnight, leaving hundreds of families without any water access.

Further complicating the issue, the water that does remain is often **contaminated with arsenic and fluoride** – up to **23 times the World Health Organization recommendation for arsenic and more than 12 times the recommendation for fluoride.** These extremely hard-to-remove contaminants are closely linked to dental fluorosis, crippling skeletal fluorosis, chronic kidney disease, cognitive development and learning disabilities in children, skin disease, and even various cancers. Entire generations are being plagued with the negative impacts of arsenic and fluoride in their drinking water, and, worst of all, the most acutely impacted are children as their bodies absorb these contaminants at a much higher rate.

This is a serious public health crisis for our region and beyond. Roughly, **2.2 billion people – or more than a quarter of the entire global population – lack access to clean water.** Upwards of **300 million people, with an estimated 21 million in Mexico alone, suffer from excessive levels of arsenic and fluoride in their water supplies,** with few appropriate solutions available to remove these problematic contaminants. The accompanying social and economic impacts of this crisis are almost impossible to overstate. Innovative, low-cost solutions are desperately needed to address both the social needs of at risk communities who are disproportionately affected by these modern water issues, as well as the increasingly complex technical water challenges we are now facing in the 21st century.

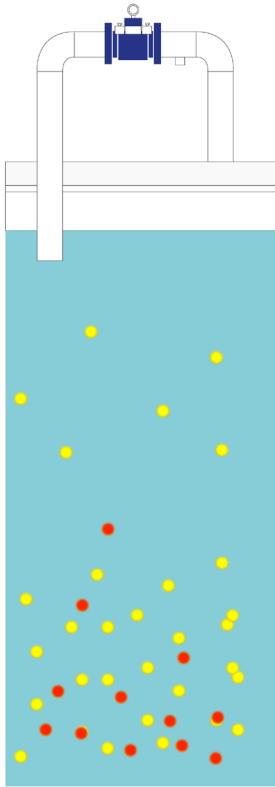
Guanajuato State

Upper Rio Laja Watershed



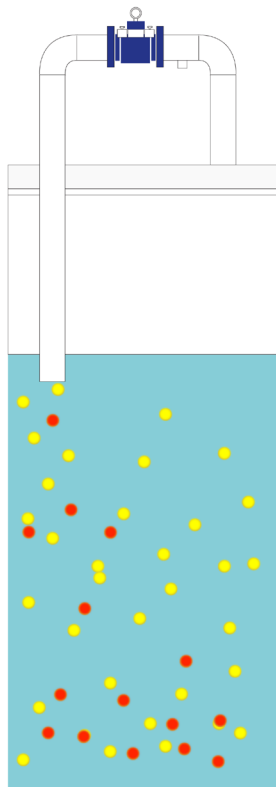
1960's

400-700 wells



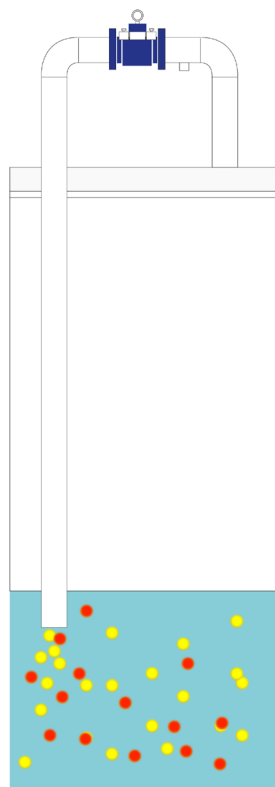
1990's

1800-2500 wells



2021

+3500 wells



WATERSHED AREA
6,840 km²



SUPPLIES WATER TO
+680,000
RESIDENTS



85%
OF THE WATER IS USED
FOR AGRICULTURE



DEPLETING
2-3 meters
(~6-7 feet)
PER YEAR

● Arsenic

● Fluoride

Note: arsenic and fluoride are invisible in the water.
Colors are for visual representation only.

2021 HIGHLIGHTS



WATER MONITORING
Identifying the problems



EDUCATION
Expanding Knowledge & Awareness



COMMUNITY IMPLEMENTATION
Creating Access to Clean Water

66 Communities received critical information on their water quality, across 20 well sites, through our new **Educational Water Monitoring Program**

Know Your Water
Expanded our private monitoring program to extend our knowledge base and help finance free monitoring for rural communities

Water Accessibility Index
A new tool designed & piloted to **monitor water access** across communities

6 **Water Learning Community** sessions – brought together dozens of community members, across 4 municipalities, to help build a new generation of community leaders

50+ **Educational Workshops** implemented throughout our region

8 **Week-long technical trainings** held to build the capacity of local communities and replicate solutions

New **Urban Water Initiative** launched to raise awareness of the growing water problems, and solutions, in the city

2 Million **Liters of new clean water storage** created (>500,000 gallons)

169 New large-scale **rainwater harvesting systems** built – nearly tripling our impact from 2020

30 **Dry toilets** brought online to better conserve limited water resources – a new technology for Caminos in 2021

32,000+ **Volunteer hours** provided by local community members to implement water solutions this year



GTS

Our first Groundwater Treatment System (GTS), which **removes arsenic and fluoride at the community scale**, went online, operated by a local community

Aguadapt

Improved the design and production of our award-winning water filter, ready for relaunch in 2022, to **provide clean water access to thousands**

Arsenic Quantification

Collaborated with researchers from the University of Liverpool and Imperial College of London to develop an accessible and accurate method for detecting arsenic in water supplies

31

Partner communities working simultaneously throughout the year

30

Institutional and organizational partnerships – collaborated for a broader impact, including foundations (11), municipal governments (2), corporations (1), NGOs & networks (12), and grassroots organizations (4)

16

University & academic collaborators – worked together to develop accessible technologies

1

Book officially published together with the INCA network and the UNAM, mapping the impacts of arsenic & fluoride contamination throughout the country

2 million liters of clean water storage!

31 communities leveraging our systems!

47 academic, organizational, and other institutional partnerships

All of this in one year!

Expanding Clean Water Access

Multiplying our impact through collaboration

This year, the phrase “**Agua y Salud**” (“Water & Health” in English) – the name of our largest, most far-reaching community project to date – has become synonymous with our community education and implementation work in general. Primarily funded by the largest grant in our history – MXN \$7.6 million pesos over three years, awarded by the **Gonzalo Río Arronte Foundation** – this project involves a colossal education initiative, water monitoring, capacity-building for community leaders, and the construction and implementation of large-scale rainwater harvesting systems, water filters, and composting toilets in dozens of different rural communities across four municipalities in our region. The municipal government of San Miguel de Allende has promised an additional \$1 million pesos to the project, and our network of grassroots organizations, NGOs, and the local communities themselves are providing more than \$6 million pesos in in-kind and cash support.

In this first full year of the *Agua y Salud* project, we worked directly with **31 rural communities** providing more than **50 educational workshops** – which included **8 week-long, intensive technical trainings**. We also **constructed 30 composting toilets, installed hundreds of water filters, and built 169 large-scale rainwater harvesting systems – by far the most in a single year in our history.**

Through *Agua y Salud*, we also launched our “**Water Learning Community**” – a comprehensive training and capacity-building program for emerging community leaders and grassroots organizations. Every three months up to 60 community members, from upwards of 30 different communities throughout our watershed, gather to learn about regional and global water issues as well as how to develop the tools to help create a new generation of community leaders. The skills learned will help leaders and organizers be effective in any number of challenges that these communities face – beginning with, but not limited to, water.

Agua y Salud helped us reinvent how we do water monitoring as well. This year, we developed a new educational water monitoring program, which actively involves community members themselves in the process. We carried out these educational monitoring sessions at 20 different community wells – which provide water to a total 66 different rural communities.

Utilizing the scale of this massive collaborative effort, we leveraged additional support by the end of 2021 from Rotoplas, the Alstom Foundation, and the Municipal Government of San Diego de la Unión. Together, they have promised to provide nearly \$5 million pesos in additional funding, allowing us to expand the scope and impact to more than 40 rural communities and build upwards of 500 rainwater harvesting systems by the end of 2022 through this project.

We simply cannot do this work alone. We are grateful to our grassroots **organizational collaborators CUVAPAS, SECOPA, and the San Cayetano Community Center**, who provide endless hours organizing, educating, and working with local communities, and, of course, to **INANA, A.C.** who is the fiscal and legal representative of the project as well as the coordinator for the Water Learning Community program.





Community Spotlight | Salitrillo

From beneficiaries to facilitators – concerned mothers change the reality of their community

Located just 20 minutes from downtown San Miguel de Allende, on the banks of the Allende Reservoir, is the small rural community of Salitrillo. Despite being located close to such a large body of water, Salitrillo does not have consistent water access and also suffers from excessive levels of arsenic and fluoride contamination in its water supply.

In 2020, concerned about the health of their children, a group of mothers from Salitrillo began organizing and, together with Caminos de Agua, constructed the first massive 20,000-liter capacity rainwater system in the community's elementary school. That first system was the catalyst for this core group to expand clean water access throughout their community. After its completion, the mothers began an extensive process of organizing and took the educational work into their own hands. With support and materials from Caminos, they started providing technical and educational workshops to other concerned families in their community in order to both understand and ultimately mitigate the impacts of our water crisis on their children, families, and neighbors.

As the community organization grew, together, we began building rainwater systems in individual households to assure that clean water access was not limited only to the school. In 2021, we were able to bring in key Caminos' stakeholders, like Planet Buyback, who provided the funds to build an additional 15 rainwater harvesting systems in community homes in Salitrillo. But the mothers knew that was only the start.



Photo: María de Jesús, from Salitrillo, posing next to a rainwater system in progress.

“Once we built our own rainwater systems, we couldn’t stop there. We had to reach others from our community. We needed to keep on working, not just for us but for all of our neighbors as well.”

María de Jesús, Community of Salitrillo

As a result of this “train the trainer” effort, this group of committed mothers – transformed into community leaders – have motivated dozens of families to become organized and take action. The story doesn’t stop here. Moving into 2022, we will be partnering with Rotoplas to expand clean water access to dozens of more families in Salitrillo.

Scaling Impact through Technical Innovation

Our Groundwater Treatment System Becomes a Reality

This was truly a landmark year for our Technology Development Team who, together with our Community Outreach Team, took our **Groundwater Treatment System (GTS)** out of the lab and into the real world for the first time. This innovative solution is the first of its kind and is now supplying the local community of Los Ricos de Arriba (Los Ricos) with a continuous source of clean drinking water.

Arsenic and fluoride, which pollute our regional water supplies, are odorless, colorless, and completely dissolved in water. They are also extremely difficult to remove. There are simply no low-cost, commercially-available methods to deal with these contaminants that are appropriate for those most at risk. In response, Caminos has focused on installing rainwater harvesting systems (rainwater is naturally free of arsenic and fluoride) over the years, in partnership with local communities, to create a reliable source of safe, healthy drinking water. Rainwater systems are a substantial help for those fortunate enough to receive them, but the need far outpaces our ability to install enough of them. Given our semi-arid environment, rainwater systems need to be sized extremely large to capture and store enough water to last the 8-month dry season. This means that each system, for 1-3 families, has a high upfront material cost and takes upwards of 200 hours to build.

Recognizing the need for a low-cost, environmentally-sustainable solution, that would serve more people substantially faster, Caminos de Agua got to work researching and designing a system to effectively treat groundwater for arsenic and fluoride on a community scale.

After six years of intensive research and development, Caminos has brought our first community-scale Groundwater Treatment System online. The system has been producing safe and healthy drinking water, with a focus on removing arsenic and fluoride, for the community of Los Ricos all year long. Our in-house staff engineers and more than 20 engineering volunteers and Technical Fellows helped bring GTS to fruition over the years – spending thousands of hours building and testing experimental prototypes in our lab as well as developing and producing our own filtration media to remove fluoride, which we produce on-site at our Field Center in San Miguel de Allende.

The full-scale GTS is easy to build and operate and, this first model in Los Ricos, **can provide water to more than 20 families at about the same initial cost in materials as installing one rainwater harvesting system that serves just 1-3 families.** Caminos is getting GTS ready to be scaled to communities of hundreds of families in the coming years, making substantial impacts not only in our region but also in other parts of the country facing similar water quality challenges.





Community Spotlight | Los Ricos

The Women Managing a Groundbreaking New Water Solution

The families in the upper part of Los Ricos receive water that is pumped from a far away well. The water arrives infrequently and at unpredictable times. Worse, the water that comes from the well is contaminated with arsenic and fluoride.

One resident, Doña Isabel, who is in her 30's and has young children, has had to stop working because the pain she suffers from in her bones (likely due to skeletal fluorosis) is too severe for her to walk to the bus stop any longer. She is an eager participant in the Caminos GTS project because she says she doesn't want her two-year-old daughter to suffer the same fate. Another mother reports that her young child is already experiencing irreversible dental decay, which the dentist attributes to the water. Regularly purchasing bottled water or having potable water trucked is simply not an option for these families either, as they simply can't afford it.

Our first GTS in Los Ricos has been live for over a year now, providing clean drinking water to nearly 20 families in Los Ricos, with more families seeking to join in often. After participating in an on-going series of workshops and technical trainings, a subgroup of the women in Los Ricos have learned to maintain the system and take regular water samples. The GTS is now administered directly by these local community leaders, like María del Rosario.

The model built together with the women of Los Ricos will help us figure out how to take GTS to the next level by scaling the system and replicating it in far larger communities throughout our watershed, allowing us to impact more people much more efficiently and inexpensively than ever before.

"We had many years without safe drinking water. And, while taking care of the [Groundwater Treatment System] is hard work, it's changed the reality for my family and my community."

María del Rosario, Community of Los Ricos



Photo: "María del Rosario, a member of the GTS management committee in Los Ricos, standing outside her home with her daughter."



YEARS OF MEETING THE CHALLENGE

Next year, Caminos de Agua will officially celebrate its 10 year anniversary! Take a look back at a few highlights on what we've accomplished so far.

2011

The seeds are planted: First workshops on sustainable construction lead to the building of the main structure at what will eventually become the Caminos' Field Center

2012

CATIS-Mexico, the precursor to Caminos, officially becomes incorporated as a nonprofit organization, and our Water Quality Monitoring (WQM) Program launches

2013

WQM Program supports CODECIN – a coalition of communities and organizations working together to present a human rights case in front of the Permanent Peoples' Tribunal

2014

The first pilot of our Ceramic Water Filters is successfully completed with dozens of families in two local communities

2015

CATIS-Mexico changes its name to Caminos de Agua, and our Rainwater Harvesting Program takes off – impacting close to 90 communities to date

2016

The Caminos' 'Tech Team' is formed – dozens of volunteers, Technical Fellows, and staff engineers invest 10s of thousands of hours pioneering innovations to global water challenges



2017

Our open-source Water Quality Map goes online, with hundreds (now thousands) of data points, giving people free and easy access to their water quality information

2018

New educational programs created for community high schools, leading to the development of an adaptable 7-module educational program

2019

Aguadapt, the new iteration of the Ceramic Water Filter, wins the Innovation Showcase (ISHOW) Award from the American Society of Mechanical Engineers (ASME) in Washington, D.C.

2020

Our most important project to date, 'Agua y Salud,' is officially approved by the Gonzalo Río Arrente Foundation and launches by the end of the year, allowing us to substantially scale our impact



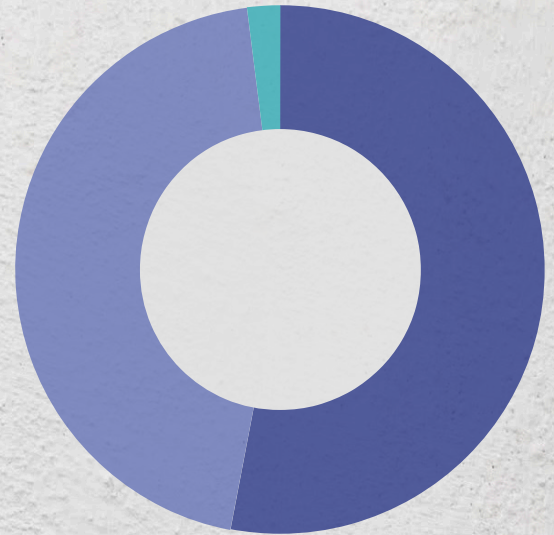
2021

Camino de Agua's staff, board, and volunteers continue expanding the reach of our work in the Upper Río Laja Watershed and beyond

IN 2021, WE RAISED USD \$382,257

Total consolidated revenue in past fiscal year

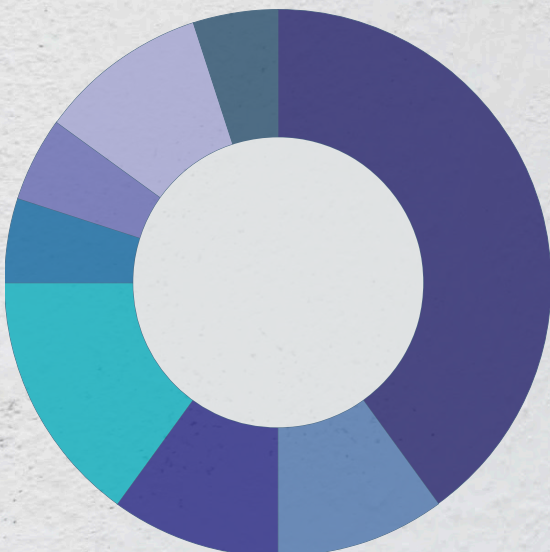
- Institutional support [54%]
- Individual contributions [43%]
- Products & services [3%]



IN 2021, WE INVESTED USD \$326,628

Total expenses in the past fiscal year

- Rainwater harvesting [39%]
- Research & development [18%]
- Education [15%]
- General operations [11%]
- Aguadapt [7%]
- Sanitation [4%]
- Water monitoring & testing [4%]
- Advocacy [2%]





OUR PARTNERS

Institutional



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FUNDACIÓN



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San Diego de la
Unión



Unitarian Universalist Fellowship
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ALSTOM
FOUNDATION



The Community
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Miguel de Allende



GlobalGiving



giz Deutsche Gesellschaft
für Internationale
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PLANET
BUYBACK



TODOS
JUNTOS
SAN MIGUEL DE LA GENTE

Imperial College
London



UNIVERSITY OF
LIVERPOOL



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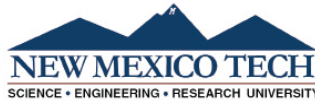
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Community
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The San
Cayetano
Community
Center



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Tierra I.A.P.



FUNDACIÓN
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AGUA
VIDA SMA



CONCERN
AMERICA
AN INTERNATIONAL DEVELOPMENT
AND REFUGEE AID ORGANIZATION



Casita Linda



Gaia



Comunidad de la Cuenca de la Independencia



Isla Urbana



SALVEMOS AL
RÍO LAJA A.C.



Vía
Orgánica



Educación Colaborativa



TOSMA

Academic

NGOs, Grassroots & Community Organizations

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Along with our institutional supporters, Camino de Agua is truly grateful to our **389 individual contributors** in 2021 who make our work possible, including our major givers this year:

Pat & George Terrell
Chip & Lucy Swab
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Steven & Margery Honig
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