Caminos de Agua- Technical groundwater treatment Volunteer job description

Information about the Charity:

Founded in 2012, Caminos de Agua's mission is to improve human health and community well-being through adequate and affordable access to clean water, in response to the decline of water level and quality of the Alto Río Laja Aquifer, in northern Guanajuato State, Central Mexico.

The organization works in partnership with local communities, grassroots organizations, government (municipal, state, and federal), international NGOs, and leading research institutions to provide open-source water solutions for over 680,000 residents, in the watershed and beyond. Caminos de Agua also trains aspiring, socially responsible engineers, scientists, and other young professionals looking to make social and environmental impacts in their work. The activities of the organization are sub-divided in several projects, including:

- the production and distribution of certified ceramic water filters, created by Caminos de Agua to eliminate water-borne pathogens,
- community-based installations of rainwater harvesting systems,
- water quality monitoring at well sites throughout the Alto Río Laja Watershed,
- research and development of specifically engineered solutions for the removal of arsenic and fluoride from drinking water,
- grassroots community development, education, and training regarding regional water quality issues and solutions,
- national water politics, and public policy work at the municipal, state, and federal levels.

Caminos de Agua has an extensive history of working with foreign volunteers, including three SAFAD volunteers and four Cranfield MSc students on thesis placements. See www.caminosdeagua.org for more information about the charity.

Information about the project:

Groundwater in the Alto Río Laja Watershed is becoming increasingly contaminated with toxic elements such as Arsenic and Fluoride, which have severe health consequences. Complementing other activities (such as community rainwater harvesting), Caminos de Agua has developed a low-cost, easily replicable, community-scale groundwater treatment system (GTS) to remove these contaminants. After years of collaborating with various academic and community partners, we have built our first two systems, which are operated by community members under Caminos' supervision and can providing drinking water to up to 130 families.

We are actively working toward implementing more systems, in different communities, with the objective to have 10 installed by 2027. Beyond implementation, we are also working toward systematisation of those systems as a large-scale solution, to create processes and an ecosystem that would support their wide-spread acceptance

A dedicated team, composed of social promoters and technicians, has been put together to support this ambition. The project will be based between our office in San Miguel de Allende, and rural communities where those systems are implemented. These communities are typically 30-60min away from Caminos' offices.

Specific volunteer tasks

The volunteer will be integrated to Caminos' Groundwater treatment team. The volunteer will be a key person moving forward the implementation and optimization of our groundwater treatment systems. Technical guidance will be provided when relevant. The responsibilities of the fellow might include (but will not be limited to):

- Participate in the consensus building and group organisation processes within the community, which will take place before (and during) the implementation
- Design and construction of the system
- Participating in laboratory-based work to further optimise the processes used
- Performing basic laboratory analysis in-house
- Coordination with external laboratories
- Analysis of water quality results
- Monitor the performance of the system, and make sure it complies with the relevant Mexican norms
- Provide technical trainings to the operators of the plant and community volunteers/assistants
- Documentation and creation of schematics
- Help review the organisation's implementation strategy based on the experience acquired during the project

Depending on the progress made on the project, and on the interest/skills of the volunteer, other projects can be considered during the stay of the volunteer.

Skills required:

- Bachelor's (or superior) in science or engineering (preference to individuals with a water background)
- Fluent in either English or Spanish with working proficiency of the other

- Dedication to technology development for social justice
- Experimental design and basic statistical data analysis
- Able to take an abstract task and work independently
- Demonstrated problem solving skills

Additional Preferred Qualifications:

- Experience working in the field with rural communities
- Experience with manual work (construction/plumbing)
- Experience working in a laboratory setting
- Comprehensive understanding of chemistry
- Knowledge of and/or experience designing gravity-driven water treatment systems
- Experience developing and/or working with novel sorbents for water treatment
- Proficiency in 3D modelling and/or CAD design, Fusion360.

The volunteer should be available from September or October 2024 and should be with Caminos de Agua for a minimum of 6 months. Ideally, a volunteer would commit to a one-year stay. Depending on the progress made on the project, and on the interest/skills of the volunteer, other projects can be considered during the stay of the volunteer.

Meeting the expectations of our volunteer is of great importance to us. We are open to discussing the scope of the projects with the incoming volunteers to match interests.