Wells and Hand Pumps for Indigenous Communities of the Bolivian Altiplano

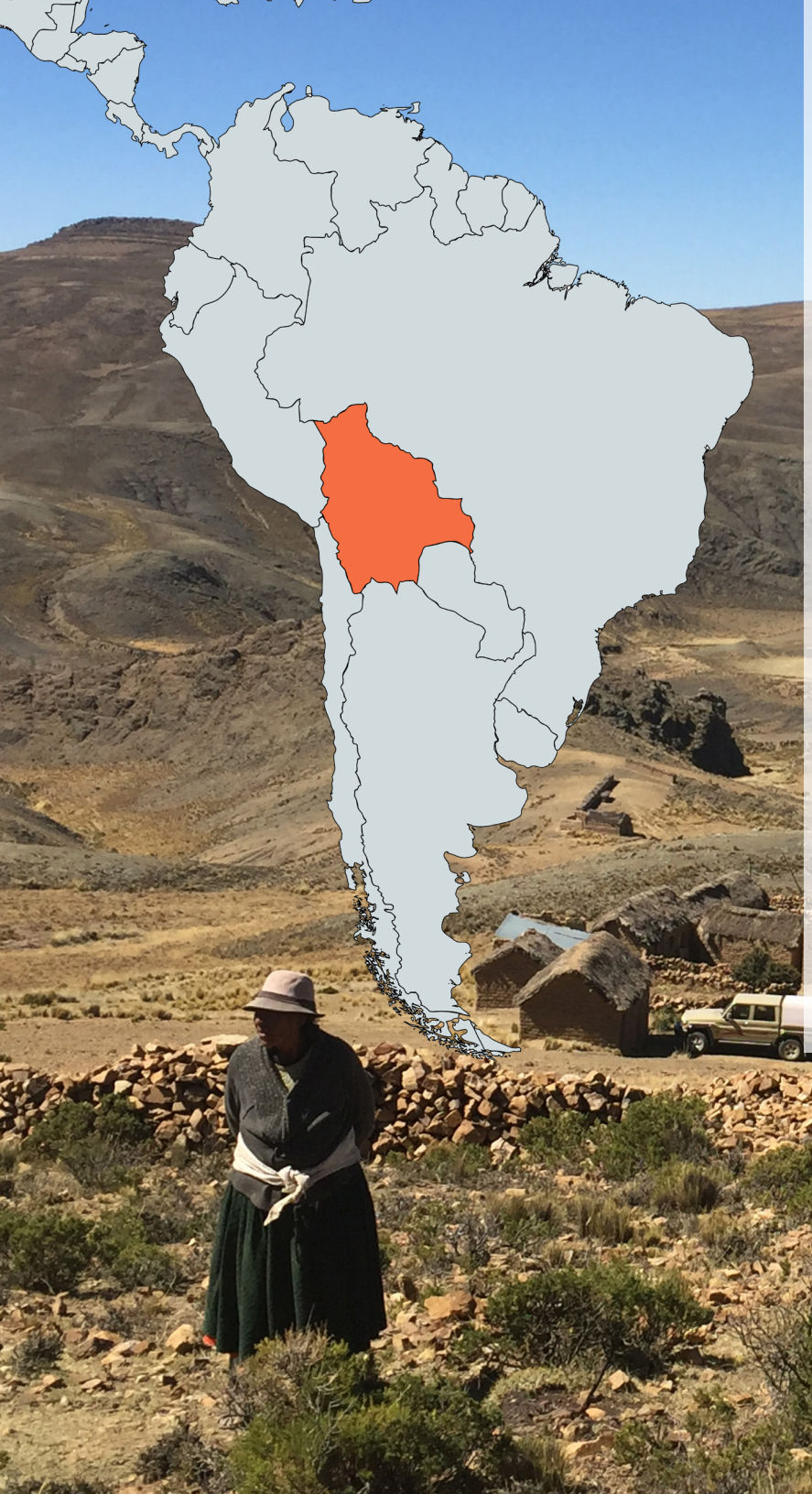
WATER ENGINEERS FOR THE AMERICAS & Africa
WEFTA

SUMA JAYMA
BRINGING CLEAN WATER TO THE PEOPLE OF BOLIVIA
LLEVANDO AGUA LIMPIA A LA GENTE DE BOLIVIA

Wheaton Franciscan Sisters Ministry Fund

Waterlines

THE PITTSBURGH FOUNDATION | 75 YEARS



Bolivia is regarded as the poorest country in South America. According to the United Nations, it has the largest proportion (62%) of indigenous people in South America, many of whom do not have access to safe drinking water sources.

According to the World Bank, 64% of the indigenous population live below the poverty line and nearly 50% of its non-indigenous population live in poverty.

In recent years, Bolivians have suffered the effects of climate change and extreme weather events with severe drought in some areas and torrential rains and flooding in others. The retreat of glaciers is diminishing freshwater resources for indigenous communities living in the Andean high plains. These cycles of flood and drought cause food and water shortage problems for those most at risk – the poor.

Capital: La Paz

Area: 1,098,581 sq. km.

Population: 11,639,909 (July 2020)

Languages: Primarily Spanish, Quechua, Aymara, and Guarani

Regions: Andes Mountains with a highland plateau (Altiplano), hills and lowland plains of the Amazon basin

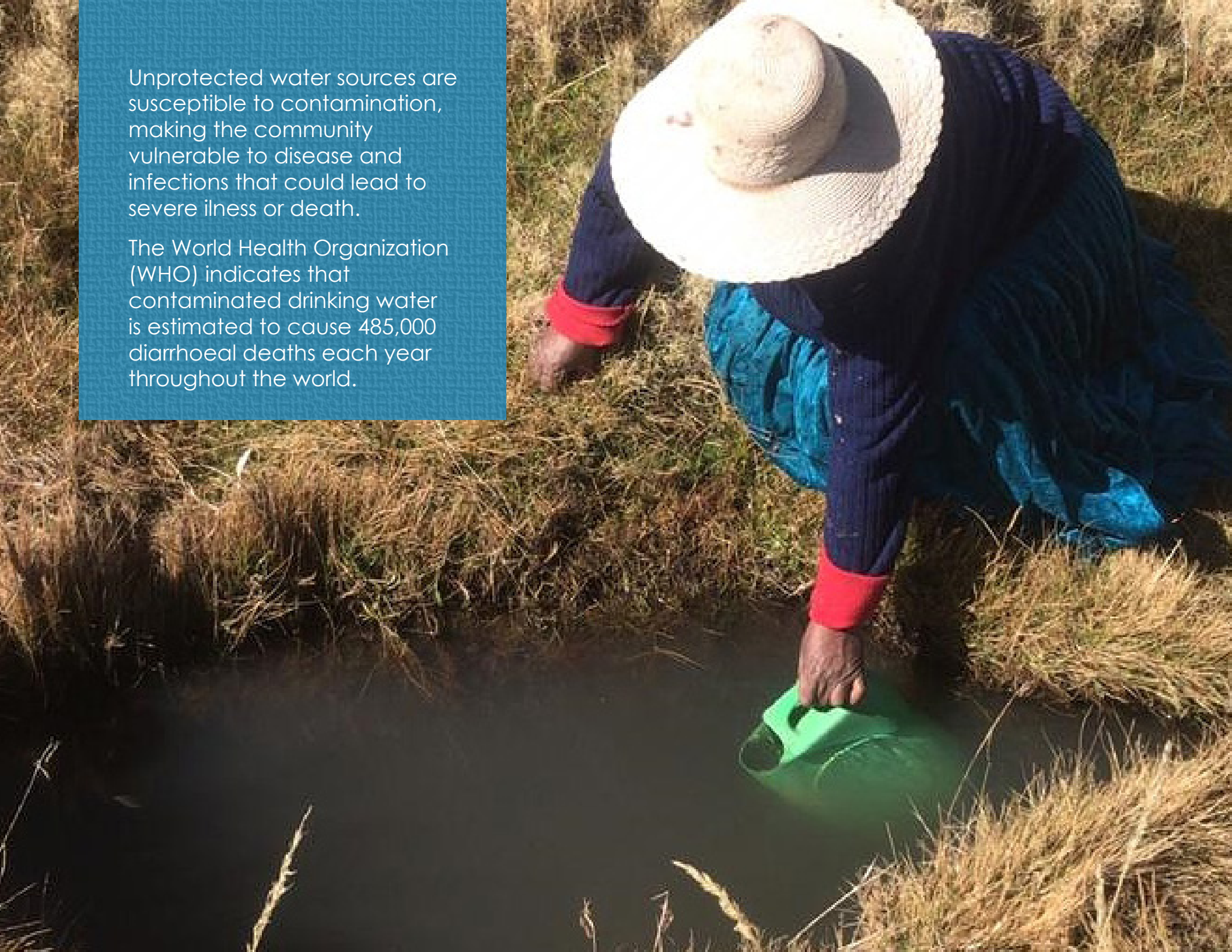
PARTNERSHIP

Since 2004, Water Engineers for the Americas & Africa (WEFTA) has partnered with Suma Jayma, a Bolivian Non-Governmental Organization (NGO) working on water and sanitation improvements for rural indigenous communities in the Altiplano (mountainous highland plateau of the Andes).

Suma Jayma was founded in 2000 by Braulio Rojas, Jaime Rosa, and Jorge Rosas. Their program objective is to develop water resources (groundwater wells) in the Andean highlands of western Bolivia while training the community to manage and operate the water resources. Suma Jayma's mission and values align directly with WEFTA's. Suma Jayma's founders and the communities they work in are Aymaran, one of the many indigenous groups of Bolivia.

Together we promote the development of safe and reliable drinking water and sanitation services.

Working together, WEFTA and Suma Jayma engineers and technicians tailor projects to meet different communities' needs by collaborating on the design and construction of drilled water wells, hand-dug wells with hand pumps, and gravity-fed community water systems with protected spring sources. Most of Suma Jayma's recent water source development projects have largely involved the construction of hand-dug wells, powered by hand pumps made by Suma Jayma of locally available materials.



Unprotected water sources are susceptible to contamination, making the community vulnerable to disease and infections that could lead to severe ilness or death.

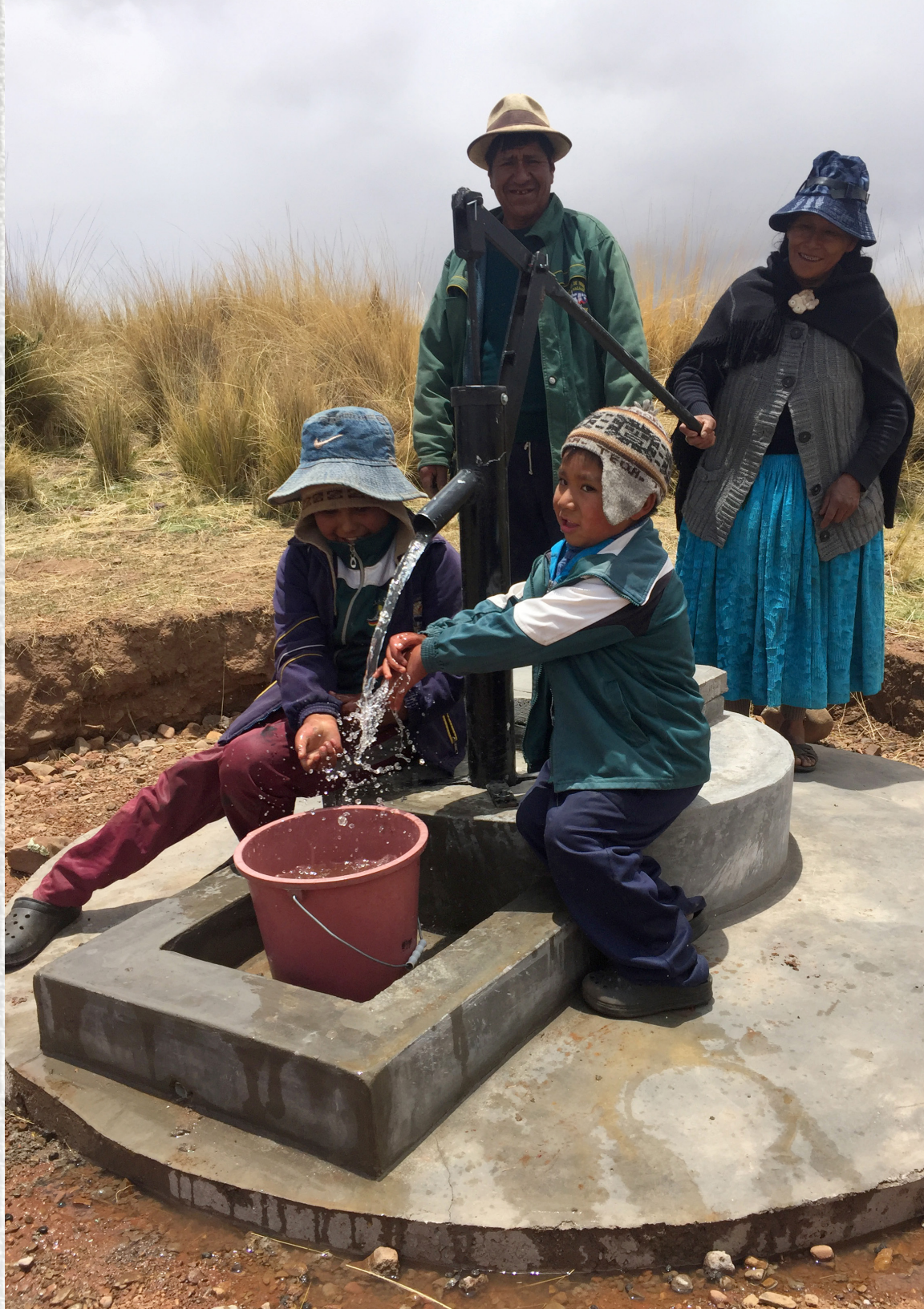
The World Health Organization (WHO) indicates that contaminated drinking water is estimated to cause 485,000 diarrhoeal deaths each year throughout the world.

In early 2020, Suma Jayma, completed the fabrication and installation of wells and hand pumps for 350 indigenous families in the Altiplano region of Bolivia. Partnering with Wheaton Franciscan Sisters for financial support, this two-year program provided access to safe water for over 1,750 people.

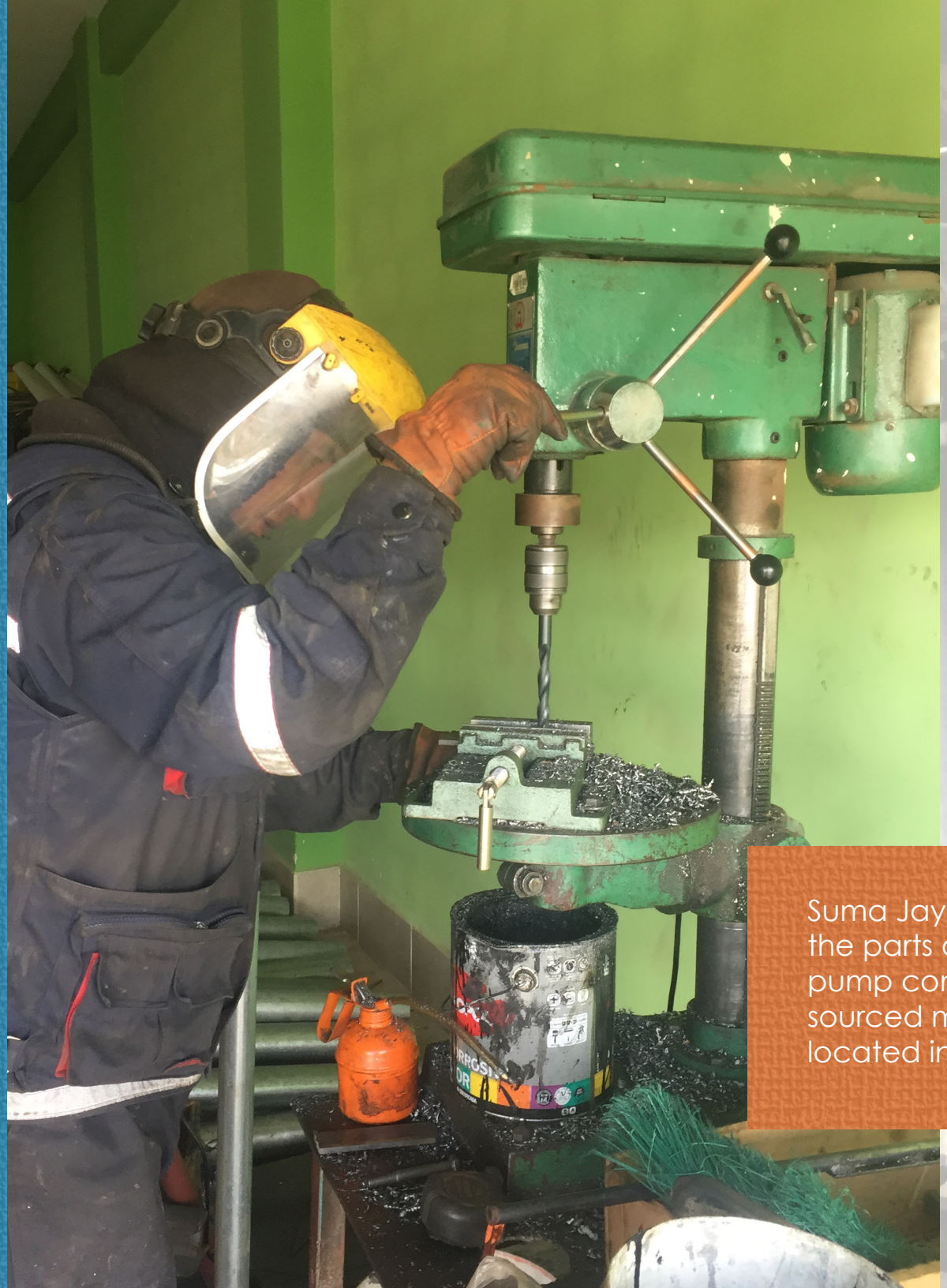
The success of this water supply program drew interest from other families in the region prompting the launch of the ***Protected Groundwater Wells for Indigenous Families Program***.

With support from WEFTA donors and engineers, Suma Jayma continues protecting wells and installing hand pumps for indigenous families in the Altiplano region, providing access to safe reliable water.

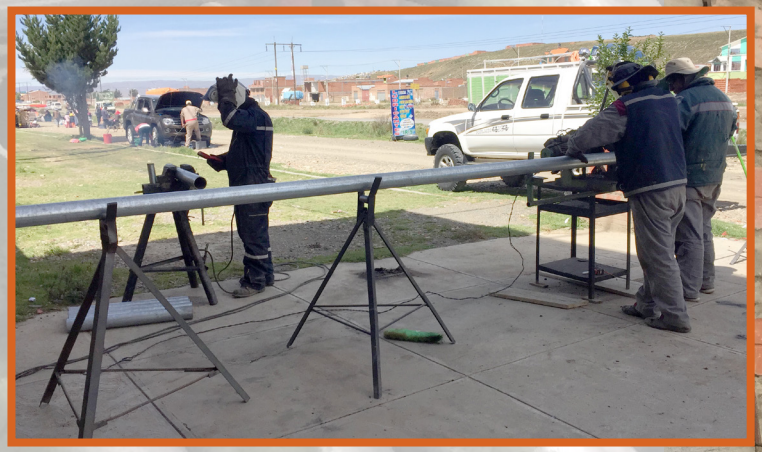
Ongoing support is necessary for the success of this program.

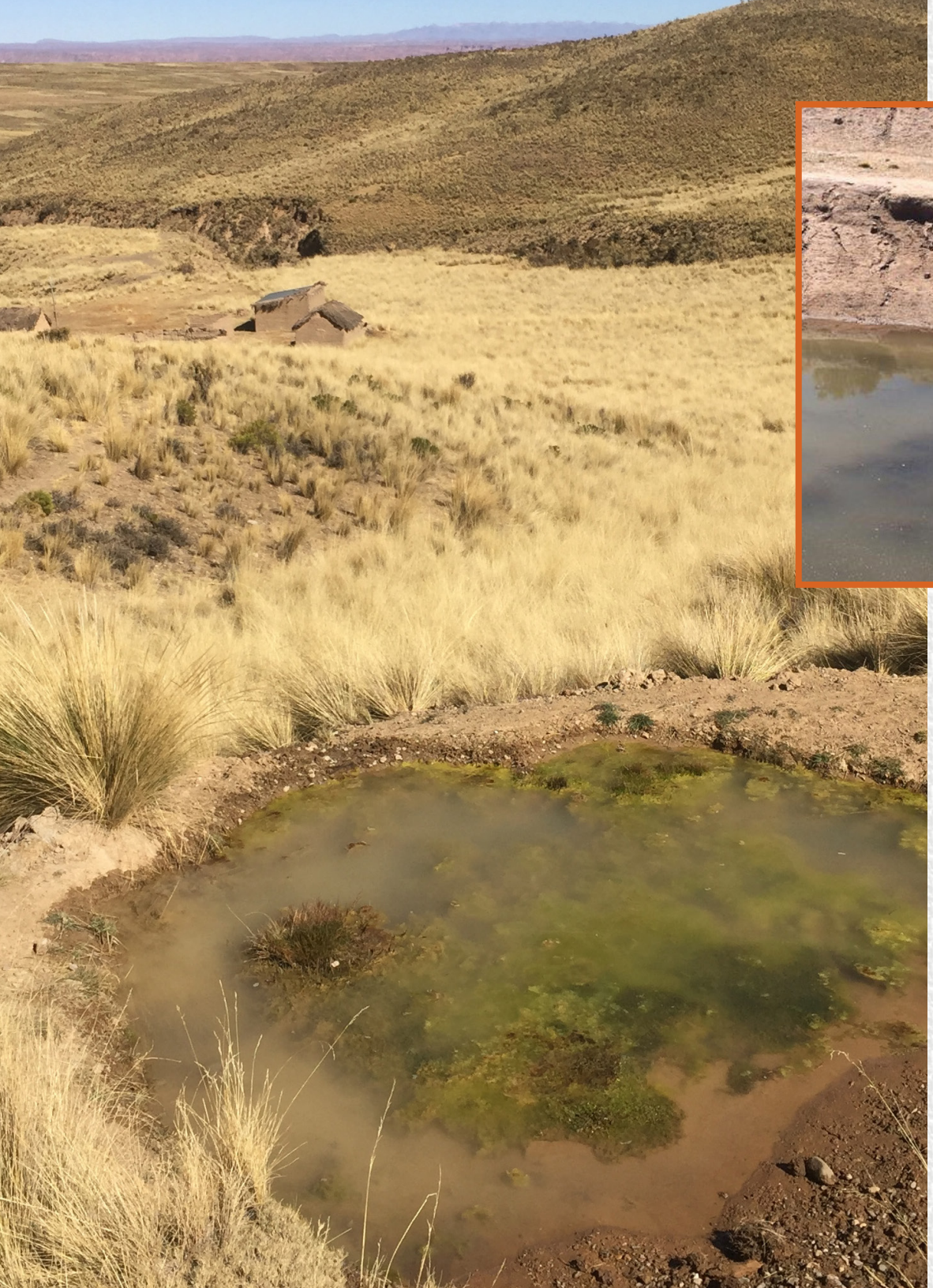


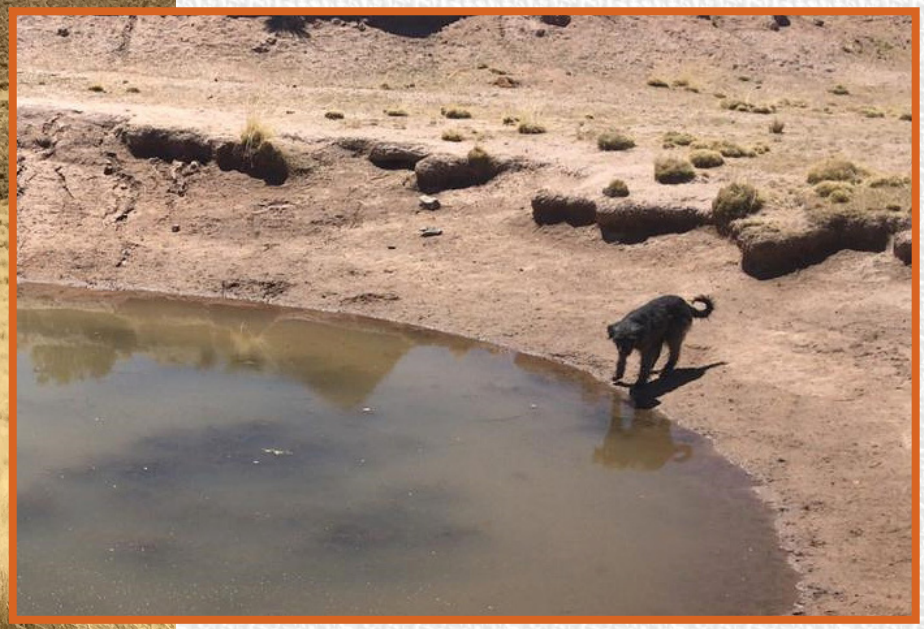
FABRICATION



Suma Jayma manually fabricates the parts of each family hand pump completely from locally sourced materials at their workshop located in El Alto - La Paz.



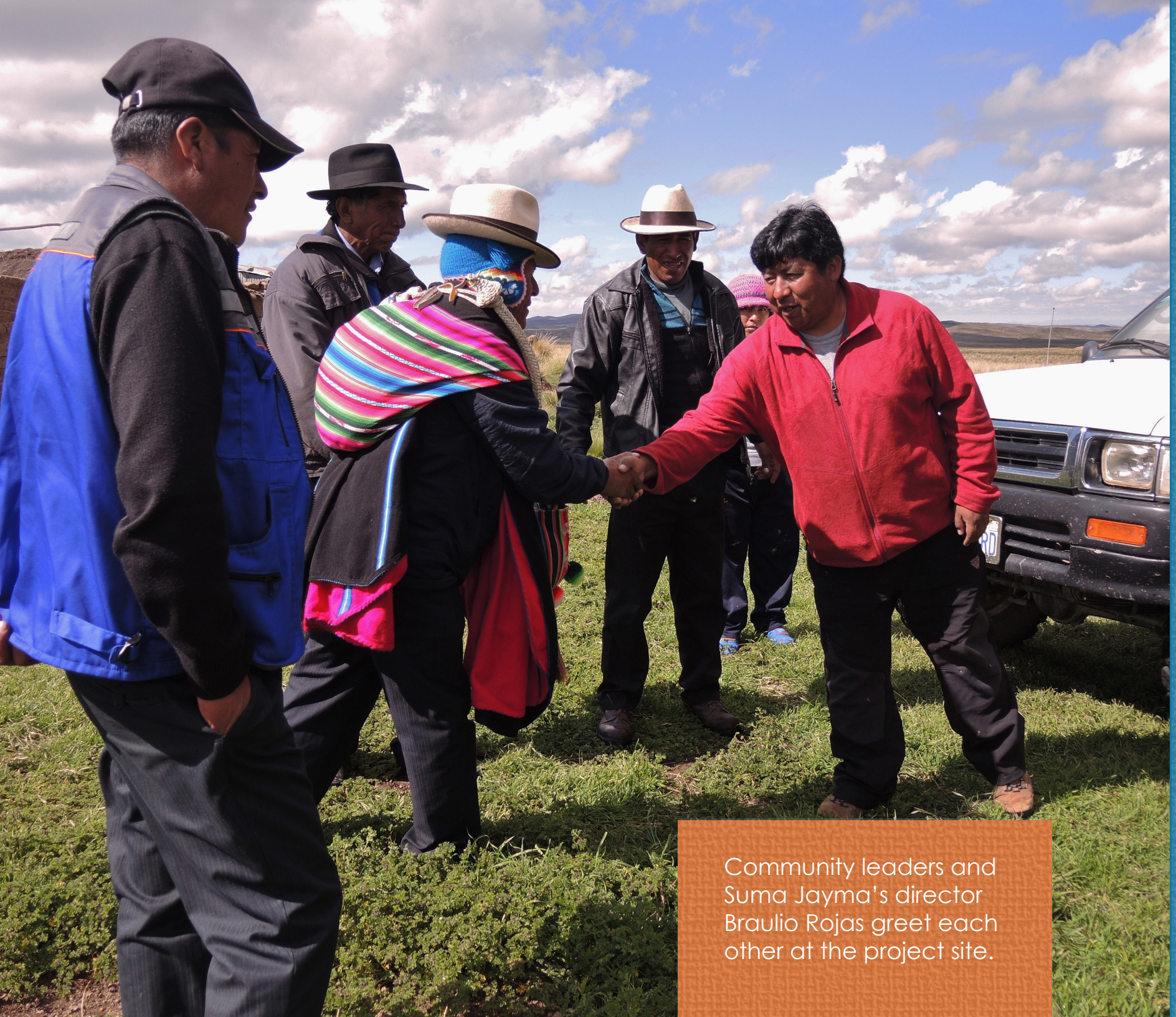




Before installation of a new protected well and hand pump, the beneficiary families collected their drinking and household water from unprotected and contaminated water sources like those shown here.

These water sources are shared with livestock and other animals and are susceptible to fecal contamination including viruses and bacteria that can cause acute gastrointestinal infection and disease.

ENGAGEMENT



Community leaders and Suma Jayma's director Braulio Rojas greet each other at the project site.

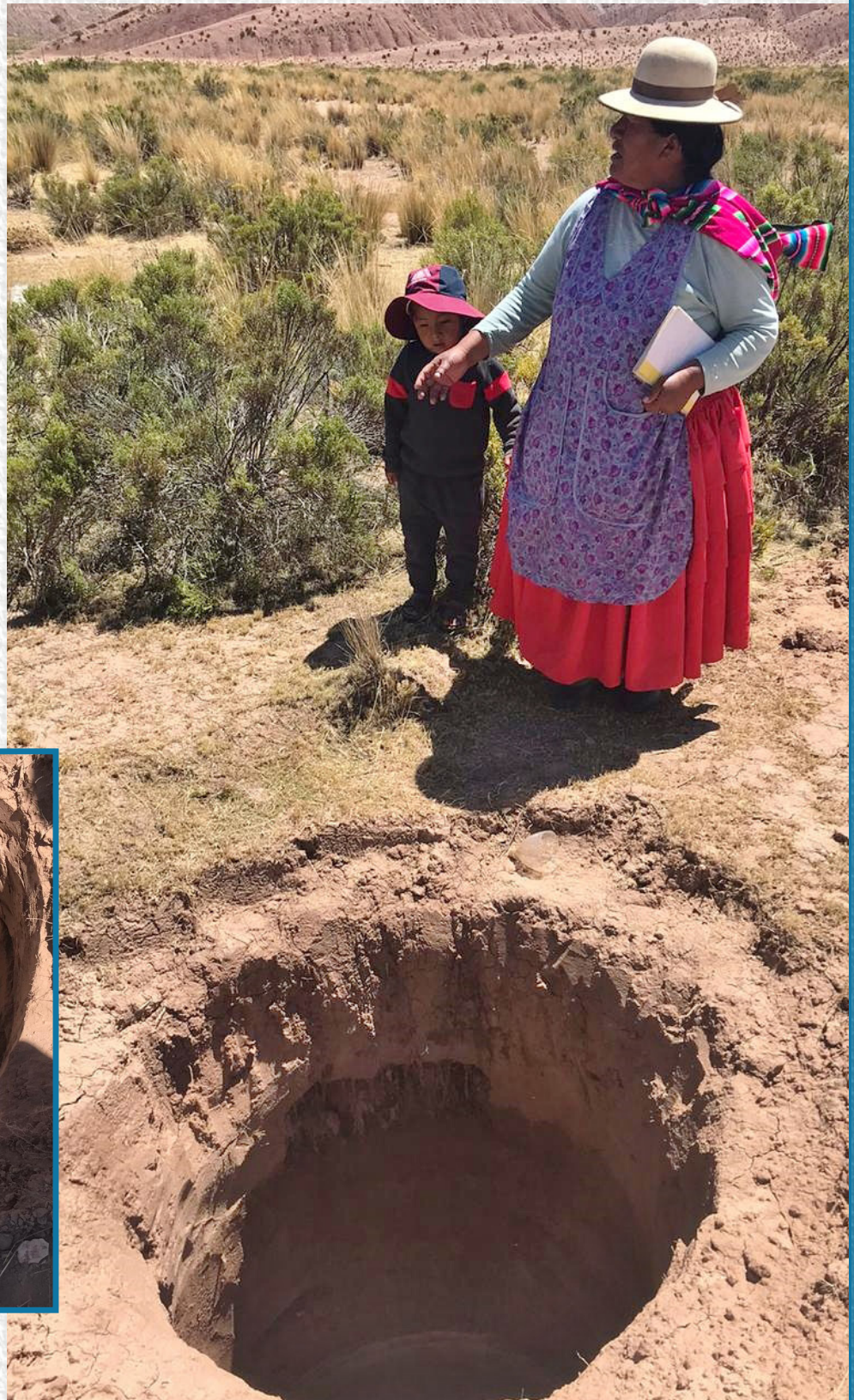
Local materials, such as sand and stone, are gathered by the community residents as contribution to their part of the project. Often animals are used to help transport construction materials to the project site.

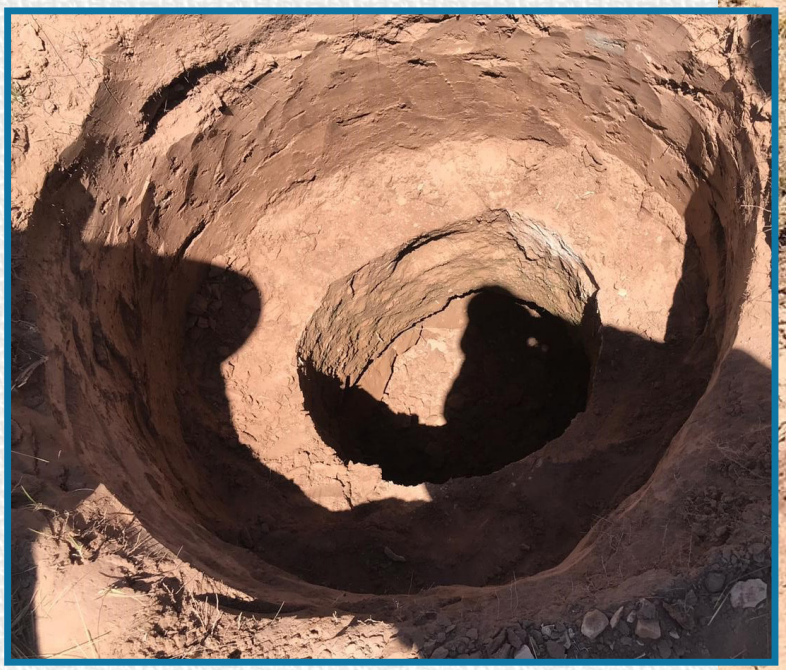
WELL DEVELOPMENT

Construction begins with excavating the new well.

Community and household members, guided by the Suma Jayma team, hand-dig the typically one-meter diameter well from the land surface down to the water table or aquifer. The well digging team work together to ensure safety on the project at all times.

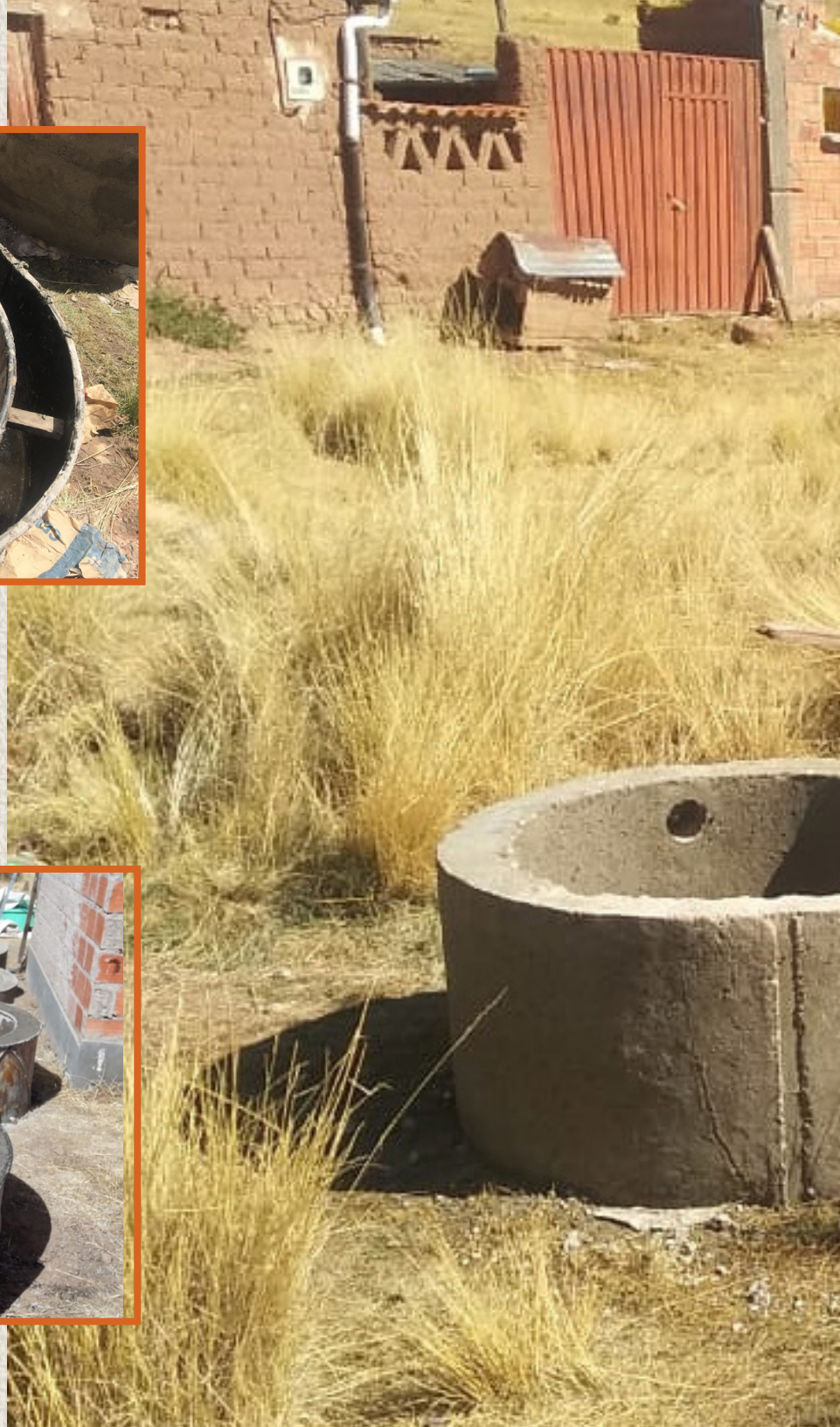
Once enough of the water bearing strata is exposed to provide adequate water to the household, the well is developed and protected.





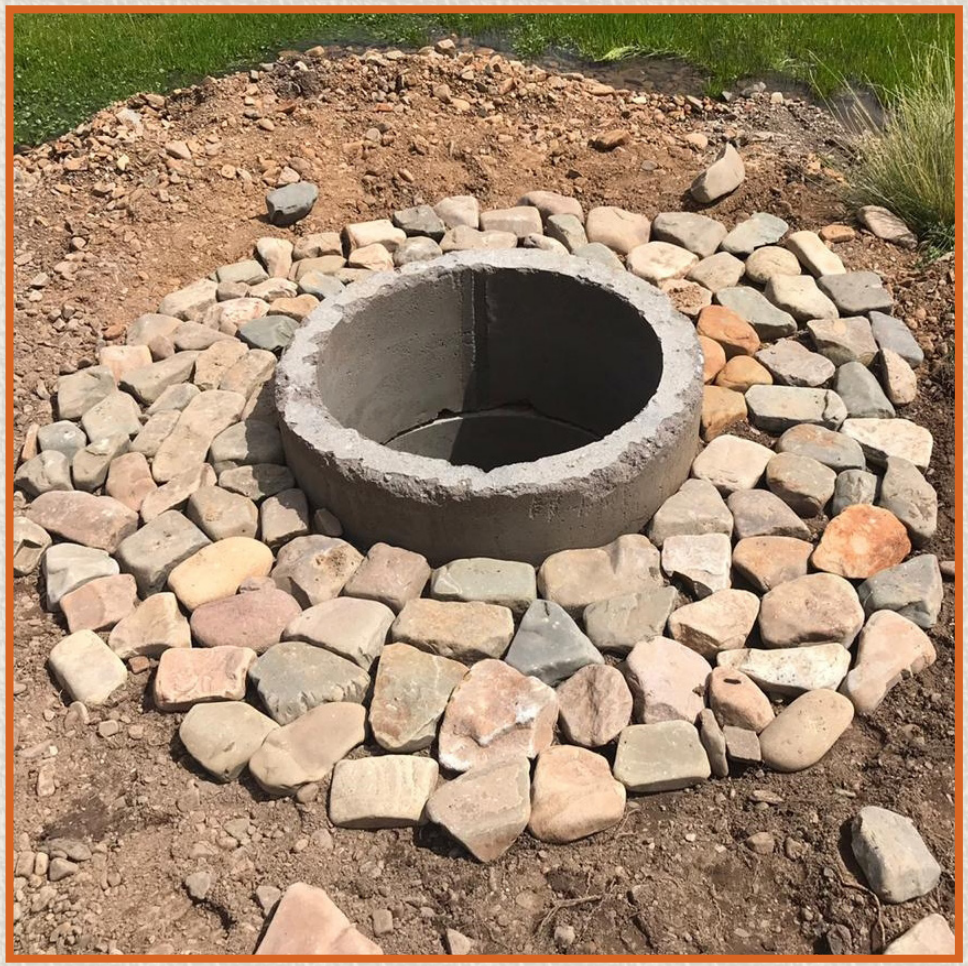
WELL CASINGS

Construction of the concrete well casings are completed on site using molds provided by Suma Jayma.



These concrete rings are installed into the newly dug well once they are adequately cured. Installation of the rings includes a structural tripod and pulley system over the well to lower the rings into place.

The concrete well casings ensure the well will not collapse and the well water is protected from surface contamination.



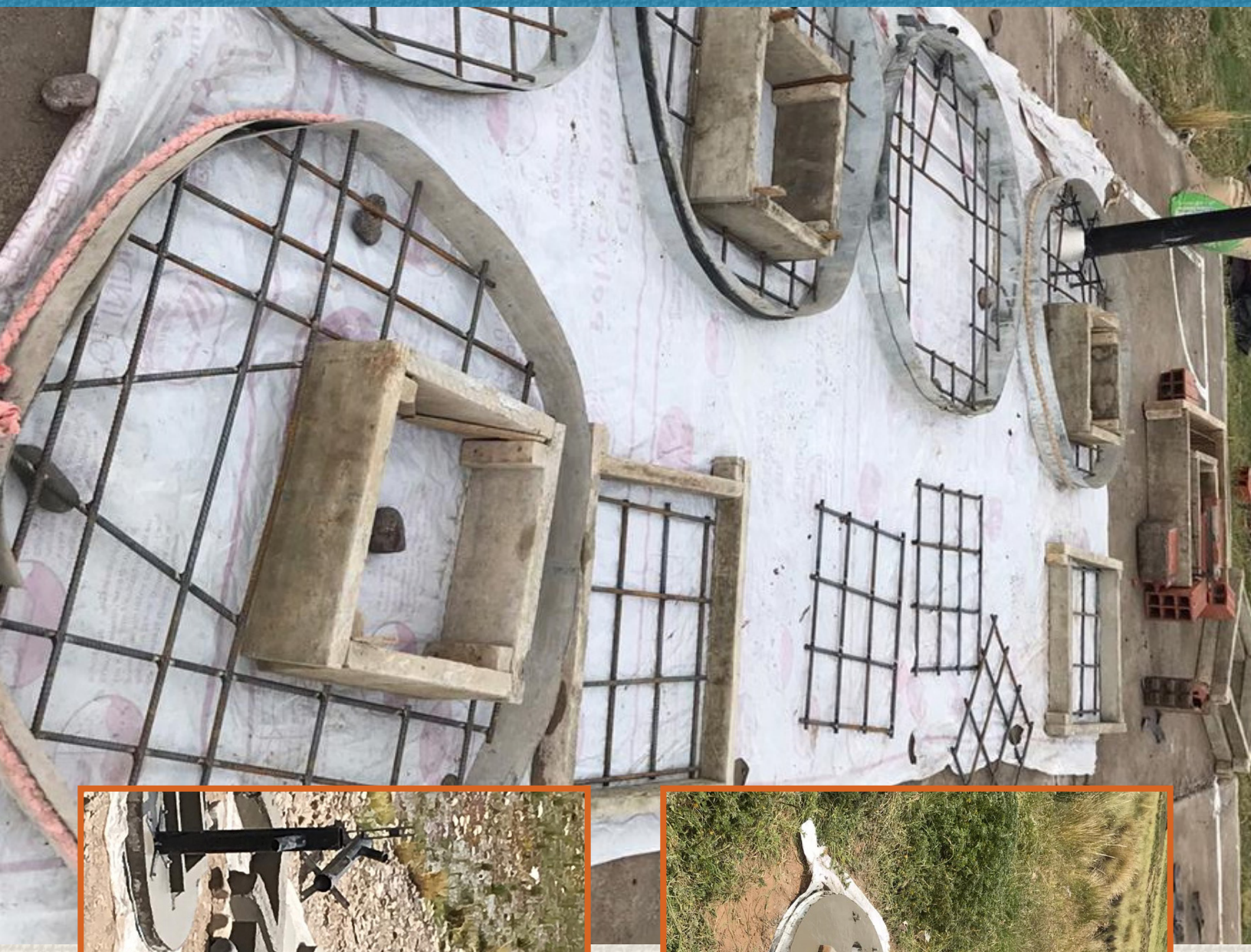
With the concrete rings installed, stones are placed and preparation is made to pour the concrete pad that forms the outer protection of the well.

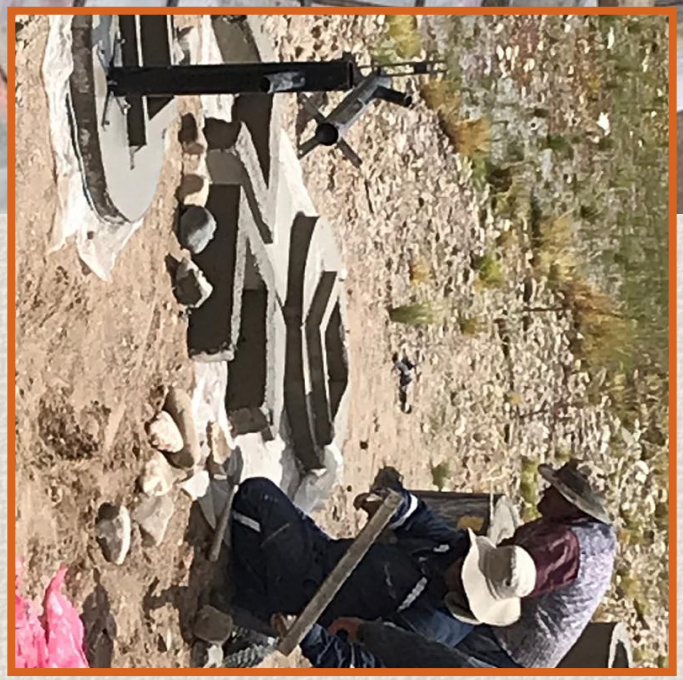
A concrete pad is placed on top of the well opening and connected to the concrete well casing. This protected wellhead ensures that surface water and contaminants do not enter the well water.

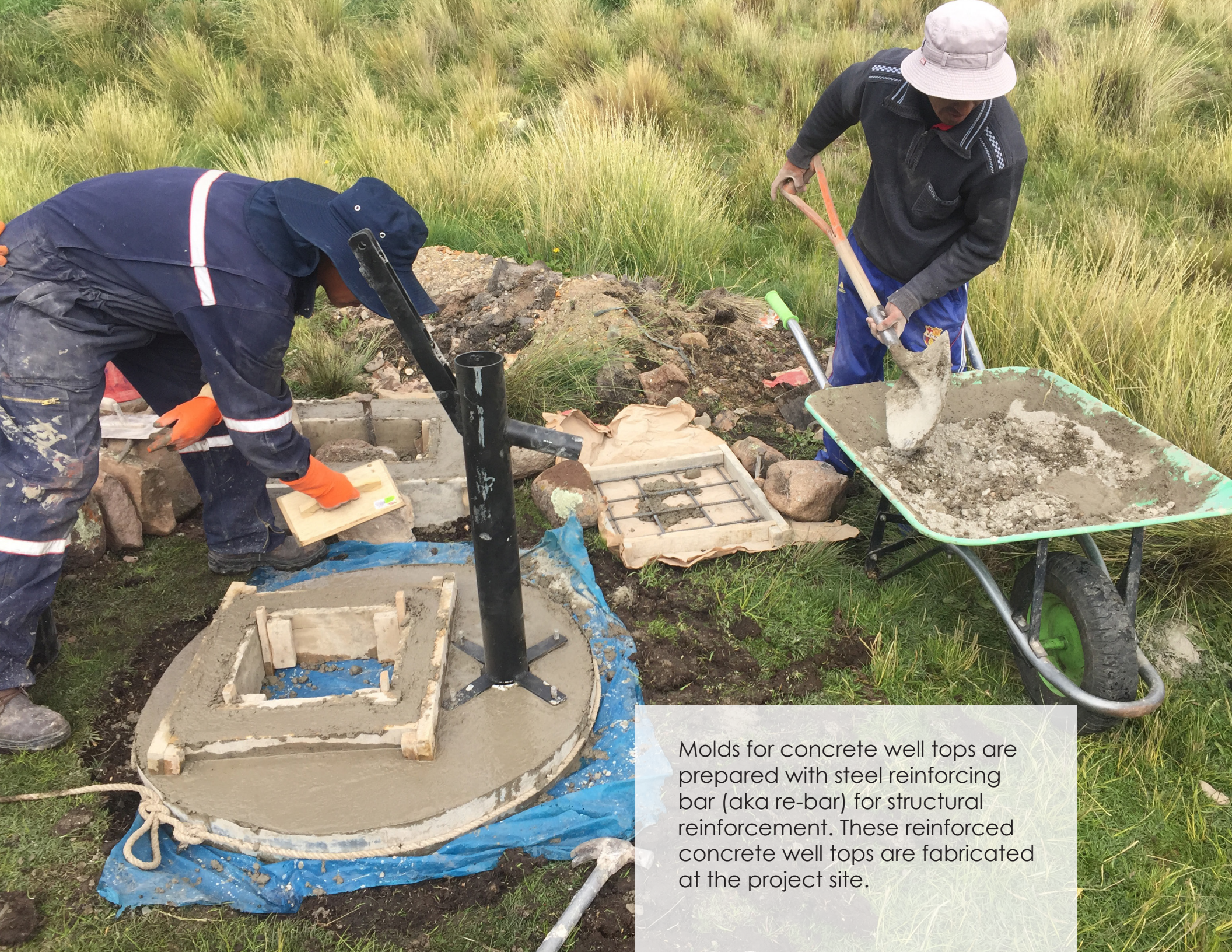
INSPECTION

Community leaders inspect the new well during the construction process.

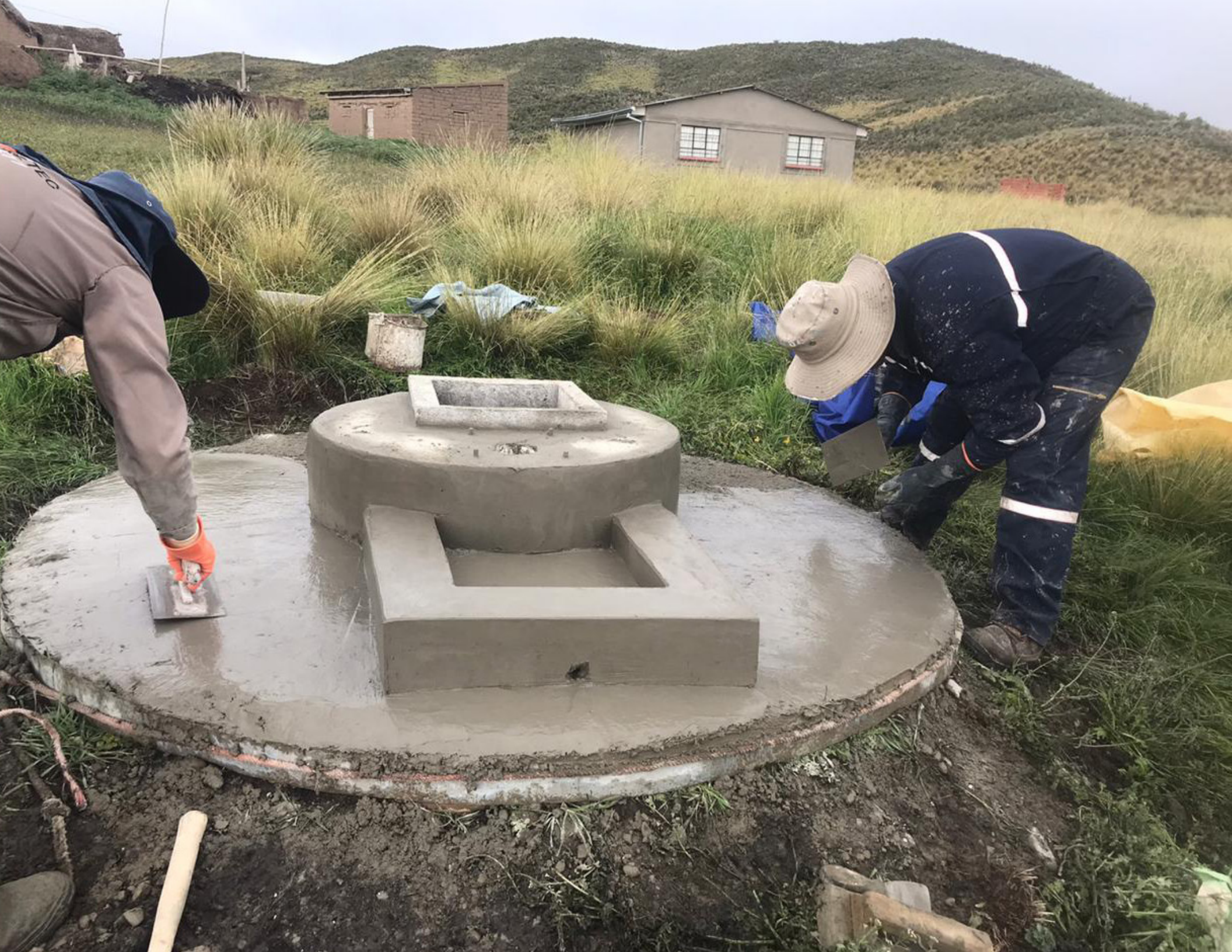
WELLHEAD PROTECTION



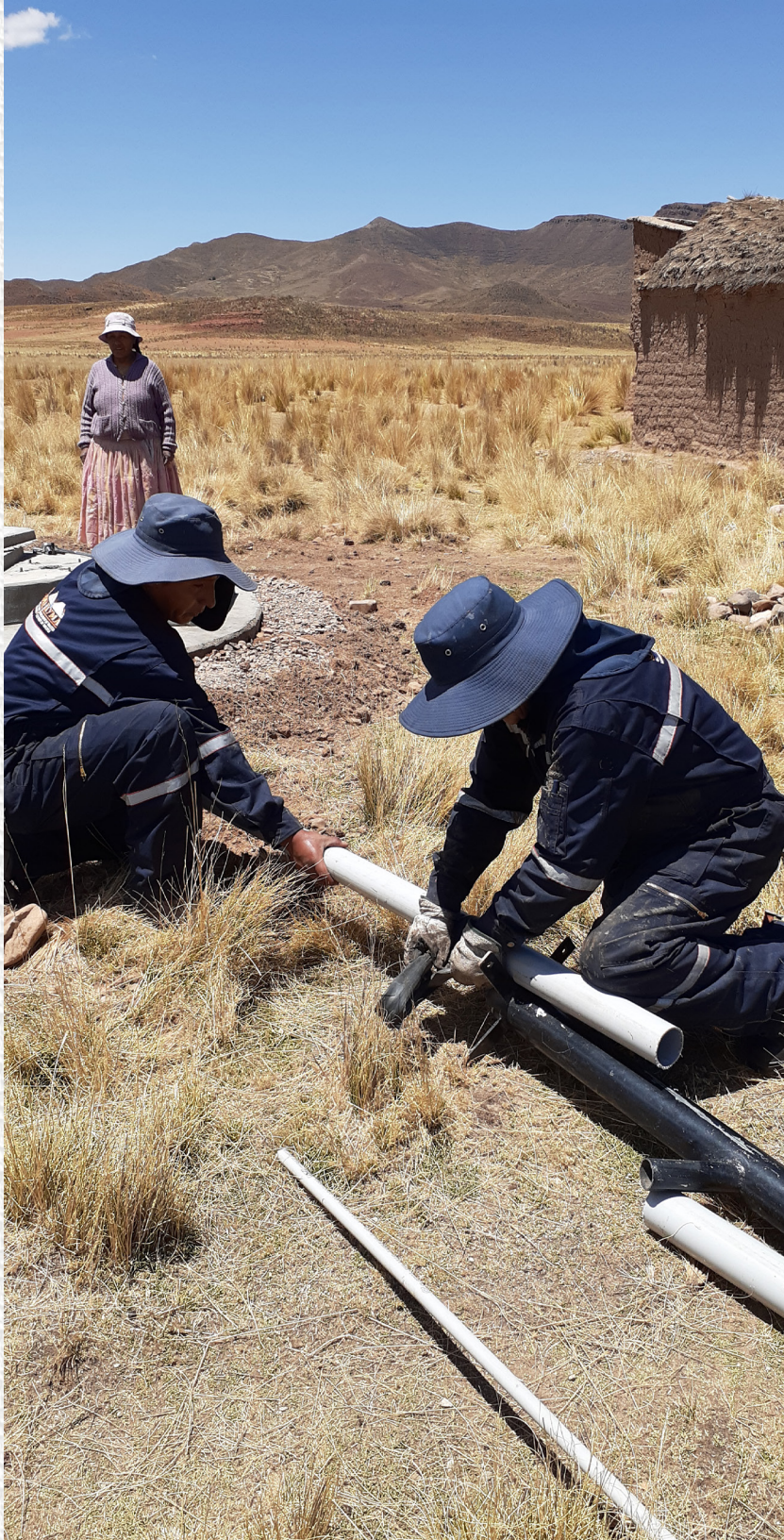


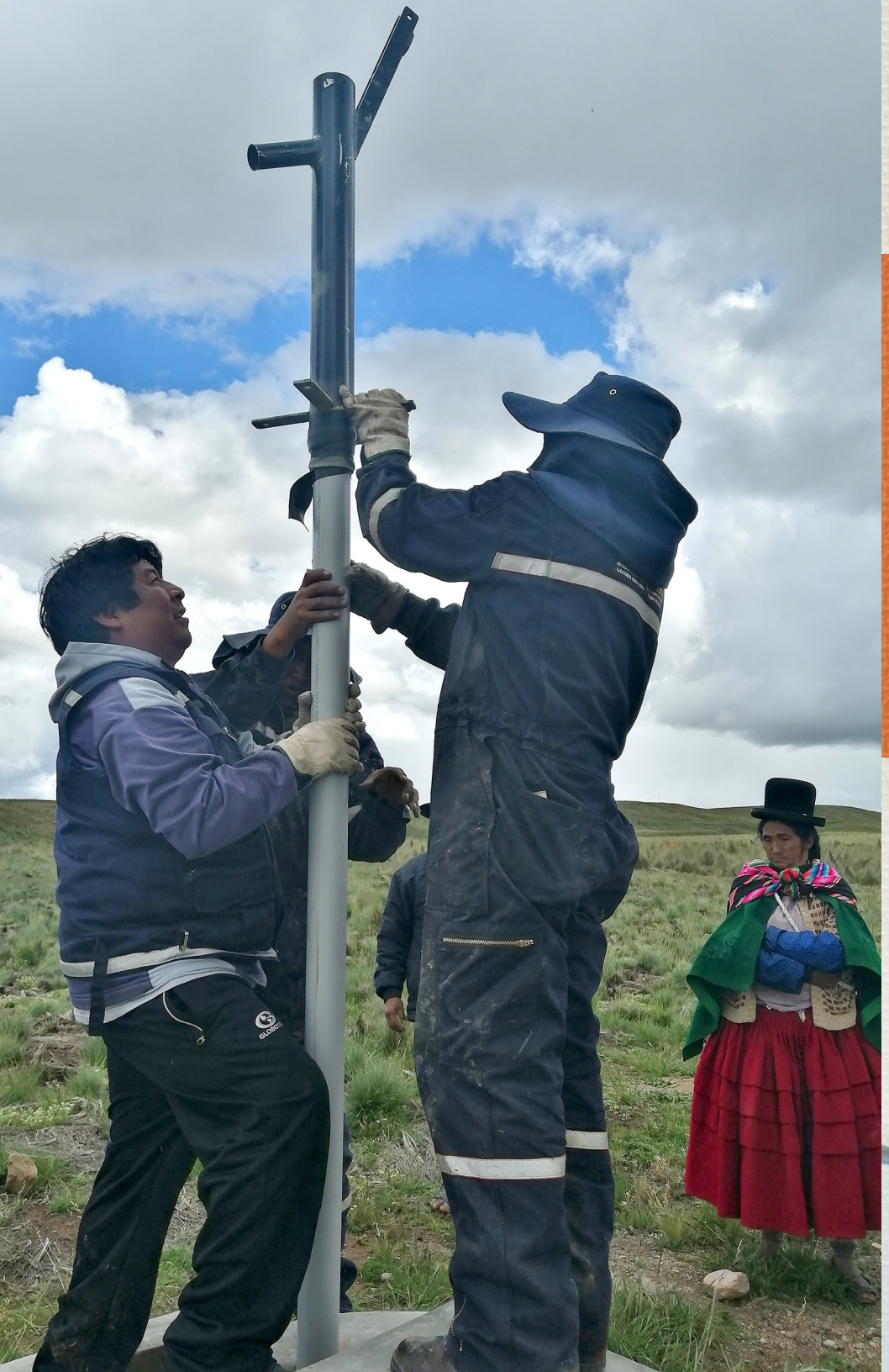


Molds for concrete well tops are prepared with steel reinforcing bar (aka re-bar) for structural reinforcement. These reinforced concrete well tops are fabricated at the project site.



Upon completion of the concrete well top, drop pipe for the new well pump assembly is prepared for installation.

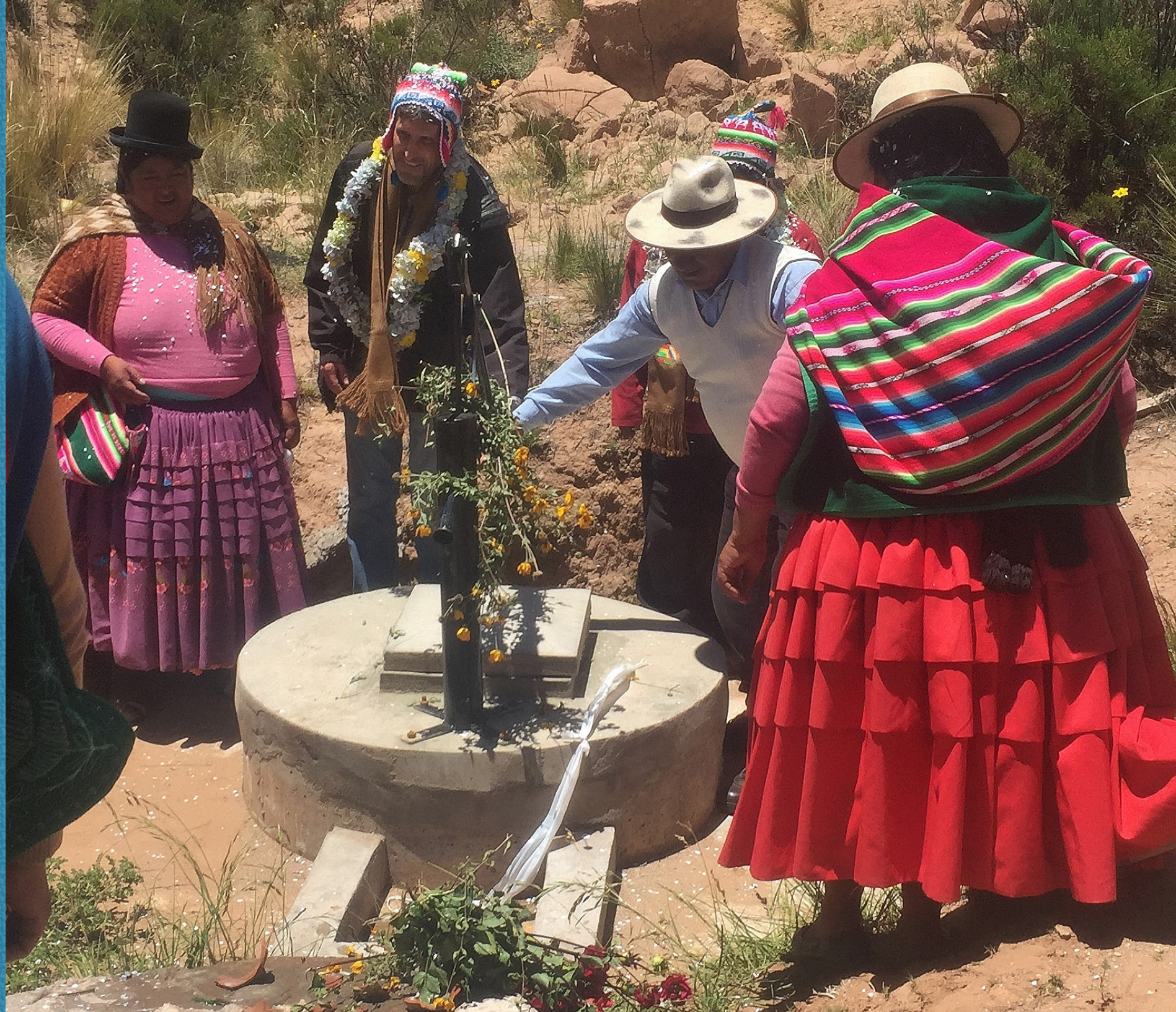




INSTALLATION

Installation is completed by connecting the fabricated hand pump to the well. Function of the new hand pump is tested by the Suma Jayma team.

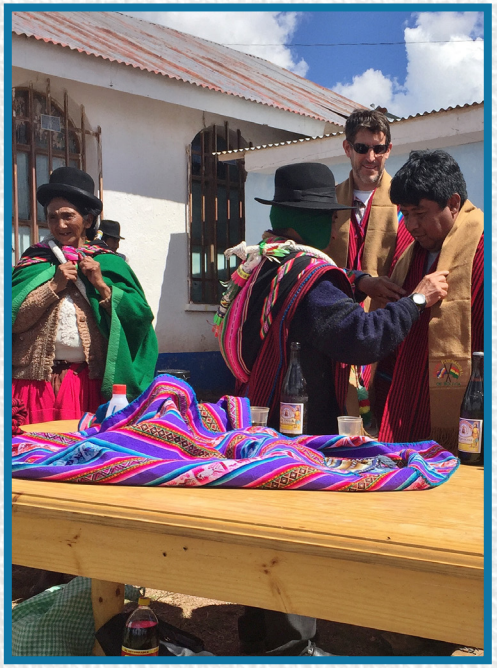
INAUGURATION

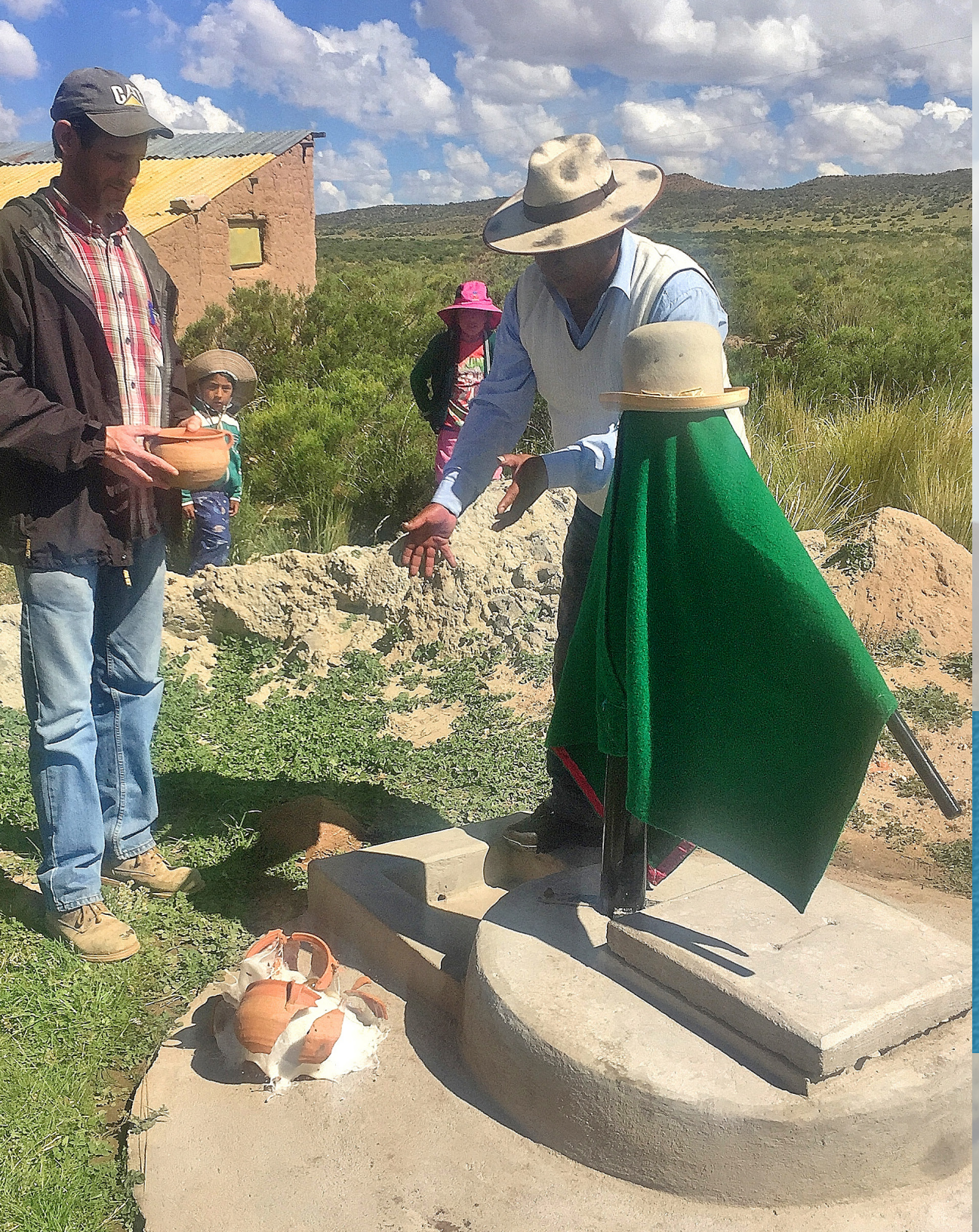


Upon completion of the protected well and hand pump installation, a ceremonious inauguration takes place celebrating the positive impact of the new well.

The community and regional leaders join the celebration which typically includes a Bolivian potluck known as “apthapi.” Gifts of appreciation are also shared.

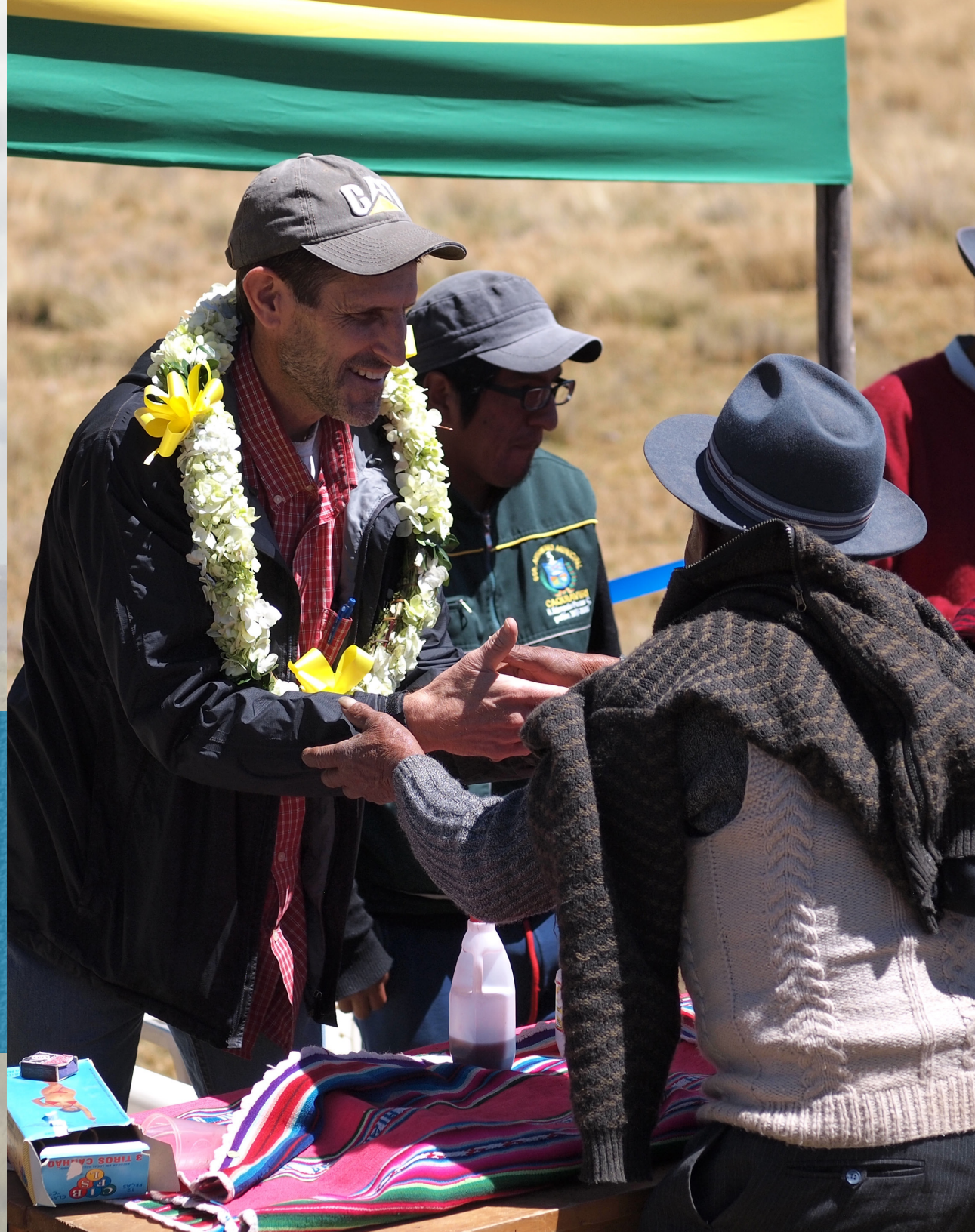
This new access to safe water changes the lives of the beneficiaries for many generations, providing new hope for a bright and healthy future. By providing access to safe water, rural communities are able to stay healthy and prosperous. These healthy communities are more likely to stay intact with less younger families moving away to urban areas.





A new well is christened with a Bolivian tradition known as the “Ch’alla.”

Jason Obergfell, a Missionary and WEFTA Field Engineer living in Bolivia, maintains a key role in collaboration with Suma Jayma, donors, and the project communities.

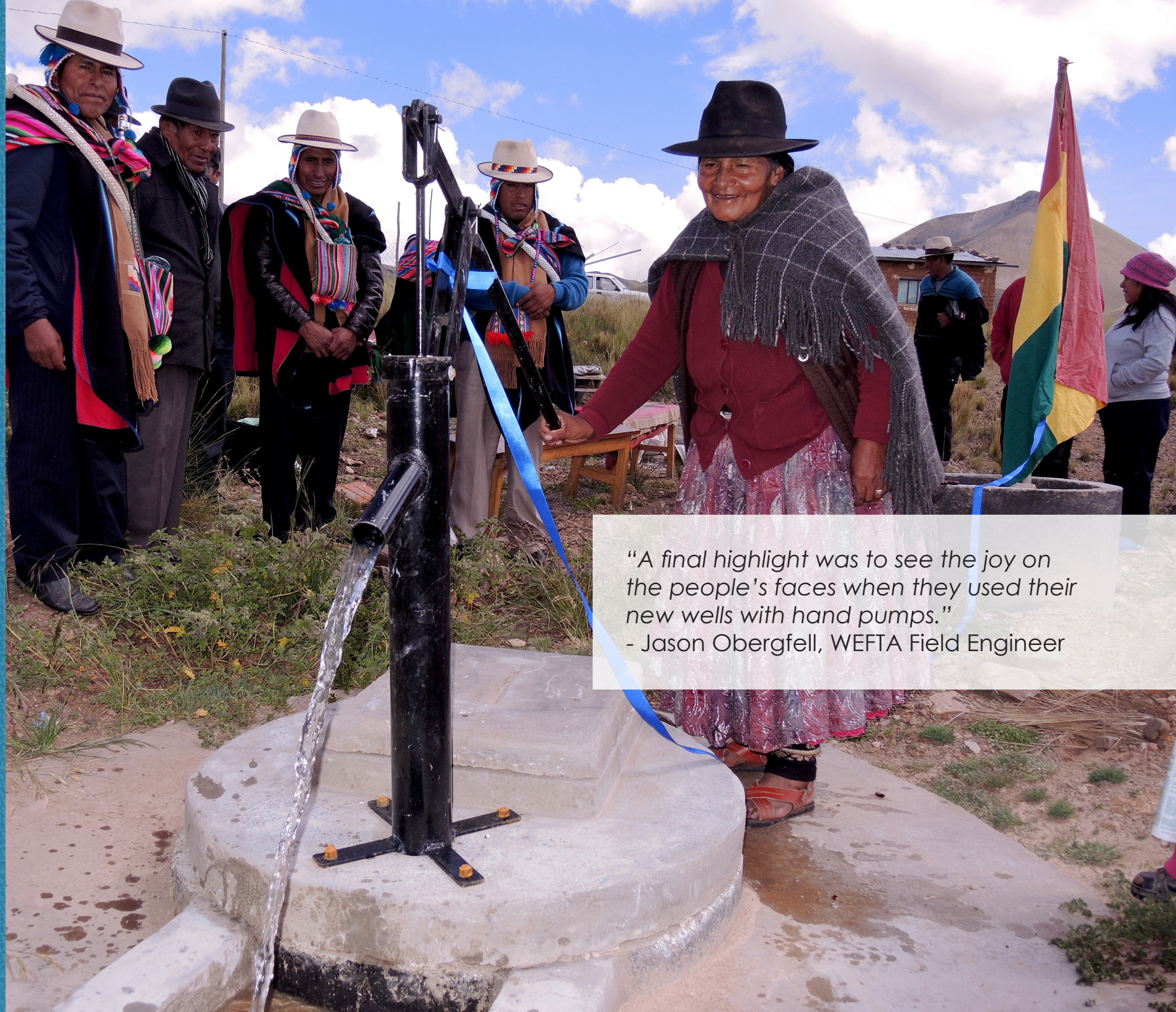


SUSTAINABILITY

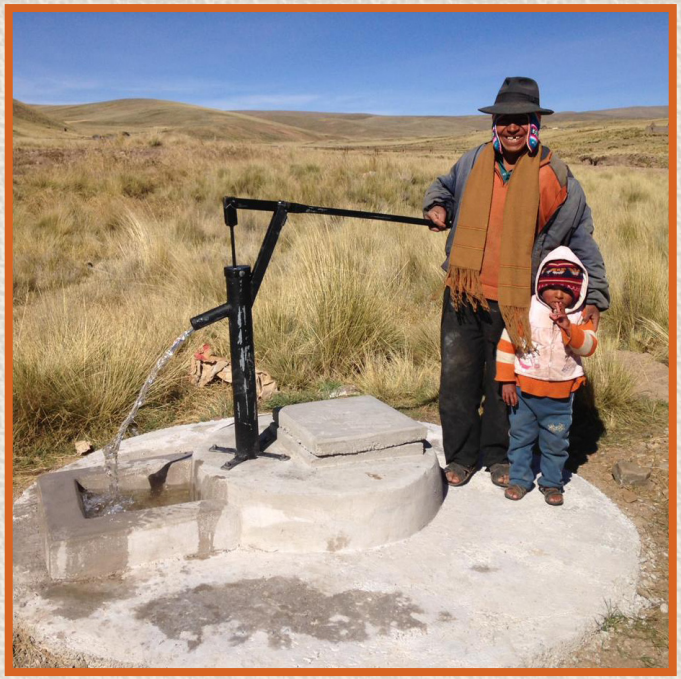
Throughout the project, beneficiary families and community members help by contributing labor and some materials during construction.

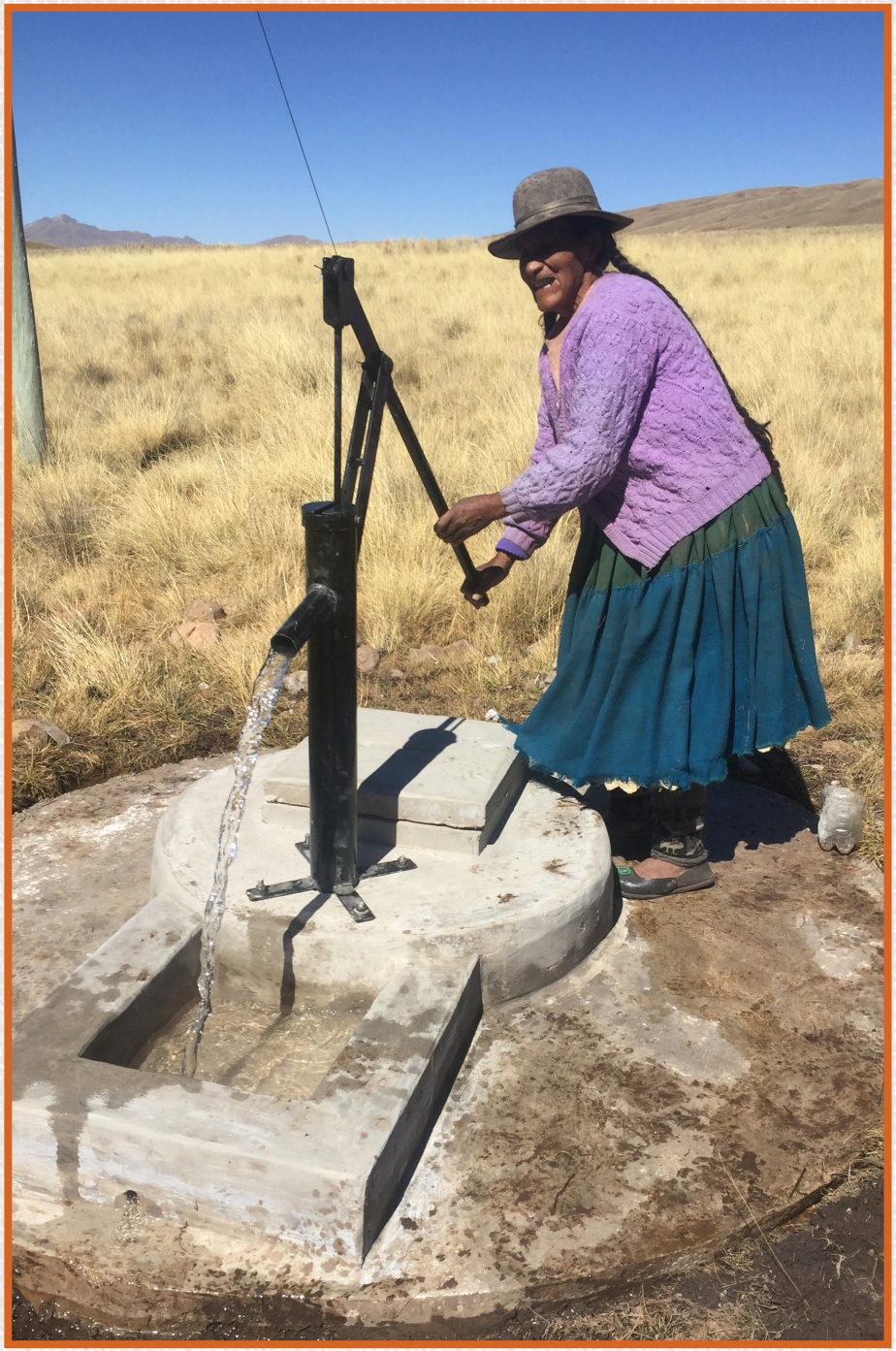
To ensure sustainability, the beneficiary families receive the necessary training to operate and maintain their new water wells.

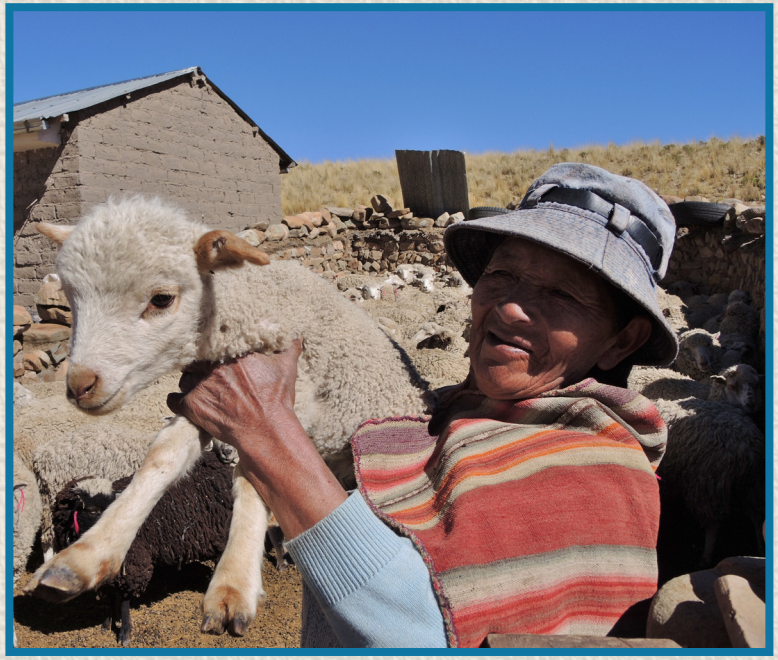
COMMUNITY FACES

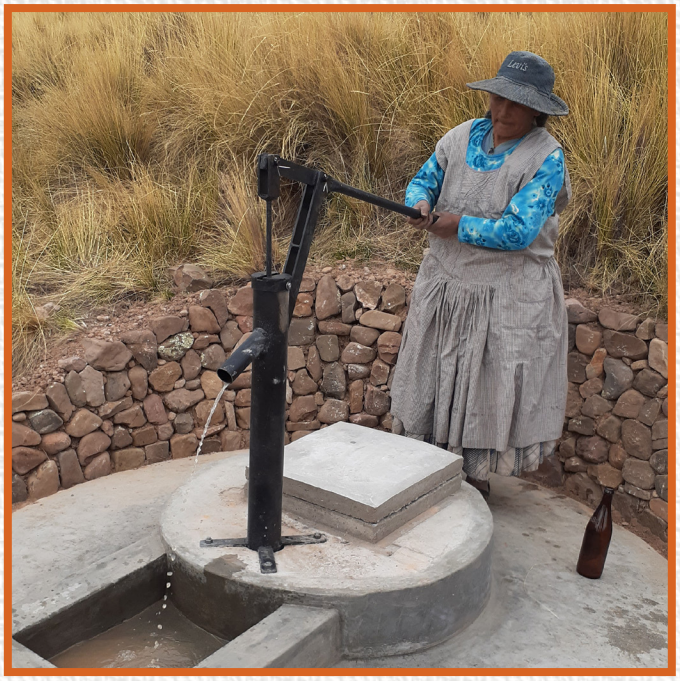


"A final highlight was to see the joy on the people's faces when they used their new wells with hand pumps."
- Jason Obergfell, WEFTA Field Engineer









Annually, Suma Jayma, with support from WEFTA volunteers and donors, completes approximately 200 protected household wells, **positively impacting over 1,000 lives each year** through protected groundwater wells and hand pumps projects.

By improving the quality of water they have access to, these indigenous families of the Bolivian Altiplano can now drink water that is not contaminated, ultimately reducing illness and death associated with unsafe water sources.

Special thanks to the Wheaton Franciscan Sisters Ministry Fund and individual donors like you.

These projects could not have been completed without you!

Thank you!

THANK YOU!

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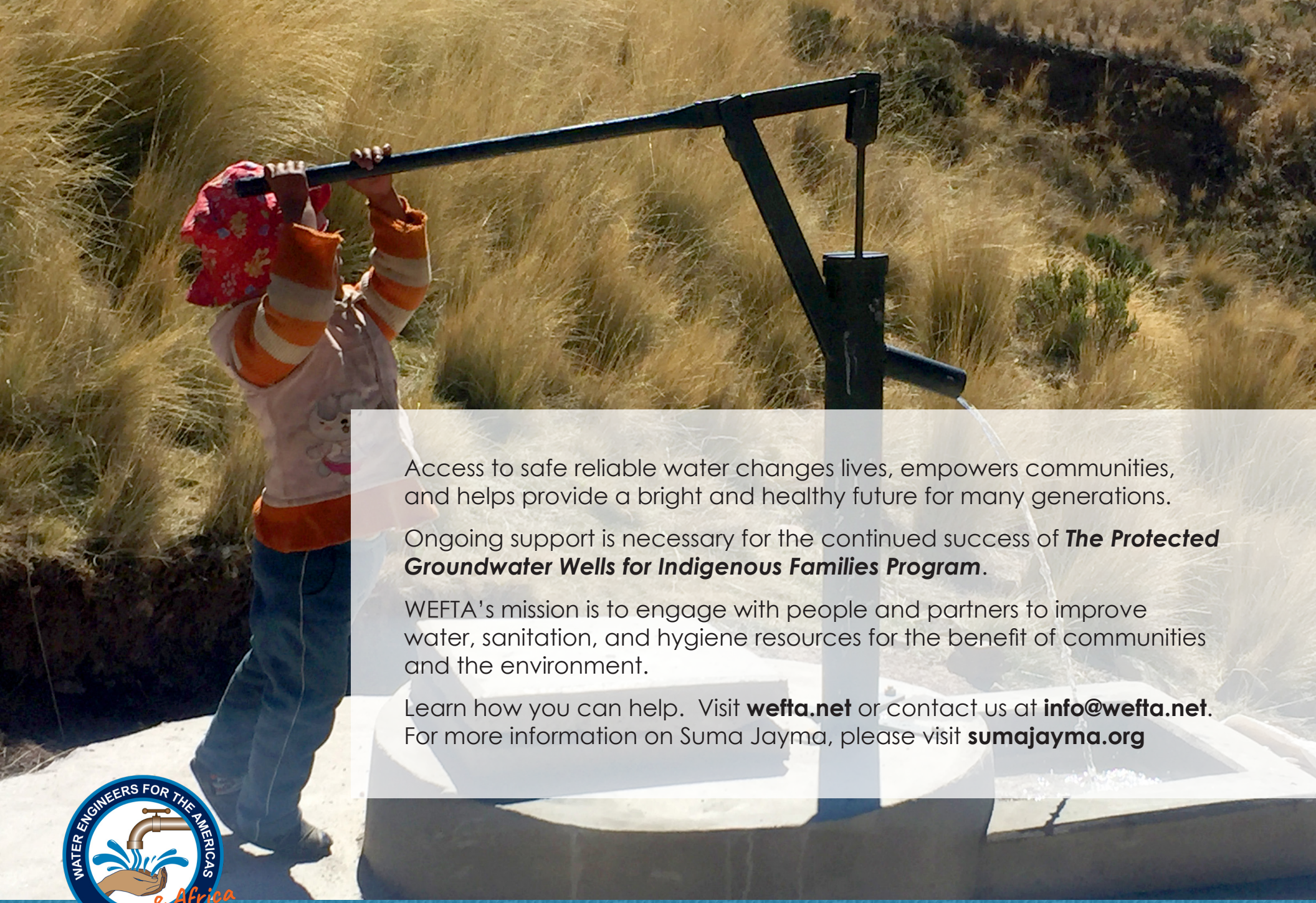
Photos courtesy of Jason Obergfell and Suma Jayma



Access to safe reliable water changes lives, empowers communities, and helps provide a bright and healthy future for many generations.

Ongoing support is necessary for the continued success of ***The Protected Groundwater Wells for Indigenous Families Program***.

WEFTA's mission is to engage with people and partners to improve water, sanitation, and hygiene resources for the benefit of communities and the environment.

Learn how you can help. Visit **wefta.net** or contact us at **info@wefta.net**. For more information on Suma Jayma, please visit **sumajayma.org**

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Making connections. Empowering communities. Changing lives.

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