

TRANSLATION OF THE “SANADORES DEL AGUA” ARTICLE  
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**HEALERS OF THE WATERS**

*They combine ancestral and scientific knowledge to face the effects of climate change. Residents of the Cordillera Blanca community in Huaraz are trying to heal the Negro River, which has been affected by glacier retreat.*

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Photos: OMAR LUCAS

*Cover photo caption : TEAMWORK. Every three months, members of the Local Agricultural Research Committee (CIAL) monitor the water quality of the Negro River, which is contaminated by toxic oxides in the rocks.*

Vicente Salvador Gonzales (66), with his fedora hat and brown eyes, knew that something was wrong with the Negro River, the only water source for the fields of the Cordillera Blanca farming community in Canrey Chico District, Huaraz, when his cows began to lose their appetite. Vicente thought that his cattle’s extreme thinness was due to *alicuya*, a liver parasite that can cause death. But it was his wife, Teodora Gonzales (64), who began to suspect that the source of the problem was actually the water with which they irrigated their pastures and cooked their meals. “The white clothes were dyed orange, our skin cracked and even the foods we prepared tasted bad, really bad,” says this farmer, who even blamed the mine for poisoning the river. The more than 100 inhabitants of the community were taken aback when they discovered that it was the natural environment that was poisoning them.

**CLIMATE CHANGE**

According to community president Adrián Castillejo Cacha (48), the damage dates back to the 1970 earthquake in Ancash, the most destructive in the country’s history. It not only killed over 20,000 people; it also unearthed hundreds of thousands of rocks rich in minerals. “Over the years, these rocks oxidized and began polluting the water which runs down from the glaciers that are melting due to global warming, thus creating a toxic stream even today,” says Salvador as we walk to Quillock Spring, one of the four that form the Negro River. Close behind him follow the other members of CIAL, over which the good Salvador presides. Among them is Fructuosa Cruz (61), who goes everywhere with her jar of Mentholatum rub and her faithful dog, Zambito. “Today I’m going to show you that the water our animals drink and that we use to water our pastures is contaminated with iron, lead, cadmium, chromium and arsenic,” says the group leader. To prove his point, he takes out a pH meter from a black case. He submerges the device, which is used to measure the acidity of liquids, in the river for a few minutes. “The pH is 3.5. That means it is not apt for human or animal consumption,” says the farmer. “Water should have a pH level between 6.5 and 8.5 in order to drink it without it seeming like lemonade,” says Fructuosa, who documents the finding in a graph paper notebook. Likewise, CIAL members and spouses Delia Rodríguez (43) and Percy Cruz (43) use a conductivity meter to measure the levels of dissolved oxygen and the alkalinity of the water. “That orange, almost reddish color you see in the rocks along the stream is what’s making us sick,” says Delia. Unfortunately, no study exists on the impact of the metals on the population’s health. Nevertheless, several families claim that their ill health is due to the contamination of the Negro River.

*Photo captions—above and below right: DANGER. Left: Cordillera Blanca residents demonstrate the strange orange color that dyed their pastures and their white clothing as a result of the excess iron in the Negro River. Below: Livestock have been most affected by the contaminated water.*

*Photo caption—center: NATURAL COLANDER. To filter the metals that contaminate the Negro River and have affected the quality of daily life in the community, residents built sediment basins in the Chonta Canal.*

## **STRENGTH IN NUMBERS**

Fray Cruz (36), livestock rancher and father of five, is one of them. “The milk you drink and the cheese you eat makes you sick if your livestock drink filthy water,” says one of the five community members who received two years of climate change adaptation training from engineers with **The Mountain Institute (TMI)**. “We try to combine local and scientific knowledge to bring life back to the Negro River. Most of the population has not completed secondary school, but they have other knowledge that helps them decontaminate the stream,” says **Doris Chávez Osorio (40)**, **TMI coordinator of the bioremediation project**. Given that cleaning the entire river was logistically impossible, they decided to begin by purifying the Chonta Canal, which is mainly used for domestic chores. “The first time we visited the canal, we noticed that the water was apparently clear. It took a laboratory test to discover that its arsenic levels were toxic for human beings,” she says. In early 2014, they began to construct sediment basins using picks and shovels.

*Photo caption 4: MORSEL OF LIFE. Thanks to the decontamination of one of the canals of the Negro River, Fray Cruz (36, in the green hat) and his family can again enjoy their food without fear. “We no longer have diarrhea or stomach aches,” he says.*

## **CHAIN REACTION**

According to Vicente’s cousin, Jerónimo Salvador Cruz (56), the system serves to capture the minerals that pollute the river. There are three pits in all, each four meters wide and nearly 10 meters deep, which allow metals that are carried by the current to settle at the bottom of the pit. This initial phase, which serves as a type of colander, is complemented by a system of natural wetlands. “We came up with the idea of planting some 900 mountain rushes (*Juncus arcticus*), an Andean plant whose roots can absorb oxides from the water, in different strategic points along the waterway,” he says. Although a preliminary study did not find significant improvements, CIAL members did not give up. “We’ve been criticized more than once. They told us we were wasting our time,” says Vicente Salvador, now considered a hero in his community. The reason? The population no longer gets sick and the livestock have become healthy thanks to the Chonta Canal. Purified through his efforts, the canal now has mineral levels that meet the national environmental water quality standards established by the Ministry of the Environment. This was demonstrated by the findings of the latest report of the National University Santiago Antúnez de Mayolo in Ancash. Nevertheless, Vicente does not want to celebrate this victory. He prefers to share his experience with other communities of the region that are affected by the melting glaciers. “If each of us puts in our grain of sand,” says the farmer who does honor to his surname (‘Salvador’ means ‘Savior’), “we can save the planet.”

## **SIDEBAR: OPINION**

**EDUARDO DURAND**, Director-general of Climate Change, Desertification and Hydric Resources of the Ministry of the Environment of Peru.

## **ADAPTING TO CHANGE**

Climate change is a reality that dictates conditions and affects the scope and sustainability of global and national development. Consequently, the Peruvian government is concerned about

its adverse effects on the national environment for long-term sustainable development. The unfavorable impact is evident in glacier retreat, the unusual temperature fluctuations and the shift in historical rainfall patterns, as well as in the increase and frequency of extreme climate events. Here at the Ministry of the Environment, we want to build consensus among the government and society in an effort to comprehensively address the challenges and opportunities of climate change, and to contribute to global efforts to reduce greenhouse emissions to avoid a 2 degree Celsius average global temperature rise by 2100. The National Climate Change Strategy attempts to strengthen concerted actions and management to comprehensively address climate change at the different levels and sectors of government, with a view to low carbon, climate-resilient, sustainable development.

**INSERT:**

**CONTAMINATION OF THE NEGRO RIVER**

Climate change has caused global temperatures to rise and our snow-capped peaks to disappear. The Cordillera Blanca community in Huaraz is familiar with this reality. As rocks are exposed above the snow, toxic metals are dispersed into the ecosystem.

1. In 1970, an earthquake struck Ancash and cracked some glaciers. Mineralized rocks broke off from these glaciers.
2. The rocks contaminated the waters of the Negro River, the only water source for the farming community of Cordillera Blanca.
3. The products derived from agricultural and livestock production, such as cheese, milk and meat, among others, were contaminated through the absorption of metals that exist in the water.
4. Community residents began to experience diarrhea, headaches and skin problems when they consumed the contaminated water.

Metals found in the rocks: iron, cadmium, arsenic, chromium and lead.

pH level of the Negro River\*: 3.5.

The pH levels that are apt for human and animal consumption: 6.5 to 8.5.

*Translation prepared by The Mountain Institute*  
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