

Results from Arequipa Nexus Institute's water interviews



WHO ARE WE: SUSTAINABLE WATER MANAGEMENT



The Sustainable Water Management team is part of the Arequipa Nexus Institute, a collaboration between professors, researchers, and students from the Universidad Nacional San Agustín in Arequipa and Purdue University in Indiana, USA. Our team researches the technical and social parts of water management in order to obtain information and develop tools that help the population improve their water management, agriculture and grazing.

We present to you the results of the first phase of our study

PERIOD OF STUDY	October 15, 2018 — December 7, 2018
PLACES VISITED	District of Caylloma and annexes, Lari, Yanque, Cabanaconde, Chivay
OBJECTIVE OF THE FIRST PHASE	Learn about community needs with intentions to develop tools that can help these groups improve their water and crop management

NEXT STEPS

WHEN?	WHAT?	WHY?
October, November, and December 2019	Potential at-home surveys	Obtain more detailed information about climate change, socioeconomic conditions, and needs
2019-2020	More focus groups	Present suggested tools
2020	Trainings	Training to use the tools in agencies and communities

SUMMARY OF RESULTS IN THE CAYLLOMA PROVINCE, FROM COLCA AND THE HIGH ELEVATIONS OF CAYLLOMA

Members of our research team conducted interviews with the representatives of the organizations in Chivay, as well as interviews with the inhabitants in the districts of Cabanaconde, Caylloma, Lari and Yanque. The people we interviewed mentioned common trends across the region, which are summarized in this document.

1. Climate changes



Cabanaconde in the dry season



Reservoir in Lari at the end of the dry season



Pasture in the District of Caylloma

Interviewees mention that there is a very extreme change in the climate. These changes began many decades ago, but have become stronger in the last 10 years.

- The heat is stronger now. Farms are drying up very fast and farmers have to water more often. In the upper parts, the wetlands are drying out and there is a lack of water for the animals.
- Interviewees said they are concerned about the glacial thaws and springs that are drying out.
- The rains are happening irregularly and the villagers can no longer predict the changes of season. Several people said that the seasons are no longer well defined.
- There are frosts that also occur irregularly. At high elevations, frost burns the pastures and there is not enough food for the animals. In the farms, the frost burns the crops, generating great losses in the capital of the inhabitants.
- Some farmers have told us that new pests that are resistant to pesticides have appeared. Frogs, birds and other animals that were once seen in rivers have also disappeared.
- Villagers do not know if some changes are due to climate change, volcano activity, or mining activity. For example, these three factors can influence at the same time and cause water scarcity.

SUMMARY OF RESULTS IN THE CAYLLOMA PROVINCE, FROM COLCA AND THE HIGH ELEVATIONS OF CAYLLOMA (CONTINUED)

2. Community changes



Lagoon of Colors, Colca Valley



Herding in Caylloma



Meeting in Chivay

Life in the community has changed a lot in recent decades. The people interviewed mentioned the following points:

- You can no longer live on agriculture or grazing alone as expenses are rising, but the price of crops and wool is low. Farmers and shepards have to look for other sources of income to support their family.
- Agriculture and grazing are declining in some places. There is abandoned land.
- Young people migrate to Arequipa and other larger cities for the very fact that there are no good opportunities for education and work in the districts.
- People who migrate out of their district often keep their land for rent. Many move between Arequipa and its districts.
- There are also many people who live in the districts of Cuzco, Puno, Espinar, etc. in search of work. These people usually rent land in the Colca Valley or work as shepherds in the upper parts of Caylloma.
- Villagers have to work hard to make a living. Therefore, they have less time to participate in assemblies and tasks. Some said that "now people prefer to pay their fine instead of attending assemblies and tasks."
- In the upper part of Caylloma, another problem is the long distances that villagers have to walk to attend a meeting. Therefore, it is very difficult to meet and organize in community.
- In the Colca Valley, we were told that there is no longer barter and ayni (I help you, you help me). In the upper part of Caylloma, some people said that there is still ayni, but that it is decreasing. Interviewees commented that "now everything is money" and that "people are more individualistic."

SUMMARY OF RESULTS IN THE CAYLLOMA PROVINCE, FROM COLCA AND THE HIGH ELEVATIONS OF CAYLLOMA (CONTINUED)

3. Water management



Sprinklers in Lari



Highland wetlands in Caylloma



Irrigation in Cabanaconde

On water management in the districts, the people interviewed mention the following points:

- In all districts, there is a shortage of water. Some users started using technified irrigation, but it is not easy to start. Sprinklers need farmers to be present three days in a row, they have to be moved on scattered plots, and the tubes freeze when it's cold.
- In the district of Caylloma, there are still no water user commissions. In some ranches, there are shepherds who pay their neighbors to have access to a water source.
- In the district of Caylloma, there are people who are in favor of forming commissions to receive support from ANA for the better management of water resources. Others don't want to because there is uncertainty about how much they should pay for water if they are formalized.
- In the Colca Valley, there are irrigation commissions with irrigation methods with pre-Inca tradition. But for the reasons mentioned previously, users have less time to attend assemblies and tasks in their commissions.
- ANA is trying to support irrigation water management with rules and sanctions, but they do not have sufficient resources. Interviewees said ANA should have more of a presence in their district. The Users' Board does not have sufficient resources and staff to comply with the processes necessary to improve water use.
- Authorities in irrigation commissions are overburdened with problems and some want more power to handle their own problems. Some interviewees said, "We are not against ANA if it worked well."
- Some commissions had to hire experts to do water studies and meet ANA requirements. But not all irrigation commissions have sufficient resources to hire experts.

SUMMARY SPECIFIC TO THE CAYLLOMA DISTRICT AND ITS ANNEXES



Principle characteristics:

- The main sources of income in the Caylloma district are alpaca raising, grazing and mining.
- A great concern of the inhabitants is water contamination by mining activity.
- There is a lack of competitiveness in alpaca wool sales, since shepherds do not have machines to process the wool and must sell to intermediaries.
- There is little tourism in the District of Caylloma.
- User commissions are in the process of formalization but there is little confidence in their operation

	SUMMARY OF NEEDS IN THE DISTRICT OF CAYLLOMA
WATER	<ul style="list-style-type: none"> • Where and how to build water reservoirs for harvesting water for drought seasons • Assessment of the degree of water contamination by mining and other polluting factors • Improve organization for the proper use and management of water
ANIMALS	<ul style="list-style-type: none"> • Promote the breeding of genetically modified alpacas and llamas • Suitable use of medicines • Avoid death and disease of animals due to climate change
BUSINESS	<ul style="list-style-type: none"> • Machinery for processing alpaca wool • Strengthening alpaca ranchers' associations • Train the local population to benefit from experiential tourism.

Thank you so much for having us in your community! If you have any questions, please contact us.

CONTACT

For more information about the developers, this factsheet, and other products developed by the Arequipa Nexus SWM team, contact us at nexus-swm@purdue.edu.

SUMMARY SPECIFIC TO THE LARI DISTRICT



Principle characteristics:

- The main sources of income in the Lari district are dairy cattle and agriculture.
- Lari is located on the right side (north) of the Colca canyon, and its only sources of water are the glacial thaws and natural springs.
- There is small-scale sprinkler irrigation, but there are barriers to adoption.
- A major concern is water pollution from mining activity.
- There are two associations of dairy farmers who produce cheeses. They want to learn how to make various types of cheeses, including mature cheeses.

SUMMARY OF NEEDS IN THE DISTRICT OF CAYLLOMA	
WATER	<ul style="list-style-type: none"> • Building reservoirs to store water • Improve technical irrigation • Studies on water quantity and quality
AGRICULTURE	<ul style="list-style-type: none"> • Avoid fluctuation in the price of crops • Mitigate crop losses due to change in climate • Potential in animal fodder
BUSINESS	<ul style="list-style-type: none"> • Empowering local people to benefit from tourism • Church repairs • Machinery for processing milk and cheese • Strengthening milk producer associations

Thank you so much for having us in your community! If you have any questions, please contact us.

CONTACT

For more information about the developers, this factsheet, and other products developed by the Arequipa Nexus SWM team, contact us at nexus-swm@purdue.edu.

SUMMARY SPECIFIC TO THE YANQUE DISTRICT



Principle characteristics:

- The main sources of income in the Yanque District are agriculture, livestock, and tourism.
- Yanque has two irrigation commissions: Hurinsaya, with land on the right side (north) of the Colca canyon, and Hanansaya, with land on the left side (south) of the Colca.
- There is small-scale sprinkler irrigation, but there are barriers to adoption.
- Yanque has land in the high elevations, and they are looking to strengthen their alpaca ranchers' associations.

SUMMARY OF NEEDS IN THE DISTRICT OF CAYLLOMA	
WATER	<ul style="list-style-type: none">• Build reservoirs to store water• Improve technical irrigation• Studies on water quantity and quality
AGRICULTURE	<ul style="list-style-type: none">• Avoid fluctuation in the price of crops• Agricultural insurance• Avoid crop losses due to climate change• Studies to see soil health• Potential for organic agriculture
BUSINESS	<ul style="list-style-type: none">• Empower local people to benefit from tourism• Strengthening alpaca ranchers' associations

Thank you so much for having us in your community! If you have any questions, please contact us.

CONTACT

For more information about the developers, this factsheet, and other products developed by the Arequipa Nexus SWM team, contact us at nexus-swm@purdue.edu.

SUMMARY SPECIFIC TO THE CABANACONDE DISTRICT



Principle characteristics:

- The main sources of income in the Cabanaconde district are agriculture, remittances from abroad, and tourism.
- Cabanaconde is the only district in the Colca Valley with 5 irrigation commissions.
- There is small-scale sprinkler irrigation, but there are barriers to adoption.
- A major concern of the inhabitants is the change in the climate and its effects on crops.
- Another concern is the overuse of pesticides and pesticide-resistant pests.

SUMMARY OF NEEDS IN THE DISTRICT OF CAYLLOMA	
WATER	<ul style="list-style-type: none"> • Build reservoirs to store water • Improve technical irrigation • Studies on water quantity and quality
AGRICULTURE	<ul style="list-style-type: none"> • Avoid fluctuation in the price of crops • Agricultural insurance • Avoid crop losses due to climate change • Studies to see the quality of the soil • Potential for organic agriculture
BUSINESS	<ul style="list-style-type: none"> • Empower local people to benefit from tourism • Machinery for processing grains • Strengthening local partnerships

Thank you so much for having us in your community! If you have any questions, please contact us.

CONTACT

For more information about the developers, this factsheet, and other products developed by the Arequipa Nexus SWM team, contact us at nexus-swm@purdue.edu.