

# Climate Change, Water Resources, and WASH Systems

COUNTRY CASE:

**BOLIVIA**



	Risk	Programming	Policy & Planning	
Polluted water	Medium	Related	NAP	No
Too little water	High	Related	National climate policies & plans	Comprehensive
Too much water	Medium	Limited	Extent WASH is included	Moderate

## Climate trends and impacts on water resources

Climate trends in Bolivia are listed below:

- The adverse effects on rainfall patterns can be attributed to climate change, with marked changes in the seasonality, intensity, and amount of rainfall, far removed from the historical average records of recent decades.
- Trends of adverse weather events such as droughts, frost, hail, high temperatures, and floods are becoming increasingly extreme.

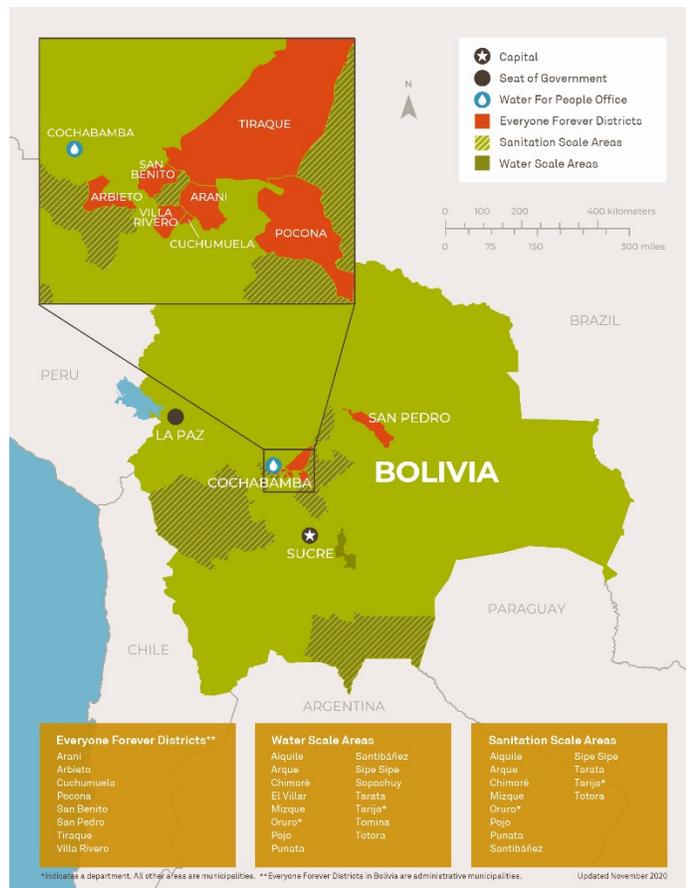
Importantly, these effects are accelerated and increased by anthropic activities through poor agriculture practices, deforestation, and inadequate disposal of solid waste and wastewater.

## Impacts on WASH infrastructure and services

The municipalities we partner with - Arbiето, San Benito, Arani, and Villa Rivero - are located in the Valle Alto region whose climate is characteristically semi-arid. The main sources of water are the deep aquifers exploited through drilled wells which supply drinking water and sanitation services. However, there is no regulation on the drilling of wells for different uses, such as human consumption, irrigation, and small industry.

The municipalities of Tiraque and Pocona are in the eastern mountain range of the Andes with a highland topography that makes up the upper part of the watersheds that recharge the underground aquifers of the Valle Alto. The water sources are mostly surface (springs and watersheds) and are vulnerable to contamination by urine and feces of cattle, agrochemical waste, and humans.

This scarcity and contamination of water stunt human development; this mainly affects health due to gastro-intestinal infections and the economy due to losses in agricultural production. Increasing demand for water for different uses due to the increase in population and economic activities amplifies the challenges of water scarcity. Furthermore, institutional and social disagreements generate water grabbing conflicts, and institutional weakness with limited financial, technical, and control capacities result in irrational use of water.



In general, the area where Water For People in Bolivia works is normally semi-arid with low rainfall. Additionally, anthropogenic activities degrade the environment, accelerating and making the effects of climate change more pronounced through an increase in temperature and water scarcity.

## Climate and WASH Policy and Initiatives

In recent years in Bolivia, we have been undergoing profound political, social, and environmental changes. Therefore, an up-to-date development model is being generated in accordance with the economic, social, health, and environmental conditions, which are strongly influenced by global trends. In this sense, issues of the environment and preservation of natural resources are becoming more and more urgent. We run the risk of losing all the achievements made in the areas of water and sanitation and affecting the most vulnerable sectors with unexpected brutality.

Environmental issues are most pressing to generate security in water availability, and this will be achieved through the conservation or restoration of the watersheds that constitute the natural and inexhaustible recycling system of clean water, as long as the existing equilibrium remains undisturbed.

Currently in Bolivia there is the [National Watershed Plan](#) (PNC, for the Spanish acronym) which is the public policy that guides actions in water resources management (WRM) according to the strategic guidelines established by the political constitution of the state, norms, and laws. In addition, it guides the measures for risk management and climate change adaptation whose responsibility is shared between various government entities. Regarding hydrological risk management, the Vice Ministry of Water Resources and Irrigation, through its Risk Management Area, contributes to the implementation of the Early Warning System, in close coordination with departmental and municipal units.

Within the PNC framework, the [Multiannual Program for Integrated Management of Water Resources and Integrated Management of Watersheds 2017-2020](#) responds with intervention actions such as the management and conservation of forested areas in the headwaters of the watersheds to preserve the characteristics of water permeability and recharge, mitigation of droughts that put food security at risk, and the provision of water for water and sanitation systems. Although the PNC does not contribute directly to investments in drinking water and basic sanitation works, it creates the necessary conditions for providing quality water resources and supplying drinking water systems.

## Country program activities: mitigation and adaptation

The first fundamental action was the development of a **Strategic Plan for Integrated WRM** within the framework of the PNC and the political constitution of the state. Additionally, Water For People provides technical assistance in water resources aimed at protecting water sources and recharge areas, according to the demand and needs of partner municipalities, promoting actions to achieve sustainability.

In each municipality, technical assistance is guided by the **Municipal WRM Plan**, which includes 5 activities:

1. **Formation of the Municipal Integrated WRM Committee:** Consists of generating the conditions, mechanisms, and instruments within the municipality such that this committee can function constantly and direct water source protection and recharge zone reforestation activities in an organic way with communities.
2. **Identification of water sources and water recharge zones:** Identification maps of potential water recharge zones have been drawn up, which are shared with Municipal

Departments of Basic Sanitation (DMSB, for the Spanish acronym) technicians and later with community leaders to prioritize recharge zones to be forested.

3. **Strengthening of municipal nurseries and propagation of forest species:** In coordination with the Department of Productive Development (DDP, for the Spanish acronym), municipal forest nurseries are strengthened with the tools, equipment, and supplies they need, as well as the acquisition of forest species seeds and the propagation of forest species whose final destination will be the water recharge zones prioritized in a participatory manner.
4. **Afforestation of water recharge areas:** The forest species saplings produced are used for forest plantations in recharge areas with community labor.
5. **Protection of water sources in use:** Water sources, watersheds, and springs are protected with fences made of shrub plants and barbed wire, where the prioritized community works on planting and driving in posts for the fences. The support is for technical and material assistance for the perimeter fence of the source area and the production of saplings, with shared investment.

In the municipalities of Villa Rivero and Arbieta there is a need to draft a law that regulates and standardizes the drilling of wells, since this activity is uncontrolled and is detrimental to the availability of water for human consumption.

Municipal plans include mitigation and adaptation components. Mitigation happens with forestation activities, and adaptation happens with the entire planning process, based on the participation of communities and families. The main result of having these plans is to ensure the sustainability of the sources so that communities have drinking water systems that last forever, considering the threats of water scarcity.

### Key challenges

Municipal plans contain a technical procedure for the afforestation of water recharge zones that guarantees water resources for drinking water and sanitation systems. The challenge will be to institutionalize this procedure so that the mayor's office, through the DMSBs and DDPs, coordinate among themselves and with the watershed authority of the departmental government and develop these activities every year.

Another challenge is getting municipal authorities and society in general to manage funds to finance the gradual implementation of their respective Municipal Plan, either from the PNC or from another body that provides specific cooperation for WRM.

Finally, the biggest challenge in the medium term is to institutionalize a Municipal Committee based on the Municipal Plan, with the participation of the municipal government, society, and various groups that have corporate interests in water use, such as the society of irrigators, drinking water committees, and small ranchers. This committee should guide the demands for water use, prioritize its use, and serve as the institutional and social forum that prevents conflicts through agreements between parties, endorsed by the municipal institutions and accepted by the citizens.