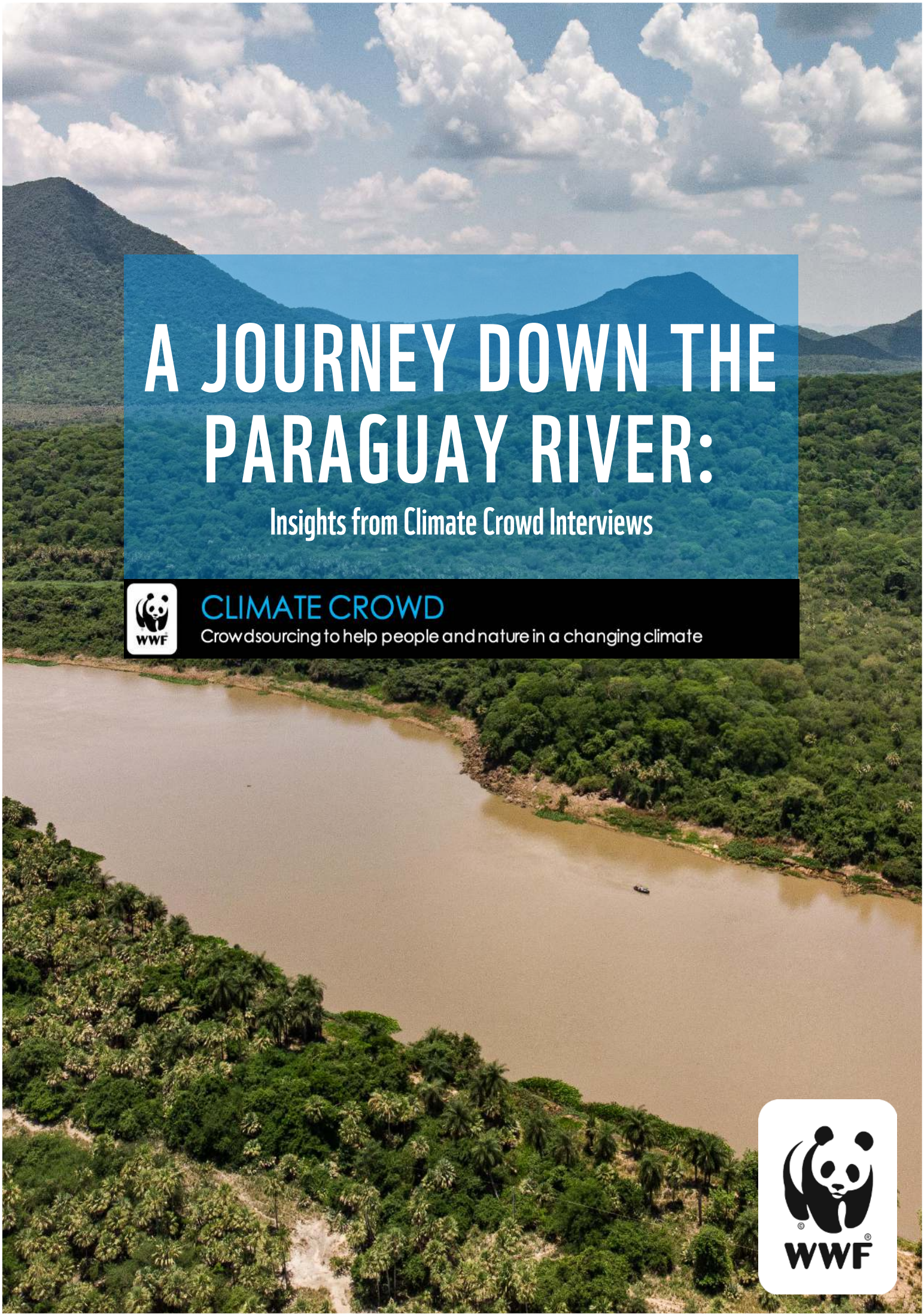


A JOURNEY DOWN THE PARAGUAY RIVER:

Insights from Climate Crowd Interviews

CLIMATE CROWD

Crowdsourcing to help people and nature in a changing climate

WWF

BACKGROUND

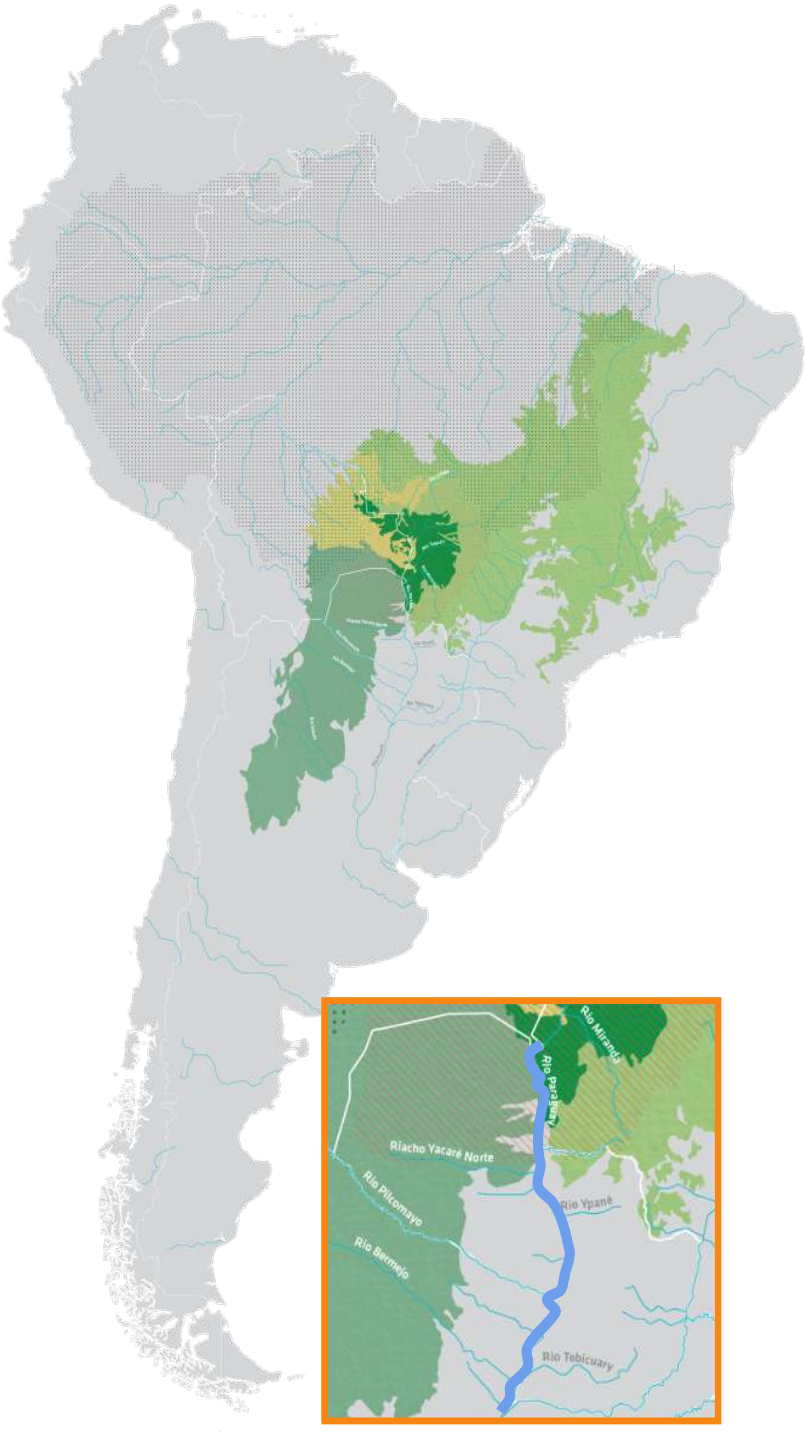
Climate Crowd is a crowdsourcing initiative that convenes and supports a network of partners to gather data on how climate change is impacting people and nature. The initiative supports on-the-ground projects that help rural communities adapt while reducing pressure on biodiversity.

As a part of the initiative, WWF partnered with two former Peace Corps volunteers in Paraguay to conduct 44 interviews (18 women, 26 men) in communities along the Paraguay River. The Paraguay River provides a diverse array of ecosystem services for people and wildlife and flows through the world's largest tropical wetland, the Pantanal. Spanning 42 million acres and three countries—Bolivia, Brazil, and Paraguay—the Pantanal supports more than 4,700 species of plants and animals. Since 2018, WWF has worked with a range of stakeholders, from communities to governments, in all three countries to achieve transboundary conservation and sustainable development of the Pantanal.

OUR PARTNERS

In October 2019, Jeff Wong and Henry Maillet embarked on a 1,300km expedition down the Paraguay River in a traditional fishing rowboat, exploring and documenting the immense biocultural diversity found along the river and engaging with local communities through interviews and dynamic school activities.

Through their travels, they learned about the local effects of climate change on daily life in various riverside communities, ranging from isolated indigenous villages to densely populated urban centers. Their conversations with local inhabitants revealed that the impacts of climate change and adaptations of local communities vary depending on many factors, including geography, livelihood, and culture.



Dark green indicates the Pantanal wetlands. Light blue indicates the Paraguay River stretch that runs through Paraguay.
Source: World Wildlife Magazine, Spring 2020.

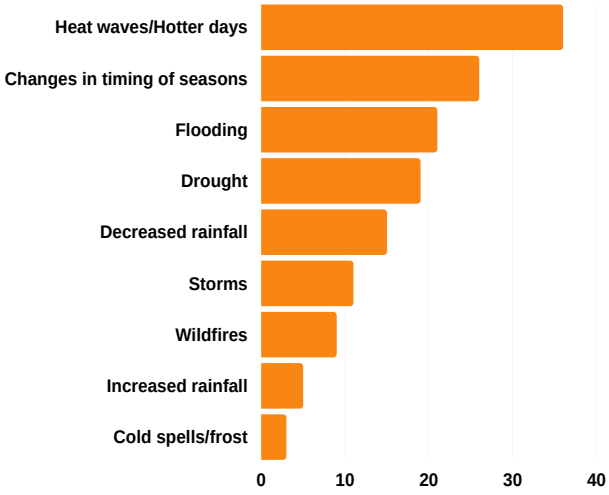
REPORTED CHANGES IN WEATHER & CLIMATE

As climate change intensifies, communities face rising temperatures, shifting seasons, and more variable rainfall.

The Paraguay River is a vital resource for riverside communities, who rely upon it for irrigation, transport, drinking water, trade, and fishing, among many other uses. Changes in weather and climate, however, have made life along the river increasingly difficult. In interviews, community members reported hotter temperatures, shifting seasonal patterns, drought, and more variable rainfall in recent years. These changes have reportedly led to more health issues, and loss of livelihoods and food security for communities. Heat and variable rainfall have also caused wetlands in the Pantanal to dry out, led to more frequent wildfires, and affected the flowering of plants, highlighting the impacts on biodiversity.

Seasonal flood pulses are vital to communities and wildlife within the Pantanal and along the Paraguay River. During the wet season, water covers nearly 80% of the Pantanal's vast floodplain, transforming the region into a dynamic aquatic ecosystem. Biannual flooding events replenish water sources, renew soil nutrients, and provide habitat for diverse flora and fauna. Communities along the Paraguay River rely on these flooding events for agriculture, drinking water, and other livelihood activities. Almost half of the interview respondents noted changes to seasonal flooding patterns, due in part to more variable rainfall. In some areas, excessive flooding has reportedly caused property damage, crop failure, and forced relocation, while in other regions, insufficient flooding has threatened water availability, local livelihoods, and wildlife habitat.

Reported Changes in Weather and Climate



A university student noted that it is harder for community members to predict the weather as their ancestors once did.

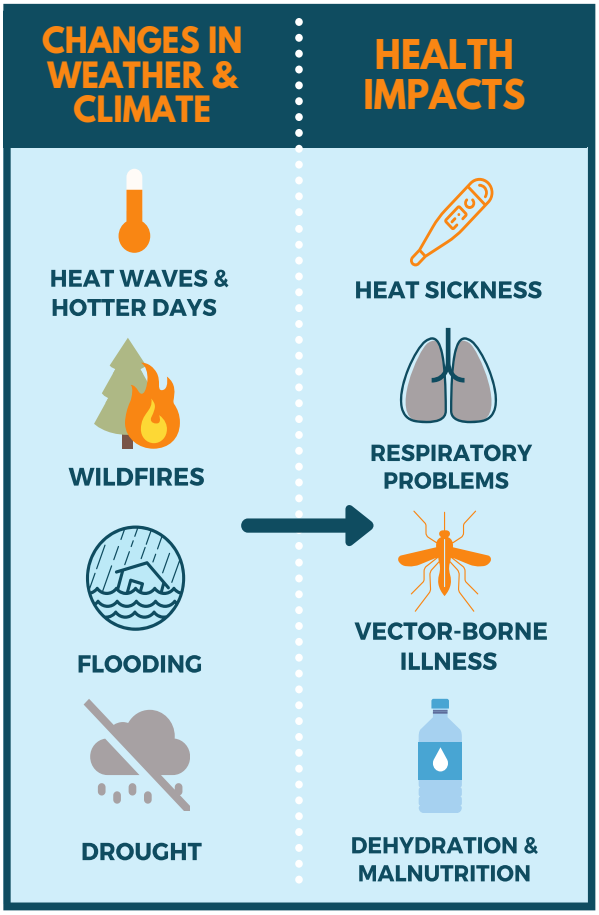
A local artisan reported that increased drought has led to the dying off of the Caraguatá plant, which she uses to make crafts as her main livelihood.

HUMAN HEALTH

Health problems were the most commonly cited impacts reported by community members.

The changes in weather and climate described above have led to emerging health problems in riverside communities, as reported by 39% of respondents. Heat-related illnesses and respiratory issues associated with increased wildfires were the most commonly cited health concerns in interviews, with vulnerable groups such as infants and the elderly affected the most. In response to extreme heat, community members report spending less time outside during the day to avoid the heat, planting shade trees, using more air conditioning [where available], and losing productive work hours.

Changing river dynamics have also impacted human health. Flooding in some areas has reportedly led to more water and vector-borne illnesses such as dengue fever. Unclean river water has also resulted in stomach problems in individuals who rely on the river for drinking water. In recent years heavy rainfall has increased surface runoff from the land, carrying pollutants into the river. One woman explained that when it rains, the chemicals sprayed on nearby rice fields get washed into the Paraguay River, rendering it "black and undrinkable." Several respondents mentioned treating water with sulfates to purify unclean drinking water.



"I believe that with the conservation of nature, we help our own bodies."

- Nancy, Karcha Bahlut

FOOD & WATER ACCESS

Respondents report difficulty sustaining subsistence practices.

Many communities along the Paraguay River procure food through subsistence agriculture, wild food collection, and fishing, and directly rely on the river for access to freshwater. However, interviews suggest that these vital food and water sources are under threat. According to 45% of respondents, changing rainfall patterns, increased pollution, and upstream development are causing water quality and quantity to decline, with some streams and tributaries drying up completely.

Twenty percent of respondents reported that intense heat, sporadic rainfall, and flooding have led to poor crop yields in recent years, prompting many to abandon farming altogether and purchase produce to replace subsistence crops. Increasingly sporadic rainfall has also reduced the amount of water and pasture available to livestock, resulting in cattle death and malnourishment.

Due to irregular rainfall patterns, commonly hunted wild animals and other wild food sources such as fruits and honey are more difficult to find. One community reported relying more heavily upon fishing as a food and livelihood source as a result. An increase in fishing may, in turn, put additional pressure on fish populations, which have reportedly declined in recent years.

"If the day comes that the Yshir people don't have our forests, the animals will be gone as well because they stay where there is food. If there is no forest, there won't be animals, either."

- Elena, Bahía Negra

"The Chamacoco people have always lived along the river in the Pantanal. It has always been our home. The river is everything to us. It is our fresh water."

- Aparicio, Fortín Patria

UPSTREAM VS. DOWNSTREAM

Perceptions of impacts differed in northern vs. southern communities.

Community perceptions and experiences differed depending on their location along the river. Only respondents in the northern part of the country, for example, reported a decrease in rainfall. Additionally, northern respondents were less likely to experience water quality issues and low fish stocks than those in the south. The proximity to the Pantanal, which provides natural water filtration and critical habitat for fish, is likely a significant factor. In the north, respondents generally had a more favorable attitude towards flooding events, which farmers rely upon to replenish water sources and provide nutrient-rich soils.

In contrast, for more urban communities in the south, flooding presents a greater problem. More intense rainfall, deforestation, and river channeling have exacerbated flooding in recent years, leading to more water and vector-borne diseases, damage to crops, property, and infrastructure, and relocation of families. In one instance, intense flooding damaged a bridge used by a local community to transport goods, forcing community members to fell 420 trees to repair it. In addition to flooding, fish abundance and water quality are reportedly worse in southern reaches of the Paraguay River, where urban development has accelerated in recent years. Some attribute the relative scarcity of fish to harmful fishing practices upstream, including the use of nets with a small mesh size.

> "There are still many fish in the river, and they're not going to run out. When the water is dirty, it seems like all of the fish are going to die... But then many more come."
>
> - Xito, Bahía Negra

> "Due to the great deforestation that occurs in the north in the Atlantic forest in Alto Parana, in the Amazon, or in the Alto Chaco, we are receiving more water than we can tolerate as a wetland population."
>
> - Cristian, Pilar

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