La Plata River Basin

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Transboundary Water Resources

The La Plata River Basin is located in the South American countries of Brazil, Paraguay, Uruguay, Bolivia and Argentina. The basin covers 3.1 million square kilometers and is the fifth largest basin in the world. There are four main rivers in the basin; Paraná, Paraguay, Uruguay and Plata. The Paraná River has the highest flow rate of the basin’s rivers. The average flow rate is 17,100 m³/s. The Uruguay and Paraguay Rivers have flow rates of 4,300 m³/s and 3,800 m³/s respectively. The Paraná, Paraguay and Uruguay rivers combine to form the La Plata prior to discharging into the Atlantic Ocean.

There are 100 million people currently living in the basin. This accounts for approximately 50% of the entire population of the five riparian countries. The capitals of four of the five basin countries are located within the basin; Brasilia, Brazil, Montevideo, Uruguay, Asuncion, Paraguay, and Buenos Aires, Argentina. Sixty percent of the economy for the five basin countries exists in the basin. Therefore in economic terms, this basin is the most important region in South America.

The hydrography of the basin is diverse. Both surface water and groundwater resources exist in the region. The Guarani Aquifer, one of the world’s largest continental groundwater reservoirs in the world, is located in the basin. 40,000 cubic kilometers of water are contained in the aquifer. This water has the ability to provide 360 million people with water for 100 years. The Pantanal wetlands, located on the upper Paraguay River, are a highly biologically diverse natural reservoir. The wetlands act as a natural flow regulator into the Parana and Paraguay
rivers. By tempering flood flows with distribution through the wetlands, potential flooding is greatly reduced further downstream in the basin.

Hydropower is very important in the region. There are over 75 large dams, currently tapping 60 percent of the 90,000 MW potential of the basin. The largest of these dams is the Itaipu Dam located on the Paraná River. Paraguay and Brazil participate in joint management of this dam. The Itaipu dam supplies 90% of the energy consumed in Paraguay and 19% of that consumed in Brazil. The dam’s reservoir flooded the Guariro falls, previously the largest waterfall in the world by volume, with its initial operation in 1982.

Since the 1970’s, climate data has indicated that rainfall and river flows have increased at rates of 16 and 35 percent respectively. This change has been attributed to the climate phenomenon, El Nino. Severe floods and droughts occur at a higher frequency than in previous years. In 1834, Charles Darwin studied the rate of severe droughts in the basin and concluded that they occurred one out of every 15 years. Current data suggests that these events are now occurring once every ten years.

The rapid industrialization of the basin combined with high levels of population growth has contributed to environmental degradation by pollution. Many new industrial centers are being constructed on the basin’s waterfront. Lack of environmental regulations and universal enforcement prevent cohesive pollution circumvention. As population rates increase, infrastructure development lags behind significantly. Water and wastewater treatment facilities are sparse and insufficient to treat the rapid increase in rate of water needs and wastewater generation.

In 1967, the five basin countries, Brazil, Paraguay, Uruguay, Bolivia and Argentina formed the Intergovernmental Coordinating Committee (ICC). The goal of this committee is to promote organization and physical development of the basin and surrounding areas. The La Plata River Basin treaty, signed in 1969, created guidelines for future agreements, contracts and deals. Over 20 of these collaborations have been created. These collaborations gave rise to the creation of different institutions and organizations with the goals of protection and integrated water management of water resources. Policy direction is provided by the foreign ministers of
the basin countries. The ICC functions as the main tool for treaty implementation. A redefinition of the ICC in 2001 added a special unit to develop action plans for regional problems caused by climate change.

The Paraguay-Paraná Hidrovia project involves all five basin countries and was initially considered over 100 years ago. The Hidrovia is a project to dredge and redirect the Paraguay and Paraná Rivers to provide a more constant means for navigation year round within the basin. The waterway would be at least three meters deep and run for over 3,400 kilometers. While this project has the potential to advance the economies of Argentina, Brazil, Bolivia, Uruguay and Paraguay, it is not without negative environmental effects. Redirecting the flows of the Paraguay River has potential to adversely affect the Pantanal wetlands. Models have shown implementation of the Hidrovia would reduce the area of the wetlands by 22 percent. Flow rates of the rivers would be accelerated along the new waterway and therefore natural ecosystems will be exposed to potentially harmful changes. The potential benefits and negative effects of the Paraguay-Paraná Hidrovia are currently under debate and project planning is at a standstill.

The riparian countries in the La Plata Basin have a long history of positive collaboration efforts. Climate change and the continuation of river flow modifications in the form of dams and waterways will continue to change the hydrology of the basin. These countries must continue to work together to evaluate the effects of the severe weather events and manmade changes to ensure that the basin remains economically and environmentally stable.

Required Reading


Reference