



São Paulo Secretariat of Environment, Brazil

Glauco Kimura de Freitas, WWF-Brazil

Context

São Paulo is the world's seventh-largest city by population. The city anchors the São Paulo metropolitan area (SPMA). It is the second most populous metropolitan area in the Americas and among the five largest metropolitan areas on the planet, with almost 20 million inhabitants.

The Tietê River, and its tributary, the Pinheiros River, were once important sources of freshwater and leisure for São Paulo. However, industrial effluents and wastewater discharges in the last half of the 20th century caused the rivers to become heavily polluted. There are no large natural lakes in the region, so the Billings and Guarapiranga reservoirs on the southern outskirts of the city are used for power generation, water storage, and leisure activities. Most of the reservoirs serving the SPMA are completely polluted because of the development of slums around the streams and rivers that feed them. Thus far the lack of affordable housing in the urban areas of São Paulo means it has been impossible to reverse this informal land occupation, and it is anticipated that this encroachment pattern will continue.

For clean water, the SPMA depends on a neighboring watershed, the Piracicaba-Capivari-Jundiaí, which provides water to the city via a diversion system (the Cantareira system). Today, the Cantareira supplies water to approximately 50% of the SPMA population. To meet rising water needs, a new water diversion project (expected to begin in the next two years) will withdraw water from the rio Ribeira de Iguape microbasin in the Vale do Ribeira (approximately 80 km south of the city). This project is expected to cost US\$630 million, and will ensure a water supply for SPMA until only 2020—it is not a permanent solution to the problem of clean water scarcity.

The state of São Paulo has the highest GDP in Brazil and is the most populous state nationally, with 41 million people. The state contributes a third of the national agricultural GDP (including crops such as corn, sugarcane, and coffee), and is characterized by intensive land use. Only 14% of the natural vegetation still remains, mostly within parks and natural reserves (São Paulo (Estado) 2010).

Climate Change

The climate in São Paulo state varies by region. The north and northeast are seasonal, with a wet and warm summer and a dry and cold winter, but average temperatures are above 20°C and rainfall is over 1,200 mm. The south and coastal zones have rainfall distributed more regularly throughout the year, with a mean temperature above 20°C and rainfall reaching 2,000 mm per year.

The state of São Paulo is vulnerable to the risks associated with extreme climate events. Flooding and landslides are already frequent consequences. The state also faces a series of non-climate pressures because of high rates of urbanization and land conversion, including poor sanitation (of the existing water supply and due to lack of sewage service and treatment) and degradation of water sources.

Climate change is expected to intensify these risks. According to recent climate modeling, extreme rainfall events are expected to become more frequent in the state and in the SPMA, leading to increased flooding and landslides (Nobre et al. 2010). Additionally, mean temperatures will rise, escalating the risk of health problems and diseases.

The agriculture of the region is also expected to change; according to the Brazilian Agricultural Research Agency, which considered three potential scenarios of temperature and rainfall increase (+1°C, +3°C, and +5°-8°C, all with 15% higher rainfall), the main crops in São Paulo state could be severely affected. Corn, which grows in sandy soils, would be reduced by 75%. In the warmest scenario, coffee would lose 90% of its current viable soil. Sugar cane, on the other hand, is tolerant of warmer temperatures and would benefit from the intermediate scenario (+3°C), nearly doubling its viable area. However, the warmest scenario (+5°-8°C) would limit sugar cane's growth to 50% because of the water scarcity inherent in a temperature increase of 5°-8°C. In short, the SPMA is extremely vulnerable under these projected future conditions. The Sao Paulo urban area is expected to double in size by 2030. Under that scenario up to 12% of the total area would become highly vulnerable to landslides (Nobre et al. 2010).

Institutional Description and Response to Climate Change

Many Brazilian states have developed or begun to work on climate change policies and plans (addressing mitigation and/or adaptation). In 1995 the state of São Paulo established the State Program for the Prevention of Climate Change (PROCLIMA), which is responsible for coordinating the state's mitigation efforts. At the present time, among the twenty-seven Brazilian states, nine already have climate change policies. The state of São Paulo launched its most recent climate change policy in 2009. It prioritizes a shift to a low-carbon development pathway but also tackles some key aspects of adaptation, mainly urban development planning and its integration with other instruments and policies.

The Secretariat of Environment (SEA) of São Paulo is still being restructured after the 2010 change in the state government, as well as its new responsibilities as defined by the 2009 climate change policy, which the SEA became responsible for implementing. SEA's Water Resources Technical Advisory Team coordinates the adaptation components.

In 2009 the SEA launched the Pacto das Águas (which translates to "Water Deal"). This ambitious program is designed to engage all of the 645 municipalities in the state of São Paulo, encouraging them to make commitments and set goals for improving water management conditions. The Pacto das Águas is a group of 21 goals, divided into three topics including sanitation and headwaters and springs protection. The third topic is defined by the individual municipalities according to their specific priorities.

Even though the state of São Paulo has only just begun a systematic vulnerability assessment, investing in sanitation and headwater protection are already "no-regret" adaptation actions. The major vulnerabilities predicted across the state are related to water security. Ensuring a water supply for people and the environment will require a shift in "business as usual" ways of managing water. Reservoir construction has been proven to be an inefficient and perhaps inadequate way of providing drinking water for São Paulo; it is clear that water security will require the protection and/or restoration of springs and headwaters.

São Paulo's water security problem involves not only water availability but also water quality. Less than 50% of the residents have access to treated water. In the future, extreme rainfall events are expected to become more frequent and intense. If the water quality problems are not addressed now, public health problems in the metropolitan region will likely increase.

Since the launch of the Pacto das Águas, 93% of the municipalities (598) have adhered to the new rules and 26% (153) of the municipalities involved have already achieved their goals (see Figure 1). These impressive results are due to a huge effort from the state to mobilize and engage its municipalities through the media, educational campaigns, and capacity-building workshops. The SEA also benefited from existing state programs that were already active in some municipalities, such as the Green Blue Village (Município Verde Azul) state program.

Discussion of Most Important Climate-Adaptive Principles

External Regime

The 2009 São Paulo Climate Change Policy is what led to the restructuring of the SEA, since the state government has a mandate to coordinate and implement the policy. This kind of legal framework was important for the development of an appropriate institutional framework and for the establishment of infrastructure (such as financing).

The SEA is already working on a national inventory of adaptation measures and has started to consider a state water and climate change adaptation plan. However, this component needs a formal "owner" (since the restructuring is still in process) in order to ensure the institutional capacity needed to deal with mitigation and adaptation.

The São Paulo state administration has utilized the Pacto das Águas in order to begin preparing the state for the impacts of climate change. The Pacto das Águas was considered a powerful platform by the prior administration, and the new state administration has just established a permanent structure to advance this effort. However, due to its relevance and its connection to climate change initiatives, the Pacto das Águas should become an institutional priority and be fully incorporated into water resources state legislation.

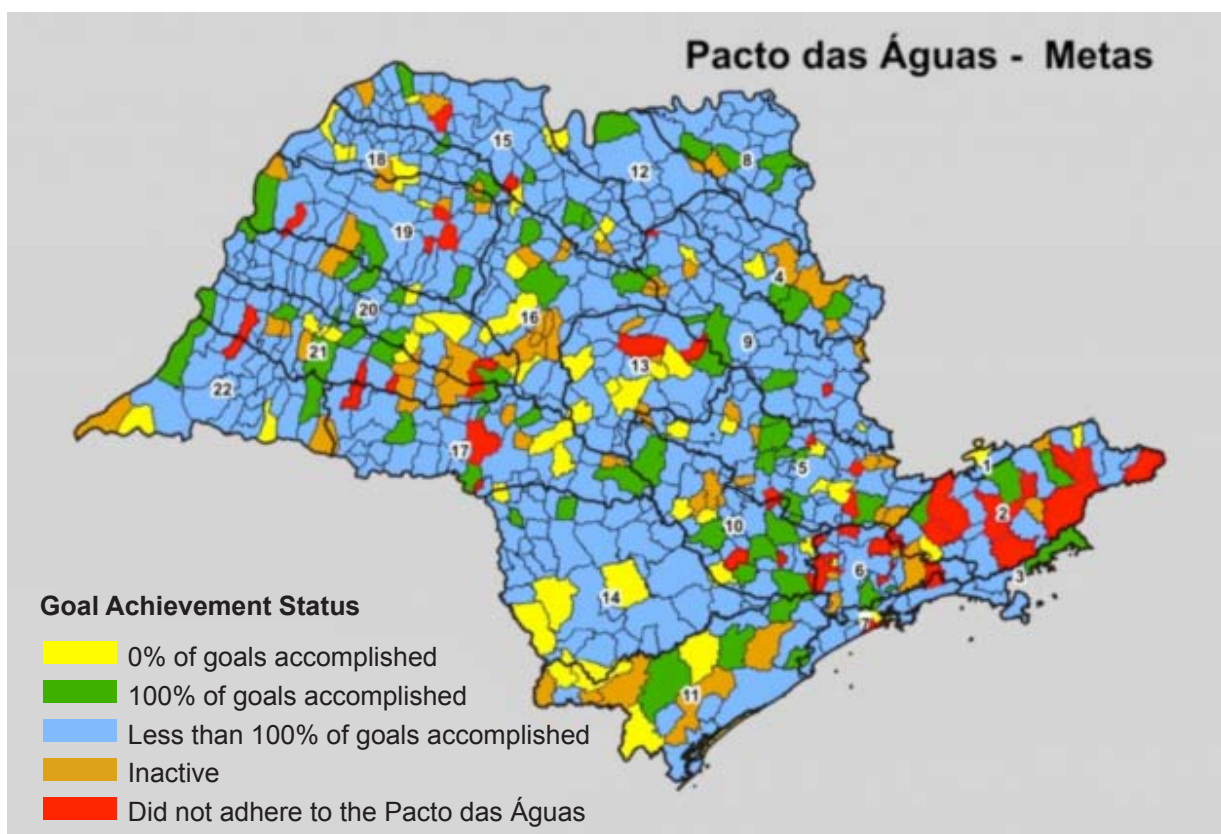


Figure 1. The 645 municipalities of the state of São Paulo and their engagement in the Pacto das Águas.

Resources

The state of São Paulo has so far demonstrated leadership by launching its first climate change state policy. Also encouraging was the vulnerability assessment for the SPMA launched in 2010, which was to be the first in a series that quantifies the impact of climate change on Brazilian mega-cities. However, the state government changed in 2010, and the new state administration has the huge duty of addressing these issues for the region. It is no longer enough to set goals for emissions reductions. The state has a responsibility to advance the adaptation agenda by investing in human resources, training, and capacity building within the SEA; making state funds available; going forward with vulnerability assessments; implementing sustainable planning for its urban areas; and managing risks at vulnerable sites.

Even though the Water Resources Technical Advisory Team has been taking the lead on this agenda successfully so far, the internal capacity (both human and financial resources) within the SEA needs to be increased to meet the considerable challenge of promoting changes at the state level. This must be a priority. Extreme rainfall episodes, flooding, and landslides are becoming frequent and are increasing in magnitude every year. Financial losses, diseases, and deaths could be avoided by investing in greater capacity within the SEA.

Collaboration and Partnerships

While the SEA currently lacks the resources required to promote sound adaptation at the state level, it has been very effective at reaching out to a strategic set of other institutions and organizations for assistance. WWF-Brazil, in particular, has been engaged on a number of fronts, including a collaborative effort to submit a proposal for the National Climate Change Fund that would take advantage of the Pacto das Águas structure and mobilization. Even if that proposal is not approved, WWF-Brazil will support SEA as it develops an adaptation framework, integrated with a plan for water resources protection, with the goal of ensuring water security at the state level. Through this partnership with WWF-Brazil, the SEA has the ability to mobilize all 645 municipalities to develop local adaptation programs within the Pacto das Águas structure. Partnerships like this can enable, on an unprecedented scale, the dissemination of adaptation concepts and principles as well as the demonstration of local adaptation initiatives.

While such adaptation-related collaborations with WWF-Brazil and other institutions are still relatively new, the SEA has a history of collaboration. The Pacto das Águas is a good example of sharing responsibility among municipalities and of consolidating strategic partnerships and efforts. A decentralized framework empowers local authorities to take the lead on key aspects of environment and health, and it represents an effective method for achieving ambitious goals that the state alone could not effectively meet.



References

- Nobre, C.A., Young, A.F., Saldiva, P., Marengo, J.A., Nobre, A.D., Alves Jr., S., Silva, G.C.M., and Lombardo, M. 2010. Vulnerabilidade das Megacidade Brasileiras às Mudanças Climáticas: Região Metropolitana de São Paulo. Sumário Executivo. Centro de Ciência do Sistema Terrestre do Instituto Nacional de Pesquisas Espaciais (INPE), Núcleo de Estudos de População da Universidade de Campinas (UNICAMP), Faculdade de Medicina da Universidade de São Paulo (USP) Instituto de Pesquisas Tecnológicas de São Paulo (IPT), Universidade Estadual Paulista (UNESP - Rio Claro). Junho de 2010. 32 p.
- São Paulo (Estado). 2010. Secretaria do Meio Ambiente/Coordenadoria de Planejamento Ambiental. Meio Ambiente Paulista: Relatório de Qualidade Ambiental 2010. Organização: Casemiro Tercio dos Reis Lima Carvalho e Marcia Trindade Jovito. São Paulo, SMA/CPLA, 2010. 224 p.
- São Paulo 2010. Conselho Estadual de Recursos Hídricos. Comitê Coordenador do Plano Estadual de Recursos Hídricos. Relatório de situação dos recursos hídricos do Estado de São Paulo / Conselho Estadual de Recursos Hídricos, Comitê Coordenador do Plano Estadual de Recursos Hídricos. <http://www.sigrh.sp.gov.br/sigrh/basecon/RelatorioSituacao2010/01.pdf>