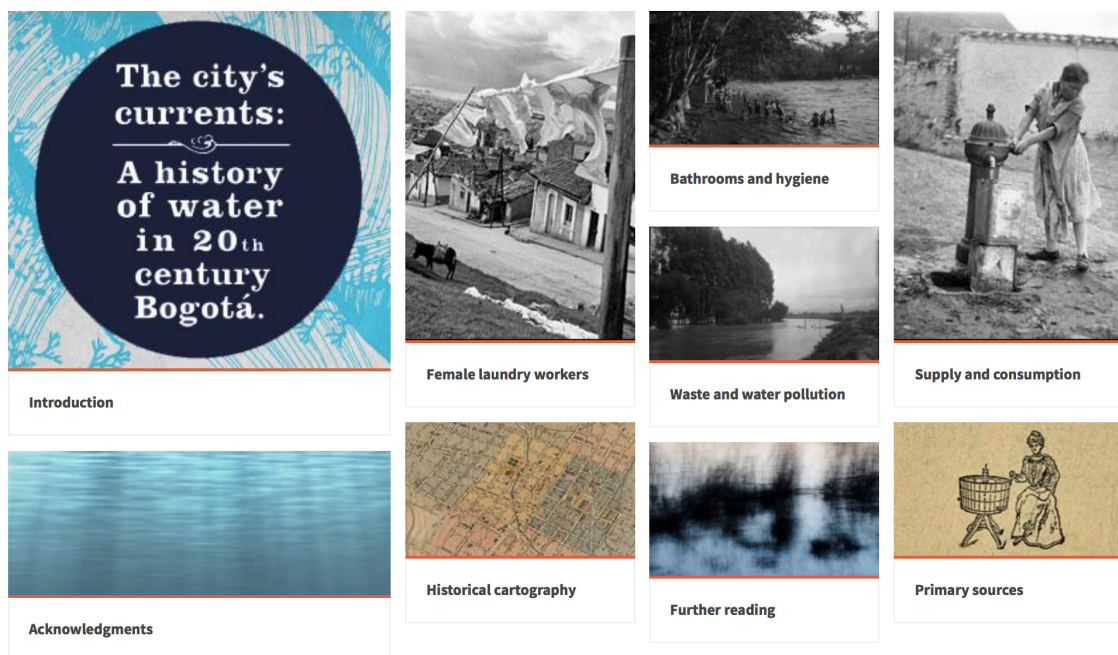


## The City's Currents: A History of Water in 20th-Century Bogotá

Stefania Gallini, Laura Felacio, Angélica Agredo, and Stephanie Garcés

This exhibition explores the role of water in the struggle of Colombia's capital to become a modern city. For Bogotá, complying with the standards of sanitary reformers and the governing elite was a social, technological, and environmental control endeavor. The exhibition examines everyday and gendered experiences of water, such as washing clothes or bathing, as well as urban infrastructural interventions including the domestication of rivers for water supply and wastewater disposal systems.



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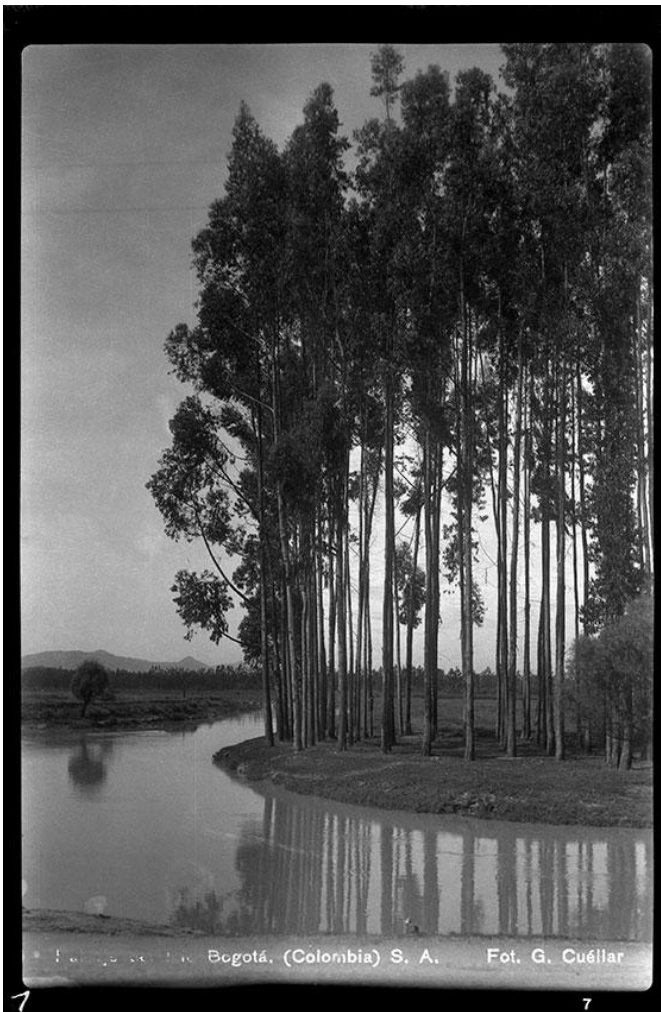
<http://www.environmentandsociety.org/exhibitions/water-bogota/copyright-information>

### How to cite:

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." Environment & Society Portal, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

ISSN 2198-7696 Environment & Society Portal, *Virtual Exhibitions*

## Introduction



*Paisaje del Río Bogotá (Colombia) S.A.* The landscape of the Bogotá River. One of the riverbanks is planted entirely with eucalyptus. (Photograph by Gumersindo Cuéllar Jiménez. © Biblioteca Luis Ángel Arango.)

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A green chain of mountains on its eastern flank, a western savanna, and a streaming system of rivers and wetlands form the cornerstone of the ecological structure of Bogotá, with water as its vehicle. This is not a mere geographical setting, but form the very ecological core of the history of Bogotá. An environmental history of this city must begin with the acknowledgement that most of its society's earlier experience is significantly linked to the web of relations created by the shifting connections within this ecological structure. Taking this into

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account, this virtual exhibition focuses on the relationships between water and society at a time when Bogotá became a modern city in terms of population growth, industrialization, development of urban infrastructure, dissemination of bourgeois cultural habits, and the emergence of a more strict biopolitical control, especially on marginal sectors.

The visually powerful Eastern Mountains (Cerros Orientales) are arguably the most striking feature of Bogotá. They form such a prominent boundary that most city maps are oriented to the east rather than to the north, presenting the green belt as a boundary within which the city is staged. These slopes belong geologically to the Eastern Cordillera and are ecologically defined as the Andean zone of cloud forests and páramos—that is, the unique and protected Andean moorland above the tree line approximately 3,300 meters above sea level. The páramos play a special role in water regulation because of their extraordinary vegetation cover and soil moisture, so much so that they have been labeled a “water factory.”

On the slopes of the Eastern Mountains lies the high plateau of the Bogotá Savanna (Sabana de Bogotá), named for its flat topography and grass cover. Both the savanna and the surrounding mountains were occupied in pre-Hispanic times by the Muisca indigenous people. This group settled upon the site well before the Spaniards officially founded Santafé de Bogotá in 1538, 2,664 meters above sea level and close enough to the indigenous site to enjoy the benefit of food supplies and an existing workforce.



Saúl Ordúz, *Tibitoc Treatment Plant*, 1974

© 1974 Saúl Ordúz. Courtesy of Museo de Bogotá, Instituto Distrital de Patrimonio Cultural. Collection Luis Alberto Acuña, Reference MdB03719

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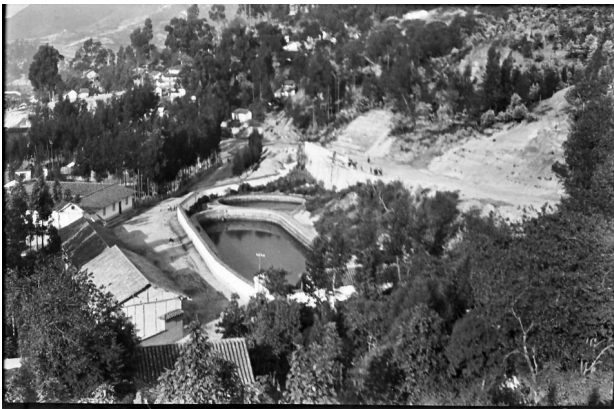
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Every stream that has been important to the city has been a tributary of the Bogotá River. The river crosses the savanna from north to south, eventually reaching the Magdalena River, the main fluvial artery in Colombian geography. San Francisco and San Agustín—the main streams of the city in the colonial period and into the nineteenth century—spring up from the eastern mountains of Monserrate and Guadalupe, joining together in a single riverbed that flows into the larger Fucha River, a tributary of the Bogotá River. The Arzobispo River, also important during this period, has its source in the Verjón Lake in the Cruz Verde Páramo, from where it runs first northwards then westwards, descending from the mountains through the National Park (Parque Nacional Enrique Olaya Herrera). Within the city the river continues to the northwest, sharply changing its direction to the north where it becomes the Salitre. It turns again to the northwest as the Juan Amarillo River, finally flowing into the Bogotá River after passing through the Salitre Wastewater Treatment Plant.

The Salitre was in fact one of the rivers supporting the twentieth-century development of the Colombian capital city, along with the Tunjuelo and San Cristóbal-Fucha Rivers. The Tunjuelo River flows from the Sumapaz Páramo, providing water to the Chisacá and La Regadera Reservoirs, and then crossing the southern part of the city from east to west to reach its mouth at the Bogotá River. The San Cristóbal River, whose source is located in the Cruz Verde Páramo, becomes the Fucha River as it enters the city, running parallel to the Tunjuelo before emptying into the Bogotá River.



Luis Alberto Acuña, *Quinta de Bolívar*, 1920

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Gumersindo Cuéllar Jiménez, *Paisaje del Río Tunjuelo. Bogotá (Colombia, S.A.)*

The landscape of the Tunjuelo River, with which the population of Bogotá established a varied relationship throughout the twentieth century. Close to its source in the Sumapaz Páramo, the river filled the La Regadera and Chisacá Reservoirs, contributing to urban water supplies. But by running through the city, the river's function as a water source changed into negatively-perceived roles as an obstacle to urbanization, a center for pollution, and a hazardous flood threat.

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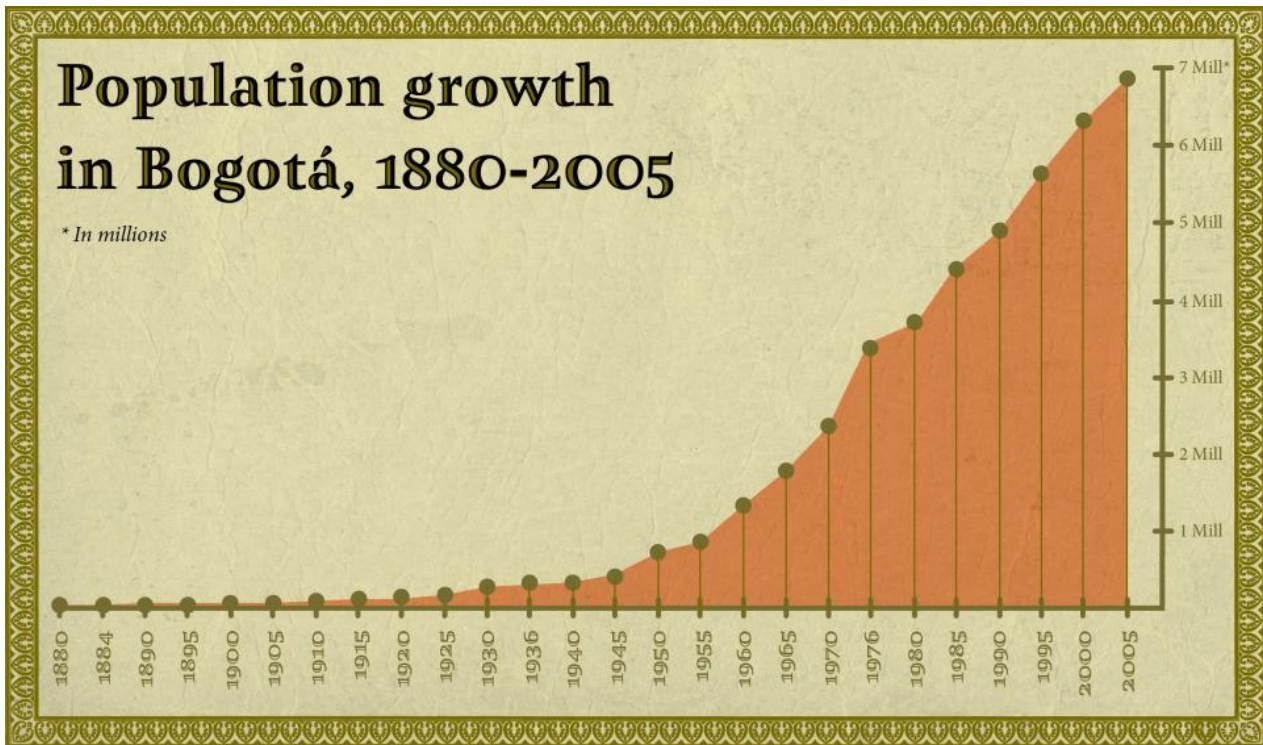
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On their way down from the páramos and mountains, this dense group of rivers feeds the wetland complexes associated with the Bogotá River basin and floodplain. The ecological and economic importance of the wetlands is well known, and this importance justifies environmental conservation measures: the wetlands act as sponges by retaining water during the rainy season, and play a part in regulating floods and water availability. They also serve as important actors by reducing water pollution, as the plants and vegetation in the swampy wetlands digest organic material while retaining sediments and metals.

By the end of the nineteenth century, the governing elite, commercial bourgeoisie, and politically influential forces of sanitary reformers—including engineers and physicians—envisioned a need for modernity in the stagnant Bogotá, motivating strong urban transformations that fulfilled these expectations. In their eyes, to be a modern city meant a series of measures to discipline both urban society and the urban environment. River flows had to be diverted, bacterial proliferation controlled, personal hygiene conditioned, and waste disposal managed. As elsewhere in the Western world, urban modernization was perceived as a tighter means of human control of, or even separation from, nature, through science, medicine, and technology.



Population growth in Bogotá, 1880–2005

It is clear that the urban population radically increased from the mid-twentieth century as a result of waves of migration from the countryside to the cities, caused by the rural political violence that has marked the history of Colombia.

Departamento Administrativo Nacional de Estadística, ed. *XV Censo Nacional de Población y IV de Vivienda. Colombia*. Bogotá: Departamento Administrativo Nacional de Estadística, 1986, 32.

Departamento Administrativo Nacional de Estadística, ed. *Censo General 2005. Nivel Nacional*. Bogotá: Departamento Administrativo Nacional de Estadística, 2008, 35.

Departamento Administrativo Nacional de Estadística, ed. “Evolución de la Población 1985–2005, Bogotá D.C. Según Proceso de Conciliación Censal y Proyecciones de Población.” Accessed 7 February 2014.

Germán Mejía Pavony. *Los Años del Cambio: Historia Urbana de Bogotá, 1820–1910*. Bogotá: Centro Editorial Javeriano CEJA, 1999, 230.

Alfonso Pérez Preciado. “La Expansión Urbana de Bogotá: Mitos y Realidades.” In *Territorio y Sociedad: El Caso del Plan de Ordenamiento Territorial de la Ciudad de Bogotá*, edited by Gerardo Ardila, 94–95. Bogotá: Ministerio del Medio Ambiente, Universidad Nacional de Colombia, 2003.

María Clara Torres. *El Alcantarillado de Bogotá 1886–1938: Institucionalización de un Problema Ambiental*. Tesis de Maestría en Medio Ambiente y Desarrollo, anexo 3, Universidad Nacional de Colombia, 2010.

Julián Vargas Lesmes, and Fabio Zambrano. “Santa Fe y Bogotá: Evolución Histórica y Servicios Públicos (1600–1957).” In *Bogotá 450 Años. Retos y Realidades*. Bogotá: Foro Nacional por Colombia—Instituto Francés de Estudios Andinos, 1988, 15, 19, 22, 40.

Designed by Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2014.



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Population dynamics are particularly important for studying the urban modernization of Bogotá and for an understanding of the environmental history of water use. After a long stagnation during the politically and militarily turbulent nineteenth century, the population of Bogotá began to grow steadily. Between 1900 and

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1925 the original 100,000 inhabitants almost doubled in number. Ten years later the population lay at 300,000, but the true jump came in the second half of the century: by 1945 Bogotá comprised nearly half a million people, and within less than a decade this number reached close to one million. The population increase that followed can be visualized as a dramatic vertical line with dots measured in increments of one million inhabitants each: above one million by 1956, above two million by 1967, more than three million by 1974, up to four million by the beginning of the 1980s, almost five million by 1990, and an astonishing estimated 6,800,000 people according to the most recent national census in 2005.

Population growth was linked to an equally strong expansion of the urbanized areas of Bogotá. The city comprised 260 hectares in 1900, but by 1999 its area had increased to 30,110 hectares. In terms of the ecological structure of the city and its water system, this urban expansion had the greatest impact on the wetlands, which was reduced from several thousands of hectares at the start of the century to 50,000 hectares in 1938, and to only 500 hectares by 2005.



Stefania Gallini, *Sumapaz Páramo*, 2013

Some of the environmental problems that the Sumapaz Páramo has faced include the eutrophication of lakes and the substitution of native vegetation for crops and pastures.

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Stefania Gallini, *Sumapaz Páramo*, 2013

Sumapaz Páramo—the largest páramo in the world—is located in southeast Bogotá. A national park since 1977, it is the source of many tributary rivers of the Magdalena and Orinoco basins. The Tunjuelo River—a tributary of the Bogotá River that in turn empties into the Magdalena River—flows from the Sumapaz Páramo.

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The perimeter of the city in the late nineteenth century did not exceed the area between the Fucha and the Arzobispo Rivers, with the exception of the suburban neighborhoods of San Cristóbal in the south and Chapinero in the north. Most people that settled in these districts sought to escape the unsanitary conditions of the city center, exchanging them for fresh air in the urban fringes and finding relief in the clean waters of the San Cristóbal River and La Vieja and Las Delicias Rivulets. The linear expansion of the city that followed during the early twentieth century was parallel to the eastern mountain chain, but the rise of scattered neighborhoods to the west was evident from the 1920s. Henceforth Bogotá expanded its range to the north, south, and west and even on steep terrain in the Eastern Mountains, crossing over rivers, channeling their riverbeds, and draining wetlands. Nowadays, the city limits reach the Bogotá River to the west, making many neighborhoods more vulnerable to regular river overflows.

## Chapters

The four chapters of the exhibition tell different but complementary stories of the historical discourse sketched above. The first two chapters entangle people's everyday life experiences with water, at a time when the sanitary revolution and urban growth touched the private spheres of individuals and families. [Chapter one](#) provides a perspective on the relationship between environment, labor, and gender by focusing on laundry and female laundry workers, while [chapter two](#) walks visitors through the consolidation of personal hygiene practices and the roles that sanitary housing, bathrooms, and cosmetic products had in this process.

The third and fourth chapter offer an interpretative glimpse to the more visible, studied, and better-documented features of the making of a modern city. [Chapter three](#) addresses the construction of water supply infrastructure in relation to the population growth of the city and according to the parameters of sanitary engineering. An environmental perspective on these long-lasting hot topics of urban and technological history enables disclosure of the importance of a web of ecological relations sustaining a city: its modernity and expansion depended on river basins and the páramos that were increasingly more distant from the city center, and transformed wetlands that once were economically productive and hydrologically vital. The fourth and [final chapter](#) introduces the issue of waste and water pollution, revealing a dramatic consequence of such interdependence: the contamination of the Bogotá River.





Laura Felacio, *Chingaza National Park*, 2013

View of the Laguna de los Patos, one of the glacial lakes located in the Chingaza National Park, which was created in 1977 to promote the conservation of the ecosystem. Today, the Chingaza Páramo remains the main source of water for the city of Bogotá.

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Saúl Ordúz, *Proyecto Chingaza*, 1982

The Golillas Dam and Chuza Reservoir, the main works of the Chingaza Páramo project developed between 1972 and 1985. This project was an ambitious technological investment in water supplies for an urban population that would continue to grow throughout the twentieth century. It was also proof of the historical importance of the high and rainy páramos for the sustenance of urban dynamics.

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## Methods and sources

Although we are fully aware that users of virtual exhibitions are more likely to “see” than read, we do hope that the exhibition will be used as an integrated multimedia experience. This does not mean that the visitor must strictly follow the chapter order: in fact, we love the freedom that digital media facilitates more readily than books. That is why we have constructed each chapter as a separate, although connected, piece of a wider picture.

Considerable effort has been put into uncovering new visual and textual sources on the history of Bogotá from local public libraries, archives, and museums, as well as into presenting them in a creative but academically rigorous way. The result is a collection of articles and print advertisements from newspapers and magazines, municipal regulations, institutional reports, statistical yearbooks, dissertations by physicians and engineers, popular education manuals, and historical fiction novels. Photographs, paintings, drawings, urban maps, and documentary videos also form part of this collection of primary sources.

When enthusiastically embracing this unusual opportunity to set up a virtual history exhibition, we did not anticipate the complexity of gaining copyright permission for each visual source included in the exhibition.

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Colombian copyright legislation is restrictive, imprecise, and often confusing, and the copyright holders of several visual sources have been difficult to identify.

Coping with the challenge of coordinating a multidisciplinary team of graphic designers, architects, cartographers, musicians, and translators was also complex but enormously stimulating and productive. Thanks to this team, many of the primary sources have been reworked in order to present information that is accessible and pleasing to the eyes and sensibilities of visitors to the virtual exhibition. It therefore includes specifically designed infographics, a [timeline](#) with newspaper clippings, dynamic virtual cartography (see the section on [historical cartography](#)), original silent videos with background music, and [architectural renderings of workers' housing](#) projected from primary sources.

### How to cite

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### ISSN 2198-7696 Environment & Society Portal, Virtual Exhibitions

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- <http://www.environmentandsociety.org/exhibitions/water-bogota/water-supply-and-consumption>
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## Laundry and female laundry workers

“Eventually they arrive at the rivulet, which is as noisy and clattery as they are. Each of them picks a spot and moments later they begin their routine. Their songs and laughter break the steady cadence of the rolling crystalline waters and the sleepy hum of insects hiding below leaves or resting on the riverbanks. The constant smacking of clothes against rocks is reminiscent of alternating hammers on a forge. Playful taunts can be heard flying from wash spot to wash spot like agile arrows. Murmurs intertwine with sweet ease and people’s lives become known and commented on while the clothes being washed sully the crystalline rivulet.”

—José Antonio Gutiérrez Ferreira. “Cronistas de El Gráfico—El Lavadero.” *El Gráfico*, 19 May 1923, 704. (Quotation translated by the authors of the exhibition.)



Luis Alberto Acuña, *Lavanderas* (Female laundry workers), 1910

All rights reserved. Acuña, Luis Alberto. *Lavanderas* (1910). Courtesy of Museo de Bogotá. Instituto Distrital de Patrimonio Cultural. Washerwomen washing clothes in small ponds built on the bank of a river. They are surrounded by clotheslines and baskets to carry the laundry.

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During the first decades of the twentieth century, most families in Bogotá had their laundry washed by female laundry workers. These women often dedicated themselves to this kind of work as a means of supporting their families. Female laundry workers generally came from lower working-class backgrounds and were characterized as being part of a group of women entering the paid labor force. They were also perceived as forming part of a distinct collective that came to symbolize a relationship between water, washing, and womanhood. On occasion, this relationship between environment, work, and gender identity created a liberating environment for socializing, in which female laundry workers could talk, laugh, sing, and smoke cigarettes together. Through these social interactions they created a sense of solidarity and camaraderie, and to some extent alleviated the hardships and sacrifices they faced in their daily lives. These female laundry workers and their working conditions inspired artistic expressions including paintings, photography, music, and literature.

“On the shores of rivers and rivulets you can see them kneeling as they suffer under the unforgiving elements. For long hours they smack clothes against large river stones, enduring the cold and humidity that attack their hands and arms. Their entire lower bodies are soaked from the contact with the wet ground. A noted hygienist commented on the characteristic look of a female laundry worker’s hands: deformed, swollen, and reddish raw in appearance. Their skin is macerated by the cold river water and the alkaline lyes or soap. Their hands are always wrinkled from the water, and when they dry their skin is cracked, and flaky. Their fingers are usually retracted and deformed and they generally have calluses all along their hands and forearms.

The two women that stake out the first two spots on opposite edges of the river wash with clean water, every successive spot downstream gets increasingly dirty and polluted water as the soiled clothes release their filth into the flowing stream. By the time the water gets to the fifteenth or twentieth spots downstream the water is completely unacceptable and undoubtedly contaminated. This makes clothes susceptible to a variety of contagious pathogens.”

—Tiberio Rojas and Pedro M. Ibáñez. “Contribución al Estudio de la Higiene Pública de Bogotá.” *Registro Municipal de Higiene*, 20 July 1919, 14. (Quotation translated by the authors of the exhibition.)



Saúl Ordúz, *Lavanderas*, 1950

Female laundry workers scrubbing clothes against the rocks of a calm river. Location was an important issue for female laundry workers. In certain spots, they could enjoy rocks better suited for scrubbing, and cleaner water, which meant easier working conditions and more rewarding results. The appropriation of the environment was also important in laundry work. Barbed wire fences used as clotheslines show this appropriation, but also evidence the role of sun and wind for traditional laundry.

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The climatic conditions caused by Bogotá's altitude—and the fact that the city is located at the foot of an Andean Mountain chain—conditioned the daily life of the female laundry workers. They would begin their workdays in the typically chilly early-morning weather of Bogotá, carrying large loads of laundry that had to be soaped, scrubbed, and washed along the edges of local rivers and rivulets. The San Francisco and San Agustín rivers sprang up from the Eastern Mountains and flowed through the central area of the city itself, picking up waste from homes and businesses on its way downstream. This forced the female laundry workers to take their

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laundry to water sources that were cleaner, but further away, like the San Cristóbal River at the southern periphery of the city or to the Arzobispo River in the north. The water from all of these rivers was cold to the point of freezing and the women's hands were often irritated, and even deformed, as a result of the combined effects of the repetitive stress of their labor and cold water temperatures. Often these hardships were endured in vain because the dirt and filth from the laundry being washed further upstream—these women had arrived earlier and as such had the advantage of picking better spots—would flow with the current and soil the laundry being washed downstream. This evidently created a competitive atmosphere among the female laundry workers to obtain the more privileged spots upstream, alluding to the perpendicular relationship between the rivers and the city, whereby people would move to higher regions in order to have access to cleaner water.

The treks upstream to the sources of the rivers were long, the loads of laundry were heavy, and joint pain and chronic skin problems became commonplace for the female laundry workers. Mothers had to leave their children at home while they worked, and so would suffer the condemnation of public opinion from a society that passed judgment without understanding the nature of the problem. Worse still, the daily sacrifices endured by the female laundry workers were all but ignored when engineers and physicians, promoting hygiene in the early decades of the twentieth century, accused them of endangering the health of urban citizens by using the rivers to wash the clothes of those suffering from contagious waterborne illnesses such as typhoid fever.

Meanwhile, the female laundry workers worried about the damage caused to their laundry by pollution and the negative effects this had on the quality of their work. They often complained about mining companies located higher in the Eastern Mountains that polluted the rivers with their industrial waste. Letters were repeatedly sent to the mayor by groups of female laundry workers, requesting a solution to pollution of the San Cristóbal River caused by lime mines located on a stretch of land called El Delirio, owned by the Copete brothers. The municipal government forbade the brothers from polluting the river, but the mines continued to be intermittently active until the municipal government was able to negotiate purchase of the land in 1911. This again demonstrates the privileged situation enjoyed by those who dominated access to water higher upstream, and sheds light on the cohesion and power that female laundry workers demonstrated collectively when it came to defending their right to work.

“Mr. Governor,  
the undersigned female laundry workers of the city, on behalf of our colleagues, hereby address this letter to you. We respectfully wish to make manifest that for some time we have used the San Cristóbal River to wash the clothes entrusted to us. Through this work we earn our daily living. For more than a month we have not been able to wash because the river water becomes muddied as it flows downstream. We discovered that this is caused by mining being undertaken by gentlemen named Copete on the riverbanks. This is to our detriment because it robs us of our daily bread, as we cannot opportunely wash the clothes we have been charged with. We are aware that you are the authority entrusted with the care of the rivers. We therefore express our formal legal complaint and request for your aid and protection.

(Signed) Betsabé Cicedo Z., Mercedes Díaz, Simona Barbosa, Leonilde Rodríguez”

—Quoted by Antonio Sánchez Gómez. *Manos al Agua: Una Historia de Aguas, Lavado de Ropas y Lavanderas en Bogotá*, 137-8. Bogotá: Universidad Nacional de Colombia, 2010. Taken from “Proyectos de acuerdo”, 1910. Collection Concejo de Bogotá, Archivo de Bogotá, Volumes 604–3570, 253–4. (Quotation translated by the authors of the exhibition.)

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City's Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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The concern for clean water—shared by both the female laundry workers and sanitary reformers—led to the adoption of technological advances for laundry that would transform the relationship between population and water throughout the twentieth century.



Manuel H. Rodríguez Corredor, *Lavaderos Comunes*, 1960

Women wash clothes in public laundry washbasins made from cement. Each washbasin has a rough surface to scrub clothes and a tank filled with water from a faucet. The public laundry washbasin was an interesting technoscientific device facilitating the transition from the collective tradition of washing clothes in rivers towards the private ritual of the home washing machine.

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In an attempt to improve the working conditions of the female laundry workers and ensure a healthier water supply for the city, the municipal government installed public laundry washbasins made out of stone and cement. Wealthier families living in large houses in residential neighborhoods could afford to have laundry washbasins installed in their homes—taking advantage of being connected to the municipal aqueduct—and usually had ample space in courtyards for a laundry room. The public laundry washbasins made it possible for the female laundry workers to avoid direct contact with river water, which was channeled through a network of tanks, pipes, and faucets into the public laundries. Doing laundry at home became a social trend that paralleled

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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the physical separation between the river and the female laundry workers. The socializing once enjoyed by female laundry workers on the riverbanks now took place in the collective spaces created by the public laundries and their rows of washbasins; meanwhile, washing laundry at home had the opposite effect, as it became a much more private and solitary affair.

Washing machines, understood here as technological devices that accentuated the separation between female laundry workers and the rivers, used dials, hoses, tubs, pumps, and agitators to scrub, wash, rinse, and spin-dry clothes. In effect this meant technology substituted the more traditional method of hand washing: river stones to smack the garments, a natural flow of water to wash out the soap, and improvised lines to hang garments to dry in the wind and sun. These new machines, which were introduced in Bogotá during the first decade of the twentieth century, used water that was piped in through the municipal aqueduct and then discarded through a precarious drainage and sewage system. Washing machines were manually operated at first, but soon gasoline, kerosene, and electrically-powered models became available. Power came from the El Charquito Hydroelectric Power Plant, inaugurated in 1900 by the Electric Energy Company of Bogotá (Compañía de Energía Eléctrica de Bogotá) to take advantage of the hydroelectric power available from the Bogotá River nearby the Tequendama Waterfall (Salto de Tequendama).

Although sometimes instruction manuals were difficult to decipher for refined housewives and tidy maids, who were increasingly responsible for laundry, washing machines became an essential appliance for a well-equipped home in the mid-twentieth century. Advertisements in the local newspapers made sure to popularize and promote the need for washing machines, which were imported by American companies like General Electric, Westinghouse Electric, and Hurley Machine, and some European companies such as Philips. Advertisements for washing machines and for a variety of soap brands—including Lux, Blancol, and Oro—promised to eliminate dirt, protect delicate garments, and to be efficient. This brought into question the traditional practices and images of the humble female laundry workers who wore their distinctive straw hats to protect themselves from the weather as they crossed the city with their loads of laundry to wash in the rivers. Parallel to technological innovation, an increasingly private and elitist attitude towards laundry led to the general conception of a modern society that was separate from its natural environment, and the perception of water as a resource whose origin and ultimate destination was almost completely unknown.

“A good number of improvised clothes lines, draped with clothes of all sizes and colors, were the happy preamble to our first visit to the legendary laundry in the Diana Turbay neighborhood. A concrete slab measuring two meters in length and supported by three columns of cinder blocks and bricks rests on a rustic cement floor. On top rests a mid-size tank where the water that falls through a thin tube is stored. The tube itself emerges horizontally from the small mountain chain, which is both landscape and wall to this place.”

—María Isabel Arias Cadena. “Las Lavanderas del Diana Turbay.” In *Talleres de Crónica. Memorias del Agua en Bogotá: Antología*, edited by Mariluz Vallejo Mejía, 184. Bogotá: Banco de la República, Pontificia Universidad Javeriana, Alcaldía Mayor de Bogotá, Archivo de Bogotá, 2011. Accessed 25 March 2013. (Quotation translated by the authors of the exhibition.)

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Daniel Rodríguez, *Calle 33 con Cra. 3*, 1940

Clothesline in La Perseverancia neighborhood, a working-class neighborhood located on the Eastern Mountains of Bogotá. This neighborhood, created to provide housing for the workers of the locally famous Bavaria Brewery, ended up being one of the most politically active urban areas during the twentieth century.

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These parallel processes undoubtedly transformed the social dynamics of laundry in Bogotá, but did not result in the complete disappearance of female laundry workers, and instead diversified the composition of the group. Along with those who washed clothes in the rivers to earn a living, there were now housewives doing laundry at home, concerned about the cleanliness and care of their clothes, and there were maids who clumsily learned how to use the growing number of new washing machines. Aside from women, there were companies specializing in laundry delivery services that took advantage of the difficulty some people had with the machines to offer a door-to-door service: they would pick up a person's dirty laundry and return it the next day clean and in good

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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condition. Ironically, this was simply a more institutionalized and updated form of the same service that was provided by the old female laundry workers. The persistence of female laundry workers as an urban collective meant the retention of the public laundry washbasins; indeed, these washbasins they still exist and function in Bogotá today despite the ample coverage provided by modern public water infrastructure and the mass use of washing machines in homes. Such is the case with the public laundry washbasins located in the Diana Turbay neighborhood in the southeastern part of the city, where women often take advantage of the public cement washbasins and the free and clean water channeled from the Chiguaza Rivulet to wash their clothes. This saves them money that they would otherwise have to spend on water bills, or in other cases compensates for their lack of means of washing clothes at home.

### **Female laundry workers in Colombian art**

In Colombia, the artistic works inspired by the image of the female laundry worker influenced the creation of characters in nineteenth-century literary *costumbrismo*, such as the novels *Manuela* and *Aguinaldos en Chapinero*, published in 1889 and 1873, respectively, both authored by Eugenio Díaz Castro.

Colombian music has also recognized the romantic potential of female laundry workers, who not only reflect ingrained popular customs but embody contradictory feelings of suffering, joy, submission, and liberation. This sentiment is expressed in songs like *La Lavandera*, written in the Afro-Colombian *bullerengue* style from the Caribbean coast and sung by the popular folklore singer [Petrona Martínez](#). Likewise the song *Las Lavanderas*, written in the traditional Andean *pasillo* style—played as duet by a guitar and a Colombian *triple* guitar—and interpreted by renowned duos such as [Garzón y Collazos](#) and [Silva y Villaba](#). The fact that such dissimilar music styles from two very different areas in Colombia have given rise to songs dedicated to the same topic is testament to the inspirational power of female laundry workers.

Visual artworks inspired by female laundry workers include photography by renowned Bogotá photographer Manuel H. Rodríguez; paintings by diverse Colombian painters like Domingo Moreno Otero, Miguel Díaz Vargas, Eugenio Zerda, Segundo Agelvis, Luis Alberto Acuña, Andrés de Santa María, Humberto Chávez and Saady González; and performance art such as the controversial piece by artist and architect Simón Hosie, who in 2009 took over Bolívar Square in Bogotá by installing the house of a fictitious female laundry worker.

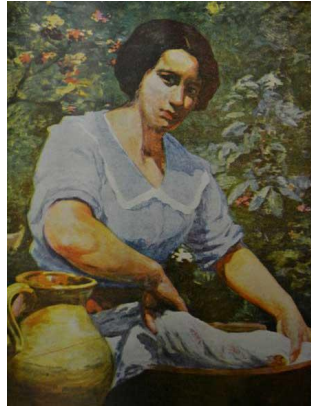


Domingo Moreno Otero, *La lavandera*, 1910

Oil painting by the Colombian artist Domingo Moreno Otero (1882-1948), known for his depictions of landscapes and customs in the early twentieth century. This painting shows a female laundry worker holding a basket with laundry on the bank of a river. The beautiful rural landscape, and the woman's gaze lost in the horizon, remind bucolic feelings that once were associated to the river, now having become a female working place.

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Miguel Díaz Vargas, *Lavadora*, 1921

© 1921 Vargas, Miguel Díaz. Courtesy of Revista Cromos.

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Eugenio Zerda, "Lavanderas", *El Gráfico*, June 23, 1923, cover

Drawing by the Colombian artist Eugenio Zerda (1879-1945), showing a group of female laundry workers with hats and headscarves rubbing clothes against the rocks of a river. This drawing was published in a cover of the magazine *El Gráfico*, which along with the magazine *Cromos* are important sources for the graphical history of Bogotá.

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### Soaps and washing machines: The conquistadors of laundry

The twentieth century revolutionized the way clothes were washed owing to the steady influx of new machines and cleaning products. As discourse on public health grew stronger in Bogotá, new brands that advertised solutions for cleanliness at home flourished. Advertisements for innovative soaps and manual, gasoline, or electric washing machines multiplied in high-circulating national newspapers such as *El Tiempo*, all promising efficiency, garment protection, and speed. They were clearly aimed at female members of the public who were progressively gaining access to the labor force and who consequently had less time for the typical chores of a housewife.

Nevertheless, such technological innovation did not result in the complete disappearance of female laundry workers. Instead they dissipated into the urban scene while the composition of their group diversified. This had

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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adverse effects for the cohesion of the female laundry workers as a collective, weakening their influence on public life. In fact, the expansion of aqueduct and sewage network infrastructure—which took off with the creation of the Municipal Aqueduct Company of Bogotá (Empresa Municipal del Acueducto de Bogotá) in 1914—had the effect of displacing riverbank and public washbasin laundry to the private sphere where housewives and maids took over the daily task of washing clothes. Laundry slowly became a middle and upper class chore—despite having previously been considered a job for lower working class women—but it was still considered a distinctly feminine chore.

As the twentieth century progressed, female laundry workers had to face new challenges from the increasing technological complexity of laundry. Attempts to overcome these difficulties included public announcements containing instructions for complex imported washing machines. Home delivery laundry services were offered in response to the frustrations of washing at home, and advertisements for efficient machines and miracle soaps became common. New improvements in water infrastructure, along with competent machines and cleaning products, led to a separation between society and nature, even though the environment was involved to some extent during each stage of development that led up to modern methods of washing.

### Laundry news: A timeline of washing machine, laundry company, and soap advertisements

The original virtual exhibition features an interactive timeline showcasing washing machine, laundry company, and soap advertisements.

View the the online timeline [here](#) or read the advertisements below.



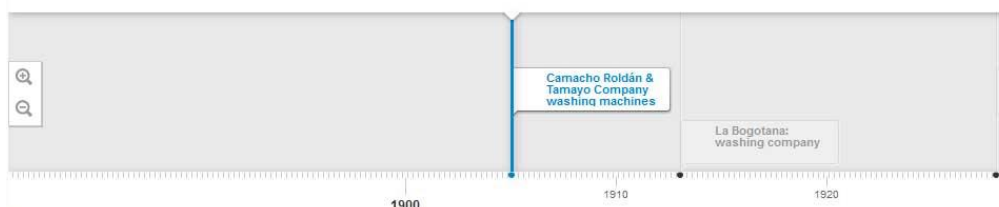
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"Máquinas de lavar ropa: Camacho Roldán & Tamayo," *El Nuevo Tiempo*, January 20, 1905, 1.

1905  
Washing machines: Camacho Roldán & Tamayo

Infographic that shows the image and description of an advertisement for the Camacho Roldán & Tamayo Company washing machines from 1905.

1913  
La Bogotana steam laundry and rinsing company



Screenshot of the timeline. All timeline infographics have been created by Tangrama (Mónica Páez Pérez and María José Castillo Ortega) in 2013 under a [CC BY-NC-SA 3.0 license](#).

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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## Laundry news: A timeline of washing machine, laundry company, and soap advertisements

### Washing machines: Camacho Roldán & Tamayo

1905

Image and description of an advertisement for the Camacho Roldán & Tamayo Company washing machines from 1905.

19  
\*  
05

19  
45

19  
85

**Máquinas de lavar ropa**

In 1905 the Camacho Roldán & Tamayo Company advertised new washing machines that not only saved time but also disinfected clothing without causing damage. They were sold for 42 and 45 pesos oro.

Acaba de llegar la nueva remesa. Cómodas, sencillas, económicas. No dañan la ropa y sí la desinfectan. En un día hacen el trabajo que á mano requeriría ocho. Máquina práctica é indispensable en toda casa de familia, colegios, ho teles, etc. Precios : \$ 42 y \$ 45 oro. Unicos Agentes, Camacho Roldán & Tamayo Bogotá

**1905**

“Máquinas de lavar ropa: Camacho Roldán & Tamayo”, *El Nuevo Tiempo*, January 20, 1905, 1.

Advertisement: Public domain.

Infographic: “[CC-BY-NC-SA 3.0 Unported License](https://creativecommons.org/licenses/by-nc-sa/3.0/).” Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2013.

## La Bogotana: Steam laundry and ironing company

1913

Image and description of an advertisement for the Bogotana Company offering home delivery laundry service in 1913.

19	19	19	19
05	13	45	85

**LA BOGOTANA**  
COMPAÑÍA DE LAVADO Y PLANCHADO AL VAJOR  
Calle 7.a, número 141-A--Teléfono 115--Bogotá  
Bogotá, septiembre de 1913

Señor don... ..

Tenemos el gusto de poner a sus órdenes esta Empresa, que hemos establecido de acuerdo con los últimos adelantos. Nos proponemos prestar al público un gran servicio, y al efecto ofrecemos el más estricto y buen cumplimiento, rapidez y orden perfectos.

Garantizamos a usted que la ropa no sufre deterioro alguno en las máquinas, y que la desinfección es completa; en cuanto a la limpieza y el brillo del planchado, estamos seguros de que dejaremos satisfechos a nuestros clientes.

Le rogamos se sirva hacer el ensayo, para lo cual basta que usted nos dé aviso por teléfono, e inmediatamente enviaremos un empleado a recoger la ropa, la que también haremos llevar a domicilio.

De usted atentos, seguros servidores,  
Cortés, Caicedo & C.a  
Precios económicos.

The Bogotana Company offered to pick up laundry from people's homes and clean the garments using the latest washing and ironing steam technology.

1913

“La Bogotana: Compañía de lavado y planchado al vapor”, *El Tiempo*, December 24, 1913, 1.

Advertisement: Public domain.

Infographic: “CC-BY-NC-SA 3.0 Unported License.” Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2013.

## Lux: Powdered soap

1928

Image and description of an advertisement for Lux soap from 1928.

19	19	19	19
05	* 28	45	85

An advertisement for Lux soap, in which a refined looking woman is shown using the powdered soap to carefully wash delicate garments.

**LUX**  
(JABÓN EN COPOS)

Los copos LUX, delicados y suaves, se fabrican para lavar y conservar las prendas deliciosas íntimas. LUX no dañará el tejido por finísimo que sea.

LEVER BROTHERS LIMITED,  
PORT SUNLIGHT, ENGLAND.

M. L. 137

**LUX**

Para todo lo que se lava en casa.

Empresas Unidas de Occidente, agentes: Ed. Urquhart, número 4.

**1928**

“Lux: Jabón en copos”, *El Tiempo*, September 16, 1928, 4.

Advertisement: All rights reserved. Unilever Andina Colombia Ltda.

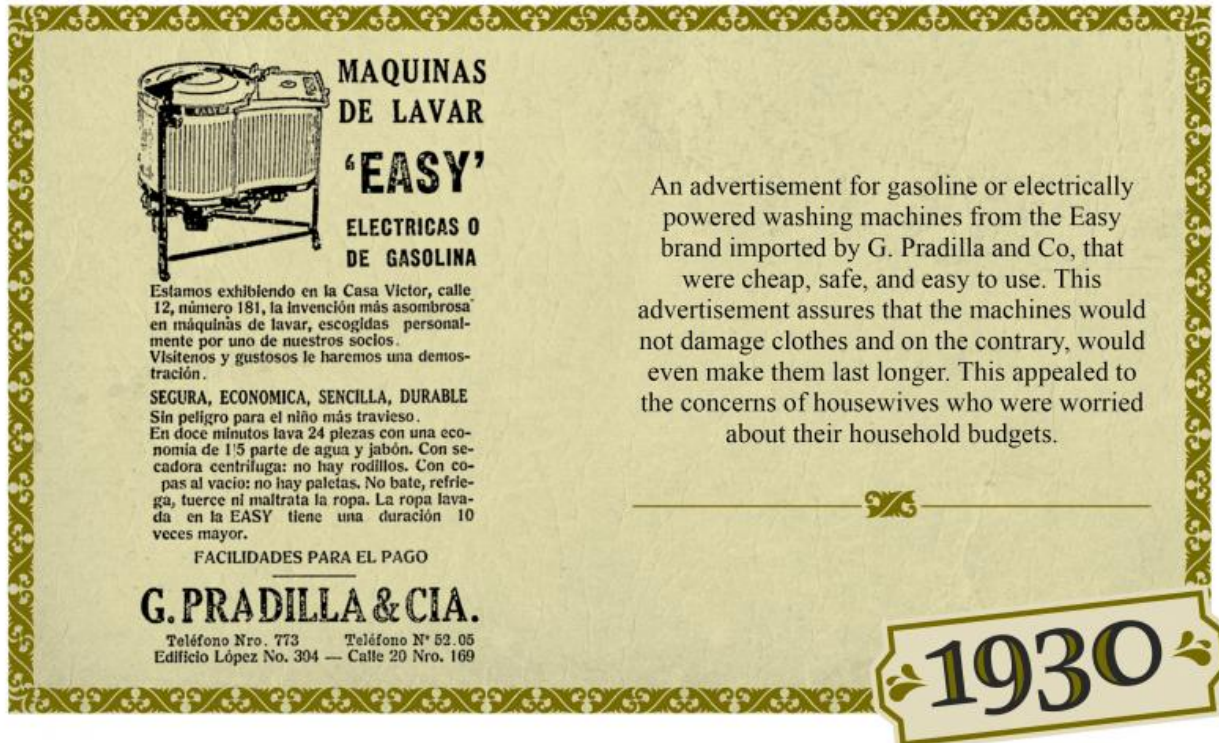
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## Gasoline or electrically powered washing machines from the Easy brand

1930

Image and description of an advertisement for Easy washing machines in 1930.

19	19	19	19
05	* 30	45	85



**MAQUINAS DE LAVAR 'EASY' ELECTRICAS O DE GASOLINA**

Estamos exhibiendo en la Casa Victor, calle 12, número 181, la invención más asombrosa en máquinas de lavar, escogidas personalmente por uno de nuestros socios. Visítenos y gustosos le haremos una demostración.

**SEGURA, ECONOMICA, SENCILLA, DURABLE**  
Sin peligro para el niño más travieso.  
En doce minutos lava 24 piezas con una economía de 1/5 parte de agua y jabón. Con secadora centrífuga: no hay rodillos. Con copas al vacío: no hay paletas. No bate, refrigera, tuerce ni maltrata la ropa. La ropa lavada en la EASY tiene una duración 10 veces mayor.

FACILIDADES PARA EL PAGO

**G. PRADILLA & CIA.**  
Teléfono Nro. 773      Teléfono N° 52.05  
Edificio López No. 304 — Calle 20 Nro. 169

An advertisement for gasoline or electrically powered washing machines from the Easy brand imported by G. Pradilla and Co, that were cheap, safe, and easy to use. This advertisement assures that the machines would not damage clothes and on the contrary, would even make them last longer. This appealed to the concerns of housewives who were worried about their household budgets.

**1930**

“Máquinas de lavar Easy”, *El Tiempo*, May 1, 1930, 5.

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**"This is an electric washing machine, which not only washes but protects clothes from damage"**

1932

Image and description of an advertisement for Energía washing machines from 1932.

19	19	19	19
05	* 32	45	85

**Aquí está** →

**la Lavadora eléctrica que no sólo lava, sino cuida la ropa**

Y además del trabajo corriente, lava con primor:

Sábanas  
Mantelería fina  
Encajes y bordados  
Colchas, cojines, almohadas  
Prendas femeninas de seda

Y para mayor asombro, pregunte Ud. precios y plazos en nuestro almacén.

**Energía**

Deja la ropa inmaculada  
Sin retregarla ni golpearla  
La seca sin exprimirla  
No la rasga ni la deforma  
No rompe botones ni aplasta broches  
Y también almidona...

**Es una maravilla**

The Energía Company advertised washing machines that do not scrub, smack, or squeeze delicate garments while starching them.

**1932**

“Lavadoras Energía”, *Cromos*, August 6, 1932, 7.

Advertisement: All rights reserved. Courtesy of Revista Cromos.

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## "Life is expensive! Do not waste your money or clothes - wash clothes with Blancol soap"

1935

Image and description of an advertisement for Blancol soap from 1935.

19	19	19	19
05	* 35	45	85

"La vida es cara: Lávela con jabón Blancol", *El Tiempo*, May 12, 1935, 12.

Advertisement: Public domain.

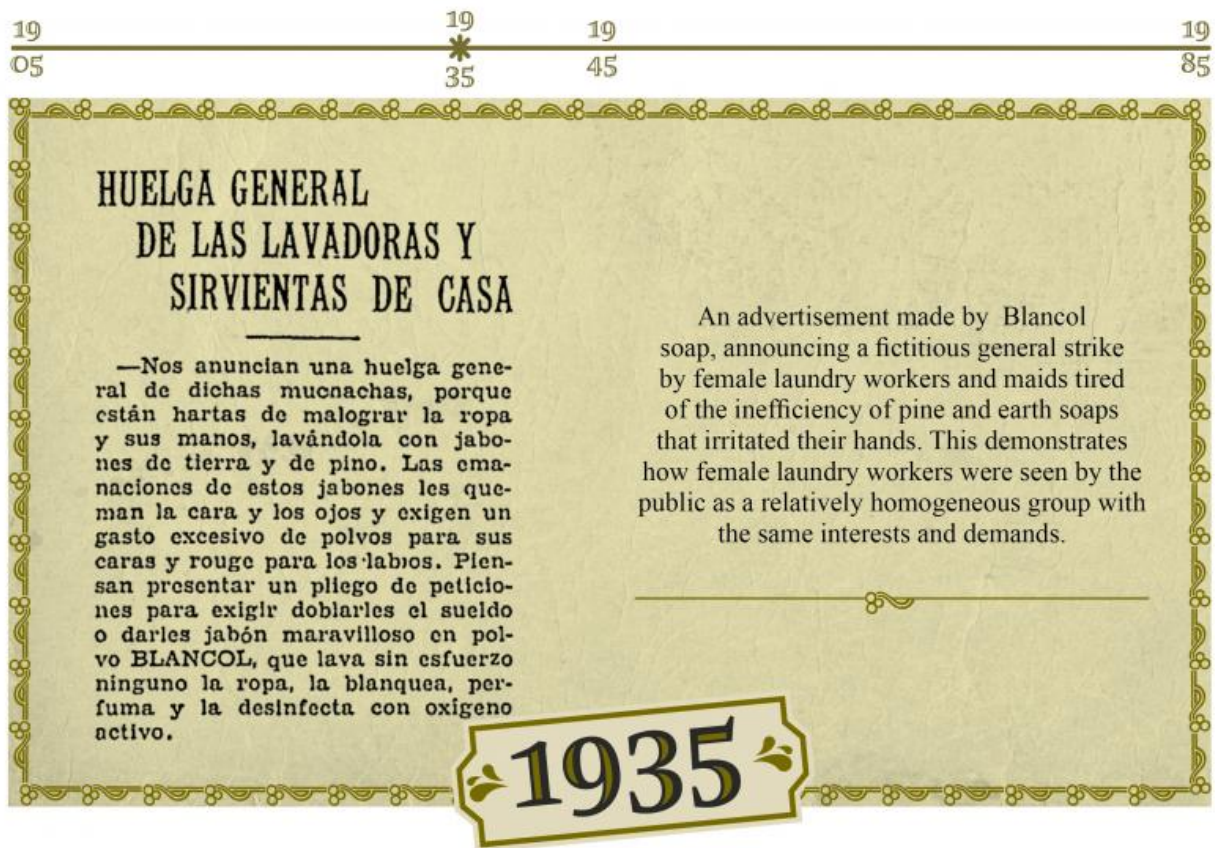
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## "General strike by female laundry workers and maids"

1935

Image and description of an advertisement for Blancol soap from 1935.



"Huelga general de las lavadoras y sirvientas de casa", *El Tiempo*, June 3, 1935, 3.

Advertisement: Public domain.

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# Advice for all women from General Electric

1941

Image and description of an advertisement for General Electric washing machines from 1941.

19 05	19 * 41	19 45	19 85
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Through a dialogue between two ladies the General Electric Company advertised a washing machine that promised quick efficient washes, saving time and adding to the peace of mind of homemakers.

*“Ahora ya no tengo que esperar días de sol y mi muchacha puede hacer el lavado, planchado y servicio de aduana en un solo día porque compré una máquina de lavar ropa de la General Electric.”*

UN CONSEJO PARA TODAS de la **GE**

**INTERNACIONAL GENERAL ELECTRIC**  
BOGOTÁ CALLEDADA 79, 16-40  
BARRANQUILLA • CALI • MEDELLÍN

Pida una demostración. Facilidades para el pago.

**1941**

“Un consejo para todas de la General Electric”, *El Tiempo*, June 8, 1941, 7.

Advertisement: All rights reserved. Mabe Colombia.

Infographic: “CC-BY-NC-SA 3.0 Unported License.” Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2013.

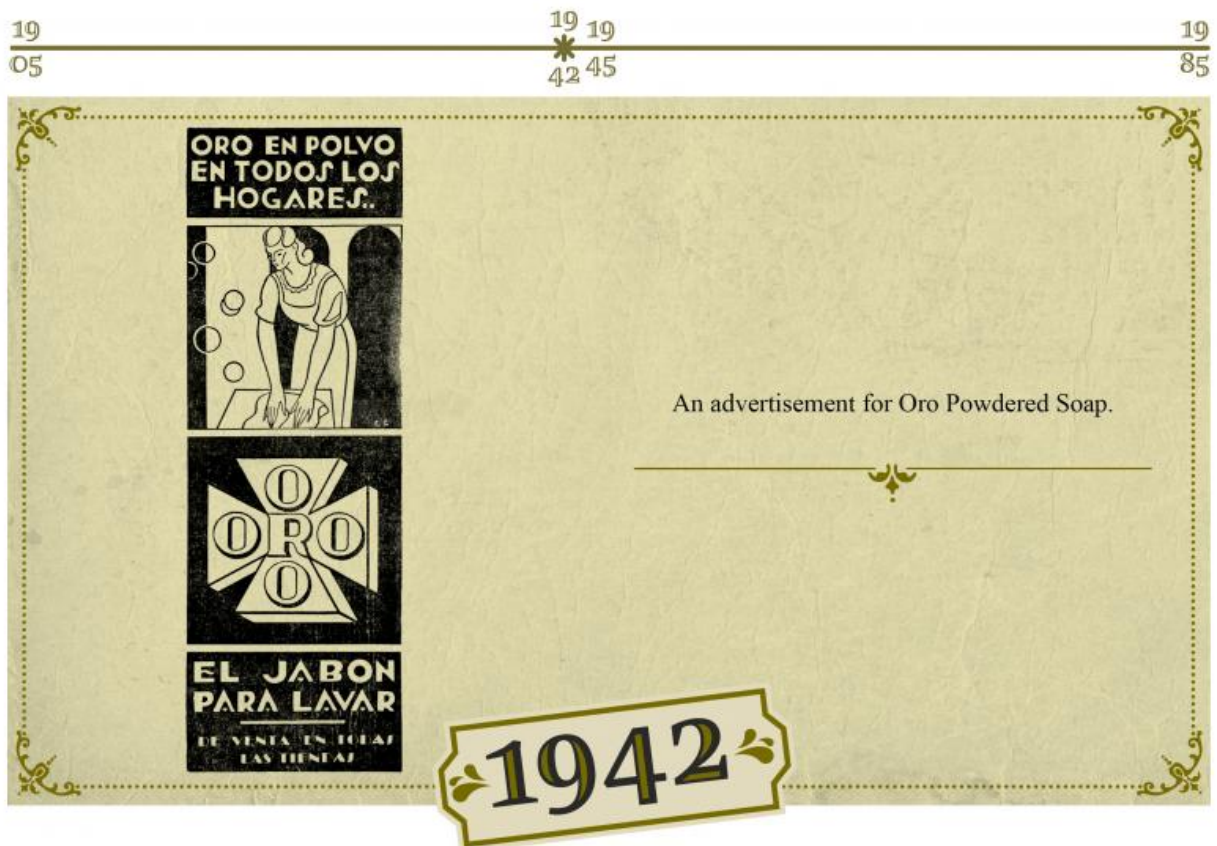
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## "Powdered gold in every home: The soap for washing clothes"

1942

Image and description of an advertisement for Oro soap from 1942.



“Oro en polvo en todos los hogares: El jabón para lavar”, *El Tiempo*, September 1, 1942, 2.

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# "Enchant your home with electricity: General Electric washing machines"

1946

Image and description of an advertisement for General Electric washing machines from 1946.

19  
05

19<sup>19</sup>  
45<sup>\*</sup>  
46

19  
85

An advertisement for General Electric washing machines that presents an image of a shiny, modern washing machine in the center, a happy house wife hanging clothes to dry, and the advantages of using this machine: healthy, protected clothing, while saving time.

**Encante SU CASA CON ELECTRICIDAD**

Tres inimitables razones de la superioridad del sistema de lavar General Electric:

**PROTEGE SU ROPA...** Si la pasamos a través del ciclo de su agua, la máquina Lavadora General Electric nos ofrece, para cada tipo de ropa, un tratamiento que evita su deterioro y la protege al lavar.

**PROTEGE SU SALUD...** Si usted se preocupa de tener una ropa perfectamente limpia y protegida, use una Lavadora General Electric. La Lavadora General Electric le garantiza la ropa limpia y desinfectada con agua hirviendo y automáticamente con agua ablandada.

**ECONOMIZA TIEMPO Y TRABAJO...** Una Lavadora General Electric, gracias al trabajo duro del lavado dentro de su agua, le ahorra tiempo, dinero y esfuerzo. Le permite lavar en un solo día la ropa que antes necesitaba tres días para lavarse y secarse.

Una lavadora General Electric le ahorra tiempo y esfuerzo al lavar su ropa con agua ablandada.

Los modelos G.E. están en todas partes y hacen su vida más fácil.

**GE Lavadoras GENERAL ELECTRIC**

1946

"Encante su casa con electricidad: Lavadoras General Electric", *El Tiempo*, December 17, 1946, 19.

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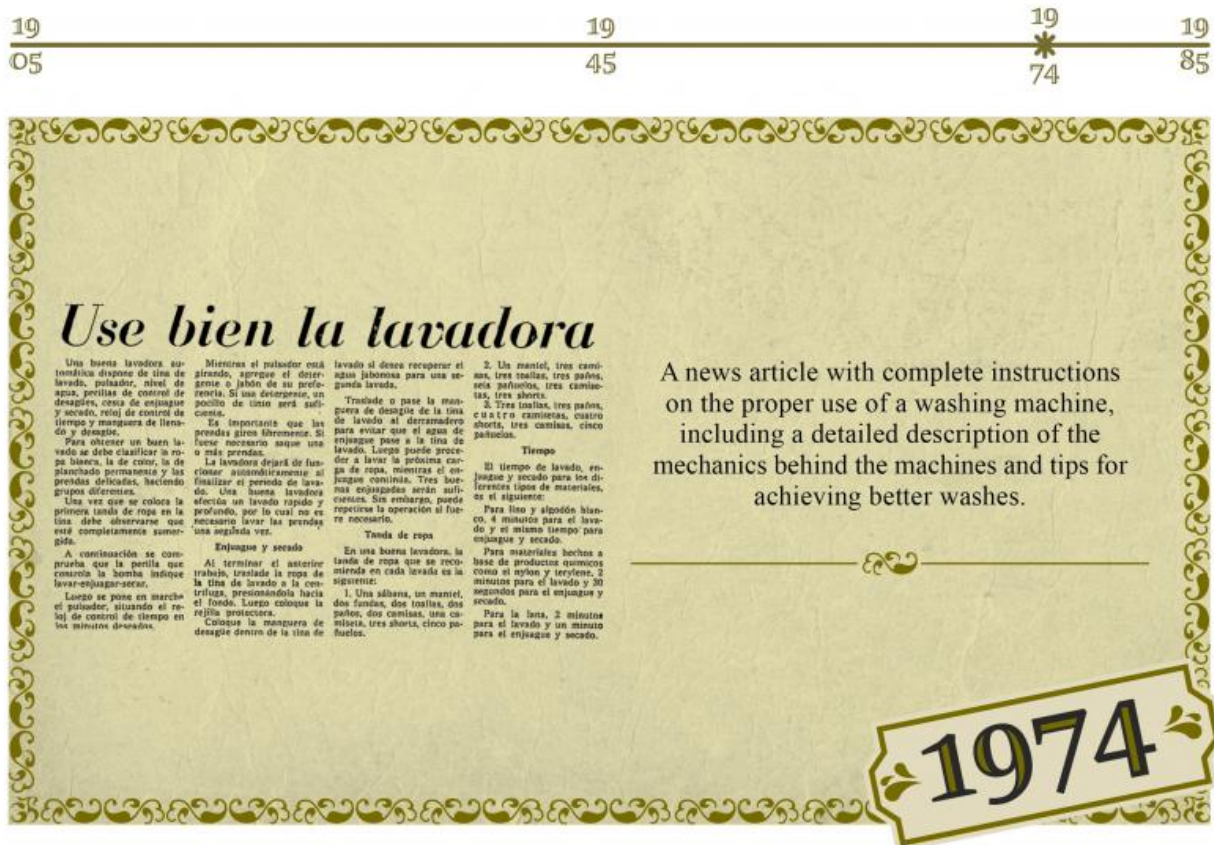
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# "Proper use of a washing machine"

1974

Image and description of a newspaper article on the proper use of a washing machine, published in 1974.



A news article with complete instructions on the proper use of a washing machine, including a detailed description of the mechanics behind the machines and tips for achieving better washes.

1974

"Use bien la lavadora", *El Tiempo*, November 7, 1974, 6 D.

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## Bathrooms and personal hygiene



Gumersindo Cuéllar Jiménez, *Mujer junto a niña sentadas junto al río*

A mother sits with her young daughter on the banks of a river, possibly the Bogotá River. They would not have suspected that decades later, their admiration for the beauty of the river would be replaced by feelings of disgust and fear towards the polluted stream.

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During the first decades of the twentieth century, serious health problems were common in the city of Bogotá. Public squares, markets, hospitals, and city streets were persistently filthy. One of the reasons for it was the design and the city's location. Bogotá was built at the foot of nearby mountains and the streets were designed to carry sewage and garbage down their slopes through shallow, open-air gutters that ran down the center. Understandably, the streets tended to become water canals of rain and sewage, which, along with the local rivers and rivulets, collected filth and garbage as they flowed, so becoming channels for waterborne diseases.

This became a matter of great concern for the public and city officials. Physicians, engineers, and architects—influenced by European and North American hygienism—began to demand transformations of public and private spaces. Filth in the city was perceived as a source of, and breeding ground for, countless

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**Chapter:** Bathrooms and personal hygiene

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microbes, germs, and bacteria that posed serious threats to human health. To remedy this, hygiene programs were adopted to solve garbage and health problems within a framework of measures that aimed to modernize the city.

The urban hygiene movement of the Colombian physicians, engineers, and architects, just like the one in Europe and North America, did not question the condition of public spaces only; it also turned its attention to people's homes. The living conditions in Bogotá that inspired so much criticism were directly related to municipal deficiencies in providing basic services such as running water, sewage management, and garbage disposal for low-income neighborhoods, whose streets were usually unpaved. These neighborhoods, called *barrios obreros*, were comprised of groups of houses that—despite their small size, poor lighting, and inadequate ventilation—were homes to large families who lived in cramped and unsanitary conditions. Many of these houses were actually huts with dirt floors, straw roofs, and only a single main living space whole families used for sleeping, eating, working, and often keeping animals.

Bathrooms were not a common feature in these kinds of houses, which sprang up along the periphery of the city. In the late nineteenth century that included the slopes of the Eastern Mountains, the unoccupied western side of the northern railroad tracks and to the south along the roads leading to what were then the towns of Usme and Bosa (which are today both incorporated as districts within the greater Bogotá area). Instead of proper bathrooms, makeshift holes or latrines excavated around the house were used by residents to relieve themselves. It was also common for people to resort to relieving themselves and disposing of their waste on the neighborhood streets, where it was expected that rainwater would eventually carry off the filth to the nearest sewers; these, in turn, would deposit the waste in the streams crossing the city.

The city's rivers and rivulets thus became a multipurpose water network across the city that took away human waste from its point of origin, dispersing a foul stench throughout its course, and propagating infestation and diseases. Skin infections, typhoid fever, dysentery, gastroenteritis, hepatitis, and cholera, all of them to be contracted by ingesting contaminated water.

Concerns over the spread of diseases drove the experts' attention to people's personal hygiene, which was considered absent or inappropriate. To combat this, manuals, posters, and public service announcements were used to teach people satisfactory methods of washing their faces, hands and bodies. These public service announcements had an important predecessor in the well-known etiquette handbook "Manual of Urbanity and Good Manners for Young People of Both Sexes" (*Manual de Urbanidad y Buenas Maneras para Uso de la Juventud de Ambos Sexos*).

"Bodily cleanliness should play an important role in our daily routines and we must never cease to dedicate to it the time it requires of us, no matter how large our workplace or how numerous our tasks.

Just as we must never lay ourselves to sleep without first praising and thanking God for all he gives us, what could be considered a kind of spiritual cleaning, that cleanses the soul from the stains of daily passions, we must never lay on our beds without first cleansing our bodies. We do this not

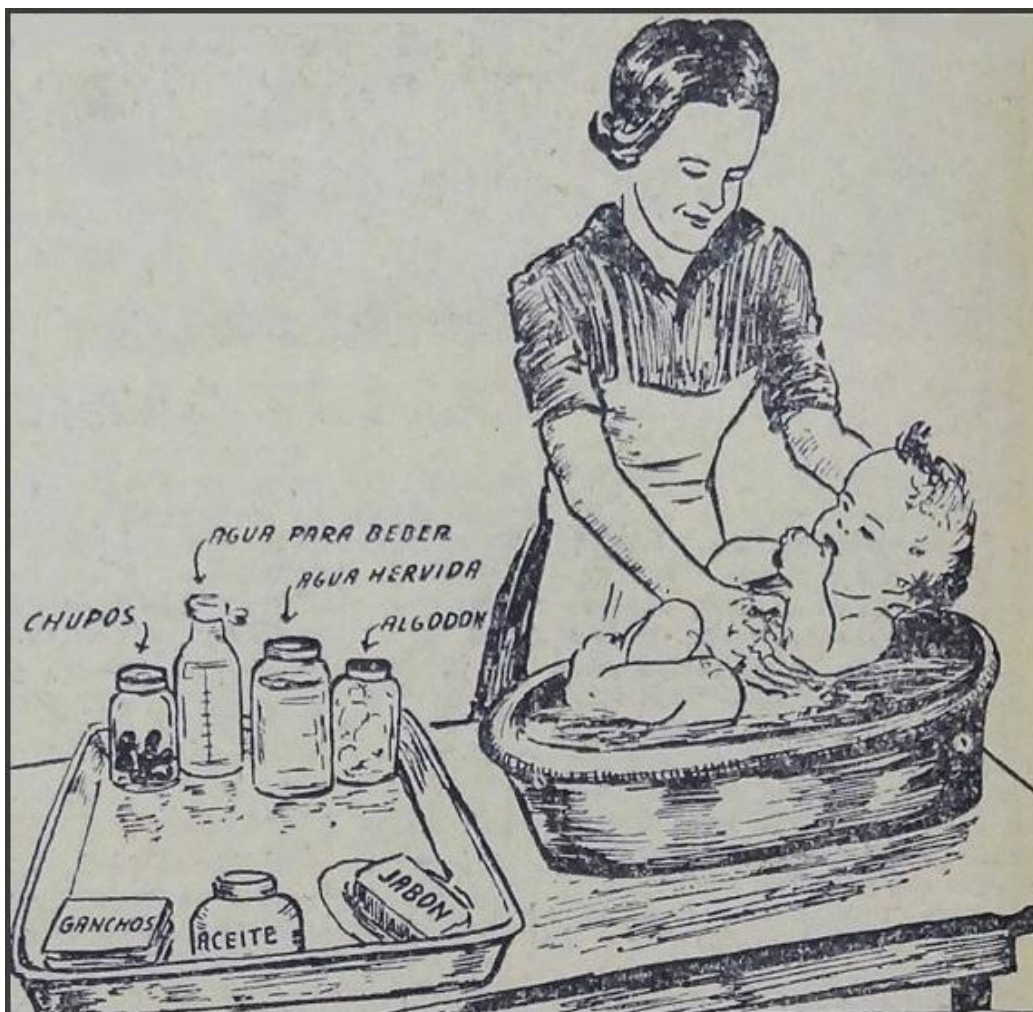
just for the satisfaction that cleanliness provides in itself but also so that we may be decently prepared for any happenstance that may occur in the middle of the night.

Upon waking we must do the same. After filling our spirits by dutifully praising God and asking for him to lead us in our day, we must clean our bodies even more carefully than we do before going to bed.

It may occur that on some occasions we may not be able to properly wash ourselves before going to bed, because of tiredness, sleepiness, or for whatever other circumstances common to the late hours that may impede us. Thus it is even more important that upon waking we never omit cleanliness from our routine. So we must wash our face, our eyes, our ears both inside and out, all around our neck etc. etc., we will then wash our heads and comb our hair.”

—Manuel Antonio Carreño. *Manual de urbanidad y buenas maneras para uso de la juventud de ambos sexos; en el cual se encuentran las principales reglas de civilidad y etiqueta que deben observarse en las diversas situaciones sociales; precedido de un breve tratado sobre los deberes morales del hombre*, 45-46. Bogotá: Editorial Voluntad, 1961. First edition: 1871. (Quotation translated by the authors of the exhibition.)

Written by the Venezuelan diplomat and teacher Manuel Antonio Carreño, this handbook became popular in Latin America upon its publication in New York in 1854. Issued for the first time in Bogotá in 1871, it influenced the daily behavior of citizens in private and public spaces where socializing took place. Personal hygiene was included in Carreño’s manual as an essential daily regimen for anyone wishing to stay healthy and to accomplish social prestige. According to Carreño, upon waking in the morning and before going to sleep at night, it was necessary to wash one’s face, eyes, ears, neck, and head. The hands should be washed several times a day, especially before eating, and the whole body should be washed at least once a week in a bath or shower.



Dirección Nacional de Salubridad, “El baño del niño: Normas generales para realizar esta tarea medular de la salud”, *El Tiempo*, December 19, 1946, 18

Illustration in a newspaper article entitled *The Child's Bath: General Guidelines for this Fundamental Health Practice*, written by the National Health Directorate in 1946. This illustration shows the method by which a mother should bathe her baby, and the increased number and quality of toiletries to use.

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Guidelines for personal hygiene in these types of manuals were gradually adopted by families who managed to get copies of them, or whose children were taught its basic lessons in school. However, the most disseminated information came from public service announcements made by government agencies like the Directorate for Hygiene and Health of the Bogotá Municipality (*Dirección de Higiene y Salubridad del Municipio de Bogotá*). These announcements were meant to promote healthy habits and practices, and were adopted so as to mitigate the effects of infections and contagious illnesses. Physicians Manuel N. Lobo, Luis Zea Uribe, Cenón Solano,

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Tiberio Rojas and Pedro M. Ibáñez, who were linked to the Directorate for Hygiene and Health, made regular use of the monthly publications of the Municipal Hygiene Registry (*Registro Municipal de Higiene*) to disseminate information detailing how public bathrooms functioned, to recommend a length and temperature for baths and showers, and to educate people as to the importance of washing their hands in order to avoid contagious illnesses like typhoid fever.

Further instructional publications included manuals specifically targeting mothers, with information on infant health and cleanliness. Among these were the “Manual of Infant Hygiene and Medicine for Mothers” (*Manual de Higiene y Medicina Infantil al Uso de las Madres de Familia*), written by pediatrician José Ignacio Barberi, and published for a second time in 1905. It recommended that mothers bathe their children every day with warm water for no longer than five minutes. In part, this daily bathing routine was to ensure that the child’s pores would not be clogged by dirt since they helped eliminate toxins—much like exhalation and urination—and thus kept internal organs healthy.

“Bathing is, for me, such an essential element for good health that I have children bathe even when they have fevers, using baths as a kind of medicine. General concerns about bathing come from the fact that among us, it is associated with rivers or rainwater and therefore cold water. As I have stated before, bathing should be done with warm water to avoid any ill effects. If a child cannot sleep, bathe him before going to bed and he will sleep all night long. Compare a child who bathes regularly to one that does not, the clean child’s skin will be clean and terse in contrast to the rough and potted skin of the one that is not bathed regularly.

Bathing prevents infectious diseases and serves as a tonic for the body in general, it is medicinal with surprising positive effects for many ailments.”

—José Ignacio Barberi. *Manual de higiene y medicina infantil al uso de las madres de familia, ó sea tratado práctico sobre el modo de criar á sus hijos y de atenderlos en sus enfermedades leves*, 46-47. Bogotá: Imprenta Eléctrica, 1905. (Quotation translated by the authors of the exhibition.)

Babies requiring special care were to be washed with glycerin soap and a soft sponge in small tubs, with water heated to body temperature. Rainwater was recommended for these baths since the city’s water supply was not trusted to be potable. This type of instructional information for child hygiene was also included in newspaper and magazine articles such as the one published in 1946 by the National Health Directorate (*Dirección Nacional de Salubridad*) with the title “The Child’s Bath: General Guidelines for this Fundamental Health Practice” (*El Baño del Niño: Normas Generales para Realizar esta Tarea Medular de la Salud*). Using illustrations and a plain writing style, the National Health Directorate insisted that the child’s tub, soap, mineral oil, cotton balls, towels, and blankets never be used for anything other than bathing the child so as to avoid cross contamination. The article also gave mothers special tips for bathing newborn babies during their first week due to the tendency of soap and water to dry out their delicate skin.

“A daily bath—or better still, bathing twice a day—is one of the most powerful ways of preserving our youthful beauty. Taken in almost-boiling water like the Japanese, or in freezing water as some nature fanatics do, bathing is always a gratifying refuge for our fatigued bodies”.

—“Higiene y belleza.” *Cromos*, 18 March 1933, 6. (Quotation translated by the authors of the exhibition.)



“Shampoo de aceite de coco”, *Cromos*, April 5, 1924, 250

Advertisement for a coconut oil shampoo for cleansing the hair by removing dandruff and natural oils. In the early twentieth century body cleansing began to be perceived as a need rather than a privilege. Shampoos, soaps, and other cosmetic products advertised in newspapers and magazines were used together with water to eliminate dirt, oil and odor from hair and skin in favor of health and beauty.

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In the early twentieth century, when bathing became an increasingly popular practice among Bogotá citizens, bathing was associated with certain health benefits and risks. Perceived health risks associated with long hot baths such as tiredness, heart problems, and dry skin waned within decades as people started following guidelines given

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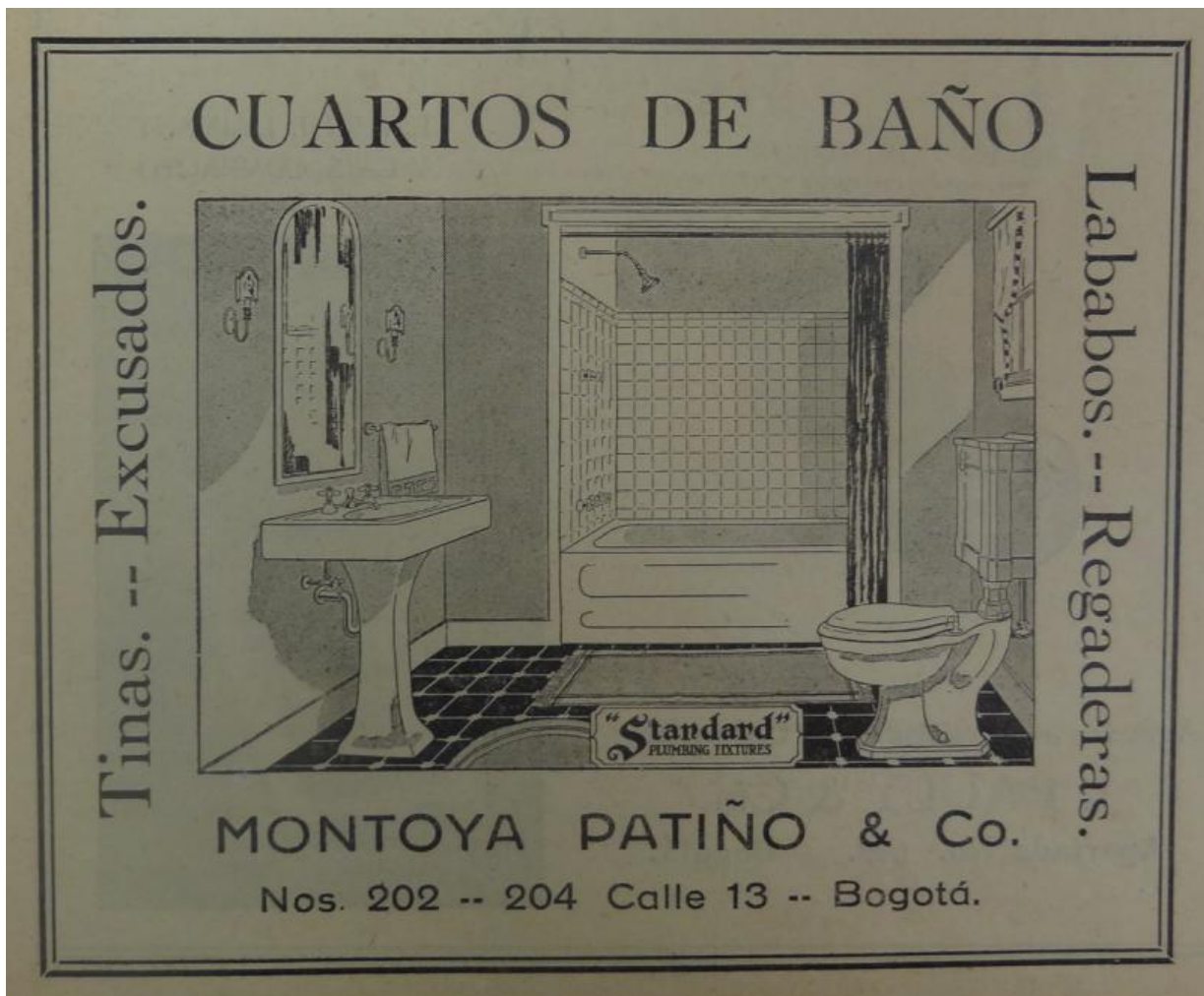
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by doctors. Bathing gradually became an essential daily practice because it helped to keep people healthy and also facilitated the feeling of being young and beautiful on account of the resulting moisturized, softened, and clean skin. The cosmetic aspects of bathing quickly inspired advertisements for related products such as soaps, shampoos, bath salts, skin tonics, deodorants, and perfumes, all of which complemented the cleansing effects of water. These products, now basic elements in daily hygiene regimens, quickly became staple consumer goods for all families.

With bathing established as a daily practice, proper bathrooms became essential domestic spaces that provided adequately hygienic conditions along with comfort and privacy. Modern bathrooms had characteristic features such as floors made of easily washable materials, cement walls that were waterproofed using lime plaster, oil-based paint, and ceramic tiles. They also included fixtures like bathtubs, showers, hand sinks, toilets, and bidets. All of these features permitted the easy disposal of human waste and hygienic washing by taking advantage of running water from pipes connected to the municipal aqueduct and sewage drains.





“Cuartos de baño”, *Cromos*, December 13, 1930, 31

Advertisement for Montoya Patiño and Co., a company selling bathtubs, toilets, sinks and showers for completely hygienic bathrooms. Having bathrooms inside homes bolstered the ongoing domestication of water in the city, but also became evidence of the socially differentiated relationship between people and water, as not everyone could afford to have one.

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However, modern bathrooms like these were absent from most Bogotá homes until the mid-twentieth century. Those houses built in the colonial period or the early Republican years did not include bathrooms in their architecture, and nor were bathrooms built in more recently constructed homes because of the owners’ economic restrictions. It was not until the second decade of the twentieth century that municipal officials, private developers, and workers’ cooperatives began building housing projects with bathrooms, regardless of the socioeconomic status of the neighborhoods in which they were located.

Having bathrooms inside homes bolstered the ongoing domestication of water in the city. This correlated both

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with the desire for modern health practices and new conceptions of bodily cleanliness as a discreet and private routine. The domestication of water meant that most of the city's inhabitants no longer had to use the local rivers or collect rainwater for bathing: water was now available from the municipal aqueducts and pumped into homes through pipes directly into faucets for showers, bathtubs, and sinks. People only needed to turn on a faucet and water would pour with a steady, adjustable, and continuous flow all year round. This new approach to water use not only increased the amount of water demanded, used, misused, and polluted, but also demonstrated how humans could sometimes control what had previously been subject to natural cycles, even though nature never became a passive actor completely submitted to human will.

Despite the increasing use of bathrooms in private homes, some people could not afford the costs to build one and had to rely on showers and tubs in public bathhouses. These public washrooms were regulated according to standards set out by municipal authorities. On 30 April 1915, the Bogotá City Council (Concejo de Bogotá) approved a proposal made by the Directorate for Hygiene and Health to draw basic regulations for public bathroom services, which until then were being offered in inadequate and rudimentary facilities that indeed increased the risk of disease propagation. The new regulations stipulated that public bathroom facilities had to be spacious and clean—meaning washable cement walls, paved floors with drains, and doors and windows constructed so as to prevent strong cold breezes coming from outside. Furthermore, any business owner wishing to operate a public bathhouse had to hire employees to sanitize tubs before clients' use, and were obliged to provide them with towels.

“Without counting the bathrooms in private homes, whose use is correct from the point of view of private hygiene and which are almost exclusively used by the city's moneyed classes, Bogotá has no other public bath and washrooms than the waters from the Tunjuelo River and distant Bogotá River, the Fucha River which receives all of the runoff from the San Cristóbal hamlet, the scarce water from the Arzobispo stream, and the rivulets that cross the Chapinero neighborhood that are just as tainted as the waters from the Fucha River.

Various private companies have bathroom services for the public, although they are insufficient for public demand. These have yet to adopt the level of cleanliness, comfort, and affordability found in other cities. The showers and faucets are well established.

Workers and their families are excluded from these public bathrooms because they lack the means to afford them. From this stems the generally disheveled state of our poorer classes who never get the opportunity to use a bathroom unless misfortune lands them in hospital, jail, or better fortune lands them in barracks.”

—Tiberio Rojas and Pedro M. Ibáñez. “Contribución al estudio de la higiene pública de Bogotá.” *Registro Municipal de Higiene*, 20 July 1919, 15–16. (Quotation translated by the authors of the exhibition.)

Public bathrooms, however, were scarce and pricey for the general public. In 1919, physicians Tiberio Rojas and Pedro M. Ibáñez claimed that public bathrooms benefited only wealthy citizens, while poor people continued to rely on natural but often contaminated water from local currents—including the Bogotá, Tunjuelo and Fucha

Rivers, and rivulets such as La Vieja and Las Delicias. The Bogotá City Council addressed the problem by approving its Accord No. 11 of 1919, which gave the Board of Relief (Junta de Socorros) a permit to build public bathrooms in new areas using city funds. Nevertheless, this utility never coupled with the population growth, and in 1936 the City Council ordered the construction of 26 new public bathhouses, which were designed like kiosks and located near public squares and open to all.



Group of people enjoying a picnic in the countryside. A small stream at the lower right of the photograph reminds us that riverside landscapes were places to enjoy recreational activities, before the rivers themselves were consumed by the urban expansion of Bogotá over the western savannah.

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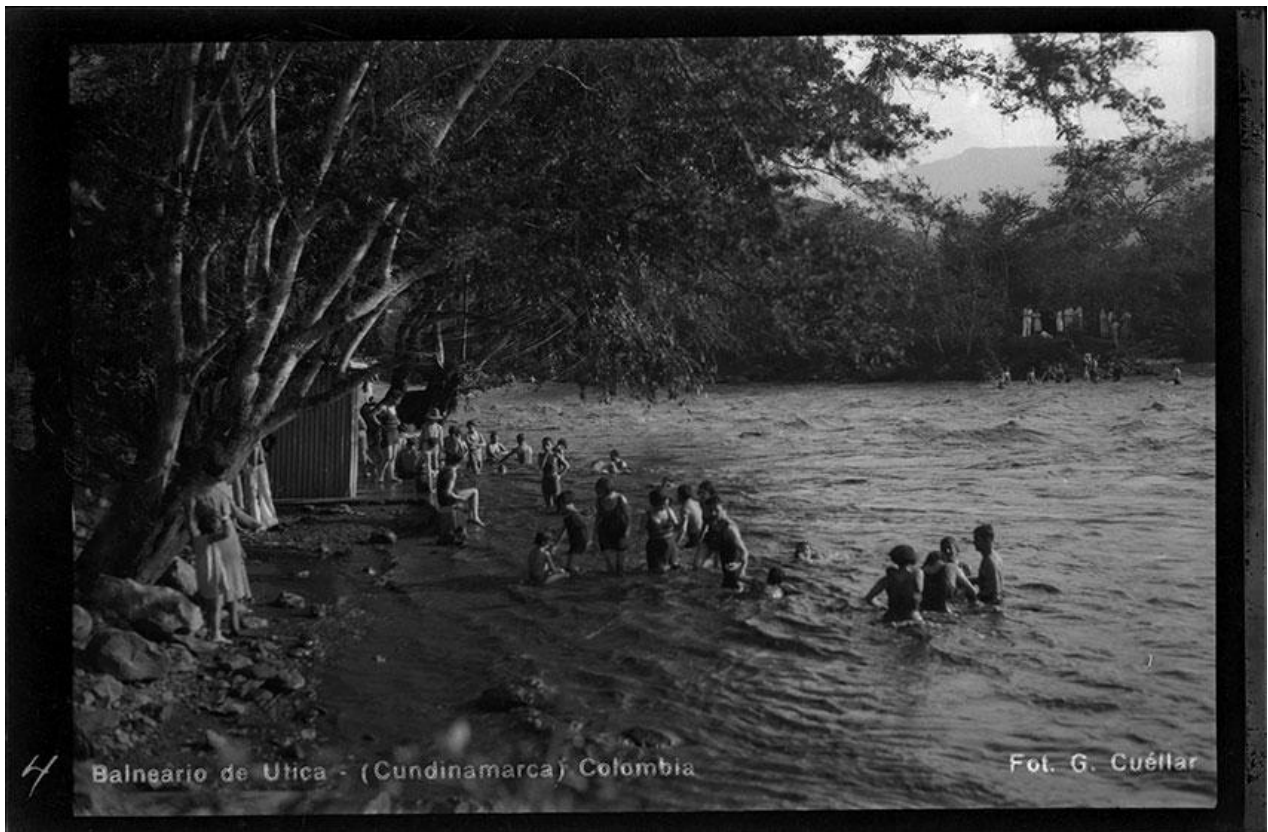
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Group of people swimming in a natural pool formed by water from a river in Útica (497 m. above sea level), a temperate town located 119 kilometers from Bogotá (2640 m. above sea level) on the route down the mountains to the Magdalena River.

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An example of watersports associated with recreational activities around rivers and lakes, this picture shows regattas sailing in the artificial lake formed by the Muña Dam, located south of Bogotá and used since the 1940s for hydropower generation.

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Bathing in rivers continued, however, remaining a long-held custom for people regardless of their socioeconomic background. Those who no longer needed rivers for personal hygiene still enjoyed rivers as recreational zones. It was common for Bogotá families to take trips on weekends or holidays to nearby rivers and natural pools on the Bogotá Savanna, or those located in the warm climates of towns along the route down the mountains to the Magdalena River. These trips to rural areas outside the city were ideal opportunities to enjoy picnics on grassy pastures, sometimes stopping along the riverbanks to stare at the tranquil flow of water or engaging themselves in watersports and refreshing swims.

The shifting use of rivers from bathing to recreational activities shifted the perception of water into a source of entertainment, and reinforced the bucolic idea of the countryside as a contrast to the dirty and restless city streets. Around the mid-twentieth century these family trips to nearby rivers began to disappear from the repertoire of common Bogotá customs as the city itself began to expand into the surrounding wetlands and rural savanna. Wetlands dried out, fertile farmland was covered by construction, and some of the nearby rivers used

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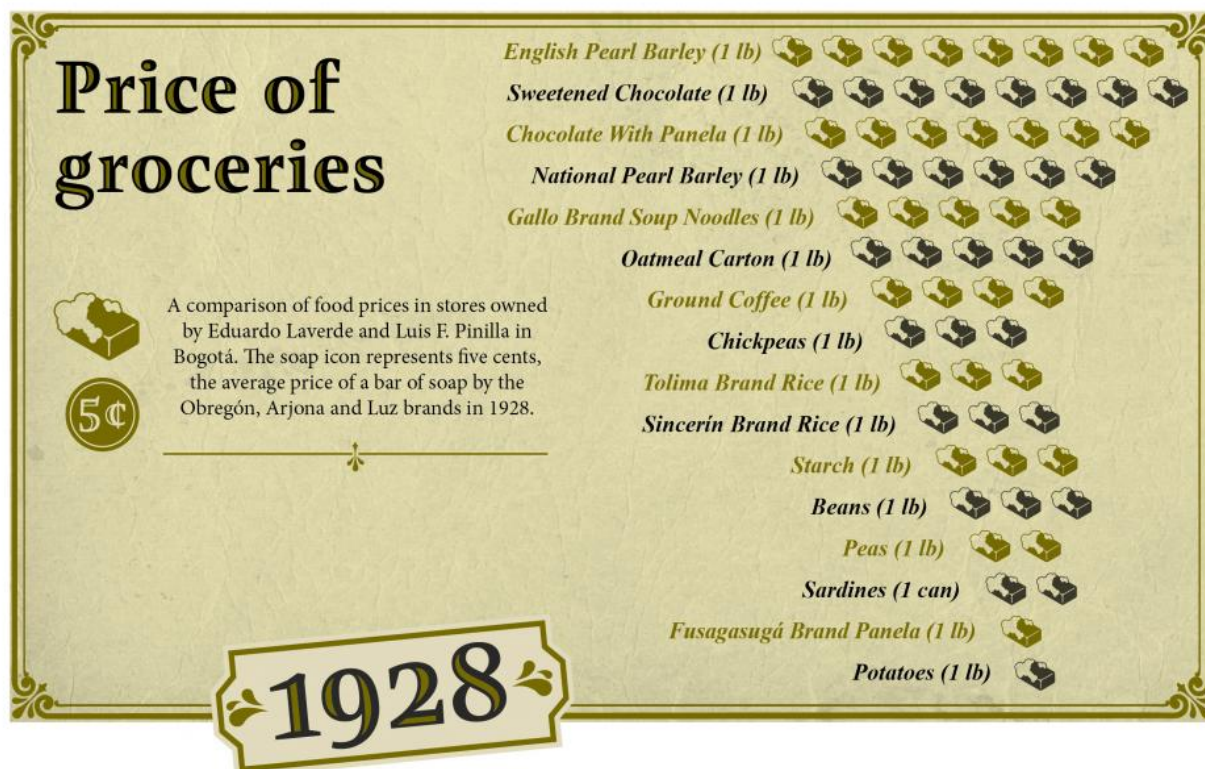
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for recreation were absorbed into the new urban landscape. Such was the case of the Fucha, Tunjuelo, and Bogotá rivers: once perceived as sites of leisure and contemplation, they were transformed throughout the twentieth century into streams that ran through the city, receiving wastewater discharges, and often flooding the neighborhoods next to their courses during rainy seasons.

### The price of groceries: Bars of soap at your fingertips

On 19 June 1928, the *El Tiempo* newspaper published a public service announcement that included the prices of goods and foodstuffs sold in the stores owned by Eduardo Laverde and Luis F. Pinilla that were located in Bogotá. This list demonstrates the importance of certain foodstuffs such as barley, oats, rice, potatoes, beans, peas, chickpeas, chocolate, coffee, sugar, and panela—solid blocks of sugar made from unrefined sugar cane juice—in Bogotá homes. It also enabled people to compare the price of a bar of soap to common foodstuffs as a means of demonstrating its affordability: for example, one bar of soap could cost 5 cents while a pound of sweetened chocolate could reach as much as 40 cents.

Easy access to cosmetic soaps towards the end of the 1920s shows how widely spread personal hygiene practices had become in Bogotá. Bathing had shifted from being perceived as an extravagant and distinguished exercise, exclusive to high society, to a routine practice for working-class people interested in staying healthy, clean, and attractive.



### Price of groceries, 1928

Infographic showing a comparison of the price of cosmetic soaps with the price of several groceries in 1928. “Precio de los víveres”, *El Tiempo*, June 19, 1928, 8. Created by Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2013.

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## Regulations for hygienic buildings as spatial projections of hygienic discourse

Homes with bathrooms began to appear in large numbers in Bogotá during the second decade of the twentieth century. These new buildings were regulated by normative standards meant to promote the construction and maintenance of hygienic homes. Among these were: Accord No. 10 of 1902 released by the Bogotá City Council, Accord No. 40 of 1918 by the Central Board of Hygiene (Junta Central de Higiene), and Resolve No. 16 of 1919 by the National Health Directorate (Dirección Nacional de Higiene).

These building standards defined architectural requirements that homes in modern residential neighborhoods had to fulfil, and also tried to mitigate health problems caused by unhygienic conditions within homes in working-class neighborhoods on the peripheries. Poorer neighborhoods like the Paseo Bolívar—which was located on the slopes of the Eastern Mountains—were known to be unsanitary and precariously constructed. Homes, which were more like shacks, had no public utilities, were notoriously cramped, lacked separate living spaces, suffered from poor lighting and ventilation, were usually built from low quality materials, and had no bathroom at all.

After years of unsuccessful proposals, the city authorities finally decided to demolish the homes of the Paseo Bolívar as part of a sanitation project led by the Viennese urban planner Karl Brunner, who in 1933 had been named chief of the brand new Department of Urban Planning for Bogotá (Departamento de Urbanismo de Bogotá) after his successful experience as an urban planner in Santiago de Chile. His mission was to plan future urban development based on legislation, focusing on urbanization and road construction. The Department of Urban Planning for Bogotá compiled and published norms for hygienic buildings while also proposing building plans for working-class housing that conformed to hygienic building codes, thereby increasing the living standards of inhabitants.

Comparing an average home in the unplanned Paseo Bolívar neighborhood in the 1920s with one of the planned working-class neighborhood proposed by the Department of Urban Planning for Bogotá in the 1930s, enabled consideration of the differences between building standards in the two timeframes, and the role of homes like spatial projection of hygienic discourse.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." Environment & Society Portal, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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## Prezi-presentation content "Working-class housing: Reality and Projection"

The original virtual exhibition features a prezi presentation showcasing working-class housing in Bogotá: Reality and projection. View the presentation [here](#).  
View screenshots and highlights from the presentation below.

### Working-class housing: Reality and projection

Improvised working-class housing in the Paseo Bolívar



Working-class housing proposed by the Department of Urban Planning for Bogotá



Architectural renderings designed by William Sarria Calderón. 2013.

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### Improvised working-class housing in the Paseo Bolívar



- House is not taller than 2.5 meters.
- Dirt floor, straw roof, wooden boards for door, and mud brick walls called *adobe* that are frequently broken and encourage humidity.
- Surrounded by garbage piles with arbitrary pits dug to dispose of human waste and filth.
- Inadequate lighting and ventilation due to the absence of windows, air vents, or patios.



- The total area of the house varied between 12 square meters and 18 square meters.
- Lacks differentiated rooms, with just one single living space.
- No bathrooms with hand washbasin, shower, and toilet.
- Contains one stove without chimney for cooking.
- No public utilities such as running water, sewage disposal, electricity, or police security.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." Environment & Society Portal, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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## Working-class housing proposed by the Department of Urban Planning for Bogotá



- Total area of the house is estimated 62.2 square meters and the total lot area is 94 square meters. The Department of Urban Planning recommended lots of up to 180 square meters for worker housing.
- Worker housing should have one to two floors with two to six rooms on each floor plus a kitchen, laundry room, and bathroom.
- The first floor should be 3 meters tall from the floor to the ceiling, subsequent floors could be 2.6 meters tall.
- Lots on which the house is built should have running water from the city aqueduct and proper waste management in the form of sewage drains that connect to the city's sewage system.
- Floors should never be made of dirt but rather washable materials such as bricks laid with cement, polished wood, or linoleum.
- Walls should not have wallpaper, but should be painted with oil-based paint or permanently whitened with lime plaster.
- Layout of the house should be such that each room receives light and ventilation from the outside or from indoor patios.
- Kitchen should have a chimney that allows smoke to exit and a sink connected to the city's sewage system.
- House should have at least one toilet for every twelve people. Pits, latrines, and sewage ditches are not permissible and should be eradicated.
- Water and sewage pipes in the house should be smooth, waterproof, and of sufficiently large diameter so as to prevent clogging.
- If the lot is large enough, the house should incorporate a garden to provide decoration and food if desired.

## Water supply and consumption



Saúl Ordúz, *Chorro de Padilla*, 1979

At the beginning of the twentieth century public water fountains were installed across the city to bring free water to citizens. This photograph shows one of them: the Chorro de Padilla, a colonial water fountain that poured freshwater from the mountain of Monserrate, one of the mountains from the Cordillera Oriental near Bogotá.

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Throughout the twentieth century, the building of infrastructure for the catchment, storage, and purification of water became material evidence of the relationship that had been established between Bogotá and its surrounding water sources. The scarcity and pollution of the water circulating through the city at the beginning of the century began to concern officials in the municipal administration, who tackled the issue by obtaining and purifying

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water from nearby rivers. When these rivers were not enough to satisfy the demands placed by the growing urban population, they opted for the exploration of bigger and more distant river basins, after which they began to build dams, reservoirs, and water treatment plants. The 1930s marked the beginning of the golden age of these great infrastructural projects, although the first steps date back to far before this period.

During the initial years of the twentieth-century water in Bogotá was supplied by a private aqueduct administered by the Colombian businessmen Ramón Jimeno and Antonio Martínez de la Cuadra, who in 1886 were given the provision of the service in concession due to the constraints of the municipal administration. The aqueduct was actually a set of unarticulated pipe networks that distributed the water stored in tanks located in the Egipto, San Diego, and Chapinero neighborhoods. The water was obtained from the San Francisco and Arzobispo rivers, as well as from La Vieja and Las Delicias rivulets. The pipes transported the water to houses with domiciliary connections to the aqueduct, but also brought water to free public fountains in plazas around the city. The free supply system also included the famous Chorro de Padilla, a colonial freshwater fountain in the nearby mountain of Monserrate.



Luis Alberto Acuña, *Quinta de Bolívar*, 1920

During the early years of the twentieth century, water in Bogotá was supplied by an aqueduct that consisted of a group of complicated pipe networks that distributed the water stored in tanks. This picture shows the storage tanks located in the Egipto neighborhood, on the Cordillera Oriental of Bogotá.

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The private aqueduct installed by Jimeno and Martínez substituted ancient colonial stone ditches with iron piping with the expectation of limiting loss and water pollution during distribution. However water quality remained deficient due to the absence of efficient purifying methods. This problem, along with the businessmen's lack of interest in widening the coverage of the domiciliary aqueduct, set public opinion against private aqueduct management, thus facilitating public debate about what we would now call the "right to water".

Politicians, journalists, and doctors promoted the initiative to give the municipality responsibility for the aqueduct, arguing as to the necessity of exercising a public government over urban services. After three years of hard negotiation, the aqueduct became municipal in 1914 with the creation of the Municipal Aqueduct Company of Bogotá (Empresa Municipal del Acueducto de Bogotá). This company assumed implementation of the measures needed to solve water's scarcity and lack of potability.

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“But for this water to give to the organism, with benefit, the quantities that perspiration and excretions have evicted from it, it is necessary, in an indispensable way, that the water destined for restoring purposes is potable water. That is, water in which, besides oxygen and hydrogen, which are natural components, there are no other animal substances, vegetable or mineral in excess or over the quantities that are compatible with health, as this would complicate the water’s nature, changing its properties from beneficial to harmful, and making it bad for health. Thence, the quality of water that is used in food preparation has a great influence over health, and consequently over the life of men.”

—Rafael Zerda Bayón. *El agua en la salud y el trabajo*, 13. Bogotá: Casa Editorial Aurora, 1909). Accessed 19 September 2013. (Quotation translated by the authors of the exhibition.)



Saúl Ordúz, *Acueducto*, 1940

A worker of the Municipal Aqueduct Company of Bogotá installing a water meter to allow the company to charge fees according to domiciliary consumption.

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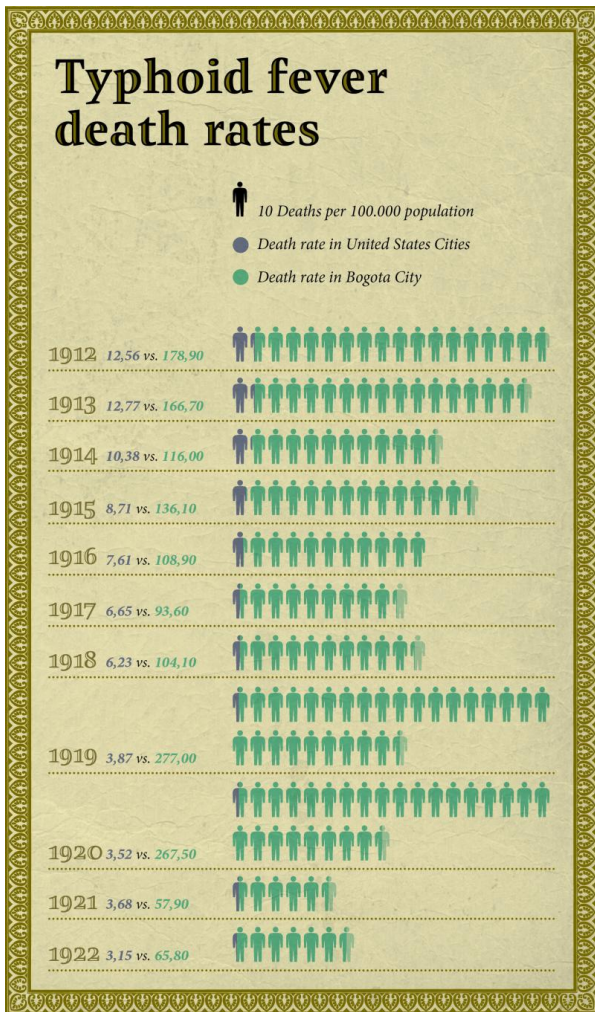
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Studies from local chemical laboratories, inaugurated in 1906 by Federico Lleras Acosta, indicate how Pasteurian microbiology was adopted in the Colombian scientific practice and prove that the water from the aqueduct did not comply with the minimum requirements of potability. It contained high quantities of ammonia and nitrites—organic substances that increase the proliferation of microbes responsible for waterborne diseases. Under those circumstances, the purification of water through mechanical processes such as decantation and filtration was insufficient, making necessary the implementation of further chemical procedures including the addition of liquid chlorine to the water.

Despite opposition from some inhabitants concerned about the toxicity of chlorine, its addition to water was approved in 1920, as it was considered an efficient and economical measure. Chlorine was initially imported from the United States, but as a result of restrictions imposed on its commercialization during World War II, the national production of chlorine became imperative, leading to the creation of the National Company of Chlorine and Derivatives in 1942 (Compañía Nacional de Cloro y sus Derivados).

“Industrial progressive men, Mr. Posada and Mr. Tobón, have given to their factory of carbonated drinks—which has functioned for some time in this city—a new broadening with the mounting of a department dedicated to water sterilization through UVA rays. This industry, built with modern machinery and in consultation with the best scientific progress, will be of great benefit to Bogotá, where bad potable water quality represents a real danger and has been the cause of violent typhus epidemics.”

—“Progreso de Bogotá—La esterilización de las aguas.” *El Gráfico*, 15 June 1918, 121. (Quotation translated by the authors of the exhibition.)



Typhoid fever death rates: A comparison between the United States and Bogotá, 1912-1922

Outbreaks of typhoid fever are related to insufficient hygiene and sanitation infrastructure. Contaminated water, used for irrigation purposes or drinking, is the main cause for the occurrence of typhoid fever epidemics affecting all age groups. Since the supply of drinking water was inadequate in the urban areas in which they settled, the migration of rural people into the city was also a problem. Another epidemiological factor was the weather: in the dry season the accumulation of waste and flies played an important role in the dissemination of the bacillus.

Cristóbal Bernal. "Estadística de mortalidad por enfermedades hídricas en Bogotá, de 1912 a 1922." *Santafé y Bogotá* 1. no. 6 (1923): 395-99.

Dabney H. Maury. *Estudios sobre el abastecimiento de aguas para la ciudad de Bogotá*. Bogotá: Editorial de Cromos, 1929, 17.

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Another key intervention was the purchase of land at the sources of rivers providing water to the aqueduct. Between 1916 and 1918, the municipal administration bought nearly 4,480 hectares of terrain in the basins of the San Francisco, San Cristóbal, and Arzobispo rivers. Inhabitants of the area were evicted, mining activities

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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restricted, farming prohibited, and reforestation programs developed. These measures mitigated the consequences of pollution in high river basins, which in turn improved water quality. The positive effect on mortality from waterborne diseases was tangible: typhoid fever death rates dropped from 136 deaths per 100,000 inhabitants in 1915 to 58 per 100,000 inhabitants in 1921.

Without waiting for institutional measures, Bogotá's citizens took action by buying home filters and bottled water. A handful of Colombian companies made these innovations available to an increasingly larger public by advertising their products with reference to scientific backing and hygienic claims. This was the case with the purification filters by Camacho Roldán & Tamayo Company, presented to the local press in 1905 as supported by studies by the French chemist Louis Pasteur. Another case was the crystal water bottle sold in 1913 by the Posada & Tobón Company. A 20 liter demijohn was sold directly at the factory for 5 cents, and home delivered at a cost of 10 cents. The success of Posada & Tobón Company was such that by 1918, it announced the opening of a department exclusively dedicated to water purification by UVA rays. The Posada & Tobón Company—later named Postobón—became the most iconic trademark of bottled beverages in Colombia, which still holds true today.



Daniel Rodríguez, *Pileta para el abastecimiento de agua*, 1950

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Woman filling water from public pump.

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“Well-educated people exert special effort to ensure the cleanliness of their water; and a fine person would never misuse the pitchers and jars that contain water for drinking. It is a great offense to use the glass to take liquid from the pitcher, drink directly from the same pitcher, pour leftovers into it, fill the glass too much, and so on.”

—Manuel Antonio Carreño. *Manual de urbanidad y buenas maneras para uso de la juventud de ambos sexos; en el cual se encuentran las principales reglas de civilidad y etiqueta que deben observarse en las diversas situaciones sociales; precedido de un breve tratado sobre los deberes morales del hombre*, 61. Bogotá: Editorial Voluntad, 1961. First edition: 1871. (Quotation translated by the authors of the exhibition.)

Citizens could also consult recommendations from sanitary reformers on water consumption. In his etiquette handbook, Manuel Antonio Carreño invited his readers to follow basic rules to avoid the pollution of water stored in pitchers. In turn, dissertations written by some physicians and communications from the Directorate for Hygiene and Health of the Bogotá Municipality (Dirección de Higiene y Salubridad del Municipio de Bogotá) recommended boiling water, and washing fruits, raw vegetables and dinnerware with this sanitary water only.



“Enfermedades contagiosas: Lo que debe saberse sobre fiebre tifoidea”, *El Tiempo*, 1946

Illustration for a newspaper article entitled *Contagious diseases: What one should know about typhoid fever*, written by the Inter-American Cooperative Service of Public Health in 1946. This illustration depicts persistent means of the spread of typhoid fever: drinking water polluted with excrement containing the bacillus, watering vegetables with contaminated water, drinking unhealthy milk, or contact with the clothes of those infected.

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The prevention of typhoid fever—a waterborne disease caused by the presence of Eberth bacillus in water contaminated with the feces of infected persons—required additional measures to control different forms of contagion. It was advised to boil not only water for human consumption, but also milk from animals grazing in the west of the city where water for cows and for cleaning milk cans was scarce. Citizens were advised to avoid disposing of excrement in rivers and sewers, not to wash clothes with dirty water, and not to accumulate garbage inside houses since this facilitated the reproduction of the housefly, which could transport on its legs traces of

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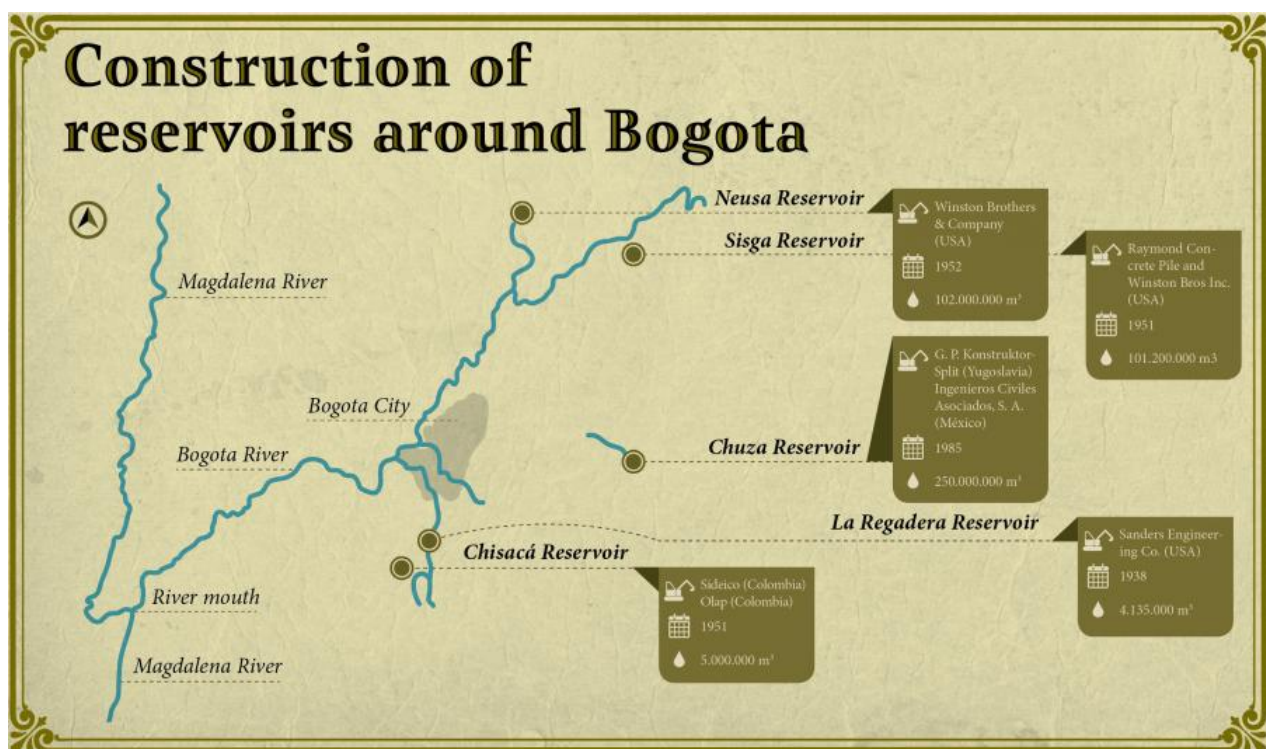
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feces contaminated with the bacillus.

Water's continuous scarcity was also problematic: demand for timber and construction materials had resulted in deforestation and erosion of the Eastern Mountains, thus reducing the soil's capability to retain the rainwater that replenished the rivers and rivulets flowing down the hills and overall altering the hydrological cycle of the complex ecology of the Bogotá high plateau. Water became increasingly scarce as the population started to increase.

In response, one of the first tasks undertaken by the recently created Municipal Aqueduct Company of Bogotá during the 1920s was the retrieval of water from the San Cristóbal River, which descended through the slopes of the Eastern Mountains before meandering through the city's southern periphery. Water from the river was seen as the solution to the reduction of the flow from the San Francisco, San Agustín, and Arzobispo rivers, which were the traditional sources of water to the city. The works included the construction of a water intake, the adaptation of two decanters to separate water sediments, the installation of a machine to pour chlorine, and the creation of a storage tank of 3,800 cubic meters' capacity. New piping was also installed to match the design of a unified network of water distribution. In 1927, Bogotá's aqueduct had a network of 65,603 meters, although the number of registered clients to the service was barely 5.8 percent of the urban population at an estimated 224,127 inhabitants.



Infographic showing locations, construction companies, years of inauguration, and storage capacities of the reservoirs built around Bogotá between 1938 and 1985.

Fondo de Atención y Prevención de Emergencias, “[Información Embalse del Neusa](#)”, Sistema de Información para la Gestión de Riesgos y Atención de Emergencias de Bogotá SIRE. Accessed 23 November 2013.

Juan Camilo Rodríguez Gómez. El agua en la historia de Bogotá. Volume II: 1938–1985. Bogotá: Villegas Editores, 2003, 45, 50, 103, 104, 119, 219, 222, 241.

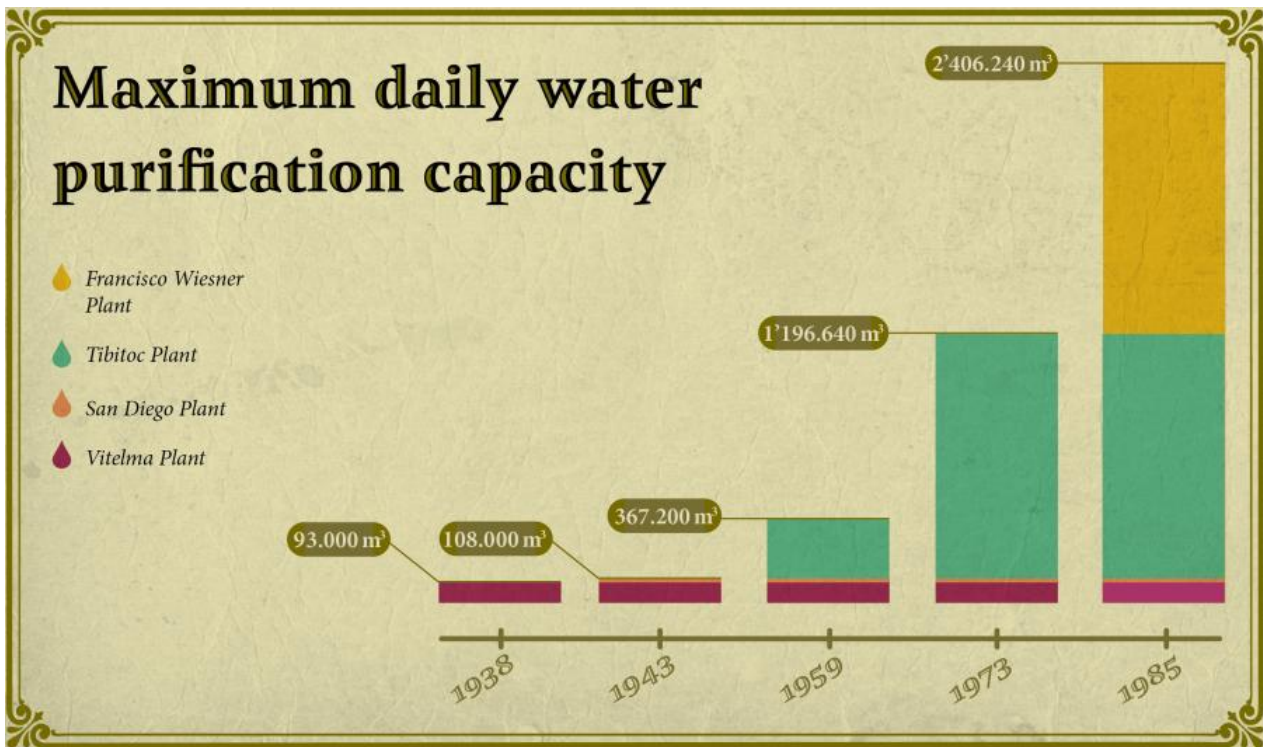
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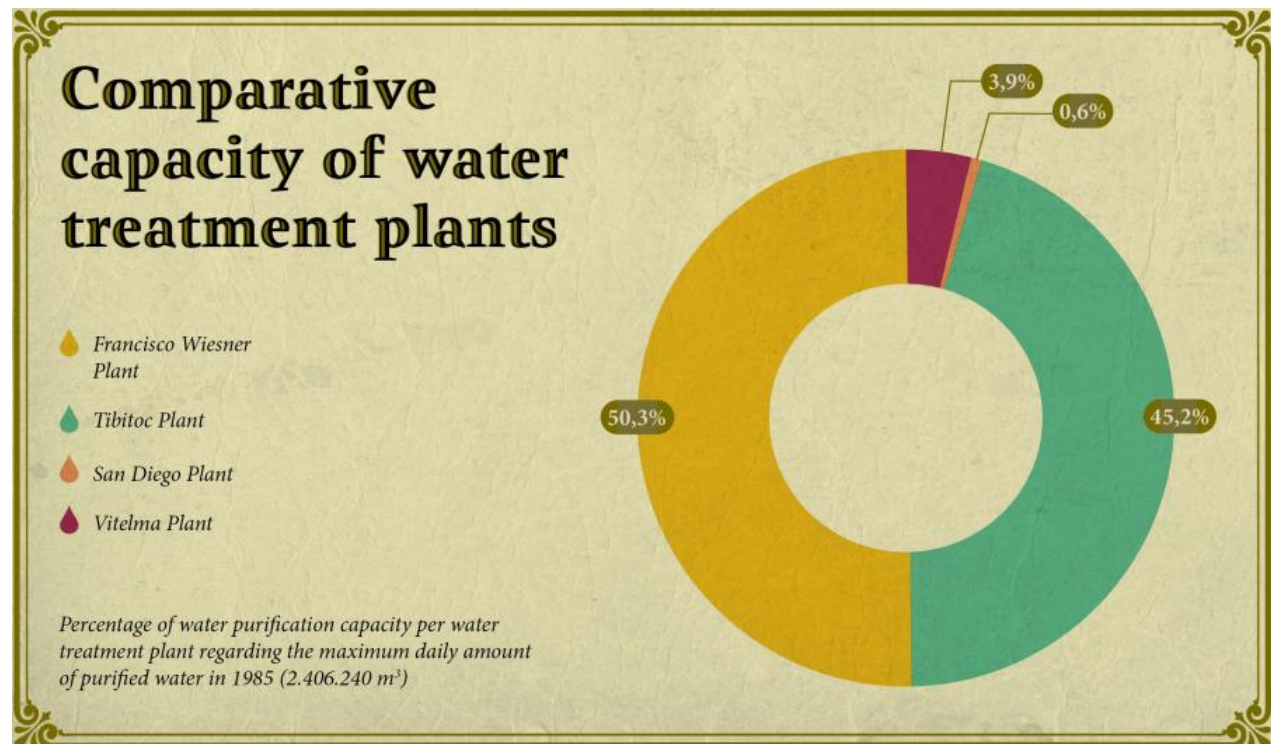
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Infographic showing the maximum daily water purification capacity of the water supply system of Bogotá, resulting from the sum of the individual capacities of the plants built between 1938 and 1985. Juan Camilo Rodríguez Gómez. *El Agua en la Historia de Bogotá. Volume II: 1938–1985*. Bogotá: Villegas Editores, 2003, 47, 51, 80, 142, 169–73, 190–95, 225.  
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Infographic showing a comparison of the capacities of water treatment plants belonging to the water supply system of Bogotá in 1985. Juan Camilo Rodríguez Gómez. *El Agua en la Historia de Bogotá. Volume II: 1938–1985*. Bogotá: Villegas Editores, 2003, 47, 51, 80, 142, 169–73, 190–95, 225.

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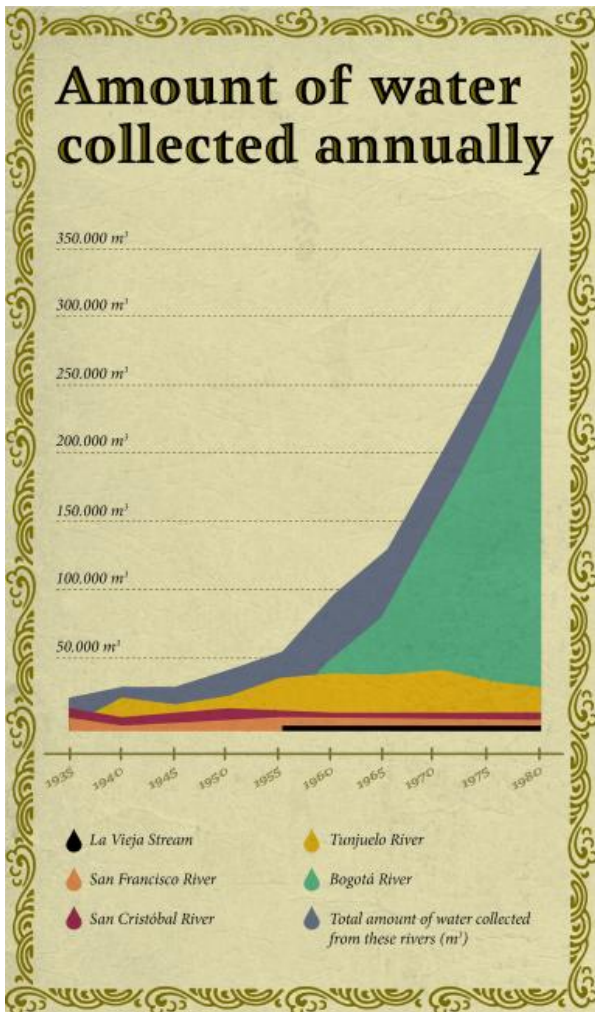
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Infographic showing the growing volumes of water collected annually from different rivers by the municipal aqueduct service of Bogotá from 1935 to 1980.

Contraloría Municipal de Bogotá. *Anuario municipal de estadística de Bogotá*. Bogotá: Contraloría Municipal de Bogotá, 1950, 164.

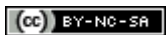
Departamento Administrativo Nacional de Estadística. *Anuario Estadístico de Bogotá*. Bogotá: Departamento Administrativo Nacional de Estadística, 1966, 180.

Departamento Administrativo Nacional de Estadística. *Anuario Estadístico de Bogotá*. Bogotá: Departamento Administrativo Nacional de Estadística, 1969, 165.

Departamento Administrativo Nacional de Estadística. *Anuario Estadístico de Bogotá*. Bogotá: Departamento Administrativo Nacional de Estadística, 1980, 183.

Departamento Administrativo Nacional de Estadística. *Anuario Estadístico de Bogotá*. Bogotá: Departamento Administrativo Nacional de Estadística, 1983, 141.

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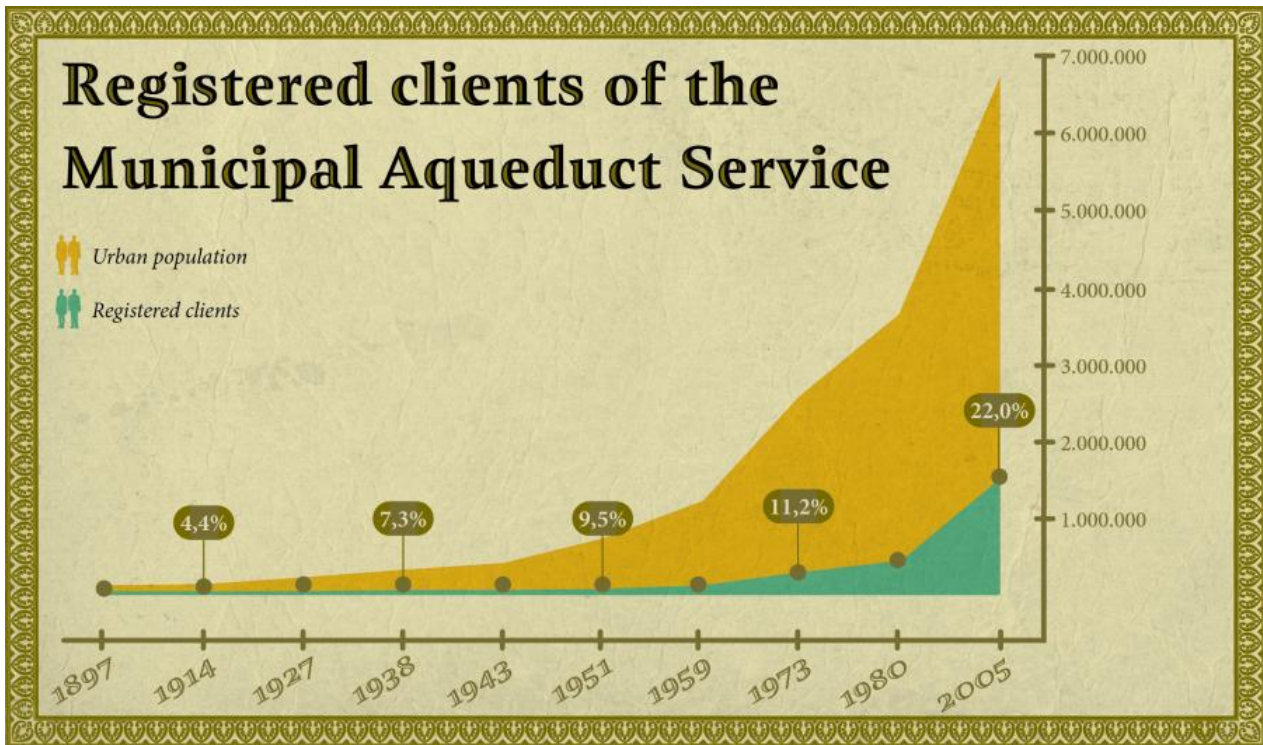
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Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Infographic showing the increase in registered clients of the municipal aqueduct service of Bogotá from 1897 to 2005, and their percentage representation in relation to the total urban population.

Gratiniano Buitrago Mora. *Historia Financiera 1914–1978*. Bogotá: Empresa de Acueducto y Alcantarillado de Bogotá, 1978, 187–94.

Contraloría Municipal de Bogotá. *Anuario Municipal de Estadística de Bogotá*. Bogotá: Contraloría Municipal de Bogotá, 1947.

Contraloría General de la República. *Censo General de Población. 5 de Julio de 1938. Ordenado por la Ley 67 de 1917. Departamento de Cundinamarca*. Bogotá: Imprenta Nacional, 1941, 9.

Departamento Administrativo Nacional de Estadística. *Anuario Estadístico de Bogotá*. Bogotá: Departamento Administrativo Nacional de Estadística, 1967, 2. Accessed 15 November 2013.

Departamento Administrativo Nacional de Estadística. *Anuario Estadístico de Bogotá*. Bogotá: Departamento Administrativo Nacional de Estadística, 1983, 115.

Departamento Administrativo Nacional de Estadística. *Características, Planificación y Principales Conceptos del Censo de 1973*. Bogotá: Departamento Administrativo Nacional de Estadística, 2009, 80. Accessed 15 November 2013.

Departamento Administrativo Nacional de Estadística. *Censo de Población de 1951 (Mayo 9). Departamento de Cundinamarca*. Bogotá: Imprenta Nacional, 1954, 12.

Departamento Administrativo Nacional de Estadística. *Censo General 2005. Nivel Nacional*. Bogotá: Departamento Administrativo Nacional de Estadística, 2008, 35.

Secretaría Distrital de Ambiente. “Número Usuarios con Servicio de Acueducto de EAAB—NUCAA”. Observatorio Ambiental de Bogotá. Accessed 29 November 2013.

Secretaría Distrital de Planeación. *Bogotá Ciudad de Estadísticas. Boletín 23. Población y Desarrollo Urbano*. Bogotá: Alcaldía Mayor de Bogotá, 2010, 6–15. Accessed 17 November 2013.

Julián Vargas Lesmes, and Fabio Zambrano. “Santa Fe y Bogotá: Evolución Histórica y Servicios Públicos (1600–1957).” In *Bogotá 450 Años. Retos y Realidades*. Bogotá: Foro Nacional por Colombia—Instituto Francés de Estudios Andinos, 1988, 15, 19, 22, 40.

“CC-BY-NC-SA 3.0 Unported License.” Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2014.



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Dam construction—an important issue in international engineering at the time—was also addressed as a possible solution for the water scarcity problem. Proposals were presented for a dam on the Teusacá, Blanco, Neusa, and

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” Environment & Society Portal, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Chisacá rivers, but the mighty Tunjuelo River attracted most of the engineers' attention. A spot called La Regadera—located in the municipality of Usme, southward Bogotá, was chosen for building the dam. The technical challenges of the project raised strong criticism from local civil engineers, despite which the national government and the Bogotá City Council authorized its construction. As a result, in 1933 the city officially entered the “age of dams”.

La Regadera Dam became the main project of the New Aqueduct of Bogotá, inaugurated in 1938 amid enthusiastic celebrations of the fourth centenary of the city's foundation. The water obtained from the Tunjuelo River was stored in the reservoir formed by the dam, with a capacity of 4,135,000 cubic meters. From there it was conducted through a 22-kilometer pipe of iron and reinforced concrete to the recently inaugurated Vitelma Treatment Plant, where nearly 93,000 cubic meters were purified daily by a process that included aerating the water to eliminate unpleasant smells, using lime and alum to decant impurities, employing sand filters to separate them, and utilizing chlorine against microorganisms. Once purified, the water was channeled through 5,200 meters of piping to the storage tanks located in the Egipto and San Diego neighborhoods, from where it was distributed to a large share of the city.



Saúl Ordúz, *Tanques de Vitelma*, 1981

Storage tanks of the Vitelma Treatment Plant located in the San Cristóbal neighborhood, inaugurated in 1938 as part of the New Aqueduct of Bogotá.

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Saúl Ordúz, *Tanques de San Diego*, 1982

San Diego Treatment Plant, inaugurated in 1943 to purify a daily average of 15,000 cubic meters of water obtained from the San Francisco and Arzobispo rivers. This plant was built to supplement the Vitelma Treatment Plant.

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La Regadera Dam was not only a major engineering project at a never-before-seen scale for the area that opened the doors to technological transfers coming from the United States; it also meant the incorporation of the Tunjuelo River basin into urban dynamics. From now on, the Tunjuelo River basin would become an important source of water supply for Bogotá and a terrain for unplanned settlement of new neighborhoods and industries that would increase the pollution of its water, and would condition its course. The river would respond to this with continuous and dangerous overflows and inundations during the heavy rainfall seasons, which are still happening today in spite of municipal interventions into sewerage, channeling, and levees. These levees—made of soil and built on the riverbanks—have proved ineffective with overflows but instead have led to a larger environmental problem: vegetation removal from the riverbanks and the increased sedimentation of water. This has worsened the floods in southern districts of Bogotá, such as Tunjuelito and Bosa.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Saúl Ordúz, *La Regadera*, 1978

This is the Glory Hole of La Regadera Dam, built between 1933 and 1938 in order to increment the quantity of water supplied by the aqueduct of Bogotá for the increasing numbers of citizens. The Glory Hole, also called Morning Glory, is a spillway designed in the shape of an inverted bell to release reservoir overflows.

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To many observers of the time, La Regadera Dam represented a symbol of industrial modernity and the power of controlling nature to the benefit of urban civilization. However the benefit did not last long. Two years after the inauguration of this major work, the city once again felt the threat of water scarcity. The uncontrolled increase in domiciliary connections, in addition to the misuse and waste of water by service users, jeopardized the water supply during months of low rainfall. While rains returned and the dam recovered its water level, immediate measures were adopted such as suspension of the aqueduct service in the evenings and the installation of water meters in each house that enabled the charging of tariffs according to consumption.

More dam construction followed to ensure a water supply to Bogotá. In 1951 the Chisacá Dam was put into

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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service. It was located at a greater height than La Regadera, and allowed storage of almost 5,000,000 cubic meters of water from the Tunjuelo River. At the same time the reservoirs of the Sisga and Neusa rivers were inaugurated, each of them with over 100,000,000 cubic meters of storage capacity. They not only expanded the availability of water sources to the inhabitants of Bogotá but also prompted the exploration of new possibilities to the north of the city, progressively focusing on larger and more distant rivers.

A few years later, in 1959, the Aqueduct of the Bogotá River, which provided 259,200 cubic meters of purified water to the city every day—particularly for the working class neighborhoods of the west—was opened. This aqueduct captured water from the Bogotá River by a dam built downstream of its confluence with the Neusa River, although it also had at its disposal some of the water stored in the Neusa Reservoir. Once captured, the water was settled for two days in an artificial pond and then driven through pressure pumps to the top of the Tibitoc Mountain. At the top of this mountain was a treatment plant where flocculation, filtration, and sterilization processes were combined to produce potable water that was transported by gravity through 38-kilometer piping to Usaquén, a neighborhood situated in northeastern Bogotá.



Saúl Ordúz, *Tanques de Tibitó*, 1982

The Tibitoc Treatment Plant, inaugurated in 1959 and broadened in the 1970s, serves as material evidence of the introduction of the Bogotá River upper basin into Bogotá's water supply system.

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Saúl Ordúz, *Visitas Presa de Golillas*, 1982

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Meanwhile, population started growing dramatically. In order to increase the efficiency of the Bogotá River aqueduct, an additional reservoir was built in the Teusacá River, a tributary of the Bogotá River. New pumping stations, sedimentation tanks, and filters of anthracite were installed in the Tibitoc Treatment Plant. An additional water driving system was built between Tibitoc and Bogotá, and new water mains for distribution were also installed within the city. By 1973—the year these works were finished—the aqueduct of the Bogotá River had increased its capacity to 1,088,640 cubic meters of drinking water per day.

The broadening of the aqueduct of the Bogotá River meant the introduction of a water governance that focused on long-term actions, because sustained demographic growth rendered shorter-term engineering interventions useless. Following this logic, the Aqueduct and Sewerage Company of Bogotá (Empresa de Acueducto y Alcantarillado de Bogotá) turned its attention to the Chingaza Páramo. A major project for a new dam, a reservoir, and pipelines began construction in 1972 and, with the expectation that it would provide water until 2020, became the largest infrastructure project in the history of water supply for Bogotá in the twentieth century.

The Chingaza Páramo project consisted of the deviation of the Chuza, Guatiquía, and Frío rivers towards Bogotá and therefore turned them into new tributaries of the basin of the Bogotá River at the western limits of the city's expansion area. Construction works included the Golillas Dam, which made possible the creation of the Chuza Reservoir, with a storage capacity of 250,000,000 cubic meters of water from the Chuza and Guatiquía Rivers and from other minor sources such as the Golillas and Leticia rivulets. The stored water was transported to the city through a conduction system of over 37 kilometers that ended in the Francisco Wiesner Treatment Plant, where up to 1,209,600 cubic meters underwent purification per day.



Saúl Ordúz, *Canal salida Simayá Plan Chingaza*, 1982

The Simayá Channel formed part of a water conduction system of over 37 kilometers that ran from the Chuza Reservoir to the Francisco Wiesner Treatment Plant, both large-infrastructure interventions incorporated into the Chingaza Páramo project.

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Saúl Ordúz, *Túnel de Ventana*, 1983

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“The other water source in the neighborhood, the one that always waited at the street corner, the diva, the manager of life, was the water fountain. Synonymous to cooking, cleaning and, of course, as it has to be with desired and scarce things, the cause of conflicts. A stream, a single stream of water comes from the fountain for the whole neighborhood. My dad, José de Jesús, my uncles, Elías, Evangelista and Ismael, all of them with prophetic and biblical but not miraculous names, as any Christian, if you will forgive the repetition, had to fall in line with a pot in hand to receive their fill of the indispensable water”.

—Natalia García Mora. “La Pila”. In *Talleres de Crónica: Memorias del Agua en Bogotá: Antología*, edited by Maryluz Vallejo Mejía, 50. Bogotá: Banco de la República, Pontificia Universidad Javeriana, Alcaldía Mayor de Bogotá, Archivo de Bogotá, 2011. Accessed 14 August 2013. (Quotation translated by the authors of the exhibition.)

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Saúl Ordúz, *Acueducto comunal de Suba*, 1972

A group of children waiting in line to fill their buckets, cans and pots with water from a public fountain in a poor neighborhood in the Suba district, northwest of Bogotá. The situation captured in this photograph shows not only the socially differentiated relationship between population and water that has characterized the history of the city, but also the active role of children in daily domestic dynamics related to water supply.

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Saúl Ordúz, *Acueducto comunal de Suba*, 1972

Woman filling a bucket with water from cans that are transported by a donkey to a poor neighborhood located in the Suba district, northwest of Bogotá.

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The project experienced many technical and financial difficulties, but was finally concluded in 1985. Nevertheless the project failed to ensure the end of Bogotá's water supply problems: the domiciliary service of the aqueduct was still absent in poor peripheral neighborhoods, which continued to grow from the mid-twentieth century onwards and became home to a large number of migrants escaping from armed conflict in the countryside. These impoverished neighborhoods faced water rationing that forced them to use alternative methods to acquire and transport water. Between these methods were the water tankers that sold the liquid, the loyal donkeys, transporters of the water, and the popular morning races of children to the closest public water fountain where crowds waited in line to fill their buckets, cans, and pots with water to satisfy their necessities.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Saúl Ordúz, *Trabajo Acueducto Barrio Nueva Caledonia*, 1980

Man filling a receptacle with water poured from the faucet of a public water fountain in the Nueva Caledonia neighborhood.

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Saúl Ordúz, *Trabajos Acueducto Barrio Verbenal*, 1980

Men and boys installing underground piping for the aqueduct of the Verbenal neighborhood, a poor area located in the northeast of Bogotá. The financial inability of the city's government to solve the urgent needs of emerging neighborhoods led many people to develop material improvements on their own.

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The absence of an aqueduct service in peripheral neighborhoods symbolized the socially-differentiated relationship between water and population. Aware of the social fragmentation linked to water supply, the Aqueduct and Sewerage Company of Bogotá turned from the technical complexity of the dams and the enormity of the reservoirs to constructing storage tanks, pumping stations, and piping networks in low-income neighborhoods shortly after completion of the Chingaza Páramo project. From now on, the Aqueduct and Sewerage Company of Bogotá gave more attention to the neighborhood-level interventions that were essential for solving the absence of aqueduct services in a substantial part of the city.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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The original virtual exhibition includes an embedded video featuring construction of the New aqueduct of Bogotá. View the film [here \(https://vimeo.com/73661768\)](https://vimeo.com/73661768) .

Video: Construcción del Nuevo Acueducto de Bogotá, DVD, directed by Acevedo e Hijos (Bogotá: Acevedo e Hijos, 1934–1938). Bogotá, Fundación Patrimonio Fílmico Colombiano, Code DVD0005-5997. All rights reserved. Courtesy of Fundación Patrimonio Fílmico Colombiano. Authorization for use of images No. 782.  
Music: Arlington Vaca, Añoranza, 2013, MP3 file. All rights reserved. Courtesy of Arlington Vaca.

[Construction of the New Aqueduct of Bogotá](#) from [Línea de Historia Ambiental](#) on [Vimeo](#) .

Selected fragments of an original silent video showing the construction of La Regadera Dam and the Vitelma Treatment Plant between 1934 and 1938. Thanks to funding from the Ministry of Public Works, the filmmakers Acevedo e Hijos attained a detailed visual record of the phases of construction of these two works that formed part of the New Aqueduct of Bogotá. The video reveals the technological advances used in the project, its magnitude, and its impact on nature. The background music was composed and recorded by Arlington Vaca, author of an original musical composition in the traditional musical genre of pasillo which was very popular in Bogotá in the early twentieth century.

#### Websites linked in this text:

- <https://vimeo.com/73661768>
- <http://vimeo.com/73661768>
- <http://vimeo.com/lineadehistoriaambiental>
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- <http://oab.ambientebogota.gov.co/registro/index.shtml?s=l&id=136&cv=1>

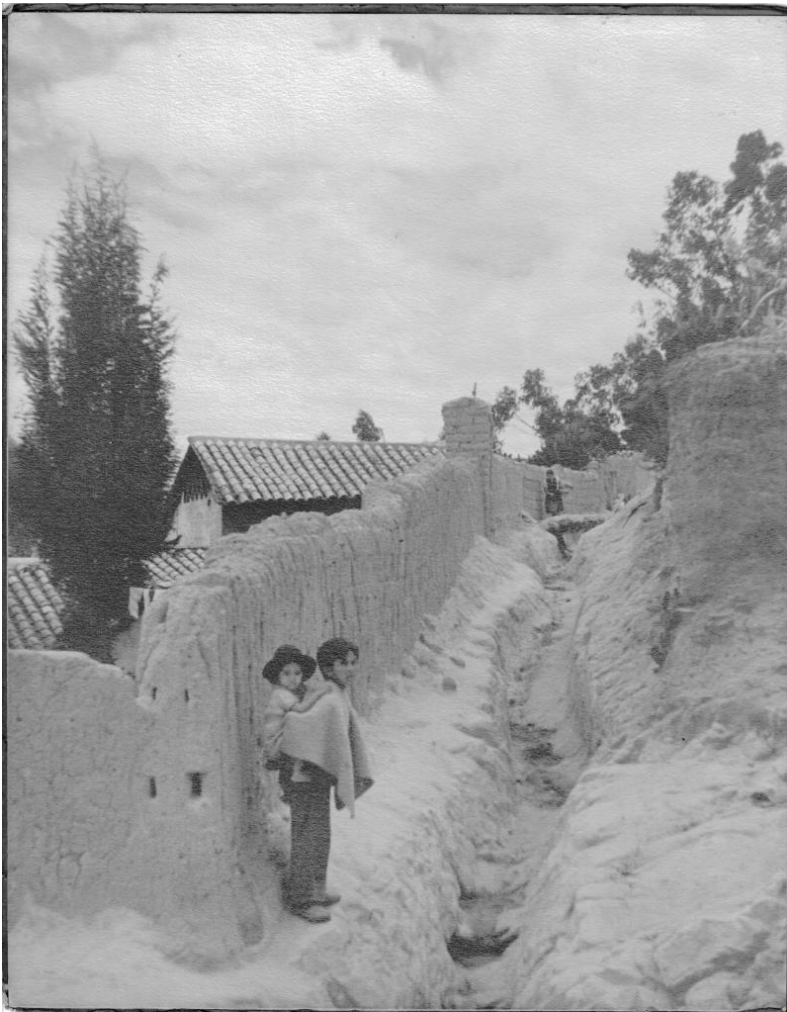
Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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## Waste and water pollution



Saúl Ordúz, *Niños en calle sin pavimentación*, 1930

Unpaved street with an open ditch in the middle. This ditch was used to channel waste, taking advantage of the rain and the slope of the Eastern Mountains of Bogotá.

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Towards the end of the nineteenth century, the city faced an urgent need for new infrastructure, owing to the demands of transforming its image and the living conditions of its inhabitants. The modernization of Bogotá necessitated the transformation of public and private spaces following European and North American paradigms of hygiene, ornamentation, and morality. While the city grew in population and infrastructure, the volume of waste produced by the population increased too. Waste materiality and placing in the urban setting changed

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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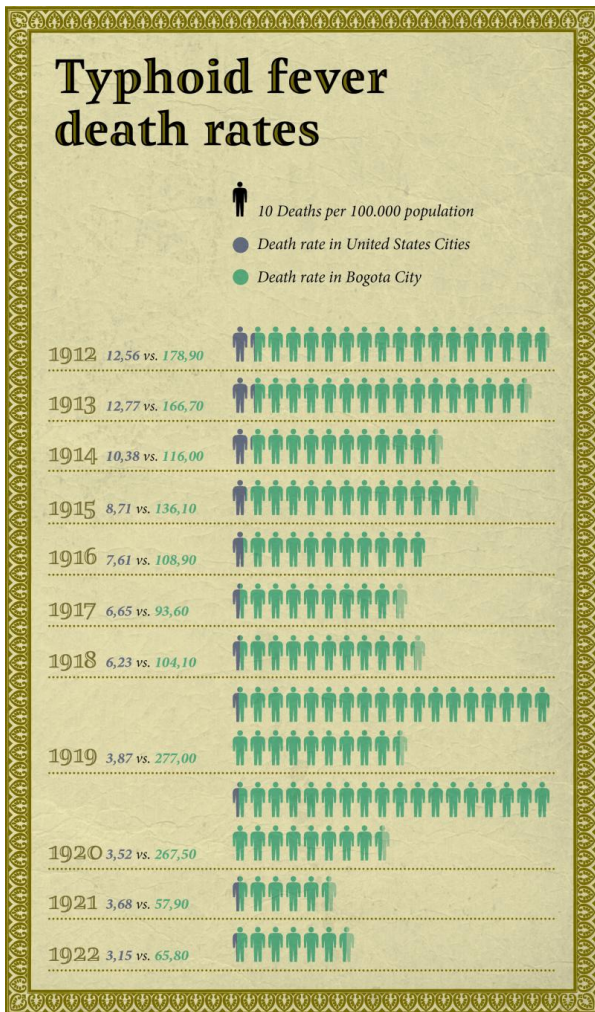
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rapidly. New industries sprang up: cement, textile, and paper plants joined the late nineteenth-century industries of glass, beer, soap making, and food processing. The industrial capitalist economy brought not only the settlement of a new working class in certain urban areas but also resulted in challenges to the urban rivers that played fundamental roles as part of the waste system. This initiated a technology-driven process of water domestication that was parallel to the intensification of water pollution.

“Bogotá feels the scarcity of water coming from the mountains into the San Francisco, Manzanares and Fucha rivers, whose riverbeds show the great amount of water that once flowed through them, and that today has been reduced to an insignificant and insufficient portion that carries huge infection deposits gathering in the riverbanks, while people remain confident of future rains and floods, the only elements of sanitary police in this city. This diminishment in the volume of water from rivers and rivulets is related to the logging performed to provide wood and coal, the only fuels consumed among us.”

—Liborio Zerda. “Climatología.” *Gaceta Médica*, 1 December 1865. (Quotation translated by the authors of the exhibition.)



Typhoid fever death rates: A comparison between the United States and Bogotá, 1912-1922

Outbreaks of typhoid fever are related to insufficient hygiene and sanitation infrastructure. Contaminated water, used for irrigation purposes or drinking, is the main cause for the occurrence of typhoid fever epidemics affecting all age groups. Since the supply of drinking water was inadequate in the urban areas in which they settled, the migration of rural people into the city was also a problem. Another epidemiological factor was the weather: in the dry season the accumulation of waste and flies played an important role in the dissemination of the bacillus.

Cristóbal Bernal. "Estadística de mortalidad por enfermedades hídricas en Bogotá, de 1912 a 1922." *Santafé y Bogotá* 1. no. 6 (1923): 395–99.

Dabney H. Maury. *Estudios sobre el abastecimiento de aguas para la ciudad de Bogotá*. Bogotá: Editorial de Cromos, 1929, 17.

Designed by Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2014.



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Water has played a key component in the clearance of urban waste since colonial times. Until the last decades of the nineteenth century, the main method of clearing out waste was to dump it into surface gutters, where it lay until rain showers drew it out of the city, as one traveler witnessed. The waste's journey as it weaved through the

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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steep topography towards the western plains of the Bogotá Savanna was an unrecorded but crucial actor of such a waste disposal event.

The demand of the growing population and changing economy on river basins lowered the volume of water that supplied fountains and aqueducts, thus reducing the volume of water that transported waste from streets to rivers. The appearance of the rivers and the quality of their waters began to deteriorate, and citizens' health worsened.

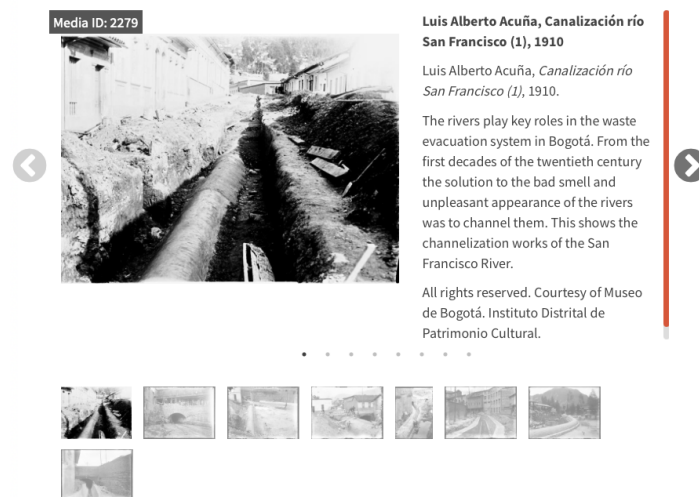
Figures showing the spread of waterborne diseases serve as dramatic indicators of how serious the epidemic problem was for the population of Bogotá at the beginning of the twentieth century. Two of the most common infectious diseases were typhoid fever and dysentery, both of which were transmitted through the ingestion of food or water contaminated with feces from an infected persons. The bacteriological theory, adopted in Colombia around the latter part of the 1910s, replaced the theory of miasma as an explanation for disease transmission, and drove engineers' and physicians' attention towards biological pollutants in water rather than its color and odor. Water chemical treatments and the urgent need for more modern infrastructure to improve the city's health became the driving forces of the city's political agenda.

The ideal of the hygienic city found a powerful mechanism of irradiation in events such as the Pan-American Conferences of Hygiene. Colombian delegates participated in several of these, most notably the Washington meeting in 1926 because of its influence on sanitary politics, later adopted in major Colombian cities.

One of the most far-reaching measures was the implementation and expansion of the domiciliary aqueduct service. This modified not only the hygienic conditions of the city but also the relationship of its inhabitants with water. The liquid that could be used and consumed was the only one that underwent a "civilization process." Rain and wastewater, once a cornerstone of the relationship between Bogotá society and water, was by this point progressively conceived as unnecessary, undesirable, and eventually dangerous to urban life.

The other main urban modernizing project was the construction of an underground sewerage system. Due to the scarce municipal funds available, construction had to be undertaken by the owners of the land that benefited from the service. But even the municipality could not coordinate the works and as a result, sewage regulation was weak, defective, and incomplete.

The original exhibition includes an image gallery with eight photographs reproduced below.



Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." Environment & Society Portal, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0043

Luis Alberto Acuña, *Canalización río San Francisco (1)*, 1910.

The rivers play key roles in the waste evacuation system in Bogotá. From the first decades of the twentieth century the solution to the bad smell and unpleasant appearance of the rivers was to channel them. This shows the channelization works of the San Francisco River. All rights reserved. Courtesy of Museo de Bogotá. Instituto Distrital de Patrimonio Cultural.



Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0105

Luis Alberto Acuña, *Canalización río San Francisco (2)*, 1910.

Channelization of the San Francisco River.

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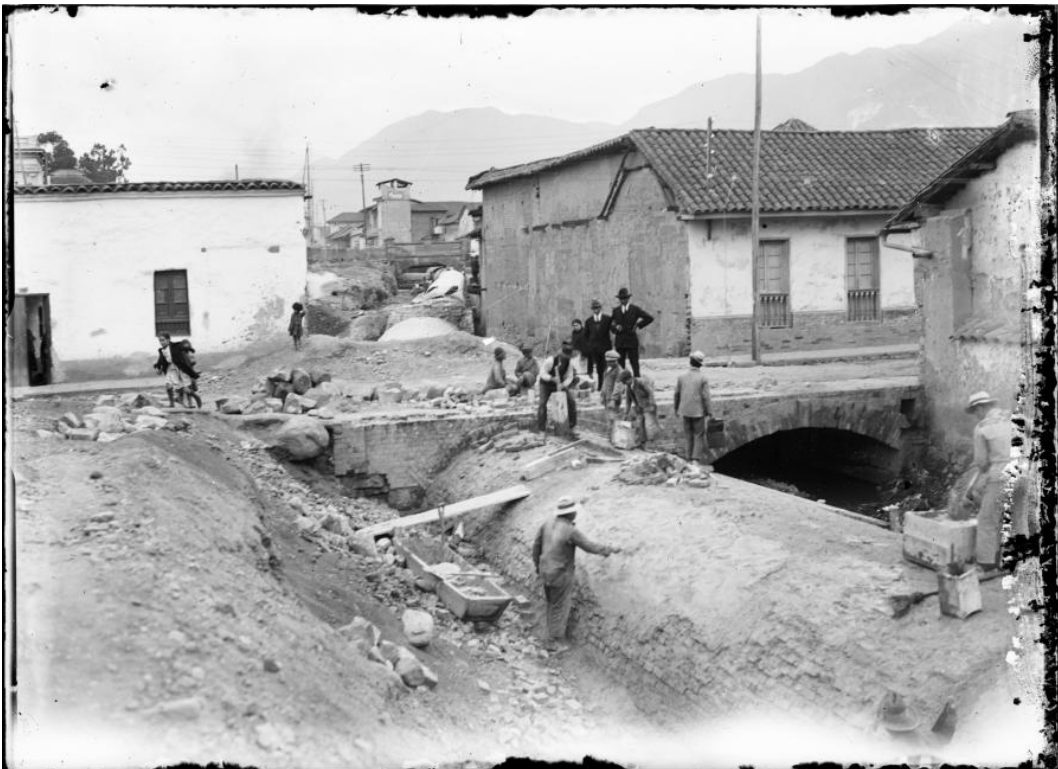


Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0106

Luis Alberto Acuña, *Canalización río San Francisco (3)*, 1910.

Channelization of the San Francisco River.

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Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0107

Luis Alberto Acuña, *Canalización río San Francisco (4)*, 1910.

Channelization of the San Francisco River.

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Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0056

Luis Alberto Acuña, *Canal río San Francisco (1)*, 1930.

Channelization of the San Francisco River.

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Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0067

Luis Alberto Acuña, *Canal río San Francisco (2)*, 1930.

Channelization of the San Francisco River.

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Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0082.

Luis Alberto Acuña, *Canal río San Francisco (3)*, 1930.

Besides depicting a phase of the channelization works of the San Francisco River, this image presents the urban landscape, with the eastern mountains in the background and trees such as eucalyptus, pines and cypress along the river. All rights reserved. Courtesy of Museo de Bogotá. Instituto Distrital de Patrimonio Cultural.



Bogotá, Museo de Bogotá, Collection Luis Alberto Acuña, Reference MdB0110

Luis Alberto Acuña, *Canal río San Francisco (4)*, 1930.

Channelization of the San Francisco River.

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“Our sewers and pavements are actually defective. But it is worth praising the employee who has worked with enough energy to suppress ancient gutters inherited from colonial times, in spite of the typical comments made by neighbors: ‘Now, where are we going to throw the garbage?’”

—Manuel H. Peña. *Servicio de aguas de la ciudad de Bogotá*. Bogotá: Imprenta de Torres Amaya, 1885. (Quotation translated by the authors of the exhibition.)

On the social discipline battlefield, the municipal authorities challenged long-lasting waste disposal practices. They prohibited dumping in rivers, and determined that home garbage could only be placed outside buildings at specific hours for collection. The implementation of modern hygienic practices was met with resistance in certain sectors of the city and society, as in most of Western history. After all, modernity was a political program with a specific class and social order agenda.

“While San Francisco and Arzobispo rivers remain sources of infection; while water is the perfect media for microbes as it is; while we lack a clean, modern and scientific marketplace, perfectly organized hospitals provided with everything necessary, sewers that are not a danger to public health, and a thousand more things that hygiene requires to save Bogotá from the deplorable state in which it operates, streets, sidewalks and parks have no reason for their existence; they only provide proof of an incredible lightness that gives importance to superficial issues instead of the essential ones.”

—“La salubridad y la higiene en Bogotá.” *El Tiempo*, 28 March 1913, 2. (Quotation translated by the authors of the exhibition.)





Gumersindo Cuéllar Jiménez, *Antiguo río del Arzobispo—Bogotá (Chapinero)*

Small bridge over the channelized Arzobispo River. Built next to the channeled rivers were squares or roads following ornamental, hygienic and mobility purposes.

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However, Bogotá citizens began to associate sewage and sanitary measures with aesthetics and comfort, and so the demand for such services increased. Economic improvements that followed in the subsequent decades were driven by coffee exports that gave both national and municipal governments more funding to get involved with urban economics by authorizing loans and hiring foreign experts—mainly from the United States—to stimulate a transfer of technology. This not only refers to engineering knowledge but also to model management. In the 1940s the management of the sewage system was progressively centralized and the Department of Public Works (Secretaría de Obras Públicas) was created to handle the waste system in Bogotá.

This institution, instead of focusing on solving immediate and urgent needs on the matter of waste recollection and wastewater treatment, struggled to create an ambitious plan for the city's future. By the mid-twentieth century, the sewerage network only covered a third of the city, 40 percent of which was useless. The institutional solution came only in 1967, when the Aqueduct and Sewerage Company of Bogotá (Empresa de Acueducto y Alcantarillado de Bogotá), created in 1955, carried out their “master plan” of construction for the city's sewer

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City's Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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system, which was concluded in the 1970s and equipped the city with underground sewers.

This, however, did not disrupt the rivers' key function as part of the waste disposal system. Waste pipes were built so that residual water flowed straight into the streams. Their consequent polluted state changed the perception of Bogotá inhabitants of urban rivers as health threats and obstacles to modernization.

Channeling and diverting urban rivers to place them out of sight and smell was the solution prompted from the second decade of the twentieth century. The first targets were the San Francisco and San Agustín rivers: terrains adjacent to the channeled rivers were paved and became urban avenues and squares with ornamental, hygienic and mobility purposes. They were then transformed into collectors integrated to the sewer system, finally expelling their load outside the urban perimeter when they reached the Bogotá River, the main stream of the Bogotá Savanna.

### **When the river sounds, trash it carries: The Bogotá River, a history of pollution**

The Bogotá River, which receives tributary streams from the capital by bordering the city's western limits, is today considered one of the most contaminated rivers in the world. Its source is located at 3,400 meters above sea level (MASL) in the Alto de la Calavera in the municipality of Villapinzón, northeast of the Cundinamarca area. The river passes through suburban and rural areas of eleven municipalities of the Bogotá Savanna for approximately 150 kilometers before entering the city from the north. In passing through the city, its stream receives pollutants from the Salitre, Fucha and Tunjuelo rivers, and upon leaving it travels through the Soacha municipality where it receives the polluted waters of the Soacha River. It then descends to its mouth almost 300 MASL to the Magdalena River, the country's main fluvial artery.



Saúl Ordúz, *Distintos Canales de Conducción Aguas Lluvias*, 1973

Wide rainwater channel flowing through a newly-created neighborhood in Bogotá.

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The rate of pollution of the Bogotá River increases as it gets closer to the city. In its high basin the river currently receives waste from various tanneries and quarries, from agricultural and floricultural activities that use pesticides and fertilizers, as well as load releases from the sewers of municipalities and industries. In 1998, Bogotá was responsible for over 90 percent of the pollution load of this stream, derived from often toxic residues from urban industries—food products, chemical substances, leather, beverages, textiles, iron, steel—and oil stations, besides household waste. It is estimated that the Bogotá River pours into the Magdalena River 318 kilograms of chromium, 278 kilograms of lead, 140 tons of iron, 111 tons of detergent, and 835 tons of suspension solids on a daily basis.

The history of the river's pollution mirrors that of the city, including its exponential population growth since the

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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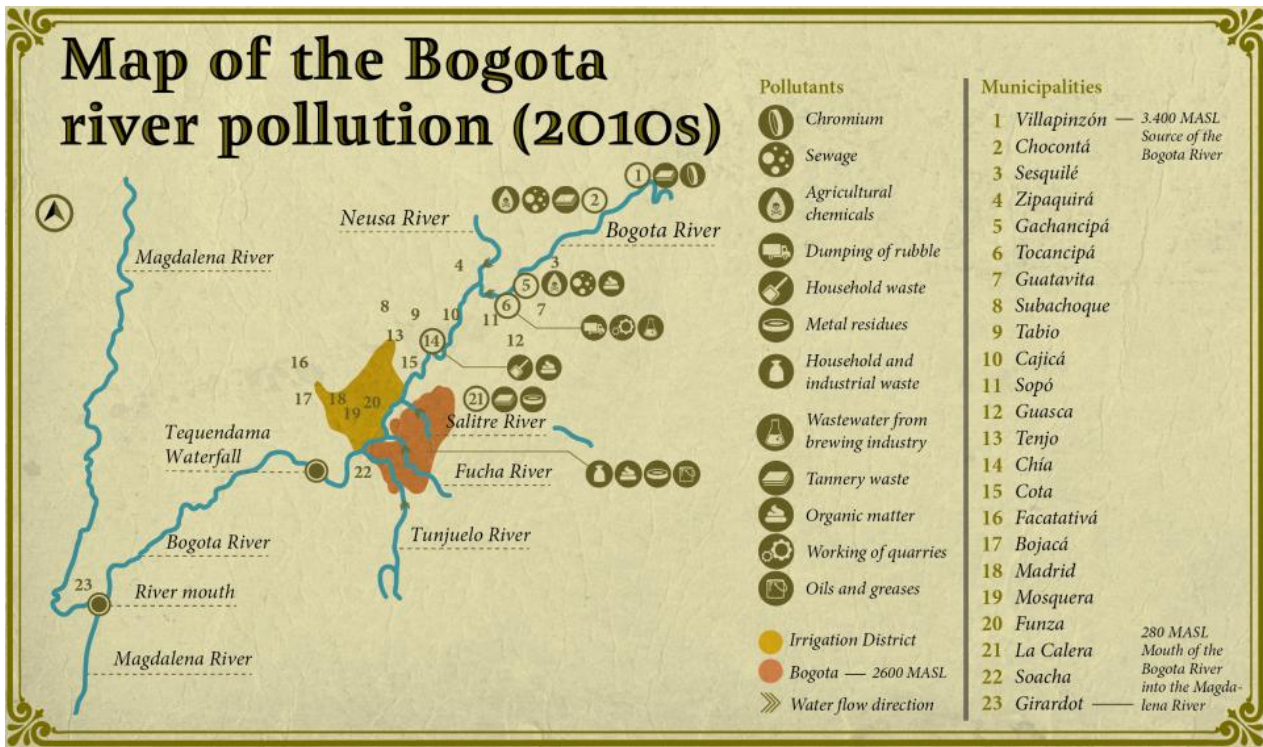
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mid-twentieth century with a dramatic increase in solid household waste, industrial development with few—if any—environmental controls, the growth of intensive farming, including the pesticide-intensive flowers cultivation, and the raising of cattle in the Bogotá Savanna. The capital city positioned itself as the center of Colombia’s economic development and as a refuge for rural people escaping from political violence and later armed conflict in the 1950s, and soon the city began to receive huge waves of immigrants. This posed greater pressure on authorities to find fast ways to dispose of the increasing volume of waste.

“Wastewater flowing through filthy deep ditches even inside urban perimeter (Salitre River, San Francisco River, Albina Rivulet, etc.) is a shame for any city considers itself to be civilized. The dangers to the hygiene and health of Bogotá’s population are countless, more so considering that with these pestilent waters saturated with all kinds of viruses and pathogenic bacteria will be irrigated vegetables from many crops located west of the city, and that with those same sewage liquids many cattle farms supply their needs. Under these conditions, milk pasteurization and other hygienic measures for the control of ailments result derisory, if the big evil, the permanent origin of every infection continues without the interest of someone on its remedy. Or at least, no one with the means to act”.

—Jorge Forero Vélez. “El proyecto de alcantarillado para Bogotá.” *Anales de Ingeniería* 57, no. 634 (1952): 15. (Quotation translated by the authors of the exhibition.)

The consequences of river pollution can be dramatic for humans and other life forms. In the Bogotá River, high concentrations of toxics have led to severe eutrophication. Ichthyofauna has disappeared from most of the stream, particularly from the mouth of Juan Amarillo to the Magdalena River. Likewise, the polluted waters from the Bogotá River have been used to irrigate farming and cattle ranching areas of the savanna, transferring their toxic content—particularly mercury and chromium—to the common food sources of most of the inhabitants of Bogotá. For instance, up to 2.2 million coliforms and 7.4 million in total microorganism number (from 100 milliliters) have been found in milk produced from pasture landscapes irrigated with water from the Bogotá River, affecting health across the population.



Infographic showing the characteristics of the pollutants recently loaded in the Bogotá River along its course through the Bogotá Savanna.

Casa Editorial El Tiempo. [4 Años para salvar el agua de Bogotá](#). El Tiempo.com Multimedia, 2013. Accessed 23 November 2013.

Eduardo Uribe Botero. [The Water Treatment Plants of the Bogotá River: Case Study](#). In *Documentos CEDE* 8 (2005): 7. Accessed 2 December 2013.

Designed by Mónica Páez Pérez and María José Castillo Ortega. Tangrama, 2014.



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Pollution also put an end to recreational traditions such as trips to rivers for swimming and sightseeing, once very much celebrated by travelers and locals. An important symbol of this cultural and environmental loss is the transformation of the Tequendama Waterfall (Salto de Tequendama), a majestic waterfall located approximately 2,400 MASL, 30 kilometers southwest of Bogotá. Once a tourist attraction and an object of regional pride, acclaimed for the purity of its waters and the grandness of its view, the waterfall is now a striking spectacle of the dramatic environmental degradation of the Bogotá River. Visitors are no longer attracted to the breathtaking sights because of the shocking smell of the dark waters.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Gumersindo Cuéllar Jiménez, *Salto de Tequendama*.  
*Cundinamarca, Colombia, S. A.*

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Gumersindo Cuéllar Jiménez, *Paisaje del río Bogotá (Colombia, S. A.)*

Floods caused by waterways such as the Bogotá and Tunjuelo rivers happen almost every rainy season. This image shows the effects of regular overflows of the Bogotá River on farms located in the Bogotá Savanna, west of the city.

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In the 1970s, when environmental movements began to gain momentum and environmental legislation improved, pollution of the Bogotá River became a matter of political and public concern. Nevertheless, it was only in the 1990s that the municipal administration outlined a strategy for river sanitation by signing a contract with the French consortium Dégremont-Lyonnaise des Eaux for the construction and operation of three wastewater treatment plants in the mouths of the Salitre, Fucha, and Tunjuelo rivers. The objective of this project was to obtain a 40 percent reduction in organic load and 60 percent reduction in suspended solids through the primary treatment. Upon the second treatment, it was expected to achieve a biochemical oxygen demand (BOD) effluent of a maximum of 20 milligrams per liter and a volume of suspended solids of a maximum of 30 milligrams per liter. The project is still running, but only the Salitre Wastewater Treatment Plant has functioned since 2001. These measures did not focus on prevention but on the use of technology to diminish the problem. The natural cycle of water was later replaced by depuration technology.

In 2010, a cooperation agreement was signed by the Colombian national government, the Department of Cundinamarca—the region where most of the Bogotá River flows—, and the city of Bogotá, aimed at constructing the treatment plants and accomplishing the decontamination of the Bogotá River in a 20-year timespan. Each of the recent mayors agreed that rescuing the Bogotá River must be a top priority on the

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municipal political agenda. Nevertheless, the intense pollution of this stream continues. Solutions have been proposed but not carried out, partly due to the enormous costs of wastewater treatment plant construction. Only recently has more attention been paid to pollution prevention rather than treatment at the dead end. Although new legislation for controlling industrial and public sewer system dumping has been enforced, the reality is that the Bogotá River continues to be a magnified example of the polluted result of the development model that the region pursued.

**Websites linked in image captions:**

- [http://www.eltiempo.com/Multimedia/especiales/salvar\\_agua\\_bogota/](http://www.eltiempo.com/Multimedia/especiales/salvar_agua_bogota/)
- [https://economia.uniandes.edu.co/components/com\\_booklibrary/ebooks/D2005-08.pdf](https://economia.uniandes.edu.co/components/com_booklibrary/ebooks/D2005-08.pdf)

## Historical cartography

Maps are political rather than objective representations of a place. By selecting some pieces of information and codifying them, while silencing others, maps work as political discourses and are used as “marching orders” of geographies to be built.

The bird’s-eye-view maps of Bogotá included in this section are chapters of the narrative of the city as a modern artifact. Throughout the late nineteenth and the first decades of the twentieth century, urban plans effectively helped consolidate the idea of Bogotá as a human achievement where mountains, rivers, topography, and the entire ecology of the city were no longer visible, and therefore no longer mattered.

Since its foundation in the sixteenth century and through the end of the nineteenth century, the city had grown slowly without expanding beyond the natural barriers of the Eastern Mountains and the San Francisco and San Cristóbal rivers. Most maps at the time graphically acknowledged the dependence of the city on the Eastern Mountains, emphasizing the foothills through the use of colors, shades, and textures. The rivers, usually drawn as wide meandering lines, descend from deforested mountains and cross the urban grid to reach the western savanna, represented in some plans as an ample green plain with wetlands almost as big as the city.

The [1894 map by the French geographer and anarchist Elisée Reclus](#) takes a regional perspective of the city and gives a prominent role to the ecological structure of Bogotá. His map shows Bogotá’s rivers flowing from the páramos and running downward to join the Funza River, also known as the Bogotá River. Unlike most of his fellow cartographers, Reclus oriented his map with north at the top.

However, during this time another cartographic discourse was taking place among Colombian topographers. The [1894 map redrawn by Rafael Álvarez Salas](#) based on a 1891 map by Carlos Clavijo is one of the most frequently reproduced plans and a distinctive “transition map” of historical Bogotá: the modern city is emerging, but nature is still at work. Water history is visible in the serpentine streets—eloquent traces of river lines—and so are water storage tanks and public baths. The still small and concentric city dissolves into the eastern foothills.

By 1910, the year of major public celebrations of the first centennial of independence from Spain, the cartographic transition was complete and engineer [Alberto Borda Tanco commemorated the modern city in his map](#). The city is now depicted as distinctly separate from the Eastern Mountains, the savanna is muted, and Bogotá is a set of ordered”—that is, under control—blocks.

The [1935 map by the powerful engineer Julio César Vergara y Vergara](#) is the historical vision of a generation of urban planners. After compiling a set of both rare and better-known historical maps, Vergara y Vergara’s map depicted the history of a dramatic expansion which would, in fact, eventually surpass anything he had imagined. As rivers were channelized, they were drawn as narrow lines. Meanwhile, the blocks, roads, parks, and other urban facilities acquired visual prominence.

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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To view these historical maps of the city of Bogotá and its surroundings, which have been overlaid on top of the georeferenced satellite images of the region, you need to have Google Earth installed and running on your computer. The following video tutorial will help you navigate the interactive maps:

The original virtual exhibition features a video tutorial that will help users navigate the interactive maps. View the tutorial [here](https://www.youtube.com/watch?v=7oWwOaE0i2o) (<https://www.youtube.com/watch?v=7oWwOaE0i2o>). 1 min 22 sec.

### 1. Map by Elisée Reclus (1894)



Map made by the French geographer Elisée Reclus in 1894. It shows the surroundings of Bogotá, making evident the nearby towns as well as the topography and hydrology of the area. North of Bogotá, one can see the suburb of Chapinero, and farther away the town of Usaquén, while the small village of Tunjuelo appears in the south. The wide western savanna is the home of many towns, such as Engativá, Fontibón, Funza, Bosa, and Soacha, most of which are part of the urban area of Bogotá today. The Fucha and Arzobispo rivers emerge from the Cruz Verde Páramo, while the San Francisco and San Agustín rivers spring from the Eastern Mountains, closer to the city. All of these rivers flow down the slopes, going through the city and its peripheries to finally arrive in the Funza River, also known as Bogotá River, which is drawn in the northwest corner of the map.

Historical map: Public domain. Courtesy of Biblioteca Nacional de Colombia.

Overlap of the historical map over satellite imagery from Google Earth: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. 2014. Biblioteca Nacional de Colombia.

Please click on the following link to download and open the Google Earth file:

[1894\\_bogota\\_map\\_elisee\\_reclus.kmz](#)

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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## 2. Map by Rafael Álvarez Salas (1894)



Map made by Carlos Clavijo in 1891 and revised by Rafael Álvarez Salas in 1894. By this time, the city of Bogotá was divided into five police quarters and eight ecclesiastical districts called *parroquias*, which are shaded in different colors on the map. The map identifies the main squares and parks of the city, the government buildings, the educational and cultural institutions, and the Catholic churches, as well as a number of banks, factories, brickworks, hotels, and restaurants. The rivers and streams that descend from the mountains of Monserrate and Guadalupe run through the city, shaping the streets and blocks. Near the San Bruno Rivulet, tributary of the San Francisco River, are the water storage tanks of the Egipto neighborhood, used since the late nineteenth century to store water for the municipal aqueduct service. Northeast of the city, in the foothills of Monserrate, are the *Baños de la Puerta Chepa*, an example of what once were public bathhouses.

Historical map: Public domain. Courtesy of Biblioteca Nacional de Colombia.

Overlap of the historical map over satellite imagery from Google Earth: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. 2014. Biblioteca Nacional de Colombia.



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[1894\\_bogota\\_map\\_rafael\\_alvarez\\_sala.kmz](#)

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### 3. Map by Alberto Borda Tanco (1910)



Map made in 1910 by the civil engineer Alberto Borda Tanco, elected President of the Board of Celebrations for the First Centenary of the Colombian Independence. The map was a cartographic support for the works and events that were part of the celebrations, thus showing the newly opened *Parque de la Independencia* with the different pavilions that were built for the national exhibition. But it also presents the image that engineers had about a city that had just begun its search for modernity. That is why the map shows not only the churches and government buildings, but also the organized blocks of the urbanized area, interspersed with squares and green parks and defined by paved streets over which there were electric or horse-drawn tram lines. Three railways and a cemetery located on the western outskirts also account for a glimpse of urban modernity. The urban water system is also marked: the map shows the San Agustín and San Francisco rivers, as well as the storage tanks located in the Egipto and San Diego neighborhoods, over the foothills of the Eastern Mountains. Paradoxically, the San Francisco River flowed down from the mountains through the Paseo Bolívar, a well-known poor settlement that lacked proper aesthetic and sanitary conditions, refusing any hint of modernity.

Historical map: All rights reserved. Courtesy of Biblioteca Nacional de Colombia.

Overlap of the historical map over satellite imagery from Google Earth: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. 2014. Biblioteca Nacional de Colombia.

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[1910\\_bogota\\_map\\_alberto\\_borda\\_tanco.kmz](#)

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#### 4. Map by Julio César Vergara y Vergara (1935)



Made by Julio César Vergara y Vergara in 1935, this map was included in an academic article about the urban development of Bogotá four centuries after the Spaniard foundation in 1538. The map shows the existing neighborhoods by the 1930s, along with a proposal for widening of major roads. The author also includes an hypothetical urban perimeter by the end of the twentieth century, for a city with a population estimated at 900,000. However, Bogotá had more than six million inhabitants by the end of the century, thus surpassing this hypothetical perimeter. The map shows the course of the Arzobispo, Fucha, and San Francisco rivers. The last of these, near its origins close to the mountains, has already been channeled under an avenue named Avenida Jiménez.

Historical map: All rights reserved. Courtesy of Biblioteca Nacional de Colombia.

Overlap of the historical map over satellite imagery from Google Earth: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. 2014. Biblioteca Nacional de Colombia.

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#### Websites linked in this text:

- <https://www.youtube.com/watch?v=7oWwOaE0i2o>

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal*, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

**Chapter:** Historical cartography

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## Primary sources

The textual primary sources for this virtual exhibition include articles in scientific journals, magazines, and newspapers, as well as published books, academic dissertations, and manuals authored mainly by physicians, engineers, journalists, and public officials belonging to the intellectual elite of Bogotá. Municipal regulations by the Bogotá City Council, the National Health Directorate, the Central Board of Hygiene, and the Department of Urban Planning for Bogotá were also important. The repositories of these sources are the Biblioteca Luis Ángel Arango, the Biblioteca Nacional de Colombia, and the Archivo de Bogotá, all of them located in Bogotá.

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Portocarrero, Alberto. “El gran problema de Bogotá: El Acueducto y las hoyas hidrográficas.” *El Tiempo*, 10 February 1920.

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## Further reading

With no intention of providing an exhaustive literature review on the topics of urban environmental history, water history, waste history, and Bogotá history, we offer some reading suggestions based on the literature that we found most influential for this exhibition.

### Urban environmental history

Urban Environmental History is a foundational branch of the general field of environmental history in Europe and North America, but less so in Latin America. Seminal references influencing the authors of this exhibition therefore reflect the unbalanced development of this perspective and its permeable frontier with urban and cultural geography. Literature that explores—both theoretically and empirically—the relationship between city and nature, includes the classic text by William Cronon. *Nature's Metropolis: Chicago and the Great West*. New York: W.W. Norton, 1991; Nik Heynen, Maria Kaika, and Erik Swyngedouw, eds. *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*. London: Routledge, 2006; Andrew Isenberg, ed. *The Nature of Cities: Culture, Landscape, and Urban Space*. Rochester: University of Rochester Press, 2006; Stéphane Castonguay and Michèle Dagenais. *Metropolitan Natures: Environmental Histories of Montreal*. Pittsburgh: University of Pittsburgh Press, 2011.

The classic article by Christine Meisner Rosen and Joel Arthur Tarr. “The Importance of an Urban Perspective in Environmental History.” *Journal of Urban History* 20, no. 3 (1994): 299–310 still merits being read. The collection of stories in Dieter Schott, Bill Luckin, and Genevieve Massard-Guilbaud, eds. *Resources of the City: Contributions to an Environmental History of Modern Europe*. Aldershot: Ashgate, 2005 provides a glimpse into the European perspective. As for Latin America, in Shawn William Miller. *An Environmental History of Latin America*. New York: Cambridge University Press, 2007 one chapter is devoted to the “asphyxiated cities” of modern times. More specific references include Regina H. Duarte. “Urban Trees and Urban Environmental History in a Latin American City: Belo Horizonte, 1897–1964.” *Global Environment* 3 (2009): 120–53; Andréa Casa Nova Maia and Lise Sédrez. “Narrativas de um Dilúvio Carioca: Memória e natureza na Grande Enchente de 1966.” *História Oral* 14, no. 2 (2011): 221–54; Rosalva Loreto López, coord. *Ciudad y naturaleza: Tensiones ambientales en Latinoamérica, siglos XVIII-XXI*. Puebla: Instituto de Ciencias Sociales y Humanidades, Benemérita Universidad Autónoma de Puebla, 2012; and Antonio Elio Brailovsky, *Buenos Aires, ciudad inundable: Porque está condenada a un desastre permanente*. Buenos Aires: Editorial Capital Intelectual, 2010.

Of course, the extensive literature by Joel Tarr and Martin Melosi are inspiring and obligatory. We mention here Joel A. Tarr, ed. *Devastation and Renewal: An Environmental History of Pittsburgh and its Region*. Pittsburgh: University of Pittsburgh Press, 2003; Martin V. Melosi. *Effluent America: Cities, Industry, Energy, and the Environment*. Pittsburgh: University of Pittsburgh Press, 2001, and by the same author, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present*. Baltimore: John Hopkins University Press, 2000. For theoretical perspectives relevant to this exhibition, special mention should be given to the following references: Mikael Hård and Thomas J. Misa. *Urban Machinery: Inside Modern European Cities*. Cambridge,

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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MA: MIT Press, 2010; Maria Kaika. *City of Flows: Modernity, Nature, and the City*. New York: Routledge, 2005; Simone Neri Serneri. "The Construction of the Modern City and the Management of Water Resources in Italy, 1880–1920." *Journal of Urban History* 33, no. 5 (2007): 813–27; and Erik Swyngedouw. "Circulations and Metabolisms: (Hybrid) Natures and (Cyborg) Cities." *Science as Culture* 15, no. 2 (2006): 105–21.

### **Water history in Latin America and beyond**

Mexico is by far the best-explored Latin American case as far as water history is concerned. Alejandro Tortolero, Luis Aboites, Rosalva Loreto, and Sonya Lipsett-Rivera have been publishing extensively, but for this exhibition and as further readings the following serve as the essential references: Alejandro Tortolero Villaseñor. *El agua y su historia: México y sus desafíos hacia el siglo XXI*. Mexico City: Siglo XXI, 2000; Luis Aboites Aguilar. *El agua de la nación: Una historia política de México (1888–1946)*. Mexico City: CIESAS, 1998; Rosalva Loreto López, ed. *Agua, poder urbano y metabolismo social*. Mexico City: Instituto de Ciencias Sociales y Humanidades, Benemérita Universidad Autónoma de Puebla, 2009; Sonya Lipsett-Rivera. *To Defend Our Water with the Blood of Our Veins: The Struggle for Resources in Colonial Puebla*. Albuquerque: University of New Mexico Press, 1999. Tortolero and Aboites also authored two chapters in the valuable volume edited by Christopher R. Boyer. *A Land between Waters: Environmental Histories of Modern Mexico*. Tucson: University of Arizona Press, 2012, while Tortolero has chapters in the books by Reinaldo Funes, ed. *Naturaleza en declive: Miradas a la historia ambiental de América Latina y el Caribe*. Valencia: Centro Francisco Tomás y Valiente, UNED Alzira-Valencia, Fundación Instituto de Historia Social, 2008 and Christian Brannstrom, ed. *Territories, Commodities and Knowledges: Latin American Environmental Histories in the Nineteenth and Twentieth Centuries*. London: Institute for the Study of the Americas, 2004. In this vein, Vera S. Candiani has also studied water technology and urban water history in Mexico with intriguing results, see for example her "Bourbons and Water." In Jordana Dym and Karl Offen, eds. *Mapping Latin America: A Journey Through Latin American Maps from the Columbian Encounter to the Present*. Chicago: University of Chicago Press, 2011.

Water in Latin America is a rich topic for research. Dams, for which the compelling book by John R. McNeill. *Something New Under the Sun: An Environmental History of the Twentieth-Century World*. New York: W.W. Norton & Company, 2000 offers a global context, are particularly promising, as numerous dams, both large and small, were built from the Rio Bravo to Patagonia throughout the twentieth century. However, there is not yet any research for this region akin to the work of, for example, David P. Billington, Donald C. Jackson, and Martin V. Melosi. *The History of Large Federal Dams: Planning, Design, and Construction in the Era of Big Dams*. Denver: US Department of the Interior, 2005. Rivers have attracted some attention but there are still only few regional comparative studies, which is why Latin America is missing from comprehensive readings such as Christof Mauch and Thomas Zeller, eds. *Rivers in History: Perspectives on Waterways in Europe and North America*. Pittsburgh: University of Pittsburgh Press, 2008, or Terje Tvedt and Eva Jakobsson. *A History of Water: Water Control and River Biographies*. London: I. B. Tauris, 2006. And needless to say, Latin America is searching for its own Donald Worster to write a study comparable to his *Rivers of Empire: Water, Aridity, and the Growth of the American West*. New York: Oxford University Press, 1992. If we were to expand on political ecology or urban water conflict, the Latin American references would be abundant. For a general overview, see

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. "The City's Currents: A History of Water in 20th-Century Bogotá." *Environment & Society Portal, Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. [doi.org/10.5282/rcc/6295](https://doi.org/10.5282/rcc/6295).

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Erik Swyngedouw. *Social Power and the Urbanization of Water: Flows of Power*. Oxford: Oxford University Press, 2004.

### **Waste history**

Waste history has recently become a field in its own right. Europe and the US have taken the lead, just as they do with global waste production itself. Essential readings include European case studies such as Sabine Barles. *L'invention des déchets urbains: France, 1790–1970*. Seyssel: Éditions Champs Vallon, 2005; Tim Cooper. “Challenging the ‘Refuse Revolution’: War, Waste and the Rediscovery of Recycling, 1900–1950.” *Historical Research* 81, no. 214 (2008): 710–31; Ercole Sori. *Il rovescio della produzione: I rifiuti in età preindustriale e paleotecnica*. Bologna: Il Mulino, 1999; Zsuzsa Gille. *From the Cult of Waste to the Trash Heap of History: The Politics of Waste in Socialist and Post-Socialist Hungary*. Bloomington: Indiana University Press, 2007; as well as studies of the US by Martin V. Melosi. *Garbage in the Cities: Refuse, Reform and the Environment*. Pittsburgh: University of Pittsburgh Press, 2005; Susan Strasser. *Waste and Want: A Social History of Trash*. New York: Henry Holt and Company, 2000; Joel A. Tarr. *The Search for the Ultimate Sink: Urban Pollution in Historical Perspective*. Akron: The University of Akron Press, 1996; Craig E. Colten. “Chicago’s Waste Lands: Refuse Disposal and Urban Growth, 1840–1990.” *Journal of Historical Geography* 20 (1994): 124–42. The book by John Scanlan. *On Garbage*. London: Reaktion Books, 2005 is an excellent theoretical introduction to the history of waste.

Appropriate historical works on waste are scant in Latin America, although this is a hot topic for urban studies and political ecology. Mexico must again be referenced: Rosalva Loreto López and Francisco Javier Cervantes Bello, eds. *Limpiar y obedecer: La basura, el agua y la muerte en la Puebla de los Ángeles, 1650–1925*. México City: Centro de Estudios Mexicanos y Centroamericanos, Embajada de Francia, 1994.

### **Urban, environmental, and other histories of Bogotá**

Colombia and Bogotá are increasingly attracting scholars’ attention, but traditionally they have been somewhat invisible to the international academic community. As a result, most of the literature is in Spanish and published locally.

Fabio Zambrano, Germán Mejía Pavony, and Alberto Saldarriaga are among the most prolific authors on the urban history of Bogotá. Classic readings are: Germán Mejía Pavony. *Los años del cambio: Historia urbana de Bogotá, 1820–1910*. Bogotá: Centro Editorial Javeriano CEJA, 1999; Fabio Zambrano Pantoja. *Historia de Bogotá. Siglo XX*. Bogotá: Villegas Editores, Alcaldía Mayor de Bogotá, 2007; Alberto Saldarriaga Roa. *Bogotá siglo XX: Urbanismo, arquitectura y vida urbana*. Bogotá: Alcaldía Mayor de Bogotá, Departamento Administrativo de Planeación Distrital, 2000; and Julián Vargas Lesmes and Fabio Zambrano. “Santa Fe y Bogotá: Evolución histórica y servicios públicos (1600–1957).” In Pedro Santana, ed., *Bogotá 450 años: Retos y realidades*. Bogotá: Foro Nacional por Colombia, Instituto Francés de Estudios Andinos, 1988.

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To put Bogotá in the context of Latin American urban history, useful references include the classic works by Richard Morse and Jorge E. Hardoy. *Rethinking the Latin American City*. Washington, D.C., and Baltimore: Woodrow Wilson Center Press, John Hopkins University Press, 1992; Jorge E. Hardoy, *Urbanization in Latin America: Approaches and Issues*. Garden City: Anchor Press, 1975; José Luis Romero. *Latinoamérica: Las ciudades y las ideas*. Medellín: Editorial Universidad de Antioquia, 1999; as well as more recent publications such as those by Venezuelan Arturo Almandoz. *Planning Latin America's Capital Cities, 1850–1950*. London and New York: Routledge, 2002; “The Garden City in Early Twentieth-Century Latin America.” *Urban History* 31, no. 3 (2004): 436–52, and “Urban Planning and Historiography in Latin America.” *Progress in Planning* 65 (2006): 81–123. Silvia Arango’s recent book *Ciudad y arquitectura: Seis generaciones que construyeron la América Latina moderna*. Mexico City: Fondo de Cultura Económica, Consejo Nacional para la Cultura y las Artes, 2012 is also a beautiful contribution.

Environmental history has been developing quickly in Bogotá in the last decade. While no Colombian environmental history monograph exists, two volumes on the environmental history of Bogotá have been published: Jair Preciado Beltrán, Roberto Leal, and Cecilia Almanza. *Historia ambiental de Bogotá, siglo XX: Elementos históricos para la formulación del medio ambiente urbano*. Bogotá: Universidad Distrital Francisco José de Caldas, 2005, and Germán Palacio Castañeda, ed. *Historia ambiental de Bogotá y la Sabana, 1850–2005*. Leticia: Universidad Nacional de Colombia, Instituto Amazónico de Investigaciones IMANI, 2008.

The environmental perspective on urban infrastructure and practices related to water attracted a great deal of the attention of the younger generation of environmental historians and general historians alike. Important publications include Juan Camilo Rodríguez Gómez, coord. *El agua en la historia de Bogotá*. Bogotá: Villegas Editores, 2003; Julián Alejandro Osorio Osorio. *El río Tunjuelo en la historia de Bogotá, 1900–1990*. Bogotá: Alcaldía Mayor de Bogotá, Secretaria Distrital de Cultura, Recreación y Deporte, Observatorio de Culturas, 2007; Antonio Sánchez Gómez. *Manos al agua: Una historia de aguas, lavado de ropas y lavanderas en Bogotá*. Bogotá: Universidad Nacional de Colombia, 2010; Clara Inés Ángel. *Agua-Fuentes en Bogotá*. Bogotá: Instituto Distrital de Patrimonio Cultural, 2011; Maryluz Vallejo Mejía, ed. *Talleres de crónica. Memorias del agua en Bogotá: Antología*. Bogotá: Banco de la República, Pontificia Universidad Javeriana, Alcaldía Mayor de Bogotá, Archivo de Bogotá, 2011; and two books by Samuel Jaramillo González: *Ciento veinte años de servicios públicos en Colombia*. Bogotá: Centro de Investigación y Educación Popular CINEP, 1995 and *Agua potable y alcantarillado en Bogotá: Realizaciones y limitaciones*. Bogotá: Centro de Investigación y Educación Popular CINEP, 1990. Also of interest are María Clara Torres. *El alcantarillado de Bogotá 1886–1938: Institucionalización de un problema ambiental*. Tesis de Maestría en Medio Ambiente y Desarrollo, Instituto de Estudios Ambientales, Facultad de Ciencias Económicas y Administrativas, Universidad Nacional Colombia. Bogotá: Universidad Nacional de Colombia, 2010; Laura Cristina Felacio Jiménez. “La Empresa Municipal del Acueducto de Bogotá: Creación, logros y limitaciones, 1911–1924.” *Anuario Colombiano de Historia Social y de la Cultura* 38, no. 1 (2011): 109–40; and Ana María Carreira. “De las perturbadoras y conflictivas relaciones de los bogotanos con sus aguas.” *Tabula Rasa* 6 (2007): 263–85.

Useful input for this exhibition came from the socioeconomic analyses of everyday life in Bogotá, such as that presented in María del Pilar López Uribe. *Salarios, vida cotidiana y condiciones de vida en Bogotá durante la primera mitad del siglo XX*. Bogotá: Uniandes, 2011; Mauricio Archila Neira. *Ni amos, ni siervos: Memoria*

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*obrero de Bogotá y Medellín, 1910–1945*. Bogotá: Centro de Investigación y Educación Popular CINEP, 1989; and Miguel Ángel Urrego. *Sexualidad, matrimonio y familia en Bogotá, 1880–1930*. Bogotá: Fundación Universidad Central, Editorial Ariel, 1997.

The perspective provided by the social history of medicine has been influential to our exploration into the social uses of water. We found Carlos Ernesto Noguera's publications particularly inspiring: *Medicina y Política: Discurso médico y prácticas higiénicas durante la primera mitad del siglo XX en Colombia*. Medellín: Fondo Editorial Universidad EAFIT, 2003, and "La higiene como política: Barrios obreros y dispositivo higiénico. Bogotá y Medellín a comienzos del siglo XX," *Anuario colombiano de historia social y de la cultura* 25 (1998): 188–215. For how biopolitics played a role in the building of modern Bogotá, we liked Zandra Pedraza Gómez. *En cuerpo y alma: Visiones de progreso y de la felicidad*. Bogotá: Uniandes, 1999 and Santiago Castro-Gómez. *Tejidos oníricos: Movilidad, capitalismo y biopolítica en Bogotá, 1910–1930*. Bogotá: Editorial Pontificia Universidad Javeriana, 2009.

Historical cartography has been growing significantly in relation to Bogotá. Two atlases and a blog deserve to be mentioned: Alberto Escovar Wilson-White, Margarita Mariño, and César Peña. *Atlas Histórico de Bogotá, 1583–1910*. Bogotá: Corporación La Candelaria, Planeta Colombiana, Alcaldía Mayor de Bogotá, 2004; Marcela Cuellar Sánchez and Germán Mejía Pavony. *Atlas Histórico de Bogotá: Cartografía 1791–2007*. Bogotá: Alcaldía Mayor de Bogotá, Planeta Colombiana, 2007; and [Razón Cartográfica: Noticias de la Red de Historia de las Geografías y Cartografías de Colombia](#), a blog created and maintained by Sebastián Díaz Ángel.

Finally, we drove our understanding of the ecological web of relations of Bogotá from two influential volumes by the German geographer Ernesto Guhl. *La Sabana de Bogotá: Sus alrededores y su vegetación*. Bogotá: Instituto Geográfico Agustín Codazzi IGAC, 1981 and *Los páramos circundantes de la Sabana de Bogotá*. Bogotá: Jardín Botánico José Celestino Mutis, 1982. Equally important are politically relevant works like Thomas Van der Hammen. *Plan ambiental de la cuenca alta del Río Bogotá: Análisis y orientación para el ordenamiento territorial*. Bogotá: Corporación Autónoma Regional de Cundinamarca CAR, 1998 and Germán Andrade, Diana Wiesner, and Fernando Remolina. "Assembling the Pieces: A Framework for the Integration of Multi-Functional Ecological Main Structure in the Emerging Urban Region of Bogotá, Colombia." *Urban Ecosystems* 16, no. 4 (2013): 723–39.

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## Acknowledgements

The virtual exhibition “The City’s Currents: A History of Water in Twentieth-Century Bogotá” is a collaboration of the Environment & Society Portal and the Línea de Historia Ambiental, the Environmental History Research Group of the department of history at the Universidad Nacional de Colombia in Bogotá. The exhibition was researched and authored by historians [Stefania Gallini](#), [Laura Felacio](#), [Angélica Agredo](#), and [Stephanie Garcés](#). However, it would not have been possible without the collaborative work of a multidisciplinary group of graphic designers, architects, cartographers, musicians, translators, and editors to whom we express our gratitude.

We are deeply grateful to Christof Mauch, Kimberly Coulter, Wilko Graf von Hardenberg, Eliza Encheva, Stephanie Hood, Emilie Perault, Marielle Dado, Brenda Black, and Susanne Darabas from the Rachel Carson Center for Environment and Society. Their guidance and infinite patience has enabled us to complete this virtual exhibition, which ended up being longer, harder and more complex than we first expected.

This virtual exhibition took up some of the topics and sources of a previous web project we prepared for the Virtual Library of the Biblioteca Luis Ángel Arango, the main Colombian public library. It is entitled “Por los tubos de Bogotá: Usos del agua en la historia de la ciudad.” (“Throughout the Pipelines of Bogotá: Water Uses in the History of the City”). We thank the former director of the Biblioteca Luis Ángel Arango, Margarita Garrido Otoyá, and virtual library coordinator Alejandro Martín Maldonado, as well as the current director, Alexis De Greiff, for allowing us to return to this modest web project to further research the topic.

Mónica Páez Pérez and María José Castillo Ortega, graphic designers from the Tangrama studio, shared with us profitable methods of designing infographics to communicate data, processes, and problems related to the environmental history of Bogotá. William Sarria Calderón used his expertise in the production of architectural renderings to draw the facades and axonometrics of worker houses that we could describe from the information found in primary sources. Andrés Felipe Nieto Quintero helped us by designing some of the wire frames for the chapters, and also taking the photograph of the exhibition’s authors. Finally, the musician Arlington Vaca composed and recorded an original piece in the traditional musical genre of *pasillo* to add background music to the silent video about the construction works of the New Aqueduct of Bogotá.

Colleagues and friends contributed generously with advice, comments, reviews, and suggestions. We want to thank our colleagues from the Línea de Historia Ambiental, especially Vladimir Sánchez, Juan David Delgado, Carolina Castro, and Katherinne Mora. We are particularly grateful to Sebastián Díaz Ángel, who gave wise advice regarding the dynamic use of historical maps of Bogotá, and provided a bridge between us and the digital map collection of the Biblioteca Nacional de Colombia. We also thank Herman Castro and Lucas Osorno Ferro for their translation work.

Finally, we want to express our sincere gratitude to the people, companies and institutions that understand the importance of common access to historical sources for non-profit purposes and gave us permission to publish photographs, paintings and videos in this virtual exhibition. We are grateful to Marina González de Cala, Jorge

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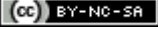
Enrique Angarita Zerda, Margarita Rodríguez Rodríguez, Mario Cuéllar Bobadilla, El Tiempo Casa Editorial, Revista Cromos, Mabe Colombia S.A.S., and Unilever Andina Colombia Ltda. We also thank the Fundación Patrimonio Fílmico Colombiano, the Museo de Bogotá, the Instituto Distrital de Patrimonio Cultural, and the Biblioteca Nacional de Colombia and its director Consuelo Gaitán.

Stefania Gallini, Laura Felacio, Angélica Agredo and Stephanie Garcés

### How to cite

Gallini, Stefania, Laura Felacio, Angélica Agredo, and Stephanie Garcés. “The City’s Currents: A History of Water in 20th-Century Bogotá.” Environment & Society Portal, *Virtual Exhibitions* 2014, no. 3. Rachel Carson Center for Environment and Society. <http://www.environmentandsociety.org/exhibitions/node/6295> .

### ISSN 2198-7696 Environment & Society Portal, Virtual Exhibitions

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## Authors

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Authors of the virtual exhibition, with the Eastern Mountains of Bogotá in the background. From the left: Stephanie Garcés, Laura Felacio, Stefania Gallini, Angelica Agredo.

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**Stefania Gallini** is an environmental and Latin American historian at the [Universidad Nacional de Colombia](#) in Bogotá, where she coordinates the [Environmental History Research Group](#) of the Department of History. She graduated with a degree in political science from the Università degli Studi di Milano (1995), took a master’s degree in area studies at the University of London (1998), and was granted a PhD in Latin American history from the Università degli Studi di Genova (2002). She is author of the book *Una historia ambiental del café en*

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*Guatemala: La Costa Cuca entre 1830 y 1902* (Guatemala: AVANCSO, 2009), which in 2010 was awarded the [Elinor Melville Prize](#) for Latin American Environmental History by the Conference of Latin American History. In the same year she spent time in Munich as a Carson Fellow at the Rachel Carson Center for Environment and Society working on an ongoing project on waste history in Bogotá. She is a founding member of Latin American and Caribbean Society of Environmental History ([SOLCHA](#)) and joint president from 2012 to 2014. She is also active in the European Society for Environmental History ([ESEH](#)) and International Consortium of Environmental History Organizations ([ICEHO](#)). Besides environmental history and Latin American history, digital humanities is her third area of interest. She has published on these areas in academic journals and has edited books in Latin America, the US, UK, and Italy.

**Laura Felacio** graduated with a degree in history from the Universidad Nacional de Colombia (2009), and is currently pursuing a master's degree in urbanism at the same university. She has been a member of the Environmental History Research Group of the Department of History at the Universidad Nacional de Colombia since 2009. Her research interests include environmental history, urban history, and social history. She is author of articles in Colombian academic journals, such as “La Empresa Municipal del Acueducto de Bogotá: Creación, logros y limitaciones, 1911–1924” (*Anuario Colombiano de Historia Social y de la Cultura* 38, no. 1 (2011): 109–40), “Memoria, territorio y oficio alfarero: La memoria colectiva en los barrios del Cerro del Cable” (*Revista Nudo* 6, no. 11 (2011): 77–98), and “La huelga de las telefonistas: Condiciones, problemas y manifestaciones de las mujeres obreras a comienzos del siglo XX en Bogotá” (*Ciudad Paz-ando* 5, no. 1 (2012): 31–48).

**Angélica Agredo** is a historian from the Universidad Nacional de Colombia (2014). Her fields of interest are environmental history and the history of science, technology and medicine. She has been associated with the Environmental History Research Group of the Department of History at the Universidad Nacional de Colombia since 2012. Her undergraduate dissertation, entitled “Naturaleza hostil y ferrocarriles: El abandono del sistema férreo en Colombia. El caso del Ferrocarril Troncal de Occidente en el invierno de 1973,” obtained the award “Best Undergraduate Dissertation in History, Version XXIII, 2014” by the Universidad Nacional de Colombia. After graduating with honors, she received a full scholarship to study at King's College London where she is currently attending the master of arts program in Science, Technology and Medicine in History.

**Stephanie Garcés** is a historian from the Universidad Nacional de Colombia (2014). She has been associated with the Environmental History Research Group of the Department of History at the Universidad Nacional de Colombia since 2012. Her work is focused on the development of digital humanities and the use of new tools for web researches on this field. She manages the blog [De Reformas y Soldados](#), which focuses on the relationship between war and religion during the modern age.

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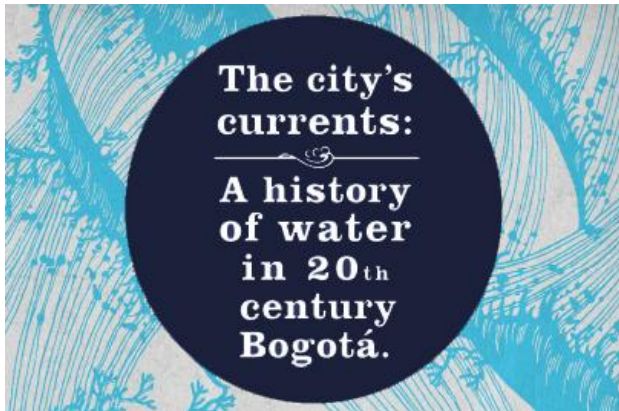
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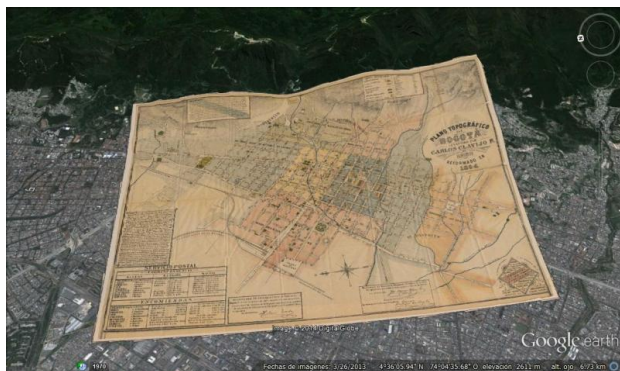
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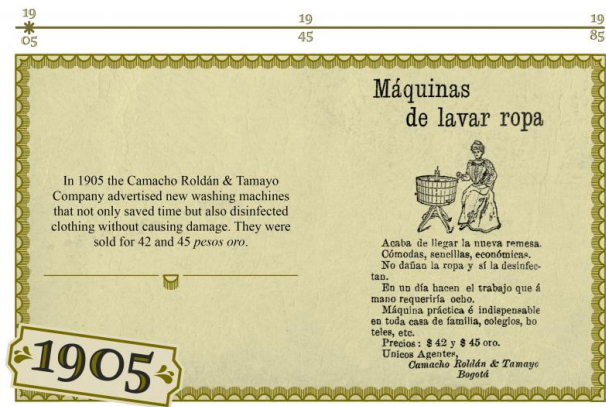
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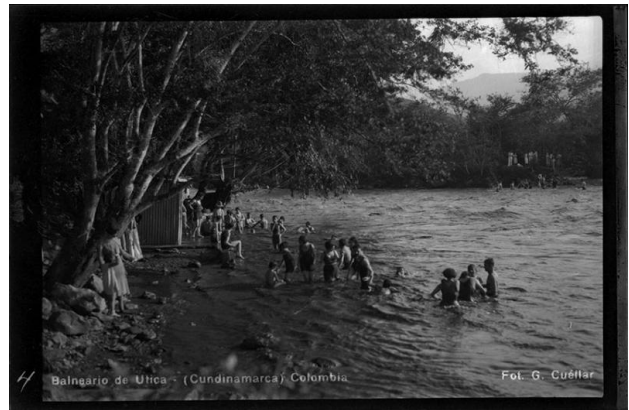
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Waste and water pollution



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