



XVIII International Conference on Water Distribution Systems Analysis, WDSA2016

## Water Distribution System of Bogotá city and its surrounding area, Empresa de Acueducto y Alcantarillado de Bogotá – EAB E.S.P.

Mauricio Jiménez Aldana<sup>a</sup> y Fabian Santana López<sup>b\*</sup>

<sup>a</sup>Director Red Matriz Acueducto, Av. Calle 24 No. 37-15, Código Postal 111321, Bogotá D.C., Colombia

<sup>b</sup>Jefe de División Centro de Control Acueducto, Av. Calle 24 No. 37-15, Código Postal 111321, Bogotá D.C., Colombia

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### Abstract

The Water Distribution System of Bogotá supplies a population of approximately 9 million inhabitants. The network is the result of more than 120 years of development and engineering, including the maximization of the supply sources and its production mechanisms, the optimization of the distribution processes, the development and implementation of best practices, and the energy generation as a by-product of the distribution system. The processes implemented have become a national and international benchmark of good operational practices in drinking water distribution systems.

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Peer-review under responsibility of the organizing committee of the XVIII International Conference on Water Distribution Systems

*Keywords:* Bogotá city; Water Distribution System.

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### 1. Description of the city

Bogota D.C. is the capital of the Republic of Colombia, which houses the main institutions of national order from the legislative, executive, and judicial branches of the country. It is a multicultural city with a population growth rate associated with the natural growth of its population as well as the internal processes of migration enhanced by the consolidation as an important economic center at the regional level. The processes of expansion and growth of the city is similar to the Latin American context, as well as the management in the coverage of the household public services.

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\* Corresponding author. Tel.: +57-1-3447520.

E-mail address: [fsanta@acueducto.com.co](mailto:fsanta@acueducto.com.co)

Bogotá is located in the center of the country, in the eastern Andean mountains. The capital of the country has an approximate extension of 33 kilometers from north to south and 16 kilometers from east to west and is located at the following coordinates: latitude North: 4° 35'56" and West longitude of Greenwich: 74°04'51". It is located within the inter-tropical convergence zone, producing a bimodal rainfall pattern; in the first half of the year around the months of March, April and May and in the second half in the months of September, October and November. Its average height is in the 2,625 meters above sea level.

The savanna of Bogota - high basin of the Bogota River, is located between the 2550 and 2800 m.a.s.l., the flat part is formed by a Quaternary fluviolacustrine deposit, while the mountains and rocky areas correspond to consolidated rocks of the Guadalupe's geological structure. The river of Bogotá, with the same name, is the hydrographic shaft of the Sabana and within its tributaries are the rivers Balsillas, Chicú, Frio and Teusacá; and inside the city the rivers Arzobispo, San Cristobal, San Francisco, Fucha and Tunjuelo.

The 70% of the city is located on a flat area or savannah with minimum slopes in the east that facilitate the drainage of the city to the Bogota River (westward), the rest of urbanized areas and urban settlements are located in areas of half slope especially at the eastern side of the city and in the extreme south east, where the service is supplied by storage tank supplied by pumping stations.

The registration of multi-year cumulative average precipitation is 892.1 mm, measured in the Camavieja Station, located in the main headquarters of the EAB E.S.P. The average temperature is 14° C with oscillations between -5° C and 25° C. The driest period occurs between the months of December to March while the wettest period is located between the months of August and November, in June and July usually appear light drizzles product of the condensation of humid fronts from the moors located at the east of the city.

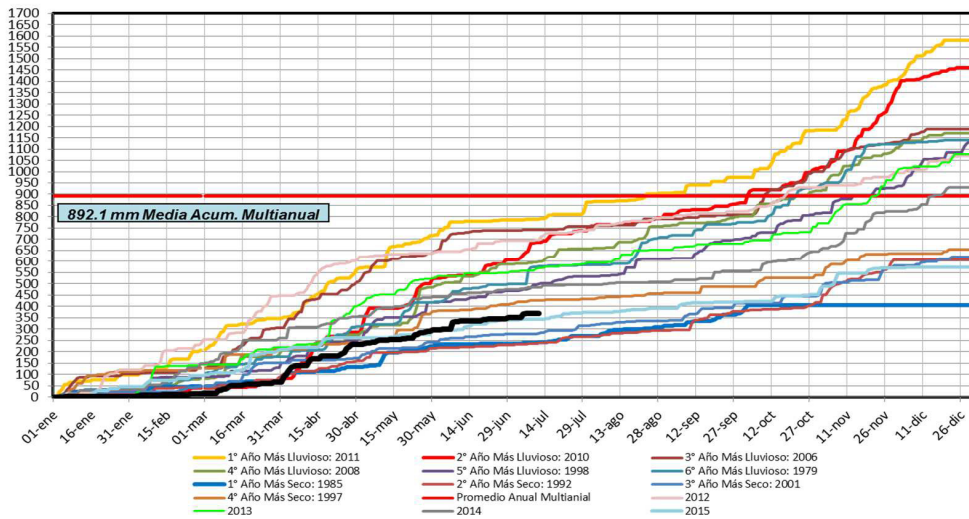


Fig. 1. Analysis of annual rain accumulated in Bogotá - Pluviographic Camavieja Station.

## 2. Population served

Bogotá is classified in six socio-economical levels defined by the socio-economic type of houses as well as by their environment and urban context, this classification is set for the entire country. The level (*Estrato*) 1, has the lowest income and quality of environment, while the level 6 is the highest and relates to the higher-income populations. The 75% of Bogotá's population belongs to the socio-economic levels 2 and 3, less than 10% belong to the level 1 and in the same way for the level 4. Less than 5% of the population lives in areas classified as level 5 and 6. Regarding the classification of the population by gender, 52% are women and 48% are men. The 25% of the population is under 15 years of age while only 6% is greater than 64 years.

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