

Observatory for Social Appropriation Knowledge on Bogotá River Basin, Colombia

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Abstract: Bogotá river basin is conformed of 46 municipalities, including Bogota city, is the ordering axis of Cundinamarca department and is considered one of the most important river basin in Colombia; for decades, it has presented pollution problems throughout its entire path. In March 2014, the State Council issued the sentence “Environmental and Social Improvement of the Bogotá River Basin” in response to numerous popular actions filed, aimed at the recovery and conservation of the river and its tributaries; therefore, the implementation of actions for the integral management of the water resource is necessary, in order to ensure its viability towards the future. To promote the effectiveness of management, the initiative to create the environmental information platform Environmental observatory of the Bogotá river basin “OCRB” emerged from the Master Program in Watershed Management of the Santo Tomas University; in order to ensure effective disclosure from research, projects or contracts between different social, governmental and academic actors. For the development of the research, two databases were built, one with the information of the main actors and another with information of academic documents (undergraduate and postgraduate thesis) and scientific documents that have been generated in the basin during last years. 253 documents were collected that were classified into five research lines; water resource management, climate variability and climate change, territorial planning, risk management and social participation. The databases were the main input to start the process of creating the observatory, which was launched in November of 2019 under the domain of the Santo Tomas University (Colombia). It is expected that, with the creation and continuous updating of the observatory, the different actors will have up-to-date and reliable information that will allow them to develop their management activities, to contribute to the social appropriation of knowledge and promote water governance in the territory.

Key words: Bogotá river basin, Colombia, water governance, environmental observatory

1. Introduction

Bogotá river basin from a historical context, has supported the socioeconomic and productive development of the country, becoming the engine that generates the highest levels of economic participation and thus providing profits from primary and secondary sectors of the country, in which it is located

approximately 23% of the Colombian population and has about 19% of the industries [1]. Due to population dynamics and economic development in this area of the country, it has a significant degradation in large part of its physical and biotic components; this river is affected from the upper part of the basin, approximately 10km after its birth in the Guacheneque paramo, located in Villapinzón municipality, until its river mouth between Girardot and Ricaurte municipalities, related to water pollution by discharges, degradation of its ecological structure, invasion of the water round, extraction and transfer of its waters for energy, domestic, industrial

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and agricultural purposes [1]. Most serious problems arise at the height of the middle basin, in the area of influence of Bogota city, that contributes with 84% of the pollution, represented in organic matter, fats, detergents and highly harmful chemical substances such as Cadmium, Chromium, Mercury, Lead, among others [2].

Historically, Bogotá river meant for the inhabitants of the basin, a reference for social, economic and cultural integration, however, the environmental problem has generated a loss of the sense of belonging and social disintegration in the communities [2]. On March 28, 2014, the State Council issued the statement “Environmental and Social Improvement of the Bogotá River Basin” in response to numerous popular actions filed for 23 years, aimed at decontamination, recovery and conservation of the Bogotá River and its tributaries [3]; in the aforementioned statement, a period of three years was provided to execute 87 orders involving actions by the capital district, 19 national entities and 45 municipalities of Cundinamarca department, that make up the basin, from its birth, to its mouth river in Magdalena River. In this statement, ten specific objectives were established aimed at the continuous improvement of the quality of life of the inhabitants, framed in three main components, related to the environmental and social improvement of the basin, the articulation and institutional, intersectoral and economic coordination and the deepening in education and citizen participation processes [3]; as a result, it has a large number of social, environmental and productive studies, even so, the appropriation of that knowledge by the communities that develop around the river, has not taken place effectively. Because of this, the Master's program in Watershed Management of the Santo Tomas University was raised, the creation of the environmental observatory for the Bogotá River Basin “OCRB, USTA”, in order to create a technological tool to promote the water governance and function as a public information system, where people have access to research and projects developed around the basin, so

the dissemination of this knowledge is expanded and the necessary social appropriation is generated, for the management, treatment and recovery of the river. It is important that scientific findings, experiments, research and concerns be presented to the public because they are a fundamental part of their culture, in a society impregnated by science and technology such as contemporary society [4].

2. Material and Methods

Bogotá river basin is located in the department of Cundinamarca, conformed by 45 municipalities and Bogota city (Fig. 1). The river covers a total of 308 km from its birth at 3300 meters above sea level in Guacheneque paramo (Villapinzón municipality), until its river mouth to Magdalena river at 280 meters above sea level in Girardot municipality; is conformed by 19 sub-basins of third order and a drainage area of 5886 km². Its passage is divided into three parts: high basin with a route of 170 km. Its path is divided into three parts: high basin with a route of 170 km; middle basin, with a route of 90 km and the lower basin with a route of 120 km. The basin contains 20% of country's population, according to the National Administrative Department of Statistics projections for 2014, a total of 9.631.301 inhabitants were estimated, of which 95% are concentrated in the metropolitan region (80% in Bogotá city and 15% in the other 19 municipalities), 2% in the upper basin and the remaining 3% in the lower basin [3].

The development of this project contemplated four phases:

Phase 1: Consultation and information gathering: three sectors were selected: Academic, Government and Non-governmental Organizations. The information about the sectors was organized in a database, indicating the type of organization, name and area of influence (local, national, international).

Phase 2: Database construction: With the information collected was created a database; organized as follows: identification code, name of the

document, author, year, type of document (undergraduate thesis, thesis of Master's degree), university; abstract, link to access the document and

line of research (social participation, water resource management, climate change, territorial planning, risk management).



Fig. 1 Location of study area [5].

Phase 3: Determination of topics of main interest for the academic community and social actors around the Bogotá river basin: Five workshops were carried out with 80 social and academic actors in total, located in the middle river basin, to determine the type of information they would like to find on the observatory and the format for presenting that information (for example, infographics, conceptual maps, other).

Phase 4: Observatory construction: With the databases generated and the information collected through the surveys applied, and with the support staff of the university's computer office help, the environmental observatory of Bogota river basin was built.

3. Results and Discussion

3.1 Information Collected

A total of 253 documents were collected from the

main sectors selected, the largest number of documents is concentrated in the academic sector, followed by the government sector (Fig. 2A); regarding the lines of research, most of the documents contain information on water resource management, other topics such as risk management, climate change and territorial planning are addressed to a lesser extent (Fig. 2B).

3.2 Topics of Interest to the Academic Community and Social Sectors in Middle Basin

The main topics of interest on the part of the social and academic sector, are related to the social and environmental problems of the Bogotá river basin, climate change, territorial planning, any type of information related to biophysical and social aspects, water quality, water footprint, climate data, technical and regulatory documents. In relation to information format, people prefer interactive images, but mainly a

Geolocator that shows the location of the associated environmental problems, biophysical and social aspects; what kind of topics have been worked on to identify missing information, in addition to interactive teaching material. In addition, other interest topics

were consulted, such as the degree of knowledge of people regarding the problem of the Bogota river basin (Fig. 3) and also, about the perception of the use of technologies to publicize this information.

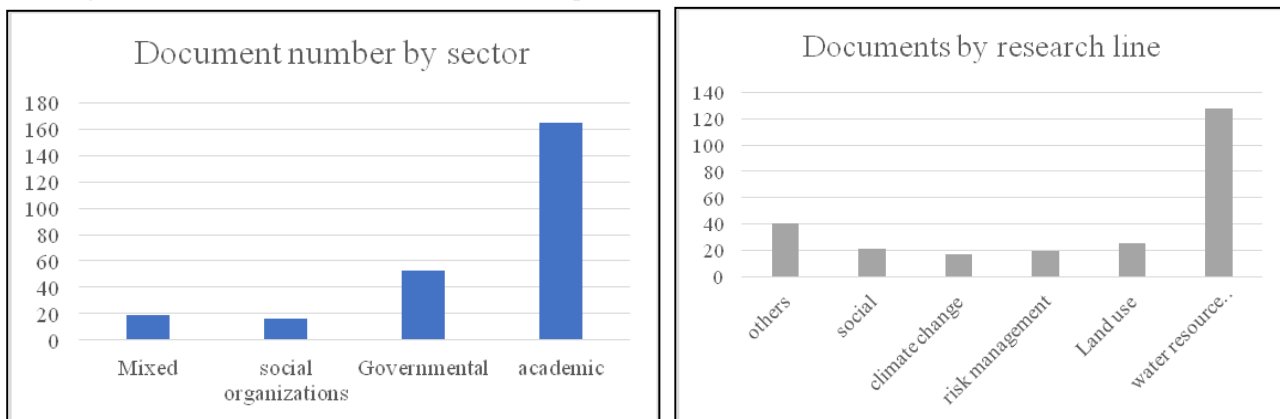


Fig. 2 Number of documents collected by actor (A) and research line (B).

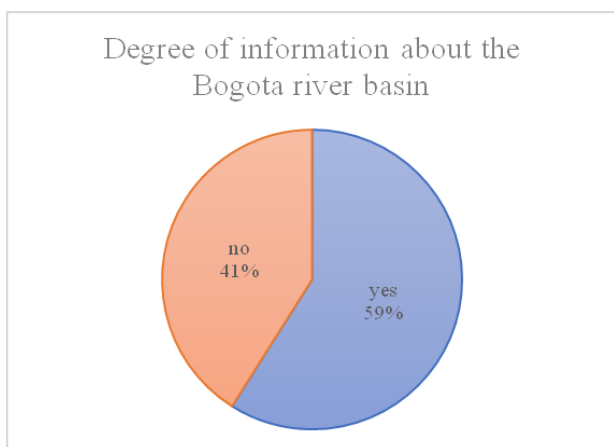


Fig. 3 Knowledge degree of about what happens in the Bogotá river basin day by day.

A high percentage of people do not know what happens day by day in the basin (41%); for this reason, it is intended that the observatory reaches all academic, public and private sectors of the country and internationally, in order to contribute to the dissemination of knowledge and social appropriation for the management, treatment and recovery of the Bogotá river.

Most people say that the information comes through email, news, academic spaces, social networks and the university environment; similarly, all people believe that it is very important to use new technologies for

learning environmental topics since, to create environmental awareness, new knowledge is built, it improves learning and increases the number of users because it is easy to use and reaches the community. Use of new technologies helps in the interaction between the sectors involved in the basin, generating support and learning throughout the community.

The observatories aim to inform about a concrete current reality, because they serve as a bridge between the institutions that produce scientific research, government entities and citizens [6]. They also constitute spaces that facilitate the flow of information towards public opinion and, in this way, favor decision-making by the responsible authorities [7].

3.3 Environmental Observatory of Bogota river Basin

The tool is under the domain of the university: <http://ocrb.ustadistancia.edu.co>; It has: a geolocator with general information on political division (surrounding municipalities), water structure and main water use in each stretch, main socio-environmental problems and heavy metal pollution (problematic button and pollution), and information on the main associated ecosystems and some of the most

representative species (button ecosystems and biodiversity) (Figs. 4, 5).

contact information such as contact email: ocrbusta@ustadistancia.edu.co (Fig. 6).

It has a search button in which, people can consult the documents that are already uploaded; additionally,

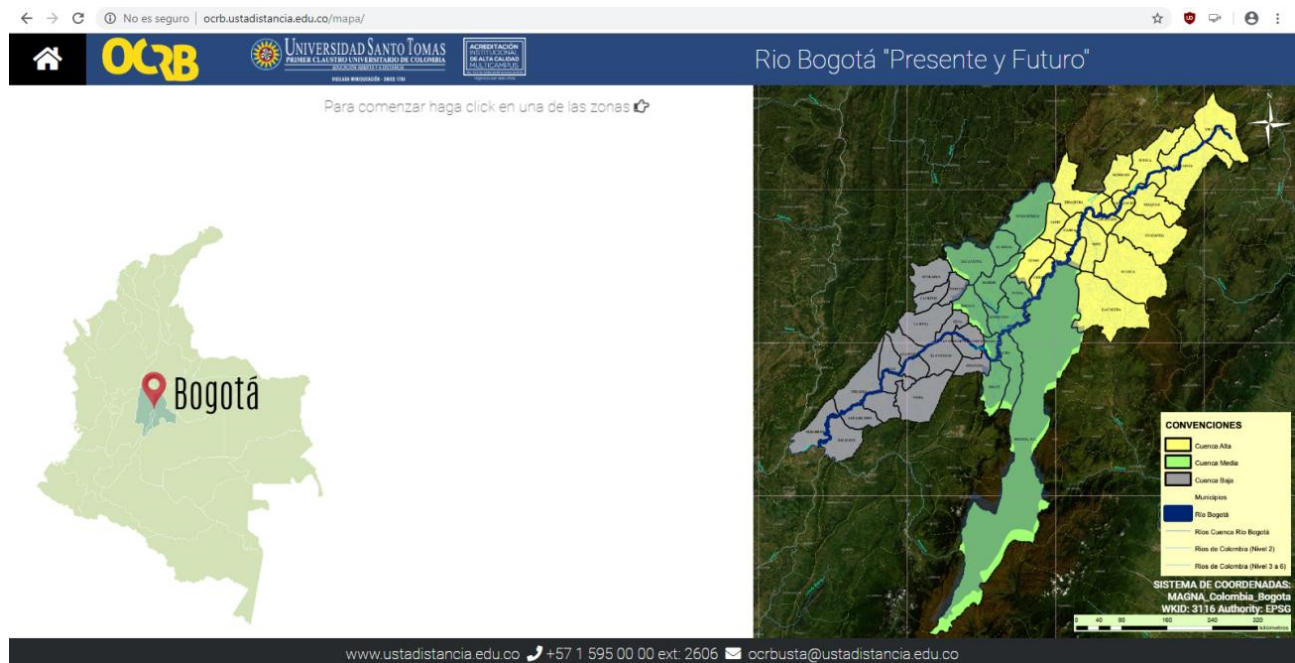


Fig. 4 Geolocator.

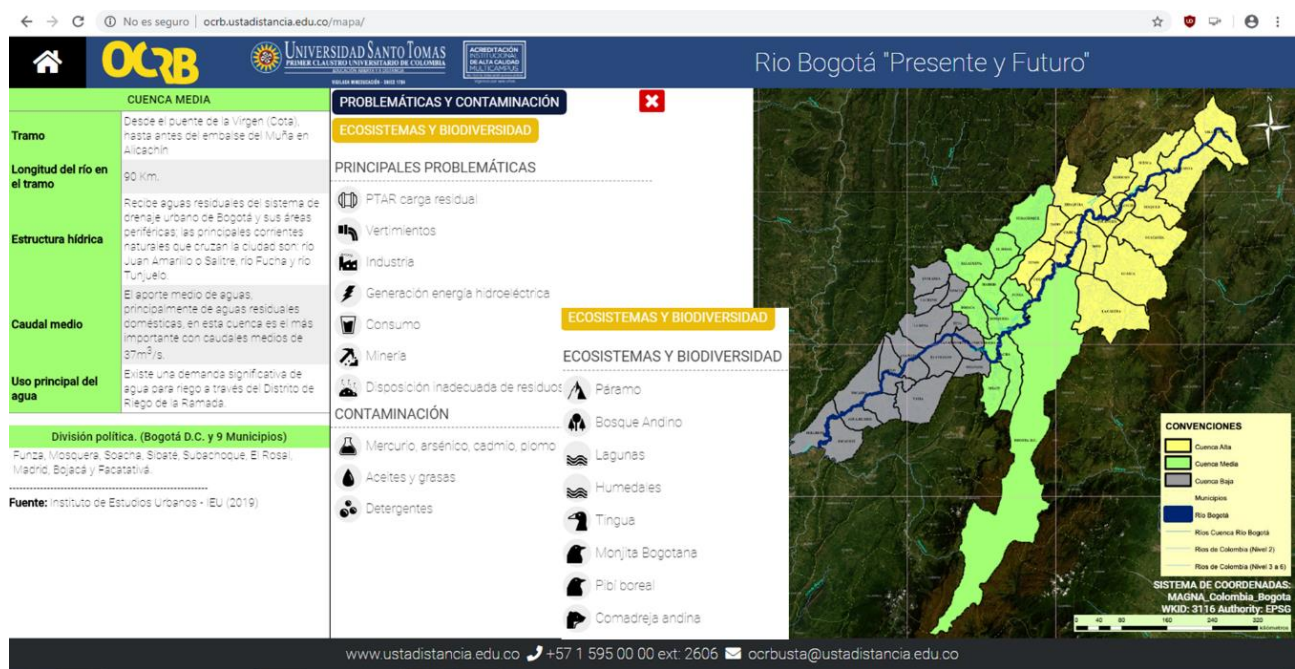


Fig. 5 Relevant related information in geolocator.



Fig. 6 Searcher tool.

It is expected to continue with the collection of more information, to make this a more robust tool; It is necessary to advance the collection of normative documents, important component due to all administrative acts that have been issued before and after the March 2014 statement, for the river decontamination. Additionally, in the first half of the year 2020, the detailed analysis of the documentation collected will begin to obtain indicators on the main topics so far addressed, such as water quality, water resource management, analysis of current interest such as climate change and the risk management component. Another topic of great interest, given the expected approach of this tool such as the social appropriation of knowledge, is the component of social participation, it is necessary to make visible through the observatory, the initiatives generated by the social actors living in the basin and present the results of the missionary actions of each sector.

4. Conclusion

With the workshops carried out with social and academic sector, knowledge dialogue spaces articulated by the Santo Tomás University were generated, which it is hoped to generate alliances for

the strengthening of the observatory and of inter-institutional and intersectoral cooperation in favor of effectively knowledge circulation.

Is expected that population in general (national and international), use the observatory for the development of all its research and management activities to consolidate it as a real tool for social appropriation of knowledge.

An observatory is a practical tool for disseminating knowledge and ensures its wide dissemination due to the possibility that almost anyone has to use it through a web portal.

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