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**EXPERIENCES OF COMMUNITY  
AQUEDUCTS IN COLOMBIA,  
1994-2020<sup>1</sup>**

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## EXPERIENCES OF COMMUNITY AQUEDUCTS IN COLOMBIA, 1994-2020<sup>1</sup>

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## Abstract

Access to drinking water has become a recognized human right and which, therefore, must be guaranteed by the States. Traditionally, this is achieved through the provision of a public aqueduct service, through state entities or through private individuals for profit. However, organized communities have also achieved through community aqueducts the achievement of access to potable water for their members. With this premise, and starting from a literature review exercise, including case studies, and limiting itself

to the period of 1994-2020, this article shows that, in Colombia, these aqueducts not only solve the problem of access to water, especially in rural areas, but also become a mechanism for the comprehensive and equitable management of water resources, being more environmentally sustainable and generating, in turn, greater cohesion, as well as the creation of identity in the populations that surround them, translating into development dynamics.

**Key words:** water supply, community action, water conservation, community development, water resources management, public utilities.

## Resumen

El acceso al agua para uso doméstico se ha transformado en un derecho humano reconocido y el cual, por ende, debe ser garantizado por los Estados. Tradicionalmente, esto se logra mediante la prestación del servicio público de acueducto, a través entidades del Estado o por medio de particulares con un fin de lucro. Sin embargo, las comunidades organizadas también han logrado mediante acueductos comunitarios la consecución del acceso al agua potable para sus miembros. Con esta premisa, y partiendo de un ejercicio de revisión de literatura, incluyendo estudios de caso, y limitándose al periodo 1994-2020, en el presente artículo se demuestra que en Colombia, estos acueductos no solo resuel-

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ven el problema del acceso al agua, especialmente en las zonas rurales, sino que también se convierten en un mecanismo de gestión integral y equitativa del recurso hídrico, siendo más sostenibles ambientalmente y generando, a su vez, mayor cohesión, así como creación de identidad en las poblaciones que los rodean, traduciéndose en dinámicas de desarrollo.

**Palabras clave:** abastecimiento de agua, acción comunitaria, conservación del agua, desarrollo comunitario, gestión de los recursos hídricos, servicio de utilidad pública.

## INTRODUCTION

Access to drinking water is a matter of great importance, not only because it is related to public health but also to the other dimensions of human development. Humanity has had different means to ensure access to such a precious liquid, from the simple transport of water from the nearest water source using buckets carried on the shoulders, to the construction of the imposing architectural structures of the ancient Romans. In one way or another, over time, society has managed to achieve this goal. In the contemporary world, access to water for domestic use has become a human right, which must be guaranteed by the different States. To do this, the two traditional ways of achieving it are through the provision of the aqueduct service directly by the State through its entities or through individuals who carry out such activity. However, a third way, generally ignored and not considered

serious, is that exercised by community organizations, manifested in community aqueducts.

The latter are located mainly in rural areas and the outskirts of cities. They are considered synonymous with backwardness, as they are seen as the community's response to the absence of a strong state and the inability of a market to expand. In Colombia, community aqueducts effectively arose framed by these situations and, as such, have been characterized by low capital availability that translates into an infrastructure that is far from optimal. However, these aqueducts have contributed to guaranteeing access to water for domestic consumption to a large part of the Colombian population, even if it is at a vital minimum, especially in the countryside. Likewise, unlike what happens when the provision of the service is carried out by State entities or individuals, under the cost-benefit logic, feelings of belonging have arisen around them, which have influenced the strengthening of neighborhood relations, as well as in the generation of a collective environmental awareness, which contributes to the maintenance of a harmonious relationship between human activities and the natural environment.

This document aims to demonstrate that community aqueducts in Colombia can guarantee access to drinking water in a more environmentally sustainable way than private ones, while generating development dynamics. To achieve the above, a literature review was carried out in search of conceptual and historical elements, as well as case studies, and the time limit was es-

tablished as the period 1994-2020. For this purpose, this document is divided into the following sections: in the first, community aqueducts are addressed, indicating their characteristics and current situation; in the second, the evolution of the provision of the aqueduct service by individuals is exposed; in the third, some significant experiences of community aqueducts in Colombia are presented; in the fourth, aspects of correspondence between these aqueducts and citizen participation are pointed out; the fifth exposes the environmental impacts of the mechanism; and finally some conclusions are given.

## Community aqueducts

One of the conclusions of the IV World Water Summit is the definition of water as a guarantee for life, that is, an element that is vital and irreplaceable for life to exist on earth. In this context, it is necessary to address the concept of the Human Right to Water (DHA) and understanding it as “that which allows access to water of sufficient cleanliness and in sufficient quantity to satisfy human needs, including among them, at a minimum, those related to drinking, bathing, cleaning, cooking and sanitation” (Ombudsman, 2013, p. 13).

According to the Ombudsman (2013), legally, the DHA is conceptualized as a general, subjective and benefit right, also called a fundamental social right. Therefore, it has the highest degree of importance since without water life is not possible, it contemplates the enforceability by people and requires actions to be carried out for its exercise.

Consequently, carrying out positive actions to guarantee the DHA is an obligation of the States, including Colombia, as well as the refraining from carrying out those that end up preventing its exercise; Hence, countries have to contemplate elements in their actions, such as the obligations that are common to all human rights, namely, protection, respect and compliance, in the same way not to discriminate, not to make regressive decisions and without justification affecting the right to water, adopting measures of an economic, financial, sociocultural, legal or judicial nature to expedite the materialization of that right, as well as access to a vital minimum based on equity (Ombudsman, 2013).

Although the DHA is not enshrined in the Political Constitution of 1991, it is understood to be attached to it because it is part of the constitutionality block, being a fundamental right by connection, being equally unnamed and recognized by constitutional jurisprudence (Defensoría del pueblo, 2013).

To access water for domestic consumption, different populations resort to decentralized networks that are managed, in many cases, by the same community; and which is observed in peri-urban and rural areas (Cadavid, 2009). These correspond to community aqueducts, which are generally born at the initiative of the communities themselves in order to respond to basic social problems related, in this case, to drinking water, which the State and the market cannot provide. any solution (Moncada et al., 2013).

Hence, a first assertion can be made regarding the phenomenon: community aqueducts arise mainly in non-urban areas, due to the high cost of investment and support for the State; and the low profitability in the provision of the service for the individual.

As Cadavid (2009) points out, such types of aqueducts have managed to subsist in Colombia for up to 70 years, being the means by which informal settlements ensured their access to drinking water and surviving ignorance and the minimization of continuous administrative and political reforms (Moncada et al., 2013). Therefore, the question arises why these forms of water supply have survived until today? The answer lies in the coverage of the drinking water service in the country and in investment. While, in urban areas, the first is very close to 100%, in rural areas it is 74% and likewise, of the total resources allocated to the water sector, only 4% is executed in the peripheries (Ministry of Housing, City and Territory, 2021). In this sense, it is not surprising that communities organize themselves to guarantee their right to water, developing their own dynamics that differentiate them from state and private entities.

In this line, as stated by Cadavid (2008, cited in Cadavid, 2009), the best example of comprehensive and equitable management of water resources is the community aqueduct, since the population that lives near the source of the water they consume has a stimulus to protect the resource, in addition to transcending the simple need for access to drinking water to an element of a mar-

ked social nature, where they also generate employment and training for community members. The foregoing implies a particular relationship with the territory on the part of the former, sustained in the concept of good living, where the aforementioned aqueducts become the instruments of a development that is not framed in the logic of the market, but in the sense of commitment and belonging to the system, which create identity and cohesion, transcending other areas of social life, generating benefits, and which are also an opportunity for environmental management (Cadavid, 2009).

Similarly, in rural areas, a more direct relationship is observed between the community and the water in terms of catchment and the protection of the basin or micro-basin that serves as a source, because any alteration has direct effects on their life and culture (Ombudsman, 2013). Likewise, it should be noted that according to Carrasco (2016) in rural areas, drinking water coverage in 2015 was 73.8% and that, maintaining the same level of state and private investment of the last 25 years, in 2030 the coverage it will be 77.3%. Therefore, the true importance of community aqueducts is revealed in this part of the country, where investment and maintenance costs, coupled with low profitability, if not zero, make it difficult to provide water service in the "traditional" way. ". Hence, community aqueducts are a valuable alternative to increase service coverage more quickly.

In Colombia, communities that wish to form and manage community aqueducts have the

National Network of Community Aqueducts (nd), which provides support to populations for non-profit community water management, opposing the delivery of both the service of water and basic sanitation to the market.

However, for the capitalist system, the supply of drinking water by the organized community is not an alternative since “They are seen as an anomaly of the market system, which prevents the generalization of the cost-benefit logic and puts the system, because it does not act in a profitable and competitive way” (Moncada et al., 2013, pp. 127-128). Such economic logic ignores that this cost-benefit factor is one of the reasons why the market does not reach certain areas of the country. As pointed out by the Ombudsman (2013), there is a significant gap between urban and rural areas, the second being the most disadvantaged with a qualitative deficit in access to public water and sewage services. Likewise, it must be taken into account that “the problem of water supply to the population is a matter of management rather than scarcity of the resource” (Cadavid, 2009, p. 60).

The community aqueduct as an alternative for the provision of drinking water service by an organized community has been left in the background. Moncada et al. (2013) point out that it has been made invisible, that it has not been considered a serious option, with the State and the private sector being the only possible ones. However, in this regard, these same authors highlight the year 1962 as one of the few moments of recognition of such communities, when the

National Government created the Basic Rural Sanitation Program to promote community self-management. Similarly, in the 1970s, the construction of village aqueducts was promoted whose management, with the support of the authorities, remained in the hands of the communities (Hurtado et al., 2006, cited in Moncada et al., 2013, p. 133).

However, in general, legislative activity has shown to have a disincentive approach to community management (Moncada et al., 2013). According to Carrasco (2016), there are around 20,000 community and non-profit organizations in the country that provide drinking water services in rural areas, which do not have legal authorization for such a service, since the Law 142 of 1994 does not specify whether community organizations can be part of the authorized organizations.

### **Private provision of aqueduct service**

According to Moncada et al. (2013), there are three ways in which, throughout history, humanity has solved the economic problems of production and distribution, namely, centralized or directed forms, decentralized forms or private freedom, and forms traditional or collective action. As they point out, in the Colombian case, the current norm allows the existence of all three in terms of home public services with a regulatory and provider State, with the particular provision by the market and with that of organized communities, being the two First, those that have greater institutional and social support.

The foregoing is found first in article 365 of the Political Constitution of Colombia of 1991, which states that public services will be subject to the legal regime established by law, as well as that they may also be provided by the State, directly or indirectly, by organized communities, or by individuals. And along the same lines, in Law 142 of 1994, which establishes the system for residential public services.

Before the promulgation of the 1991 Constitution and subsequently of Law 142, the history of the public drinking water service was characterized by a constant “pull and loosen between the State and individuals, who have fought to appropriate their supply, relegating the organized communities to the background” (Moncada et al., 2013, p. 130). Its beginning is in the last part of the 19th century, when the State, through the municipalities, granted concessions to private parties to provide drinking water to the population (Tobón & Valencia 2006; Valencia 2006, cited in Moncada et al., 2013, p.130). For the second decade of the 20th century, the dynamics changed and the municipalities, understanding the service as a pillar of local development, opted for greater intervention, aiming to directly assume the water supply (Cuervo, 2004, cited in Moncada et al., 2013, p. 130). Consequently, the exclusivity privileges given to individuals were abolished, the service was assumed by the municipalities and the correction of the deficiencies that existed in its provision was sought (Ochoa et al., 1990, cited in Moncada et al., 2013, p.130).

Due to the above, the configuration of a state monopoly was seen whose first step was taken through the municipalities (Rojas & González, 1988, cited in Moncada et al., 2013, p. 131). With the creation of the Municipal Development Fund through Decree 503 of 1940, the Colombian State made available an instrument for the acquisition of private companies and mixed economy providers of the service, since such action had already been declared of public utility. In the 1930s (Moncada et al., 2013). Consequently, as Valencia points out, between 1950 and 1990, the guarantor of the aqueduct service to the population was the State (Valencia 2010, cited in Moncada et al., 2013, p. 131).

By the 1980s, the fiscal problems of the State caused the drinking water service to be questioned (Moncada et al., 2013). In 1986, the coverage of the latter was 63% throughout Colombia (Cuéllar, 1989, cited in Moncada et al., 2013, p. 131), generating nonconformity due to the way in which the State provided the drinking water service, to which the national government responds in two moments: in the first, within the framework of decentralization, it transfers the provision to the municipalities, succeeding in reducing social pressure; and in the second, it again consents to the provision of the service by individuals, reserving the role of regulator (Moncada et al., 2013).

With Law 142 of 1994, the provision of the aqueduct service becomes an economic activity where the main providers are the public service com-



panies, which can be official, mixed or private. In the former, 100% of the capital contributions are held by the Nation, the territorial entities or the decentralized ones. In the second, these last three have 50% or more of the contributions. While, in the third, the capital belongs mostly to individuals. Likewise, an important element in this law is the contemplation of the utility bill, in numeral 14.9 of article 14, which reads "It is the account that a person providing public services delivers or remits to the user, due to consumption and other services inherent in the development of a contract for the provision of public services", therefore, the full dominance of the market logic is observed, although the same law indicates the guarantee of access to the service by the populations most vulnerable to through subsidies and differential rates, the dominant factor is the cost-benefit ratio in the provision of the service, which in itself is exclusive.

As can be seen, in the provision of drinking water by public utility companies there is a characteristic element of great importance, which is the absence of a relationship between the population and the territory, as well as with the entity that provides the provision. of the aqueduct service. In the first case it occurs because the water supply comes from distant sources, and in the second because the link lies in the payment of a monthly bill (Cadavid, 2009).

## Experiences of community aqueducts in Colombia

In Colombia, depending on the source, the number of community organizations that manage

community aqueducts varies. According to the information recorded in the Rural Health Inventory (ISR) between the years 2000 and 2002, the figure is 11,552 (Carrasco, 2016), which surely changed. On the other hand, Moncada et al. (2013) points out that there must be more than 12,000, which supply drinking water to almost 40% of the rural population. The Superintendence of Home Public Services (2018) estimates that there are potentially 32,205 public service providers in rural areas, while Carrasco (2016) in his study states that there are close to 20,000.

For example, in the Aburrá River basin there are some 300, which provide drinking water to approximately 160,000 people (Area Metropolitana del Valle de Aburrá et al., 2007, cited in Cadavid, 2009, p. 58). According to the studies of Cadavid (2009) in this basin, the community experiences in the management of the water resource have shown in the population feelings of solidarity with the families that have gone through or are going through economic difficulties, in the same way, the existence of a culture of payment, community cohesion, as well as "participation, associativity, management capacity for the education of its users and for the protection of the supplying micro-basins" (p. 62).

Also, as noted earlier in the document, in Colombia there has been a coexistence between the three ways of covering the problem of water supply. Proof of this is that capital cities such as Pereira, Ibagué or Villavicencio have community aqueduct systems that complement large companies in providing the service, covering



20% of it; thereby demonstrating how organized communities not only govern water as a common resource, but also ensure its sustainability (Moncada et al., 2013).

On the other hand, negative situations in the provision of the service can come from the State itself. As indicated by the Ombudsman's Office (2013), the Association of Users of the San José Aqueduct of the La Mina Sector and San José la Statue in Envigado, had been supplying water in this sector having three streams as a source of supply, which it lost due to of the construction of a condominium, to which the Secretary of the Environment of the Municipality had granted authorization.

Along the same lines, an aspect to highlight that is problematic is the efficient use of water and its saving, since situations have been observed in which the precious liquid is wasted, such as, for example, in Puerto Leguízamo, Putumayo, in where unavailability of faucets or other means causes the above; while, in other regions, the inhabitants hardly reach the minimum amount necessary to subsist (Ombudsman, 2013).

Next, the proposals developed by communities in the departments of Boyacá (Municipality of Guáquira) are reviewed in detail; Risaralda (Municipality of Dosquebradas); Caldas (Municipalities of Marmato, Riosucio and Santa Rosa de Viterbo).

The presentation of the aqueduct project by the community before the Mayor's Office of

the Municipality of Guáquira dates from 1997. However, due to the negligence of the authorities regarding the issue, the community began the construction of the initial infrastructure of the community aqueduct (1999) and the community organization (ASUAGUAQUIRA), through collective action, faces the solution of a pressing problem, such as the lack of water resources. An important boost to the community aqueduct was given by the Mayor's Office when allocating resources that allowed the formal start of the work in 2001. In this, the community contributed 30% of the project, represented in labor, the rest, was assumed by the Governor's Office and the Mayor's Office.

Despite the work carried out by the community, the control and management of the aqueduct was delegated to the Mayor's Office. Until now (2021) a sustainable and efficient development of this community project has not been achieved, which for the author is a process of environmental governance, understood as "the social relations that are generated between actors in order to create a community development " (Guerrero, 2018, p. 10) to the extent that public actors have participated in it; private; NGOs and most importantly the communities in processes of land management.

In the case of the Municipality of Dosquebradas (Risaralda), the community has designed, built and supported a community aqueduct as infrastructure for the supply of drinking water. This development occurs as a result of the collective action developed by the Community Aqueduct

Association, an organization made up of users, who participate in the general assembly of associates (highest authority) in charge of periodically electing a board of directors. Among the tasks of the Association, is the hiring of personnel in charge of administrative and logistical tasks.

Likewise, the community processes of the village aqueduct of the indigenous reservation of San Lorenzo, in Riosucio (Caldas), which has 305 users, are presented. There is an Association there with 35 years of existence, which elects a board of directors made up of "a president, a vice president, a secretary, a treasurer, a prosecutor and a member" (Cardona et al., 2020, p. 214).

In El Socorro (Viterbo), the community aqueduct once had the support of the Coffee Growers Committee. The Users' Association develops permanent reforestation campaigns and tries to generate a community model that enables the correct use of water. In the same way, there are inconveniences to guarantee the preservation of the birth and the same access to it. This is because to access the birth, it is necessary to go through privately owned spaces that, according to the Association, "are not aware of the care of the resource" (Cardona et al., 2020, p. 214).

In the case of the village aqueduct of La Cabras, the community association in charge of the aqueduct has pointed to mining as the main problem affecting the aqueduct. With the paradox, that this activity is the main economic activity of its inhabitants, a reality to which is added the lack of protection of births, which

are affected by livestock farming. Certainly, neither the association nor the State guarantee that the water consumed in the village is suitable for human consumption.

In conclusion, the community aqueduct projects of the three aforementioned municipalities are characterized by the gap between public and private actions, a reality that has the consequence that the parties involved (fundamentally communities and the State) do not assume the protection of births as their own. of water. This in a context where, in most cases, these births are located on private property and "their owners are unaware of and evade responsibility in the face of legislation and public policy regarding a common good, in addition to generating pressure on the population to be able to dispose of the land for its economic uses" (Cardona et al., 2020, p. 215).

## **Citizen participation and environmental conservation**

According to the cases studied, the work carried out by the communities around the construction of community aqueducts has enabled not only the empowerment of individuals -men and women- through their social recognition; It has also allowed the positioning of communities and territories, which achieve political and social recognition by the State, as legitimate managers of water resources (Quintana, 2016, p. 362).

Another element of special relevance around community participation is the formation of social networks between various actors who

become allies of community development, in a context of decentralized models such as those of environmental governance, which eventually allow changing the areas local, regional and national from the promotion of public policies in accordance with the needs of the communities.

It is clear that the promotion of community aqueducts has occurred in a context of privatization of common resources, including water. In this sense, the collective management of water becomes the only alternative for access to the resource by marginal residents.

In some cases, community aqueducts are associated from their conception with the preservation and defense of natural ecosystems (Zuluaga et al., 2020). In the first place, sustainable management is given to both surface water and groundwater. Second, development and environmental sustainability are taken in an integrated manner. Thirdly, unlike private management, these aqueducts do include environmental indicators within the monitoring of their operation.

Examples of the above are the municipalities of Viterbo and Marmato in Caldas. In these municipalities, the associations of rural aqueduct users seek development that guarantees common well-being. In the case of Marmato, the efforts are to defend the use of water so that it is not used for mining; and in Viterbo the objectives are conservation and oversight of water resources (Soto et al., 2019). One of the factors that prevents the goal of good environmental

management from being achieved is the lack of support from the State. In these municipalities it was also evident that an obstacle is the poor understanding and knowledge of environmental issues (such as the conservation and preservation of ecosystems) by the population.

In other cases, the aqueducts are also the way to promote environmental management from education. Such is the case in Dosquebradas, where the aqueduct was a space to promote environmental education processes (Cardona et al., 2020). In other cases, educational dynamics around community aqueducts serve as a boost to sustainable agriculture processes (Zuluaga et al., 2020). Other experiences show that community aqueducts can be used to make populations aware of the importance of water and its conservation (Carrillo & Mosquera, 2021).

The management of aqueducts by the community can also serve to create environmental plans beyond water management, with which comprehensive sustainability strategies can be created (Angarita, 2015). An example is the one carried out by Fernández & Rentería (2016) for the municipality of Dosquebradas in Risaralda, where the environmental management guidelines proposed for the aqueduct include strategies for the conservation of biodiversity and ecosystem balance, the inclusion of strategic ecosystems in territorial planning instruments, the effective guarantee of the right to water, sustainable community infrastructure, communication and community awareness, among others.

Community aqueducts can also unite scattered individual initiatives. In the aqueducts of Cachipay (Cundinamarca) people's strategies converge, such as not throwing garbage, not cutting down trees, recycling water, among others, with strategies of aqueduct organizations such as cleaning and recycling campaigns, quotas for reforestation and awareness campaigns (Barahona, 2017).

At this point, it is necessary to recognize that community aqueducts are not necessarily synonymous with good environmental management. In a study on the community aqueducts of Ibagué, Méndez (2014) found that only 5 of 30 community aqueducts supply water that meets the parameters for human consumption. Similarly, there are 21 aqueducts that have unfulfilled environmental commitments.

Despite the above caveat, when reviewing the various investigations referenced in this documentary analysis, the balance that is drawn is that in most cases community aqueducts have fulfilled a favorable role for environmental conservation.

## Conclusions

With all of the above, it is concluded that the community aqueducts, many of them operating for more than 70 years, emerged initially as the response of the communities to solve the problem of access to water for domestic consumption, to later become a sustainable means of water resource management that guarantees

a human right, especially in rural areas. A medium on which a relationship of belonging is generated that is not observed in the mechanisms indicated above and with which the interaction with the population is reduced to the payment of a bill. Therefore, unlike the latter two, the organized communities that provide the drinking water service generate in their scope of action a relationship with the territory based on the senses of commitment and belonging, and not on a transactional one.

Community aqueducts are the best example of comprehensive and equitable management of water resources. People who are close to the source from which they obtain the water they consume have a motivation to protect it. This closeness converges with that of the other people who benefit from the mechanism. This strengthens the links between neighbors, which translates into greater cohesion and identity creation, transcending other areas of social life. This is best observed in rural areas of the country, where the relationship with water is more direct in terms of collection and protection. That is why these aqueducts become instruments of development, involving the generation of employment and education.

The experiences in Colombia that are addressed in this work show that organized communities through community aqueducts can continuously supply drinking water to a good number of people in a sustainable way, carrying out actions to protect the water source, such as For example, carrying out reforestation processes by the

community. Likewise, they can do so in a complementary way to the other two mechanisms.

However, they also show that they have weaknesses, which lie when their existence collides with the logic of the market. The involvement of actors with economic interests affects the sustainability of community aqueducts. When the sources are located in territories of economic importance, and which are often private, individuals ignore the common good and give primacy to the economic use of the land, counting on the support of state entities due to ignorance and by decision.

The effects that those have on citizen participation and the environment must be considered. In the first, facilitating empowerment and the formation of social networks among the various actors. And in the second, creating sustainable water management strategies, promoting environmental education processes and promoting the creation of comprehensive environmental plans that go beyond water protection.

Based on the above, it can also be concluded that community aqueducts can not only guarantee the aqueduct service in a more environmentally sustainable way, but also generate development dynamics. However, its actions are complementary to the provision made by the State and the private sector, for which its scope of action should focus on rural areas, where the type of relationship between the community and water sources is closer and more direct. Therefore, and recognizing that there are weaknesses,

the State should provide them with more financial and technical support, as well as their full inclusion in the legal regulations.

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