

The 2016 Water Crisis in San Andres Island: An Opportunity for Change?

La crisis del agua del 2016 en San Andrés islas: ¿una oportunidad para el cambio?

Carolina Velásquez

University of Delaware, Newark, Estados Unidos

csvelas@udel.edu

ARTÍCULO DE INVESTIGACIÓN

Fecha de recepción: 29 de julio de 2019 · **Fecha de aprobación:** 10 de febrero de 2020

DOI: <https://doi.org/10.15446/cp.v15n29.86373>

Cómo citar este artículo:

APA: Velásquez, C. (2020). The 2016 Water Crisis in San Andres Island: An Opportunity for Change? *Ciencia Política*, 15(29), 73-109.

MLA: Velásquez, C. "The 2016 Water Crisis in San Andres Island: An Opportunity for Change?". *Ciencia Política*, 15.29 (2020): 73-109.



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Abstract

During the first half of 2016, the “Niño” Phenomenon reached severe conditions in San Andres Island, Colombia. On April 2, people, mostly the Raizals, an ethnic minority group, and people from poor neighborhoods started 11 road protests asking for water. The water crisis affected, differentially, more than 14.000 people. The institutional response focused on distributing free water trucking during dry periods, increasing the water frequency, and incrementing water production. This study analyzed the crisis response and explored, in the short term, whether there was a change in access to water. In August 2016 were conducted 34 semi-structured interviews and 45 in November 2018. Findings suggest that crisis response used a conservative philosophy embedded in a technocratic perspective; as a result, it is still limited water access in the way it was before the crisis. This study contributes to the understanding of the factors that influence crisis response.

Keywords: Crises; Caribbean; Drought; San Andres Island; Seaflower; Water.

Resumen

Durante el primer semestre del 2016 el fenómeno del Niño alcanzó condiciones severas en San Andrés islas, Colombia. El 2 de abril, raizales y personas de bajos recursos hicieron once protestas por la falta de agua. La crisis del agua afectó diferencialmente a más de catorce mil personas. La respuesta institucional se enfocó en distribuir agua gratuita durante las épocas secas e incrementar la frecuencia y producción del agua. Esta investigación analiza la respuesta a la crisis y explora en el corto plazo, si hubo algún cambio en el acceso al agua. 34 entrevistas semiestructuradas se realizaron en el 2016 y 45 en el 2018. Los resultados sugieren que en la respuesta a la crisis se usó una filosofía conservadora arraigada en un paradigma tecnocrático. Como resultado, el acceso al agua se mantiene en las mismas condiciones que en el 2016. Este estudio contribuye a entender los factores que influyen la respuesta a la crisis.

Palabras clave: agua; Caribe; crisis; San Andrés isla; sequía; Seaflower.

Introduction

Climate change is posing and revealing essential challenges for the Caribbean region. Small islands are being affected due to alterations in the hydrological cycle, resulting in a more frequent “Niño” phenomenon and severe droughts in the Caribbean and Central America. However, the water problems are not only associated with natural or climate causes, though this does remain a concern, they are more related to the quality of service and the maintenance and operation of the infrastructure (Cashman, 2014). In addition, multiple factors such as mass tourism, groundwater contamination, poor governance, social inequities, and the prohibitive cost of accessing water from both formal and informal water companies, have exposed high levels of vulnerability contributing to the configuration of profound water crises. For instance, Bermuda, the Bahamas, and the Cayman Islands have aquifers that are approaching to an emergency, where water tables are going down, and conflicts for water are more frequent (Gössling, 2001).

Global water companies now manage water resources in the Caribbean. They are overexploiting and allocating water resources, raising issues of water injustice. Islanders are becoming more prone to face and more fragile to cope with droughts. San Andres, Colombia, is a small Caribbean island that is suffering from these kinds of acute water problems. It is a tourist destination struggling with tourism’s water demands. It is visited annually by more than one million tourists (Howard, 2015). It is located in the Southwest of the Caribbean Sea, about 800 km from the continental Colombian Caribbean coast. In 2016 there was a water crisis that affected more than 14.000 people, mainly Raizals who are the ethnic minority group on the island. At one side, Raizal neighborhoods affected included: Barkers Hill, Court House, Cove, Loma-Lynval, Loma Barack, Flowers Hill, Orange Hill, Tom Hooker, Elsy Bar, South End (*Hoyo Soplador*), San Luis and Schooner Bight. On the other side non-Raizal neighborhoods such as: Sagrada Familia, Atlántico, Natania, School House, Las Palmas, Buenos Aires, Vista Hermosa, and Tablitas. Also, some schools reported being affected such as First Baptist School, Brooks Hill, Phillip Beckman, and El Rancho.

The scale of the crisis overstretched local coping mechanisms and required external assistance. Therefore, the risk management council declared the island in a state of Public Calamity. Officially the state of emergency lasted one year and four months, and then, return to normality was proclaimed on August 14, 2017. However, the crisis never

really ended, and in March, 2018 there were two protests for water: in Loma and Brooks Hill neighborhoods, and in March, 2019 another two in Flowers Hill and Schooner Bight neighborhood. People affected have reported the same conditions as in 2016, and they are struggling due to the lack of water.

Participants framed the crisis as the result of the convergence of multiple factors such as the “Niño” phenomenon, drought, high water demand by tourism, inequities in the distribution of water, inefficient aqueduct coverage and service, lack of technology, weak crisis management and overpopulation. However, the crisis was framed by institutional leaders as the result mainly of the “Niño” phenomenon, without considering the multidimensional character of the crisis. In this sense, the crisis response consisted of different closed-door sessions where engineers from the private water company were the main participants. The crisis response focused on maintaining the water truck distribution, done by firefighters during the dry season, increasing the water production through the acquisition of two desalinization plants, the rehabilitation of 26.1 km of the aqueduct network, and the expansion of the aqueduct pipeline with two new neighborhoods, prioritized to be connected, La Paz and Mission Hill.

The crisis response focuses on the supply side, and basically was entrusted to the private water company, who will operate the desalinization plants. The beneficiaries of this newly available water were mainly the aqueduct subscribers. Regarding that San Andres only have 50 % aqueduct coverage (CDM Smith, 2016), the government put on first place the needs of the company to provide a better service and overlooking solutions for people not connected to the aqueduct. The crisis response was based on a linear cause-effect view. The acquisition of new desalinization plants may be part of the solution; but it is necessary to address the water crisis as a complex phenomenon.

This study focuses on contrasting the ways institutional leaders and the affected populations made sense of the crisis, and the crisis response done in the short term. It used a qualitative analysis of interviews with those involved in the water crises. The goal is case-oriented, viewing the water crisis experience through the lenses of participants and taking into account the literature on crisis management and policy change. Results in this article are part of the investigator’s dissertation. This paper proceeds as follows: We start by detailing the case of the San Andres water crisis, a description and analysis of the body of literature about crisis

management applied to water-related crises. Then is described the qualitative method used. Finally, it is presented the main findings to gain a deeper understanding of the relationship between making sense and institutional response and closing up with some conclusions.

Case presentation: The 2016 Water Crisis in San Andres Island

The Archipelago of San Andres, Providencia and Santa Catalina (Colombia) is a group of small islands located in the Caribbean Sea, between 12° and 16° N and 78° and 82° W. It is located in the southwest of the Caribbean Sea, about 800 km to the northwest of the Colombian Caribbean coast, and 80 km from the Nicaraguan coast. It has an approximate surface area of 300,000 km² and is composed of three major islands: San Andres, Providencia, and Santa Catalina, as well as several keys. The capital is San Andres Island, which has a surface area of 27 km². It has the smallest area and the highest population density (approx. 2573 inh./km²) of any Colombian province (Gobernación Departamental del Archipiélago, 2013).

The San Andres society has a close family relationship where people know each other; there is a strong cultural heritage, sense of identity, sense of place. It has a long history of dealing with social, political, and environmental changes like other Pacific and Caribbean islands (Kelman, 2010). There is a persistent conflict with the central government in Bogota, Colombia. On the island lives an ethnic group, the Raizals or Raizal People, group that enjoys special protection by the Colombian State and the ILO Convention 169 on the rights of indigenous and tribal peoples. Their main rights vindications are regarding over territory and self-government (Ortiz, 2016). They have an Anglo-Puritan African heritage, and the majority is located in the hills and the south part of the island. Different cultural groups cohabit the island from different parts of Colombia, including Medellín, Cartagena, Barranquilla, and also from the Western Asia, like Syria and Lebanon.

Because of its high biodiversity, environmental fragility, and rich cultural characteristics, UNESCO, in November 2000, declared the islands a protected natural biosphere reserve (BR), called Seaflower. This designation signified a transformation in the economic model to one of sustainable development. However, contrary to reducing environmental

problems in the Archipelago, after 19 years of implementation of the BR program, the problems are magnified in quantity and complexity.

San Andres is a drought-prone area. Historically, the dry seasons have reported turn into droughts, but only a few scientists have confirmed this. The wettest month is October, with an average of 338 mm precipitation, and the driest month is March, with an average of 22 mm (UNAL, 2010). The dynamic conditions of “El Niño” cause substantial changes in the amount of precipitation. For instance, there could be a reduction of precipitation of approximately 50 mm from a typical year (UNAL, 2010). This decrease may influence the occurrence of severe drought throughout the year.

The main economic activity on the island is tourism, which is posing a steady pressure on water resources (Velásquez, 2016). Currently, the island is visited annually by more than a million tourists (Howard, 2015). The water that currently supports life comes from three primary sources: (1) Groundwater: Well extraction operated by the private utility, at the household, official, and commercial levels. (2) Rainwater: Capture from roofs and canals during the rainy season and storage in cisterns and tanks, rainwater is used mainly by Raizals. (3) Marine water: Requires relatively expensive treatment; desalination is carried out on the island by reverse osmosis by private companies and by the public services company to meet the demand, mainly from the urban area of the island.

There are different ways of water supply. Before 1953 there was no electricity, aqueduct, and sewage services on the island. Islanders supplied their water necessities from family wells (e.g., Rock Hole, Simpson Well) and rain harvesting. After the 50's, an in-depth transformations process begins on the island related to cyclical migrations inflows. One main change was between 1953 and 1970, in which there was a concentration of the new cultural groups in the North part of the island, there was the time of opening warehouses, commerce, and hotels. The second change was between 1970 and 1985, where the population was interested in generating residential settlements, and there was the time of the creation of new neighborhoods, also concentrated in the North part of the island. While the center of the island, known as La Loma or The Hill, and the southeast coast, called San Luis, became the Raizal neighborhoods par excellence (Aguado, 2010).

The north part of the island became the main area for tourism development. Therefore, the part with better aqueduct coverage. Culturally, there was a rupture in the custom to collect rainwater and built cisterns

in each household (Aguado, 2010). There was an unplanned process of occupation of the island's lands directly related to the development of water supply infrastructure. Also, as the island's demands for water resources growth rapidly, water problems began to worsen.

The Water Resource Master Plan (CDM Smith, 2016), yielded the following results in terms of the sources used by the community for water supply: 92 % of respondents use bottled water, 55 % use well-water, 42 % rainwater, 31 % aqueduct, 24 % water truck and 3 % other sources. There is a variety of combinations in the way islanders, Raizals and non-Raizals get water, but, in general, it can be classified in three different ways:

1. Autonomous water supply in which rain and well water is stored in cisterns. In the last census of wells done by the local government health secretary, a total of 5837 household wells were reported on the island. The wells are located, mainly, on the San Luis formation, in which the extracted water has not good quality, neither physicochemical nor microbiological, due to the poor management of wastewater in both urban and rural areas.
2. Water supply through water-trucks: there are some neighborhoods mostly non-Raizals that does not have aqueduct or have inefficient water service. In neighborhoods like Los Manguitos, Morris landing, Natania, Las Tablitas, Buenos Aires, Atlántico, there is not enough space or the economic capacity to build a cistern. Also, they do not have the custom to build a cistern in their houses; therefore, they used to buy water trucks, and in some cases, they use communitarian wells between 25 to 40 houses.
3. Public household aqueduct: pipeline currently operated by Veolia (before Proactiva) in four districts North End, La Loma, El Cove y San Luis. San Andres have 36.7 % aqueduct coverage (DANE, 2018)

The water supply sector in the island is established by the formal providers that are the government which officially contracted a specialized private company to distribute pipeline water. Informal providers, outside the formal piped network system, include water trucks who sell water to households and hotels and they are not subject to strict regulatory frameworks.

After more than 40 years of sociotechnical difficulties in water management, in 2004, San Andres' government selected the private company Proactiva Aguas del Archipiélago S.A. ESP (currently Veolia) as the

operator to provide water supply, aqueduct, and sewer services. It is important to make a parenthesis to talk a little about this company. The company is a foreign firm from France that became the only operator in the island. It is one of the small numbers of companies that have control over approximately 80% of the world's private water market and is also one of the two companies that have the highest participation in the water market (Lopez, 2011), and it has presence in more than 65 countries worldwide. The company works in three main services and utility areas traditionally managed by public authorities: water management, waste management, and energy services (Lobina, 2014). It gets more than half of its revenues from managing municipal and industrial water facilities around the world (Schneider, 2008). The company self-proclaimed in its web page as a global leader in desalination that has more than 100 years of experience implementing desalination plants. The company has diverse subsidiaries and associations with local enterprises due to specialized services. In the Caribbean the common service provided is desalinization. It has presence in U.S. Virgin Islands, Curaçao, Saint Martin, St. Croix, and Aruba.

Veolia is one of the private water corporations that perceive privatization, in its many forms, “as a cure-all that will reduce costs and increase efficiency” (Lobina, 2014, p. 3), and the leading company priority is market development over community development, profit maximization over the public interest (Lobina, 2014, p. 2). There are diverse strategies used by the company to gain and maintain long-term contracts; for instance, corruption, political spending, lobbying, marketing of illusory fiscal gains, and limited democratic supervision and accountability (Lobina, 2014). Notwithstanding the multiple problems and failures of privatization in water supply services, local governments in Latin America continue delegating public services to the private investors, and this is the case of San Andres Island.

The local government and Veolia signed an operation-contract on September 8, 2005, for a term of 15 years (Ministerio del Medio Ambiente, 2010). After the agreement was signed, the contract became the central core of water policy on the island. The company has two subsystems to produce potable water: a water softener plant and a desalinization plant, both taking water from the aquifer but through different geological formations: San Luis and San Andres. The San Andres formation water softening plant has 66 l/s water production capacity, but the company only extracts 14.4 l/s, in which only 8.3 l/s reaches people located in the east

and hilly part of the island due to water leaks. A desalination plant (from the San Luis formation) with 50 l/s water production capacity, in which the company extracts 42.4 l/s, of which only 23.6 l/s reaches people located in the north and urban area of the island due to water leaks.

The arrangement established that each subsystem would provide water to different sectors; desalinated water is given mostly to the touristic sector, hotels, and some neighborhoods located in the north part of the island, and the water from the softening plant is given mostly to the island residents. The focus on the contract was on increasing the sewage pipelines and not increasing aqueduct coverage. The contract established a differentiated water supply frequency. The distribution was 24 hours a day for the north part of the island and only once every 20 days for the other sectors of the island (Proactiva, 2005), where mostly the poor and the Raizals are located. There is aqueduct access of 31.6 % of the population, and only 22.7 % of the population receives sewerage (DNP 2011; ORMET Archipiélago, 2015). There is a high imbalance between supply and demand for drinking water for the population (Guerrero, 2015).

On April 2, 2016, a group of people who live in the Lynval-Cove neighborhood put up barricades, burned tires, shouted, and put up notices saying: “We need water.” That was the first social road protest for the lack of water on the island. Protest followed by ten additional road protests spread throughout the south center of the island, where some poor neighborhoods and most people from the ethnic minority group live. On April 15, 2016, occurred the first official water crisis in the history of the island. The local government, supported by the national government, declared a State of Public Calamity in the Archipelago, attributing the cause of the lack of water to the “Niño” phenomenon. Thus far, unfortunately, the crisis affected 14000 people (Gobernación Departamental del Archipiélago, 2016). Officially the state of emergency lasted one year and four months and then the return to normality was declared on August 14, 2017.

A Review of Crisis Literature Applied to Water Crises

In most rural areas from Latin-American and Caribbean (e.g., Cuba, Puerto Rico, Jamaica, Trinidad and Tobago) are suffering from a lower water supply coverage, and these areas are the most impoverished (Heartsill, 2012; Silva, 2018). Especially the Caribbean islands are predominantly vulnerable to water resource stresses due to inadequate

water management; inequality seeps down towards the accessibility of water, pricing, and service quality (Silva, 2018). Also, areas with inadequate water supply systems face frequent flooding, drastic seasonal changes in precipitation, droughts, and erosion as well as other climate change problems that hinder water supply (Rhiney, 2015). Indeed, the availability of water resources is under threat in the Caribbean region. In this sense, moving to a water crisis often takes a “small step,” and this “step” could be in the form of climate variability, drought, or tropical cyclone resulting in negative impacts on water quantity and quality.

Water crises are becoming a common situation in the Caribbean life. For instance, Antigua and Barbuda, Barbados, Dominica, Jamaica, St. Vincent and the Grenadines, St. Kitts and Nevis and Trinidad and Tobago are facing extremely high levels of water stress (Reig, Maddocks & Gassert, 2013). The exploitation of water resources has raised multiple conflicts, where the central issue in dispute is the allocation of water resources and water scarcity (Smith & Rhiney, 2016). Islanders are highly dependent on limited amounts of water and susceptible to even the slightest change in supply. They are becoming more prone to face and more fragile to cope with climate variability and droughts. This critical water condition has become a matter of great concern for the Caribbean region and is demanding urgent and innovative institutional responses.

Crises involve the convergence of factors and the combination of multiple events and may grow gradually over time. It threatens core social values and life-sustaining systems. It can be triggered in a variety of ways, for instance, by natural forces like droughts, and also find its roots in malfunctions of society (Boin, McConnell & ‘t Hart, 2008). According to Quarantelli (1993) and Stern (2009, 2013), crises are social processes having their foundation in economic, cultural, and political structures (Blaikie et al., 1994; Fothergill et al., 1999). In some cases, crises impact a community as a whole, or it can differentially affect various members or sectors of the community (Wisner et al., 2006). In any way, crises usually uncover underlying vulnerabilities in the policy of the sector at stake; for instance, in the water sector. Also, it casts doubt on the adequacy of institutions to prevent and respond adequately to the crisis (Boin & ‘t Hart, 2000; Boin et al., 2008).

Water crises are processes of tension where conflict is one of its central features. Conflict can be a way to intensify the crisis and gain sufficient societal and political attention in recognition of the lack of water to be a crisis (Boin & ‘t Hart, 2000; Boin, ‘t Hart & Kuipers, 2018). Also,

conflict may be the main factor that opens the door to influence a turning point of the status quo in the policy sector; it can be used by stakeholders to seek reforms than in regular times would be impossible. In general, crises may open windows of opportunity for reform and change (Bellamy, Head & Ross, 2017; Boin et al., 2008; Stern, 2009). However, in the aftermath of a crisis, many factors influence policy change. Some of them are: (1) the way the water crisis is understood and portrayed by organizational leaders (e.g., sense-making and meaning-making), (2) the approach and paradigm used during crisis response (e.g., conservative or reformative), (3) the history of the water sector, and (4) political will to make structural changes.

The way of understanding the crisis is central to crisis response. Sense-making is commonly defined as the attempt to make sense of an ambiguous, complex, and highly uncertain situation in order to make decisions, and involves frameworks for understanding, as people play a role in constructing the situations they attempt to comprehend (Maitlis & Sonenshein, 2010; Maitlis & Christianson, 2014). In this process, a crisis can be considered as an event or as a process. When a crisis is considered a specific event, the response is directed to a specific moment. If, on the other hand, the crisis is considered as a process, the response will be more comprehensive, dealing with the multidimensional causes that trigger the crisis (Roux-Dufort, 2016; Williams et al., 2017; Wolbers & Boersma, 2019). Considering a crisis as a process allows the organizational leaders to look back and to look forward, in other words, to analyze the sociohistorical process that contributed to the configuration of the crisis and to analyze the longer-term effects of the solutions proposed (Williams et al., 2017).

Moreover, a crisis can be perceived as unforeseeable and uncontrollable, as a situation that goes beyond institutional capabilities where there is no one to blame. The causes can be attributed to uncontrollable natural causes, rather than controllable human actions, and this may lead people to see crisis and its impacts as unforeseeable (McClure, 2017); a natural hazard cannot be controlled nor anticipated (Boin et al., 2008). Therefore, there is not a definite necessity to change institutional structures because the crisis was not due to human error.

Another critical issue is the paradigm applied during the crisis response. Technology is deeply intertwined in the water sector, so water crises usually have been framed through the lenses of a technocratic paradigm. Technology, innovation, and science have often been

promoted as a way of avoiding the effects of water scarcity (Aggestam & Sundell, 2016, p. 1304). Bearing this in mind, most of the ideas resolving water scarcity have centered on creating new technological infrastructure rather than addressing more complex socio-political dynamics of redistribution (Aggestam & Sundell, 2016). There is a widespread debate about the adverse effects of a technological paradigm in the deterioration of the environment, loss of local autonomy, and adverse changes in a society's lifestyle. In the aftermath of a water crisis, it is not unexpected that solutions would be framed within a technocratic perspective.

Such framing gives power to water managers and experts because their expertise is viewed as objective, unbiased, and apolitical. However, this puts aside other kinds of knowledge, including indigenous knowledge and emergency management perspectives (Aggestam & Sundell, 2016). Velásquez (2017), argues that in order to understand the crisis, not only are the organizational leaders' voices needed. In this process, the voice of the people affected plays an essential role in identifying important aspects that contribute to the configuration of the crisis. Although, it is known that establishing a collective understanding of a dynamic situation may become a "mission impossible" when more actors and a greater variety of institutions are included at the main discussion table (Boin & Renaud, 2013). In this vein, the collective understanding is part of a participatory process during the crisis response. The problem then presents itself as to how to make sense of the crisis promptly, addressing the knowledge, needs, and concerns of people affected in a socially just and ethical manner, in order to respond appropriately to the crisis (Vojinovic & Abbott, 2012).

Boin and 't Hart (2000) claim that misunderstanding of the crisis by organizational leaders will determine whether the policy sector descends deeper into a crisis or manages to resolve the acute problems that beset the crisis. Organizational leaders can take a conservative or reformative approach to respond to the crisis. On the one hand, a conservative approach consists of restoring order and bringing the sector back to the pre-crisis period; in other words, to "normalcy". It is the idea to work on incremental improvement rather than a radical redesign of existing processes. The context of the crisis is characterized with a deep institutionalization of rules, practices, budgets, which makes it extremely hard to make a change.

According to Boin et al. (2008), after adopting a conservative approach, crisis managers may eventually come to realize that the crisis

is more profound than they had initially estimated. It seems that the crisis has never ended, and then, a long period of stagnation follows. On the other hand, the reformist approach is about renewal, adaptation, and institutional redesign features of the policy sector; it looks for restoring faith in the sector at stake (Boin et al., 2008; Wolbers and Boersma, 2019). According to Boin et al. (2008), it is not natural and not usual that policy changes occur after a crisis occurs, it is usual to observe just minor changes and only in a limited number of cases, major core reforms are made.

Methodology

Acknowledging the importance of both voices of the organizational and those of the people affected, this paper describes and analyses how each group framed the 2016 water crisis and evaluated the crisis response, and identified, by 2018, changes in the water situation.

- 34 semi-structured interviews were conducted in August 2016 (12 females, 22 males; 19 Raizals and 15 non-Raizals).
- 45 in November 2018 (26 females and 19 males; 25 Raizals and 20 non-Raizals). 29 semi-structured interviews were conducted to participants who live in different neighborhoods of the island. Nine interviews were conducted to public and private local institutions, and seven participants were from big and small hotels in the North part of the island.

In total, in this research were conducted 79 semi structured interviews, 38 women and 41 men, 44 Raizals and 35 non-Raizals. Typically, interviews took about 30 minutes. The participants were at first purposively sampled, and then snowball sampling was used, asking the interviewees if they would recommend anyone else to be interviewed, too. Participants were people from several neighborhoods, including Court House, Little Hill, Barkers Hill, Loma Linval- Loma Cove, Smith channel, Elsie Bar, San Luis, Buenos Aires – Atlántico, Saria Bay, Cabañas Altamar, los Almendros, and Sagrada Familia. Officials were interviewed from the public services secretary, the risk management office, the fire department, the civil defense office, the environmental corporation, the water public/private company, and owners of the water truck companies.

All data were collected and recorded in face-to-face interviews with people affected; two semi-structured interview guides were used: one

for officials/organizational leaders and the other for residents in the affected communities.

A general description of the participants is included in order to allow a better understanding of the different perspectives: (1) Raizals: People identified as the indigenous ethnic group, characterized by their Anglo-Puritan/African heritage, Protestant religious tradition, and English mother tongue. (2) Non-Raizals, people identified as Islanders (people who are from San Andres but came from the Colombian mainland during the 50's until the 90's, including their descendants). (3) Environmental organization: CORALINA is the local agency in charge of environmental action and natural resources management in the Archipelago. (4) Private water companies: Veolia, in charge of the production, sale, distribution of freshwater, and the disposal of wastewater in the island, excluding bottled water. Such water truck companies extract and transport water to different sectors on the island. (5) Local government, including fire-fighters, the risk management office, and the public services secretary. (6) Hotel maintenance supervisors: people who were in charge of the maintenance of the hotel, including the water system and treatment.

A general description of the primary decision-makers over water resources in San Andres Island: The Political Constitution of Colombia establishes that the provision of public services and environmental sanitation is the responsibility of the State. Then, the State distributes its functions in different institutions at different levels: at the national level, the Superintendent of Public Services, which is the technical body responsible for exercising control, inspection, and surveillance of the entities that provide domiciliary public services in the country. The Vice Ministry of Water and Basic Sanitation is responsible for promoting sustainable development through the formulation and adoption of policies, programs, projects, and regulations for the population's access to drinking water and basic sanitation. At the local level: The responsibility for water supply falls into the Public Services Secretary and Aguas de San Andres, which subscribes a water agreement with a private company called Proactive and after Veolia. The institutions responsible for the conservation of water resources is the environmental corporation CORALINA. According to Zamudio (2012), there is and instability, lack of institutional coordination, and dispersion of water policy in Colombia, which has contributed to the deterioration of the water supply services.

Considering the research question, the analysis centers on answers, comments, and expressions related to the causes and understandings of

the water crisis and crisis response. In the data analysis, the researcher went from inductive to deductive analysis where were developed umbrella categories under which to organize specific themes. The interview transcripts were re-read, and the codes and concepts were reconfigured or redefined if necessary. Manual coding was performed. Overall, under the “crisis response” umbrella category, the “people affected voices” defined three themes: injustice water issues, relationships with neighbors, government’s response dissatisfaction; the institutional voices defined three themes: water trucking distribution and desalinization.

How was the crisis response framed by people affected?

One key factor that differentiates this study from others is whose sense-making is analyzed; the common focus is on top managers. However, this study takes into account not only public officials and organizational leaders on the top but also the voices of people affected. According to interviewees, there were problems in all water sources during the crisis; they explained that it did not rain for more than six months, the wells and cisterns were dry, and they did not receive pipe-water for one to four months. However, they realized that some sectors and some people on the island did have water during the crisis; multiple times, they said: “why do some parts of the island have 24-hour access to water and others do not” (Barkers Hill Raizal woman 1, 2016; Loma Lynval Raizal man, 2016). Participants perceived inequalities when it comes to their access to water resources.

Participants perceived that the water crisis was not directly related to natural causes (Velásquez, 2018). Some of them did not even identify the presence of drought on the island. A participant said, “what is happening here is not part of nature; instead, it is the private water company, they put us in drought even if they have the water” (Barkers Hill Raizal woman 1, 2016). A recurrent comment during the interviews was, “there is no drought, you can find water on the island, the problem is that they [water company] do not distribute water properly” (Sagrada Familia non-Raizal woman, 2016). They directly blame tourist activity, the private/public water company and the government for supplying the water to the tourist enterprises and not to them. One of the repeated affirmations was, “it is necessary to stop tourism and reduce the number of people who live on the island”.

Since 1912 there has been a cyclic and historical conflictual situation between Raizals and the Colombian National Government. Disputes have been around access to land, natural resources, and the low participation of the Raizals in commercial activities. Since 1953 started progressive migrations on the island provoking profound changes; as a result, there is a latent conflict between the two main cultural groups (Raizals and non-Raizals –includes *Paisas, Árabes, Costeños*). To date, there is a constant struggle in which Raizals look for ethnic recognition and autonomy in the management of the territory and natural resources.

The crisis became a situation of public order. Participants from Raizal and non-Raizal neighborhoods wanted a change, and they thought that through the multiple protests, they could achieve it. The first protest started in a Raizal neighborhood called El Cove, and then the non-Raizals began to join. The stress for water resources pushes both groups to organize eleven protests to call government attention strategically.

They believed that the only way the government will listen was by making protests. A participant from Loma-Cove said: “the only language they listen is when you protest when you become violent when you become aggressive” (Loma Cove Pastor Raizal, 2016). They claimed that the protests worked successfully to call the government’s attention to it. A person from Loma-Barack said this time “we were determined to change this situation” (Barkers Hill Raizal woman 1, 2016) and a woman from the Barkers Hill neighborhood explain [metaphorically] “in order to be heard, we had to burn half-island” (Barkers Hill Raizal woman 1, 2016), this time “we were desperate” (Loma Barack Raizal man, 2016). Some protests were violent and others peaceful; there was a general sense of anger and dissatisfaction with the government and the private water company.

There were many negotiations between the governor and different neighborhoods; some of these negotiations were written down and signed. For instance, the Barkers Hill neighborhood signed an agreement with the governor on April 20, 2016, to ratify their petitions, there were four main points asked: (1) water service must be provided every week through the pipe networks, and the desalination plants should be installed urgently. (2) When the maintenance of the pipe networks is necessary, it must include the Raizals who live in La Loma. (3) Overpopulation has to be strategically controlled, through the reduction of illegal and displaced persons residing in the islands. (4) Built a recreation center for the Barkers Hill community. However, to date, these

Raizal claims remained undefined and unresolved, leaving them in the same vulnerable condition. Generally, the protests happened during the dry season, but when the rain starts everything goes back to “normal”.

According to the participants’ responses, the seeds of the water crisis have existed for several years, but this time they decided to do something. They framed the crisis as a long-lasting problem related to tourism activity where social issues like justice were predominantly named (Velásquez, 2017). Listening to participants, the researcher noticed opportunities for change embedded in the different ways people respond to the emergency; these activities may be options to solve the crisis in a consciously balanced way. Therefore, talking about how they managed to get water during the crisis may give some insights about how they cope with water shortages.

Throughout the interviews, participants frequently talked about their good relationships with neighbors. They made emphasis on how neighbors played a central role, as they, almost every day, share or sell small water tanks. Also, interviewees manifested, as an essential fact, to know who in the neighborhood has the biggest cistern and who is willing to give or sell water. Also, they mentioned that multiple meetings took place in each neighborhood to discuss and collect money in order to pay a water truck delivery to share. In this sense, individuals’ capacities to respond to water crises are strongly connected to their social capital (e.g., relationships and networks). Relationships within neighbors can enhance their capacities to cope with drought as feelings of companionship can encourage people to help each other and develop enabling relationships (Törnros, 2015). Friendships with neighbors promote capacities that make it easier for people to cope with hazards and recover from crisis. Crisis management programs should target the social infrastructure within communities in order to be more productive.

In 2016 the water truck company service collapsed because of the high demand. They manifested to have difficulties in supplying water “it was chaotic because we could not deliver water to everyone who called us” (White watta company manager, 2016). In 2018 participants manifested that if they go back to being without water, they would have to call the water truck companies again. Generally, people rely on commercial water providers to meet their needs; as water scarcity worsens, better-off households also purchase water for resale within their communities. In this context, water truck companies had a vital responsibility during the water crisis as they became one of the first responders when the water

was scarce. However, it is expensive, unsustainable, and challenging to manage, implement, and monitor.

The majority of the participants located in the hilly and south part of the island manifested having the same water problem in 2018 as in 2016. According to the responders, the first semester of the year, the private water company limited even more severely the water to these areas, and they reported in 2018 have been approximately one month without water.

Another subject was that during the “2016 water crisis” the government installed in Barkers Hill, and Elsy Bar –mostly Raizal-neighborhoods, three water tanks of 5000 l capacity each. The interviewees in these neighborhoods reported that the government uses the tanks during the crisis, but after they abandoned it and never used them again. Interviewees said installed tanks were not the best solution; instead, they prefer to receive water in each house’s cistern. The issue here is that the government should have determined in advance whether tanks are a solution that fits the local necessities; instead, they never asked the community what kind of solution will work for them. There are some neighborhoods, non-Raizals, that do not have cisterns in the houses, and maybe the big tanks would fit better. Also, the government needs to think to use the tanks in the rainy and dry seasons.

In general, they manifested being dissatisfied with the government’s response, “during the crisis they came every fifteen days and filled the tank with water, but they did not come back” (Barkers Hill Raizal woman 2, 2018). Nothing changed, they claimed, a person from Barkers Hill neighborhood explained, “They [government] gave us a tank and filled it up with water when they wanted to, not when we needed it” (Barkers Hill, Raizal woman 3, 2018). An interviewee from Sagrada Familia neighborhood explained that “the government only attended the moment, but they did not solve the real problem; they just wanted to stop the protests” (Sagrada Familia non-Raizal woman, 2018). An interviewee from Loma-cove said, “they promise a desalinization plant, but nothing happens yet” (Loma Cove Raizal man, 2018).

The government promised them two desalination plants, which was the solution that the majority of the participants see as the most appropriate. They talked about this technology optimistically as they perceived it, rainfall independent. There were no comments about possible environmental impacts.

How was the crisis response by public officials?

In this section, the voices that tell the story about the water crisis response includes personnel officials at the operative level, who were more inclined to talk about the “clear facts” on the ground that they had to do (Boin & ‘t Hart, 2000); and from the strategic level who were more inclined to talk in a broader sphere about political and technical concerns and solutions.

Findings showed that the 2016 water crisis was framed as a problem triggered mainly by technical and natural factors (Velásquez, 2018). Public officials point out multiple causes, like an unbalance between supply and demand, but the majority emphasize classic natural hazard types like drought and the “Niño” phenomenon as the leading cause of the water crisis. Additionally, officials point out that the crisis was characterized by conflicts, violence, misunderstandings and political negotiations, and it was necessary to act immediately. The government secretary said that “the crisis became a situation of public order” (Loma Lynval Raizal man, 2016), and therefore, his role was to talk and persuade the community to stop the blockades. He said: “after three days of negotiations and agreements with the inhabitants of the different sectors, the blockades stopped” (Loma Lynval Raizal man, 2016).

For some officials, the crisis was perceived as something new, uncertain, and without preparation in advance. Different positions were found about whether it was unexpected or not. However, a recurrent insight among participants was that “I had never seen a protest or fight for water” (Chief firefighter, 2016). Personnel from Proactiva –today, Veolia, said that:

We did not expect them (community) to run out of water, nor that it would not rain during the whole year. [Furthermore, he explained] On the island, there is a good culture of water conservation; for instance, the community in addition to having aqueduct, have a well, and they collect rainwater. (Operations coordinator, 2018)

For its part, the government secretary in 2016 blamed partially the private water company saying that “they have to be more efficient; the company needs to commit itself to supply communities with water more frequently; in the wake of the crisis it is necessary to renegotiate the water agreement with the company” (Risk management office coordinator, 2016).

The chief firefighter manifested that “when you get half an hour of water every month (from the aqueduct), and it does not rain for six months, that is when you realize the difficult situation in which you find yourself” (Chief firefighter, 2016), and he explained that “It was the low frequency of rainfall which let us see how bad we are in water distribution”. The Civil Defense director added, “this drought-impacted more than half of the island [...] it grew and expanded silently” (Civil Defense director, 2016). The risk management office coordinator explicated that “We were not prepared [...] This crisis took us by surprise [...] We did not have an emergency response protocol in place because this never happened before” (Government secretary, 2016). The environmental corporation engineer in charge of the risk management project justified this lack of preparation, saying that “it took us by surprise because we did not inform ourselves beforehand that drought could really happen on the island” (CORALINA, 2018).

The immediate response, at the operative level, was done mainly by firefighters, Colombian Civil Defense, risk management office, and operators from the private water company. On April 2, 2016, when the first protest for the lack of water started, the chief firefighter said that “we [firefighters and water private company] rapidly analyzed the situation and defined routes to distribute the water among people affected” (Chief firefighter, 2016). The Proactiva (Veolia) operations coordinator was clear to stated that “we only follow our contract”; during the crisis, “we only distributed water among our subscribers [and] we sold the water to the government for them to distribute among non-subscribers” (Veolia operations coordinator, 2018). The Proactiva (Veolia) manager clarified that “the problems that arose during the crisis were in the rural area and most of those who protested did not have aqueduct” (Veolia operations coordinator, 2018). In this sense, the government took full responsibility for the crisis response.

The task of distributing water was divided into two: the subscribers and the non-subscribers. The risk management office coordinator with the firefighter-in-chief coordinated and scheduled the water truck routes, and they indicated to which neighborhood and which family to deliver the water: “We decided to give between 1500 and 2000 liters of water per family. Then, we selected the sectors to deliver very rationed water [...] The community leaders in each neighborhood helped us to know which house needed the water” (Chief firefighter, 2016).

[In some areas] we [the government] provided three plastic tanks of 5000 liters, which we installed in key points where we noticed there was a greater need for water [...] In some cases, we had to clean and rehabilitate some water storage systems [tanks and cisterns]. (Risk management office coordinator, 2016)

The Civil Defense contributed actively to the distribution of water, although they said: “there was not enough clarity regarding the competences of each institution in the face of drought” (Civil Defense director, 2016). Officials stated that the crisis response was prompt, appropriate, and effective. The distribution of water was over 8,666,660 l to various neighborhoods in 2016. On March 17 and 30, 2017, there were two new protests for water in the same areas as before. According to the Defensa Civil Colombiana (2017) report, they distributed over 285,070 l of water in 2017. In March 2018, there were two new protests for water in the Loma and Brooks Hill neighborhoods, and more than 200,000 liters were distributed in 2018. In March, June and July 2019, there were multiple protests in Flowers Hill, Atlántico, Barkers Hill, and Schooner Bight.

The coordinator of the water project in the environmental corporation explained that they fulfilled their role and reported the situation on time:

We recommended, eight months before the crisis started, that hotels and people should adopt water-saving practices. We also started to make strict controls on the volume of water that is extracted from wells,” and “two months before the state of emergency, we made the first alarm informing the levels of conductivity of the wells. (CORALINA, 2016)

During the crisis, the organization used for coordination and cooperation among institutions was the State (*Departamento*) Council for Risk Management (Ley 1523, 2012). The government secretary said, “immediately I noticed there were multiple protests, I called an extraordinary risk management meeting” (Government secretary, 2016). In this reunion institutions like the Police, Navy, water resources management organizations like Proactiva (Veolia), public services secretary and the environmental corporation Coralina participated, but no community leaders and water trucks company owners were included. As a result, on April 15, for the first time in history, the local government declared a State of Public Calamity (Decreto 0170, 2016). The congressional representative for the island underlined “declaring the state of emergency was the

logical response to the ‘Niño’ phenomenon and a one-year drought in the island” (Congressional representative, 2016).

The causes of the crisis were based on three main statements: the drought in relation to the “Niño” phenomenon impacts, the imbalance between water supply and demand having a 194 lt of water deficit, and high levels of salinity in the aquifer, in which was necessary to close some wells. The main conclusion of this meeting was to find new forms to produce water to increase water frequency. The most appropriate solution was desalinization. It was perceived optimistically, virtually unlimited, flexible, and rainfall independent.

The government developed different work sessions with Proactiva (Veolia), the Public Services secretary of the local government, the environmental corporation CORALINA and the energy production company SOPESA, to study the viability of the acquisition and installation of a desalination plant to mitigate the deficiencies in the water service. As a result, there is a technical report where they analyzed and described four different alternatives to install the plant. Factors taken into account were the plant production capacity in a range from 10 l to 25 l per second, the location of the plant and in which place would be better to extract the water (from the sea or the coastal wells), the power system required, the additional infrastructure needed (storage tank, pipelines, impulsion system) and its economic costs.

Eventually, the decision taken was to buy two desalination plants, 25 l and 50 l per second, and additionally 75 l per second of water for the island. The National Government in 2019 decided to draw water from the sea at a point on the northwestern coast. The congressional representative for the island said: “The response to the crisis was successful; the governor managed to reorganize the economic resources coming from the national government to purchase two desalination plants” (Congressional representative, 2016).

In summary, and taking into account the Action Plan Report of the state of public calamity, the institutional response consisted of (A) immediate response: the distribution of more than 18 million liters of water valued at 200 million Colombian pesos (equivalent 62,473 USD), the acquisition of a new water truck for firefighters exclusively to distribute water, rehabilitation of some household water storage systems, and installation of three 5000 liters’ capacity tanks. (B) In short term, buying a desalination plant of 25 l/s capacity that had to be installed by November 2016, but it was installed in December 2018. (C) A medium-term

and long term solution by buying another desalination plant of 50 l/s capacity that should have been installed by November 2017, but has not yet been purchased. And (D) the development of educational activities for rational water use. The return to normality was declared on August 14, 2017, through Decree 0340 (Decreto 0340, 2017). Officially the state of calamity lasted one year and four months. However, people still have the same water access difficulties.

Currently, there is one new desalinization plant on the island. The operation of the plant had some administrative and technical problems related to who was going to operate the plant. The government did not have the specialized human resources to operate the plant, and the water agreement with Proactiva (Veolia) was coming to an end. Therefore, this was the beginning of a series of tussles and negotiations between the government and the water company Proactiva (Veolia). At the end of 2018, the local governor signed an amendment to the water agreement with Veolia, "Otro Si No. 9", in which it was stated that the company would continue being the water operator in the island for another 15 years, and the plant has to be operated by the company. This situation has caused controversy within community leaders who have blamed the company for the water problems.

Some other actions done by the government and the private water company concerning the crisis response were: A construction of a water line to send water to the hilly parts. The rehabilitation of 26.1 km of water supply networks. The government formulated a Master Plan formulated by the government for water management on the island. And the prioritization of the aqueduct network expansion for two neighborhoods affected, Bottom House and La Paz. There was no investment directed to expand the aqueduct pipeline to the South and West part of the island. Also, the environmental corporation personnel explained that they had done a range of educational projects for water conservation. Additionally, they completed a study about the groundwater quality, in which one of the primary results was that 93 % of the analyzed wells showed a low water quality (UNAL, 2018). The engineer highlighted the importance of a better systematic monitoring network for high-risk contamination of wells, and the importance in differentiating the water authorizations for water extraction according to the season, dry or rainy.

According to the above mentioned, the crisis response focused on produce water to being distributed mainly through the aqueduct that

only covers 35 % of the total number of households (14,841). The government response focuses on solving the water needs of the company subscribers, increasing water frequency, overlooking the necessities to those who are not connected to the aqueduct. Firefighters continue distributing water trucking during dry periods. However, it is a temporary solution, not a definitive one. Water trucking was and is a life-saving emergency intervention during water crises. However, this solution is expensive and consumed a large sum of human and technical resources. Therefore, it is central for the government to put all efforts into a more sustainable water source project.

The crisis did not affect the entire island. In the North part, where tourism and commerce are located, the crisis was slightly felt. Maintenance supervisors from big hotels like Aquarium, Los Delfines, and Sunrise Beach manifested had not suffered any water problem in 2016. They explained to get water from three different sources: the maintenance supervisor from the Aquarium Hotel explained: “We have two desalination plants, each one produces 130 cubic meters per day, we also get water from the private company, more or less 200 cubic meters, and when it rains we also collect rainwater” (Maintenance supervisor Aquarium Hotel, 2018). According to the water agreement, the North part of the island received water from the aqueduct every day. Indeed, the tourism industry is a high-water consumer. In this vein, the literature claims that tourism is very likely to exacerbate local water problems during the dry periods and that there is a disparity in water consumption between locals and tourists, in which tourists consumed three times more water than the locals. The crisis reveals the disparity in the distribution of water and how locals and tourists differ in water consumption.

In the crisis response, no efforts were made or planned to transform or analyze inequitable and unsustainable water arrangements. There was a prioritization of technical solutions over engaging local socioeconomic and political problems. For instance, tourism should not have preferential treatment when it comes to its share of water resources consumption. On the contrary, the tourism sector must contribute to the full cost of resource consumption and the associated environmental impacts. There should not be a competition among domestic users and the tourism sector in terms of water supply and infrastructure needs.

The government portrayed the crisis as a supply-side crisis that could only be resolved by securing additional supplies of drinking water. Thus, reinforcing the engineering and infrastructure paradigm of water

planning (Head, 2014). Two years after the 2016 crisis were devoted to upgrading water infrastructure. Under conditions of crisis, the local government turned first to the technical experts. The problem of providing water supplies for the island has been perceived primarily as an engineering task to be solved by technical experts through the construction of complex infrastructure systems (Brown, Keath, and Wong, 2009; Head, 2014). The majority of officials at both levels, operative and strategic, were broadly aligned with this approach, and all other water-related issues and priorities were displaced. The primary knowledge needed to solve the water problem is very specialized. In other words, the island requires mainly engineering experts who know about the construction and operation of desalination plants. Few comments were made about energy costs and high saline discharges by the plant.

According to Head (2014), this crisis response engineering-based paradigm has been challenged as a result of the occurrence of more complex and frequent water crises. He states that the primary argument is that the traditional engineering-based approaches and associated technocratic decision-making processes, are ineffective in addressing increasingly complex water problems (Head, 2014). Engineering expertise alone could not resolve future water policy directions to tackle complex and wicked problems like water crises. The inter-related nature of the problems and the uncertainties concerning future weather patterns, led to a need for more interactive and integrated approaches to scoping the issues to prevent a new crisis. An alternative vision, sustainability, of collaborative water governance is progressively evolving, which is characterized by more participative and integrative and interdisciplinary approaches to problem-solving and sharing of information (Head, 2014).

The portfolio of measurements to take into account could be behavioral incentives for water conservation, restructuring government, and institutional arrangements, infrastructure investment measures, demand management, the development of preventive plans and protocols concerning the “Niño” phenomenon and drought, the inclusion of early warning systems and stakeholder inclusive participation.

Finally, participants described in 2018 the same conditions as in 2016; there were no significant institutional or technical changes. Neither were renewal and institutional redesign of the policy sector nor attempts to modify processes and structures (Boin et al., 2008). Accordingly, it can be said that a conservative approach was applied to the 2016 water crisis response. According to Boin et al. (2008), in crises where it is

immediately evident that exogenous factors play a pivotal part –like the “Niño” phenomenon and drought, it is relatively easy for government actors to make authoritative statements about what happened and why; while avoiding essential factors such as operator errors, political negligence, and social injustices.

Conclusions

This study has sought to answer the question: how different stakeholders framed the 2016 water crisis and its consequent institutional response, and whether there was a change in the water situation by 2018. The different stakeholder voices showed that the crisis was framed differently by institutional leaders as opposed to the people affected, and this sense-making process influenced the crisis response. Officially, the crisis lasted one year and four months, according to Decree 0340 enacted on August 14, 2017 (Decreto 0340, 2017), but nothing could be further from reality. Interviewees in 2018 revealed that people continue having problems in access to water, and they only received water once per month. People still protest in different parts of the island, especially between March and July. Therefore, firefighters continue distributing water every time a person or institution called for water. As Williams (2016) explains when water crisis-response is tied to drought, the dominant paradigm becomes that a momentary shortfall requires a short-term solution. In this sense, the island can be in a constant crisis or a pre-crisis condition.

Public officials and organizational leaders frame the crisis as an unexpected event for which they were not prepared. The causes were ascribed mainly to the “Niño” phenomenon and drought. In other words, the crisis was assessed as natural, in which the hazard was conceived as challenging to predict and control. One of the main impacts identified was the reduction of water availability for the water softener plant, one of the subsystems for the water company, from 66 to 16 liters per second. Others technical problems in the water service, such as low aqueduct coverage, water leaks in the water pipeline, low water pressure in the system and old aqueduct system were omitted. In this way, the significance of the historical lack of efficient water service on the island that also leads to a water crisis was unnamed.

Furthermore, the crisis response did not consider the relationship between the inequitable shares of water and the increment of tourism water demands on the configuration of the crisis. In other words, during

the crisis response, there were nor considerations nor actions to counteract socio-historical and economic factors that played an essential role in the water crisis configuration. No efforts have been made to transform or analyze inequitable and unsustainable water arrangements, neither to evaluate the tourism impact in water access. There was a prioritization of technical solutions over engaging local social, economic, and political problems. There was also an evident separation between water and crisis management approaches. A technocratic paradigm was used in the crisis response, and preventive actions to cope with drought or advanced rainwater capture systems were not taken.

The findings of the present study suggest that the government divided the crisis response in two types of people affected: subscribers and non-subscribers from the private water company. The water that will be produced by the new desalination plants is going to be distributed mainly through aqueduct pipelines in which the main beneficiaries would be the subscribers. Others will continue getting water from water trucks and continue holding their hope in the rain and the aquifer. According to Belmar, McNamara, and Morrison (2016), the worst impacts affect the poorest and most marginalized members of society, and these inequities in access and control of water increase their vulnerability.

Public officials did not expect people to run out water, and this happened in part because they do not monitor the rain harvesting process. There is no control over water shortages from the water company, and they do not have an early warning system to know the precipitation reduction. In the configuration of the crisis, the unawareness of the impacts of climate change and the way different social groups collect water play a vital role. Each group (Raizals and non-Raizals) displayed a different level of vulnerability and capacity to cope with water shortages and drought. Generalizations by the government about the way people get water cause institutions to misdeliver and misallocate the emergency water, and that was the case of the 2016 water crisis, in which, for example, firefighters provided storage tanks to the community who already have cisterns in their houses. In this vein, the crisis response is more complex and include more than two categories of people affected than just subscribers and non-subscribers.

Currently, people in the hilly, west, and south parts of the island reported the same problems as in 2016. Nowadays, protests and riots for the lack of water are a common situation on the island. Conflict, rather than cooperation, also characterize relations between government

and the community. This study agrees that crises are processes that can intensify both social solidarity and social conflict.

In 2016 people affected had the sense that a change would be possible to intensifying the crisis through social protests. However, the crisis response by institutional personnel has been conservative, preserving organizational structures evading policy changes. The crisis was not an opportunity for change for all. It was an opportunity for the private water company to continue being the water operator on the island for another 15 years, having more water to distribute and sell, and increasing the company infrastructure with two additional desalination plants. The way the crisis response was managed revealed the political and economic power held by the private water company, a situation that makes room for future research about water-politics, around questions over who is granted to make sense of this crisis and why they are, and others are not. The literature explains that in some cases, what is a crisis to some may be an opportunity to others; usually, crises do provide direct benefits to some economic sectors mostly during the response and recovery phases (Boin et al., 2008).

This study argues that the crisis revealed underlying vulnerabilities in the water policy sector that lead to an institutional crisis. This crisis exposed how the institutional integrity (structures, values, processes) of the water policy sector was at stake (Boin & 't Hart, 2000). Voices of the people affected implies that the credibility in the way water policy decisions were made stopped making sense for them. According to this, the water crisis could be institutional too (Boin & 't Hart, 2000). The water sector could come under severe pressure for change; however, the process of making sense of the crisis and subsequent decision making on the response stayed within the domain of the personnel of the private water company hindering the opportunity for change.

In general, crises may open windows of opportunity for reform and change (Boin et al., 2008; Stern, 2009; Bellamy et al., 2017). However, reforms may not occur, and multiple factors influence possible changes; some of them are: (1) the way the water crisis is understood and portrayed by organizational leaders, (2) the approach and paradigm used during crisis response (e.g., conservative; technocratic), (3) political and economic interest, (4) power relations, and (5) the participatory process.

The crisis response was mainly reduced to a series of short-term responses by the government. It was primarily water trucking distribution in response to protests and multiple calls, quite the opposite of

what people expected as a definitive solution of their water needs. The crisis response must offer a different outlook, a way of thinking, a policy change, a preventive plan, a lifestyle that is more coherent in the face of limited consumption, and traditional forms of water management. This crisis required that the government move beyond the technocratic paradigm and take a more sociological and creative standpoint, in which it is necessary to determine who is at risk and more vulnerable and why this happens (Head, 2014; Wilhite & Pulwarty, 2005).

In this research, the voices of affected people revealed human responsibility in the configuration of the crisis. They explain clearly how injustices in water distribution, tourism activity, and deficiencies in water services were the cause of the crisis. Also, they showed how cisterns, neighbor networks, economic resources, and water truck companies were crucial to cope with water scarcity. The crisis response not only requires knowledge over the water management system; also, it needs to ask the people affected what happened and gain knowledge about the sociocultural factors of the exposed community. Understanding the “Niño” phenomenon and drought concerning mass tourism was also essential as well the diverse mechanisms used to cope with the lack of water. Local institutions need to combine different knowledge forms, like scientific with traditional knowledge (Raizal water-culture), acknowledging the limitations of each one and reinforcing the strengths of all of them (Kelman, 2010). With that in mind, public officials and organizational leaders must move from concentrating on a specific discipline to a broad knowledge of factors. More comprehensive crisis response is required to manage the crisis effectively. Failure to incorporate these diverse forms into a broader response effort can lead to a repeated crisis. This study hopes to stimulate further research in this area, which may, over time, enable more adaptive sense-making during crisis and change.

The crisis response focused on the supply side, in which producing more water was the main task to solve the problem. Decisions were confined, mainly, to technical experts from the private water company, and the technological expansion, through the acquisition of more desalination plants, was the first solution found to solve the crisis. Crises are multidimensional, and the reduction of water production is only one of a range of factors from the crisis origination. This research raises this matter and put the government on notice that it cannot hide the complexity of the water crisis under a natural phenomenon.

Additionally, Shiva (1991) and Redclift (1984) argues that technology is not neutral and comes with the values and interest of the society that it comes from. They explain how the adoption of technology has the power to transform society. The technology like desalinization plants has a strong possibility to reduce San Andres' autonomy over water resources, and this could be the root of a new social struggle for the right to manage water resources.

San Andres residents, because of regular precipitation reductions, are now forced to depend on the private water companies who sell water by tankers and have to wait in long queues to obtain a few liters. To collect water, people in neighborhoods have to wait for the water tanker which may arrive any time during the day, causing impacts in daily life activities.

Private companies are gradually becoming the owners of most of the water on the island; besides, they have control over their water treatment and water safety. Hence, the community's health is in their own hands. In some cases, communities prefer to be wholly separated from centralized piped water delivery services due to failures of the systems, and they believe that maintaining separate control of their water resources guarantees autonomous access to at least some water (Minnigh et al., 2005).

Finally, in most crisis studies, the common focus is on organizational leaders on the top, but the goal of this research was to put the voices of both organizational leaders and people affected at the table and understand the importance of hearing both sides. These multiple voices showed how the process of making sense of the crisis requires a participatory process involved and how there is an essential relationship between the interpretation and the response activities made during the crisis.

This research confirms the complexity and multidimensionality of recent crises. It argues the central role that sociopolitical factors plays, like justice, in the crisis configuration and the needs of interdisciplinary knowledge to understand and manage a crisis. This article contributes to the growing body of work that aims to understand the causal factors of crisis vulnerability, but with a specific focus on small Caribbean islands. However, the current COVID-19 world pandemic-crisis reveals that some of the findings of this study may have application even for large and wealthy nations in crisis, such as the United States and United Kingdom and for crises other than those of water. For example, it has been seen

that minority and poor communities in the United States have a much greater COVID-19 vulnerability than others. The need for this kind of analysis appears to be immediate and critical. Ultimately, this study recommends developing a longitudinal and multidimensional framework to study crisis response outcomes.



Acknowledgements

Special thanks to the San Andres community who participated and shared their experience in this study. The study was funded, in part, by The University of Colorado Natural Hazards Center through its Quick Response Grant Program, grant number CMM11030670. Thanks to the University of Delaware Biden School of Public Policy and Administration and the Disaster Research Center. Specially thanks to Director Tricia Wachtendorf for her advice. Thanks to my friend, Professor Michael Brook, for his comments.



Carolina Sofia Velásquez Calderón

Ph.D. candidate in the Disaster Science and Management program at the University of Delaware. MSc in Caribbean Studies from Universidad Nacional de Colombia, where she is also part of the Caribbean Environmental studies research group. Her master thesis is related to risk, concerning hurricanes in the agricultural production system. Velásquez's current research work includes water crisis and water justice in small islands like San Andres, Colombia, climate change impacts in marine resources, and the analysis of the municipal ecological structure in land use planning.



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