

Water and sanitation are not gender-neutral: human rights in rural Brazilian communities

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Abstract

The Human Rights to Water and Sanitation (HRWS), adopted as UN Resolutions since 2010, contemplates key elements that seek to ensure equal and non-discriminatory access to water and sanitation, including the elimination of gender inequalities. Working in populations with socio-environmental vulnerabilities, this study aims to assess gender division of labor in households of two rural communities in the North and Northeast Brazilian macro-regions and identify why greater impacts occur on the lives of women when compared to men, resulting in human rights concerns. A qualitative analysis was carried out through semi-structured interviews and direct observation. The study showed that in the two rural Brazilian communities there is a clear labor division for water and sanitation access from a gender perspective. Men undertake more specialized work, sometimes requiring greater physical effort. As for women, they are assigned functions related to the domestic environment, including activities concerning water and sanitation. When facilities are inadequate, there is a disproportionate impact on women's health and quality of life, showing that the non-compliance with the human rights to water and sanitation often results in more harmful consequences for them.

Keywords: Gender inequality; Human rights; Rural sanitation; Water access; Women

Introduction

Some 884 million people lack access to safe drinking water and more than 2.6 billion people lack access to basic sanitation. In the case of Brazil, for example, although it contains 12% of the world's freshwater, water resources are distributed unevenly in the country, and there are enormous regional discrepancies. Approximately 24 million people live in the Brazilian semiarid region, which is equivalent to 12% of the national population (IBGE, 2011), designating it the most densely populated dry region in the world (Rêgo, 2012). This region is situated in a place of socio-environmental vulnerabilities.

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Because of its irregular rainfall, the semiarid region has been the victim of frequent droughts and floods, and development programs have mostly been driven by emergencies aimed at fighting droughts. Estimates show that more than 1.9 million families are living without adequate access to clean drinking water in the Northeastern region (IBGE, 2011). Another very important macroregion that is also considered of high vulnerability is the North region, which occupies the equivalent of 42% of the Brazilian territory (IBGE, 2011). In it is located the Amazon Forest, the Amazonas River, and the Bacia Amazônica, the largest watershed in the world. However, despite water availability, many households lack access to safe drinking water and lack of adequate sanitation solutions. Many residences located in the rural area are isolated by the forest and rivers. In some areas, the only means of transport is by boat and it takes up to days to access. In addition, traditionally, the area has frequent floods, which interfere with the water supply and sanitary solutions adopted.

This paper aims to identify and discuss behavioral patterns that permeate tasks related to the supply of water and sanitation in the routine of families of two areas of great social and environmental vulnerability in Brazil. Through a qualitative approach, it seeks to understand, in depth, in the studied localities, why water supply tasks are attributed to women and why non-existent or inadequate sanitation solutions affect them more, corroborating the knowledge of basic prerogatives that should be considered by public policymakers or projects related to water supply and sanitation, with specific regard to Human Rights to Water and Sanitation (HRWS).

The study is based on the hypothesis that under conditions in which there is a lack of water supply and sanitation services or in conditions where those services are precarious, the HRWS violation occurs unequally among people of the same family, with a greater impact on women. In regard to the household's situation (urban or rural), it is even possible to affirm that living in rural areas, precarious settlements, or in the urban peripheries can greatly influence the rights to water and sanitation, boosting socio-environmental vulnerabilities, especially for women (Crow *et al.*, 2012; Padhi *et al.*, 2015; United Nations, 2016; Caruso *et al.*, 2017).

Water and sanitation: human rights according to gender

The United Nations (UN), in 2010, adopted a resolution explicitly recognizing the HRWS (A/RES/64/292) (United Nations, 2010). The normative content of HRWS includes the elements: availability, quality, acceptability, affordability, accessibility. These elements are supported by the principles of: equality and non-discrimination, participation and inclusion, responsibility and accountability and progressive realization using the maximum available resources. The HRWS establishes that access to water and sanitation are essential conditions for the full enjoyment of life and other Human Rights (United Nations, 2010). The right to sanitation, in particular, must be ensured to all people, without discrimination, through safe and physically accessible and economical solutions. Sanitary solutions need to be hygienic, socially and culturally acceptable, and also provide dignity and privacy to users (United Nations, 2010; Caruso *et al.*, 2017), aspects which are very important for women and girls (Brown *et al.*, 2016).

The UN states that gender inequalities exist in all countries, in various aspects of social life, including the way people access, manage and benefit from water, sanitation and hygiene (United Nations, 2016). Lack of access to safe drinking water and sanitation affects women in particular. Women and children do most of the water collecting if drinking water is not available on the premises. Collecting and carrying water takes time and is a heavy burden on them. It is not rare for women to spend up to 4 hours a day

walking, queuing, and carrying water, time that could be put to productive activities or housework and childcare. The water collected is often dirty and from unprotected sources. Women's health can be particularly affected by the heavy burden of carrying water, as well as by water contact diseases such as schistosomiasis (United Nations, 2010). Moreover, very often, women are excluded from decision-making concerning water and sanitation. As a result, their specific needs and circumstances are not taken into account in the development of water and sanitation programs or in the extension of these services (United Nations, 2010).

Several studies, conducted in different countries, indicate that in rural contexts, women dedicate more time to the execution of activities related to water supply and sanitation than men (Wutich, 2009; Pilling, 2011; Crow et al., 2012; Caruso et al., 2017; Routray et al., 2017b). Researchers have revealed, regardless of the country, gender norms are deeply rooted in sociocultural aspects and reflect, explicitly or implicitly, the tasks performed in the home (Kandiyoti, 1988; Stevenson et al., 2012; Gómez & Winkler, 2015; Routray et al., 2017b; UNDP-SIWI, 2017). In general, men feel more responsible for the family's livelihood and are more challenged to develop technical skills and those that require more physical strength. To a large extent, women are responsible for the routine activities necessary for family life in and around the home. Those activities include the provision of household water to meet several needs: drinking, food preparation, hygiene, household cleanliness, water for small animals, and irrigation of gardens and orchards (Upadhyay, 2004; Bennett et al., 2008; Wutich, 2009; Melo, 2010; Stevenson et al., 2012; Chifamba, 2014; Gómez & Winkler, 2015; Hora et al., 2015). Women assume responsibility for the cleanliness of toilets (Brewster et al., 2006; Kwiringira et al., 2014; Hirve et al., 2015; Hadley & Freeman, 2016; Caruso et al., 2017; Routray et al., 2017a). In the case of non-existence or inadequacy of indoor toilets, they are at greater risk of sexual violence (McCarthy, 2014; Hirve et al., 2015; Sahoo et al., 2015; Jadhav et al., 2016; Winter & Barchi, 2016; UNDP-SIWI, 2017), direct exposure to sources of contamination, hygiene difficulties during the menstrual period, and other constraints (Paria et al., 2014; Kansal et al., 2016; Taukobong et al., 2016; Caruso et al., 2018).

In fact, many researchers have focused on the greater negative impact on women when there is inadequate and/or absent water supply and sanitation solutions. Most of this research is dedicated to urban areas, peripheries, or rural areas, all of which are in a situation of vulnerability (Brewster et al., 2006; Wutich, 2009; Pilling, 2011; Crow et al., 2012; Kwiringira et al., 2014; McCarthy, 2014; Paria et al., 2014; Hirve et al., 2015; Padhi et al., 2015; Kansal et al., 2016; Caruso et al., 2017, 2018; Routray et al., 2017a). Based on qualitative and quantitative approaches, current studies reveal, especially, the negative impacts on women's health and quality of life, as they devote a considerable part of their time to water supply activities or suffer more from inappropriate sanitary solutions (Geere et al., 2010; Stevenson et al., 2012; Campbell et al., 2015; Hirve et al., 2015; Hulland et al., 2015).

In relation to Brazil, there are few studies of water supply and sanitation carried out from a gender perspective, especially in areas of high vulnerability, such as rural, peripheral, and favela areas of large urban centers (Garcia, 2007; Melo, 2010; Moraes & Rocha, 2013; Silva, 2017). There are currently no published studies on Brazil that consider water supply and sanitation exclusively from a gender perspective, in line with the HRWS framework. Therefore, this research intends to add to the current global status of scientific production with a deep analysis, through the understanding of gender relations in Brazilian rural areas. The features of water supply and sanitation in these areas, as well their cultural pattern, are similar to those found in other parts of the world. Hence, exploring and improving the understanding of gender relations in water and sanitation services in rural Brazilian communities may

contribute to better formulated public policies and interventions in different realities. 21% of the population (39.9 million people) live in Brazil's rural areas (BRASIL, 2018), a considerable percentage of the population that experiences vulnerability similar to those in other parts of the world. This research is innovative because, in combination with the principles and prerogatives of HRWS, it intends to understand how the sanitary situation contributes to gender inequality, compromising the contemplation of women in HRWS. In-depth understanding of these issues can support sanitation public policies more appropriate to these localities.

In the next section, the methods used in the research are described. In 'Results and discussion', a brief characterization of water supply and sanitation in the study areas is presented and the results obtained from interviews and observations presented and analyzed.

Research methods

This research is part of the 'Studies for the conception, formulation and management of the National Program of Rural Sanitation (*Programa Nacional de Saneamento Rural – PNSR*)', carried out by researchers of the Federal University of Minas Gerais (UFMG) in partnership with the Brazilian National Health Foundation (FUNASA). Based on a qualitative methodology, 15 rural communities were selected for the PNSR study (communities surveyed). These communities are located throughout the five Brazilian macroregions (North, Northeast, Center-West, Southeast, and South), and are examples of the different realities experienced in different parts of the country. Two rural communities, included in the scope of PNSR case studies, were selected for this paper: Barreiro Amarelo, in the State of Bahia and Seringal Vila Nova, in the State of Acre (Figure 1). These communities were selected because they are situated in places of great socio-environmental vulnerability, Brazilian macroregions North and Northeast, and in order to typify and understand the peculiarities of the excluded population groups.

Although conducted in the Northern and Northeastern macroregions of Brazil, the study did not address indigenous peoples. It considered riverside dwellers (traditional population living next to rivers and practicing artisanal fishing as their main survival activity), extractivists (traditional population practicing extractivism – gathering natural products from the forest – as the main economic activity), and family farmers (small producers who produce mainly by the workforce of their own family). The selection of the two communities had the aim of understanding whether and how the management of water supply and sanitation in rural areas is grounded in gender relations. The study did not intend to compare and identify differences and similarities between the two communities, but to explore how women and men comprehend housework.

This paper mainly draws on qualitative data which facilitated an in-depth understanding of the gender disparities in Brazilian rural areas. The data collection is based on participant observation and interview – individual and collective, with residents of the communities and key informants. Key informant interviews were conducted with local leaders (technical or political), agencies that provided sanitation to these areas and public health providers. These key informants freely offered their time to be interviewed. The number of respondents correspond with the criterion of saturation. When there was no new information and the narratives were repeated, saturation was obtained, then the interviews could be closed.

Three researchers collected the data (interview and participant observation) during 10 days of field work in each location, in the months of January and February of 2016. The semi-structured interviews

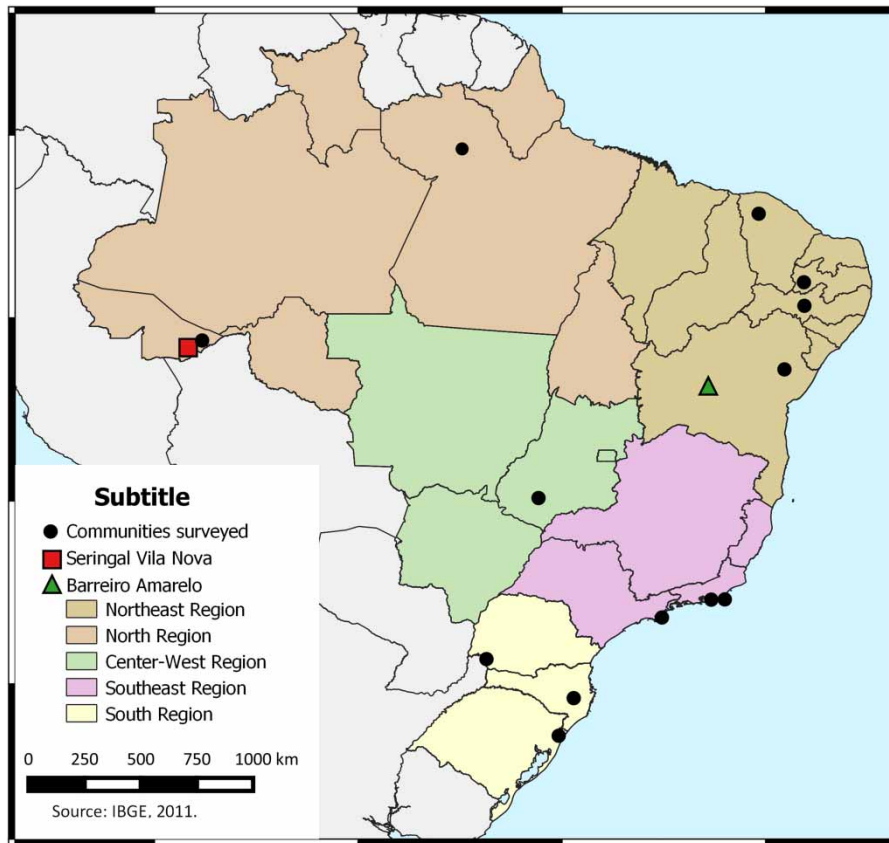


Fig. 1. Map of Brazil with the location of the 15 communities surveyed in the PNSR and, in square and triangle symbols, the communities studied in this paper.

are based on a script (see the Appendix) prepared by specialists in water supply and sanitation – teachers, masters, and doctors, and had the objective of understanding the sanitary reality of the communities and the relations of gender (question examples: ‘What is the water supply and sanitary solution adopted?’, ‘By whom was it managed?’, ‘What are the difficulties?’). The study involved both women and men. In Barreiro Amarelo, 12 interviews were conducted (one in each household); a group interview with women and two interviews with key informants – a political leader representing¹ the city and a Community Health Agent (ACS – in Portuguese)². In Seringsal Vila Nova, 17 interviews were conducted in different households; a group interview and 10 interviews with key informants: managers of ICMBio (Chico Mendes Institute for Biodiversity Conservation)³, a political leader member, a health professional, and a representative of the Secretary of Extension Agroforest and Family Production

¹ Responsible for public policies and projects, including those related to water and sanitation.

² Has direct contact with all inhabitants; identifies factors related to sanitation and/or gender inequality and can help the communities’ characterization; performs disease prevention and health promotion activities.

³ Vila Nova’s Seringsal is managed by ICMBio so to have access and understand some questions about the access to water supply and sanitation, including gender inequalities, it was necessary to interview one of its members.

of Acre's – Seaprof⁴. Seringal Vila Nova's residents live very far from each other, the access is difficult, and to reach their homes it can even take days of walking in the forest. Thus, environmental and spatial factors were limiting for the collection of interviews. The field log, for recording observations, was developed for collection of information on practices associated with water supply and sanitation with a focus on gender relations.

The anonymity of the participants is a pre-condition of the research. Codes were created to identify respondents. To identify the community, the abbreviations BA were used for Barreiro Amarelo and VN for Seringal Vila Nova's residents, followed by the interviewee's number (sequential number given to each interviewee), which was followed by F when the interviewee was female and M when the interviewee was male, for example, BA01F; BA02M; VN01F; VN02M.

A total of 41 semi-structured interviews was analyzed in order to obtain more in-depth narratives of the residents on some topics of interest. Data were analyzed using the method of content analysis (Bardin, 2011). The procedures after transcription of the interviews were: (a) pre-analysis, sketchy overall reading of the interview transcripts to gather impressions; (b) reduction of the text to words and significant expressions articulating with the emerging themes for consolidation of categories analysis; and (c) treatment of results through inference and interpretation.

After identification of the themes, the related categories were created, as shown in Table 1. In category A, the criterion was to identify which functions related to water and sanitation would be carried out primarily by women and which would be performed by men. That division was proposed in order to find out who spends more time performing water- and sanitation-related activities in those specific contexts, and if the routine of women would change if they were not required to spend part of their time in water supply- and sanitation-related tasks. Category B sought to identify the main difficulties associated with absence and/or precariousness of water and sanitation services. Categories and themes identified were then analyzed with regard to their relationship with women's health, in order to highlight the extent to which absence or precariousness of these solutions impacts women's lives.

In compliance with Resolution No. 466/2012 of the National Health Council, this study was approved by the Ethical Committee of the Federal University of Minas Gerais, CAE 49966015.5.0000.5149, on January 15, 2016.

Table 1. Elements gleaned from the content analysis.

Categories	Themes
A – Division of labor	Water collection, transportation and storage Definition of water usage Technical maintenance of water and sanitation facilities Household hygiene and cleaning Time spent on tasks relating to water supply and sanitation
B – Absence of a sanitation solution	Open defecation Precarious hygiene Postponing the will to urinate/defecate

⁴ Coordinates and executes environmental management and sustainable production projects. Has contact with the inhabitants and conducts projects related to water and sanitation.

Results and discussion

The studied communities: contexts of vulnerability

Seringal Vila Nova is one of the 48 *Seringais*⁵ of Chico Mendes Extractive Reserve, in the municipality of Capixaba, Brazilian state of Acre, in the Amazon Region. The Seringal Vila Nova is 37 km of asphalt road plus 16 km of dirt road from the municipality of Capixaba. The dirt road ends on the Acre River, and across the river is Seringal Vila Nova, composed of about 80 families.

The village water supply relies on water sources next to the households, such as cacimbas (shallow wells) (Figure 2), nearby streams (Igarapé) (Figure 3), or the Acre river (Figure 4). The provision of water varies; either it is pumped to a water tank near the residence or it is collected manually in buckets.



Fig. 2. Cacimbas (shallow wells) where water is collected for bathing and washing clothes.



Fig. 3. Streams where the water is collected with a bucket for bathing and washing of clothes.

⁵ Preservation area for the latex extraction activity of the *Seringueira* tree or rubber.



Fig. 4. Water collected from the Acre River is stored.

Regarding sanitation, although in most households there is a dry cesspit, most residents opt for open defecation (Figure 5). Baths are taken directly in the Acre River or in streams, or even in a small room attached to the house, used exclusively for that purpose.

In addition to water supply and sanitation, other deprivations intensify the communities' vulnerability. Seringal Vila Nova has no access to electricity; some houses use solar panels for lighting. The residences are scattered throughout the Reserve, with an average distance of six to nine kilometers between them. Access and movement within the community is compromised during the rainy season due to flooding. The low income of its inhabitants and the distance from the city (about 53 kilometers) compromise access to basic services such as health and education. There are no health centers or any kind of medical care within the Reserve. There are two schools in Seringal Vila Nova, both up to the sixth grade of elementary school. Many children live in the home of relatives who live near the school due to the distances and difficult access; one resident said: *'you can't take it every day'* (VL06M). To continue their studies, young people have to move to nearby cities, such as Rio Branco or Capixaba. Households' livelihood practices are related to nut and latex extractivism, subsistence agriculture and livestock. Most families receive government assistance programs such as Bolsa Familia (R\$48 – approximately US\$12 per month) and/or Bolsa Verde (R\$300 every 3 months or R\$1,200 per year – approximately US\$72 every 3 months or US\$288 per year), and in some cases, this is the main source of monetary income.

The Barreiro Amarelo's community, in turn, has nine residences and 30 inhabitants altogether. It is situated about 30 km from Oliveira dos Brejinhos, the administrative center of the municipality, located in the state of Bahia, in the Northeast region of Brazil. The water is considered of better quality by residents and therefore the water used for drinking and cooking comes from a spring and is pumped to a reservoir located in the center of the community (Figure 6). From that point, residents manually collect the water in buckets to transport it to their homes. Because the spring is subject to rotation, also being used by other communities near Barreiro Amarelo, it is an intermittent source and therefore not able to fully meet the residents' demands. As a result, the community has contemplated the construction of a deep pit, whose water would be pumped to a high reservoir and distributed in taps installed in the backyards (Figure 7). However, the population of Barreiro Amarelo considers the deep pit water brackish,



Fig. 5. Little houses built on the cesspits.



Fig. 6. Community water cisterns used to reserve the water coming from the spring.

therefore it is used for other purposes than human consumption. Bathing takes place in private areas shrouded with sewn fabrics located in the backyards of houses (Figure 8). There is a practice of open defecation without covering feces.



Fig. 7. Left, pump house built above the deep pit. On the right, a faucet installed in the backyard of one of the houses, to where the well water is pumped.



Fig. 8. Locations used for bathing.

Some other features of the community contribute to its context of vulnerability. The Barreiro Amarello's community has no electricity. The only perennial source of income for some residents is government assistance programs such as Bolsa Familia (R\$48, approximately US\$12 per month). Two of its residents are retired and receive a minimum wage. Men in the community often engage in temporary informal work in the region. The low income of its inhabitants compromises access to staple foods and a varied and balanced diet. The main source of food is self-cultivated beans and cassava. However, given the environmental context in which they are placed, much of what is planted is not enough to feed the families due to frequent water shortages. Access to the community is compromised during the rainy season, because part of the road floods and the community is isolated. During this time, the children cannot go to school because it is in another community and the school bus cannot get through to pick them up. The nearest health center is approximately 20 km away in another rural community, where access is by dirt road only.

Lack of water supply: ‘Each person has a vocation’⁶

In category A, which addresses men and women’s roles regarding sanitary solutions, it is possible to identify a well-established division of tasks in both communities. Women generally perform activities related to routine household demands, including water collection, while men undertake household livelihood activities around the community, such as agriculture. An interviewee when asked about the labor division said:

‘My wife is the queen of the home, but if she goes to buy or sell something she has no vocation. When you ask, she does not know anything. Now, inside the house, to clean, watch over, make food ... that is what she’s good at. Each person has a vocation.’ (VN01M)

It is possible to infer that water management and looking after the house are women’s tasks and deeply rooted in the interviewees and this social reproduction has been going on for generations. The interviewees always reported their history when they were asked about the tasks related to water and sanitation (e.g., collecting and using water at home):

‘Because the man goes out to work. The woman stays at home, so she has to use more water.’ (BA01F)

‘Since I was a kid, I was collecting water. (...) I don’t know how many miles away, but it was far, I walked for more than an hour. I used to walk and carry it on my head. (...) It had to be early, or I couldn’t stand to it. Sometimes the kids would carry one bucket ... it eased the burden.’ (BA02F)

Very young girls assume tasks related to water supply. It is women’s daily responsibility to provide, treat, and store water. Also, they ascribe it for different uses, rationing it, and inspecting its quality when necessary. When they realize that water quality is not good for consumption, normally they use it for other purposes. In Barreiro Amarelo’s community, the reservoir with the best water quality available is about 750 meters from the farthest house. Women usually collect water in plastic containers or buckets, which they carry supported on the head or in their arms. Some rely on the help of children and use wheelbarrows to facilitate traveling and make the task less exhausting. They report collecting water in the morning and at the end of the day, when the sun’s rays do not affect them as much.

‘I carry [water] in the bucket. I carry 15 liters on my head. We carry the weight we can handle. (...) It is in the morning, early, at 7 o’clock.’ (BA03F)

After collecting the water, women store it in smaller containers, usually clay pots, to ‘keep it cool’ since there is no electricity in the community. They also treat it by retaining solids in cloth strainers or porcelain filters, or by adding some disinfectant prior to ingestion. Selection of treatment type depends on the appearance of the water collected. When questioned about treatment phases or types, men were unable to explain how it is performed, which indicates that this is not a task they master. On the other hand, with specific reference to the reality of Barreiro Amarelo’s community, it was possible to perceive that when the matter is the construction of alternative solutions and maintenance that

⁶ The expression used comes from an interview excerpt collected at Seringal Vila Nova.

requires labor for heavier jobs, then it is left to the community's men. Although it is also considered hard work, it is specific work. Men do not need to use time that could be dedicated to other daily tasks.

According to the World Health Organization (WHO), between 50 and 100 liters of water per person per day is needed to ensure that basic needs are met and health problems are minimized. The water average per capita, used daily, for bathing is 5–6 liters. For cooking and drinking, a bucket of 15 liters per day, per family, is used. To wash clothes and clean the house also uses a bucket of 15 liters. The demand for water may vary according to the tasks performed during the day, but it is noted that the minimum amount of water per capita per day recommended by WHO is not achieved in the community.

In Seringal Vila Nova, each family has only one water source, usually located near the house. Collection is by inserting a pump directly into the well or manually with a bucket. The task of providing water also falls to the women, except in situations where it is necessary to use a car, motorcycle, or cart to transport it, or when women for some reason, generally related to health, are unable to acquire it. An interviewee reported this exception:

'In those days I had surgery; I had a cesarean and my husband collected the water. But now I do it myself.' (VN02F)

In that context, one of the Seringal Vila Nova's residents affirmed that due to the exhaustion caused by the water-collecting process, they generally chose to use the nearest source, even if it was of worse quality. About the choice of water source, an interviewee reports:

'Up ahead there is a spring that has crystal clear water. We stopped collecting it there because it's so far; I'm alone at home and I do not have conditions to go and get it. So I collect water from the river and add potassium and chlorine when they are available.' (VN03F)

The WHO points out that the water source should be located at a maximum distance of 1,000 meters from the home and the collection time must not exceed 30 minutes. According to the UN (2010), water must have an acceptable color, odor, and taste for personal and domestic consumption. All water supply and sanitation facilities and services should be culturally appropriate and considerate of gender aspects, life cycle, and privacy. In situations such as those studied, the tenuous presence of the State compels the residents to provide their own water supply and sanitary solutions and, given the resources they have, the guarantee of basic rights identified in the HRWS is compromised.

Several studies point to the importance of the woman's role in relation to sanitation in rural areas, especially for water supply (Upadhyay, 2004; Brewster et al., 2006; Bennett et al., 2008; Stevenson et al., 2012; Shonsey & Gierke, 2013; Caruso et al., 2015; Silva, 2017). Because they are the ones responsible for water management in the home, women are those most impacted when water supply solutions are precarious or absent (Wutich, 2009; Stevenson et al., 2012; Kevany & Huisingsh, 2013; Hulland et al., 2015; United Nations, 2016). Sorenson et al. (2011) added that long routes with heavy buckets not only cause fatigue and decreased energy, but can also cause injury to the head and arms from carrying heavy buckets. Regarding the impacts, particularly on health, of inadequate water supply, most complaints are of intense physical exhaustion due to frequent water collection, which often limits women's participation in other productive activities. Other complaints are excessive exposure to the sun, pain in the legs, back, and arms and headaches. An emblematic example was given

by one of the interviewees who reported the occurrence of head wounds from the transport of buckets of water and explained how to use a cloth wrapped around the head in order to avoid them:

‘I used to go with my mother and my sister [to collect water]. I carried it on my head. I would take a cloth and make a hat to pad my head, otherwise we could not stand it. It used to bleed, if it was not for that [the pad] it would bleed.’ (BA03F)

During periods of drought, women go to water sources up to 10 kilometers from their homes, often encountering lines of people, in addition to transporting up to 18 liter buckets (Melo, 2010).

‘My back hurts because of the weight. I take the buckets [of water] from there below and come here to almost die. Today a neighbor said she would carry my water in the cart because I could not take [the bucket] on my back.’ (BA02F)

Besides the physical effects, it was possible to observe that the activities performed by women in the absence of adequate water supply and sanitation services also triggered psychological and emotional effects, impacting life quality. In the interviews, it was clear the feeling of anguish and concern related to the experience of living in a situation of water scarcity. The women feel guilty when they fail to provide enough water of adequate quality for their families. In the Northeastern region of Brazil, for example, there are reports of dehydration among women who deprive themselves so that other residents of the household, especially children, can consume it.

In all interviews, regardless of gender and community, whenever it was asked who was most impacted by the absence or precariousness of water supply and sanitation solutions, the answer was always the same: women. There are two female-headed households where the physical distress situation is even greater, since the women take on both domestic activities and the labor required for the family’s economic support. Stevenson *et al.* (2012) reported that water-related activities are clearly within the women’s responsibilities, and therefore they are more exposed to the stress resulting from those activities. A wide theoretical framework confirms the field findings relating the lack of sanitary solutions to stress (Wutich, 2009; Caruso *et al.*, 2015; Hulland *et al.*, 2015; Sahoo *et al.*, 2015). Regarding the time spent performing such activities, women responded that they could use the time better to rest, care for their children, and engage in other domestic tasks. The following quote is emblematic in this sense.

‘We spend at least half an hour to go and come when we collect water. (...) I could sleep a little more, wash clothes, take care of my children, go to the countryside ... When we carry the water we cannot do anything else, because it is very exhausting.’ (BA04F)

Wutich (2009) reiterates that women spend more time doing sanitation-related activities than men. However, quite often this time is not considered as a productive activity but only an extension of their obligations (Heredia & Cintrão, 2006; Butto & Dantas, 2011). This dual shift task of women is maintained as being essential to the family, but also results in a lack of time for their intellectual/professional formation and income generation for the family, in addition to the physical and emotional exhaustion that affects them.

Studies have shown that time spent by girls and adolescents to supply water jeopardizes their attendance at school, since it is not possible to reconcile the execution of those two activities

(Jasper *et al.*, 2012; Kansal *et al.*, 2016). However, in contrast to those studies, in both communities studied the burden of fetching water apparently does not fall disproportionately on girls and adolescents and they are spared from those tasks during school hours. The interviews also revealed that families acknowledge that education is crucial for life-changing chances. As a result, adult women increase water fetching trips when their daughters are unavailable due to school attendance. Although water supply and sanitation are not constraining factors, school access in the surveyed communities is limited by distance, lack of transportation, and poor roads.

However, both directly and indirectly, tasks are essentially and predominantly performed by women and may jeopardize access to other rights, such as to education and health, especially among women (United Nations, 2016). Caruso *et al.* (2015) highlighted that the availability of sufficient drinking water means not only better health and dignity, but also frees women to dedicate themselves to economic opportunities and to improve knowledge. The big difference is that the activities performed by men are specific while those of women are daily, causing chronic impacts on women's lives and health. Sanitary solutions that take into account different needs or public policies that encourage the equal division of tasks could bring about significant changes to improve women's quality of life.

Lack of sanitation: deprivation triggering stress

Both analyses of the qualitative data generated and other studies on the subject reinforce the observation that women are the most affected when sanitation solutions are precarious or nonexistent (Stevenson *et al.*, 2012; Kevany & Huisingh, 2013; Hirve *et al.*, 2015; Hulland *et al.*, 2015; Kansal *et al.*, 2016; Caruso *et al.*, 2017). It was found that women from both locations are clearly more affected than men by the absence of toilets and other sanitation systems – such as drainage from sinks and tanks. In Barreiro Amarelo, where there is no water or sanitary facilities, all residents resort to open defecation. Although there are pit latrines in Sengal Vila Nova, a significant proportion of the residents still practice open defecation. There are several factors that influence selection of the woods to the detriment of using another sanitary solution, when available. It was possible to perceive that if a woman does not feel comfortable using the available sanitation solution, she tends not to clean the place and also discourages its use by the other residents of the household, making the available solution useless. The bad smell resulting from poor solutions and constructions that do not have adequate ventilation were the main reasons to waive toilet use mentioned by the interviewees:

'We defecate in the woods because it is more comfortable ... this toilet stinks a lot.' (VN02F)

Many studies show that the use of the pit latrine is still more common among women compared to men, because it is a solution that provides greater privacy and safety and, in some cases, even comfort, factors that are determinant for selecting the location to defecate (Kwiringira *et al.*, 2014; Simiyu, 2016). According to Reddy & Snehalatha (2011), the issue of privacy affects women more strongly both on account of their physical constitution and social constructions that emphasize guilt and shame. Brazilian Christian culture may exacerbate this inequality. In Barreiro Amarelo, the issue of honor was well emphasized when women reported choosing wearing skirts to provide a little privacy when they were defecating or urinating in the bushes.

'It is even more complicated for the women wearing shorts. Sometimes we wear a skirt or a dress so it's better for us to squat, right? Sometimes a person comes by and does not even realize what we're doing.' (BA06F)

Fear is also an intervening factor when entering the woods, especially at night. It is common for women to deprive themselves of satisfying their needs at night and wait until dawn to urinate and defecate. In houses where there are no men, they use a pot – containers such as PET bottles and other recycled plastic containers – to avoid leaving the house at night. While men go into the woods whenever they have the need to urinate and defecate, women often rely on companionship, most often from their husbands:

'When I go, my husband goes with me. I'm not going alone, no. I call, and he has to get up!' (BA02F)

Among the issues that prevent women going alone into the woods to defecate or urinate are the fear of animal attack, fear of strangers, and of people who have died. Rain also complicates open defecation and many residents abstain from defecating and/or urinating when it rains:

'It's more complicated. When it is raining and we don't go.' (BA07F)

There were also greater difficulties experienced by old or sick people, who, with great difficulty, deal with the lack of sanitation.

In Seringal Vila Nova, although during the interview no fear or restraint was reported of going into the woods or the pit latrines furthest from the houses, one of the residents recommended that the researchers relieve themselves in a bucket instead of going out to urinate or defecate, showing a certain fear of leaving the house at night:

'Until now it is with company. (...) we are afraid of animals.' (BA04F)

'I'm afraid! Of dead people. Of those who have already died.' (BA02F)

Not less important, the issue of menstruation is also delicate, since in the woods women do not have running water for their own hygiene and often also do not use toilet paper or have access to trash cans. This issue was reported with shame and discontent by the interviewees, especially in Barreiro Amarelo:

'I have to go in the woods several times because I need to change the sanitary pad. And at night it is even worse.' (BA05F)

According to the UN (2010), everyone has the right to safe and adequate sanitation. The premises must be located where physical security can be guaranteed. This means that toilets must be available for use at any time of day or night and must be hygienic; water and waste solids should be disposed of safely and the sanitary facilities must have a solid construction. Services should ensure privacy and water points should be positioned to allow personal hygiene, including menstrual hygiene, to be exercised. But as noted in this study, all these prerogatives are violated. The sanitary solutions adopted do not guarantee the basic needs of the residents, especially of women who have different needs from

men. In addition, women and girls, especially the poor and those living in rural areas, should receive special attention through policies so that progress towards gender equality can be achieved (United Nations, 2016).

Conclusions and recommendations

This study shows that division of tasks related to water supply often intensifies women's daily work and can compromise other tasks, such as education and leisure, taking up much of their time and making them more susceptible to negative impacts on their health and quality of life. That division, in addition to the socio-environmental vulnerabilities, makes it difficult for women to properly enjoy their HRWS. In both contexts investigated, lack of adequate sanitation facilities jeopardizes basic requirements for the HRWS, such as privacy and dignity, especially among women. In addition, other human rights standards are in conflict with the reality studied, such as availability, physical and financial accessibility, quality, safety, and acceptability.

These findings highlight the need to recognize the important role of women in activities related to water and sanitation and their related impacts. Tasks related to lack of water supply and sanitation solutions in rural areas of Brazil also underscore the urgent need to discuss how men and women have been educated, taking into account the social construction of gender and its negative impacts on women's lives and what can be done to ameliorate such glaring differences. Overcoming this reality can only be achieved through public policies that recognize and address, and do not amplify, the role of women. Awareness of a more egalitarian division of culturally established responsibilities is needed.

In this sense, the National Program of Rural Sanitation (PNSR) is an example of policy initiative that not only recognizes the fundamental role played by women in relation to water supply and sanitation activities, but also has within its scope clear guidelines and strategies aimed at empowering women, reaffirming and encouraging their participation in the workplace, prioritizing the fulfillment of their demands, and indicating a more equitable division of tasks.

The naturalization of these 'women considered activities' should involve society as a whole, revealing the need for changes in the social structure of the country. It is therefore necessary to identify the root causes of those differences and to dismantle the cultural barriers, so that women can enjoy their human rights in an equal manner to men. Laws and policies that are neutral may be discriminatory to women, once considering men and women have the same rights and needs – in the case of water and sanitation – means (not only in the case of this particular study) violating the principle of non-discrimination and equality (United Nations, 2016).

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Supplementary material

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