Basic Sanitation and Health - Challenges and Perspectives in Brazil and Brazilian Federal District

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Abstract

Basic sanitation has been considered an important environmental determinant of health. Mainly related to the services of drinking water availability, solid waste management, sanitation problems are aggravated by the unplanned growth of urban centers, affecting an important part of the total disease burden in the world. The Sanitation Ranking prepared by the Trata Brazil Institute (2020) was used as the basis for the studies presented here taking into account the data from the SNIS (National Sanitation Information System – Ministry of Regional Development, Brazil), which were consulted for the 100 largest Brazilian municipalities, in terms of inhabitants, in the year 2018. 27 out of the 100 largest municipalities in Brazil have 100% total water service, that is, they have universal water service. Only one municipality has 100% sewage collection (Piracicaba –SP). 14 municipalities have a sewage collection rate greater than or equal to 98%. The average indicator of sewage treatment in the municipalities is 56.07%, that is very worrying. According to SNIS 2018, the national average for the treatment of generated sewage is 46.3%; that is, the average of the 100 largest municipalities in the study is higher than the national average. However, in both cases, the indicator is at a very low level, pointing to an area whose challenges to be overcome are great. The Brazilian capital' city (Brasilia, Federal District of Brazil) in the sanitation is ranked 27th among Brazilian capitals based on data from the National Sanitation Information System (2018). The new Basic Sanitation Legal Framework, signed on July 15, 2020 has as its main objective to universalize and qualify the provision of services in the sector. The Federal Government's goal is to achieve universal access by 2033, ensuring that 99% of the Brazilian population has access to drinking water and 90% to sewage collection and treatment. The expectation is that the universalization of water and sewage services will reduce annual health costs by up to 290 million USD.

Key words: Basic sanitation; Water; Sewer; Health; Brazil; Federal District.

INTRODUCTION

Sanitation is a set of measures that aims to preserve or modify the conditions of the environment in order to prevent diseases and promote health, improve the population's quality of life and the individual's productivity, and facilitate economic activity (Manual do Saneamento, Instituto Tratabrasil, 2012)

One of the principles of Law no. 11,445 / 2007 (January 5, 2007, Casa Civil, Presidency of the Republic, Brazil) is the universalization of basic sanitation services, so that everyone has access to a quality water supply in sufficient quantity to their needs, to the collection and proper treatment of sewage and waste, and the correct management of rainwater.

The World Health Organization (WHO) points out the following data:

• In 2017, 45% of the global population (3.4 billion people) used a safely managed sanitation service.

• 31% of the global population (2.4 billion people) used private sanitation facilities connected to sewers from which wastewater was treated.

• 14% of the global population (1.0 billion people) used toilets or latrines where excreta were disposed in situ.

• 74% of the world population (5.5 billion people) used at least one basic sanitation service.

• 2.0 billion people still lack basic sanitation facilities, such as bathrooms or latrines.

• Of these, 673 million still defecate outdoors, for example in gutters, behind bushes or in open water courses.

• At least 10% of the world population is believed to consume food irrigated by wastewater.

• The cultivation area in peri-urban areas irrigated by untreated urban wastewater is estimated at approximately 36 million hectares (equivalent to the size of Germany).

• The lack of sanitation is linked to the transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid and polio and exacerbates short stature.

• Poor sanitation reduces human well-being and social and economic development due to impacts such as anxiety, risk of sexual assault and missed educational opportunities.

• Inadequate sanitation is estimated at 432,000 deaths from diarrhea annually and is an important factor in several neglected tropical diseases, including intestinal worms, schistosomiasis and trachoma. Poor sanitation also contributes to malnutrition.

In 2010, the UN General Assembly recognized access to safe and clean drinking water and sanitation as a human right and called for international efforts to help countries provide safe, clean, accessible and cheap drinking water and sanitation.

Goal 6.2 of the Sustainable Development Goal requires adequate and equitable sanitation for all. The goal is tracked with the "safely managed sanitation services" indicator – use of a type of improved sanitation facility that is not shared with other families and from which the excrement produced is safely treated on the spot or transported and treated off site.

Sanitation and health

According to WHO (2015) about 827,000 people in low and middle income countries die as a result of inadequate water, sanitation and hygiene each year, representing 60% of the total deaths from diarrhea. Poor sanitation is believed to be the main cause of about 432,000 of these deaths.

Diarrhea remains a major cause of death, but it is largely preventable. Better water, sanitation and hygiene could prevent the deaths of 297,000 children under the age of 5 each year.

Open defecation perpetuates a vicious cycle of disease and poverty. Countries where open defection is more widespread have the highest number of deaths of children under 5, as well as the highest levels of malnutrition and poverty and wide disparities in wealth.

According to data from the Ministry of Cities, the coverage of treated water in Brazil is 83.6%, which means that 35 million Brazilians do not even receive drinking water at home. With the sewage collection, the situation is more critical: not even half of the population (43.4%) has access to the system, that is, more than 100 million Brazilians throw the waste directly into rivers, pits or soil.

According to the United Nations Children's Fund (Unicef), every 15 seconds, a child dies from diseases related to the lack of drinking water, sanitation and hygiene conditions in the world.

A study by the Trata Brasil Institute (2020) showed a direct relationship between the scope of the sanitary sewage service and the number of hospitalizations for diarrhea, especially for factors related to the availability of drinking water, food poisoning, inadequate hygiene and cleaning of water reservoir tank.

This close relationship between “disease and lack of sanitation” affects the Brazilian constitutional right in two main spheres: the right to health and the right to sanitation.

The lack of sanitation is a problem commonly referred to in Brazil and contributes to the emergence of morbidities and even fatalities in our country, especially diseases associated with poverty such as intestinal parasites (PAIVA and SOUZA, 2018).

The World Health Organization recommends that actions to tackle this public health problem are aligned with the improvement of environmental conditions (WHO, 2012).

Basic sanitation, in addition to a sanitary and public health issue, is a matter related to the urbanization of social spaces. Brazilian cities have been subject to unbridled growth and without planning, which implies a series of deficiencies and demands public policies that conform to the forms of construction of cities arising from the urban expansion process.

Basic sanitation has been considered an important environmental determinant of health. Mainly related to the services of drinking water availability, sanitation and solid waste management, sanitation problems are aggravated by the unplanned growth of urban centers, currently affecting an important part of the total disease burden in the world. In this context, it is estimated that about 10% of the total volume of diseases could have been prevented by improving sanitation conditions (Oliveira, 2015).

Exposure to environmental risk factors, such as housing, water and sanitation conditions, is closely linked to social determinants of health. Less developed regions, with lower per capita income and education level, for example, have greater sanitation deficits. Another factor that can influence the coverage of sanitation services is the process of unsustainable urbanization, which provides an increase in housing in places without adequate infrastructure.

Although both the availability of drinking water and the extent of sanitary sewage have increased in recent decades in Brazil, the inefficiency in basic sanitation networks and inequalities in the availability of these services still represent an important field of action for public health policies. In 2013, the National Basic Sanitation Plan was published, which established goals for 2018, 2023 and 2033, with the objective of reducing the deficits present in sanitation services and with a view to universal water supply, collection sewage and garbage.

The deficiency in basic sanitation services in the residence is related to the increased susceptibility of individuals to Diseases Related to Inadequate Environmental Sanitation (DRIES). Among the main diseases associated with environmental sanitation conditions are diarrhea and dengue, responsible for more than 93% of hospitalizations for DRIES between 2001 and 2009 in Brazil. In 2013, there were significant rates of hospitalization for diarrheal diseases in the city of Belo Horizonte, with a mortality rate equal to 1.57 per 100,000 people. Dengue is another disease that has been a major public health concern, and there is an increase in its occurrence in cities such as Porto Alegre and Rio de Janeiro. The increase in the incidence of these diseases, in turn, has the ability to significantly influence the quality of life and health conditions of the population (Paiva and Souza, 2018).

In view of the above, this work proposed to summarize the situation on the relationship between basic sanitation and health issues in Brazil, particularly in the country's capital, and the challenges that arise.

METHODOLOGY

The Sanitation Ranking prepared by the Institute Trata Brazil (2020) was used as the basis for the study presented here, taking into account the data from the SNIS (National Sanitation Information System - Ministry of Regional Development, Brazil), which were consulted for the 100 largest Brazilian municipalities in terms of inhabitants in 2018.

The database gathers information from state, regional and municipal service providers for access to water, sewage collection and treatment, and solid waste. The information computed by the SNIS is self-declared, that is, it is presented by the service providers themselves.

RESULTS

Analysis of indicators

Coverage Level Water Access

This indicator shows what percentage of the municipality's total population is served with water supply. 27 municipalities in the 100 largest in Brazil have 100% total water service, that is, they have universal water access. 18 municipalities have service values above 99%, being, in practice, very close to universal access. The minimum that a municipality has for water service in 2018 was 32.63%, which is the case of Ananindeua (PA). In the previous year, 2017, the lowest index found was 31.78% in Porto Velho (RO), which in 2018 had an indicator of 35.26%.

Sewage Collection

This indicator shows what percentage of the total population of the municipality has its sewage collected. Only one municipality has 100% sewage collection (Piracicaba –SP). 14 municipalities have a collection rate greater than or equal to 98% and can also be considered universal. The minimum population served with sewage collection service is 2.05% in the municipality of Ananindeua - PA.

The municipalities' average collection indicator is 73.30%, slightly more than the 72.77% observed in 2017. The total average for Brazil reported in SNIS 2018 is 53.2%.

Treated Sewage Index Referring to Water Consumed

This indicator shows, in relation to the water consumed, what percentage of the sewage is treated.

The average indicator of sewage treatment in the municipalities is 56.07%, that is, very worrying. According to SNIS 2018, the national average for treatment of generated sewage is 46.3%, that is, the average of the 100 largest municipalities in the study is higher than the national average. However, in both cases, the indicator is at a very low level, pointing to an area whose challenges to be overcome are great.

Nineteen of the 100 largest Brazilian municipalities treat 20% or less of their sewage. Only 26 municipalities treat at least 80% of the sewage they produce. Thus, among the coverage level indicators, it is the sewage treatment that is farthest from universalization in the sample municipalities, proving to be the main bottleneck to be overcome.

In general, the Sanitation Ranking presented by the Trata Brazil Institute for the year 2020 (SNIS 2018) indicates that of the 20 best municipalities, 10 are in the state of São Paulo, including the city of São Paulo itself, which has 12,176,866 inhabitants (IBGE 2018). Most of the municipalities with the best conditions for basic sanitation are in the south and southeast of Brazil, and the worst in the north and northeast and central part of Brazil.

SITUATION OF SANITATION IN THE CAPITAL OF BRAZIL, BRASÍLIA - DF

Located at 1,130 meters above sea level, Brasília has the following geographical coordinates: Latitude: 15 ° 46 '48" South, Longitude: 47 ° 55' 45" West (Figure 1).

The country's capital, Brasília - DF, occupies an outstanding position in the list of the 100 most populous municipalities in Brazil due to its important population, 2,914,830 inhabitants (IBGE, 2015), being ranked in fourth place, just behind São Paulo, Rio de Janeiro and Salvador.

The Federal District traces its peculiarities in a different way, as it addresses a region whose urbanization was planned to receive the country's capital, and which, as a result of this decision, ended up being characterized by the predominance of economic activities, preferably directly or indirectly related to the public administration.

According to CODEPLAN (Federal District Planning Company), Brasília was planned as an organized city. Opened on April 21, 1960, after 1,000 days of construction.

The urban plan for the Federal District, most commonly “Plano Piloto”, was developed by Lúcio Costa and the architect Oscar Niemeyer. It was a milestone in the history of architecture and urbanism, and in December 1987, the capital was listed by UNESCO as a Cultural Heritage of Humanity.

Although the Federal District was a city designed under modern standards, the fact that it has accelerated growth, going from almost no population to almost 2.5 million (IBGE, 2010) in less than 50 years, has extrapolated population forecasts. This caused, in addition to invasions and uncontrolled urbanization in several areas, enormous social inequalities.

In the Federal District, the legal and institutional framework that governs the provision of water supply and sewage services, as well as their related areas, follows the guidelines of the Federal Government. The sanitation policy is the responsibility of the Secretariat for Urban Development, which is linked to the "Companhia de Saneamento Ambiental do Distrito Federal - CAESB". The regulation of the management of water resources and sanitation services occurs through a single body, the "Federal District Water and Sanitation Agency - ADASA". This body is responsible for regulating, controlling and inspecting the quality and quantity of surface water bodies in the territory of the Federal District, as well as water supply and sewage services.

In 1998, the "Integrated Development Region of the Federal District and Surroundings - RIDE" was created, with the objective of establishing an institutional mechanism designed to assist the public power in dealing with regional issues. The RIDE region covers an area of 55,400 km, comprising the Federal District itself and twenty-two municipalities, two of which are from the State of Minas-Gerais and 20 from the State of Goiás. It involves actions at three levels of government: i) Federal, through the Ministry of National Integration; ii) State, through the states of Minas Gerais and Goiás and the Federal District; and iii) Municipal, with the participation of twenty-two municipalities.

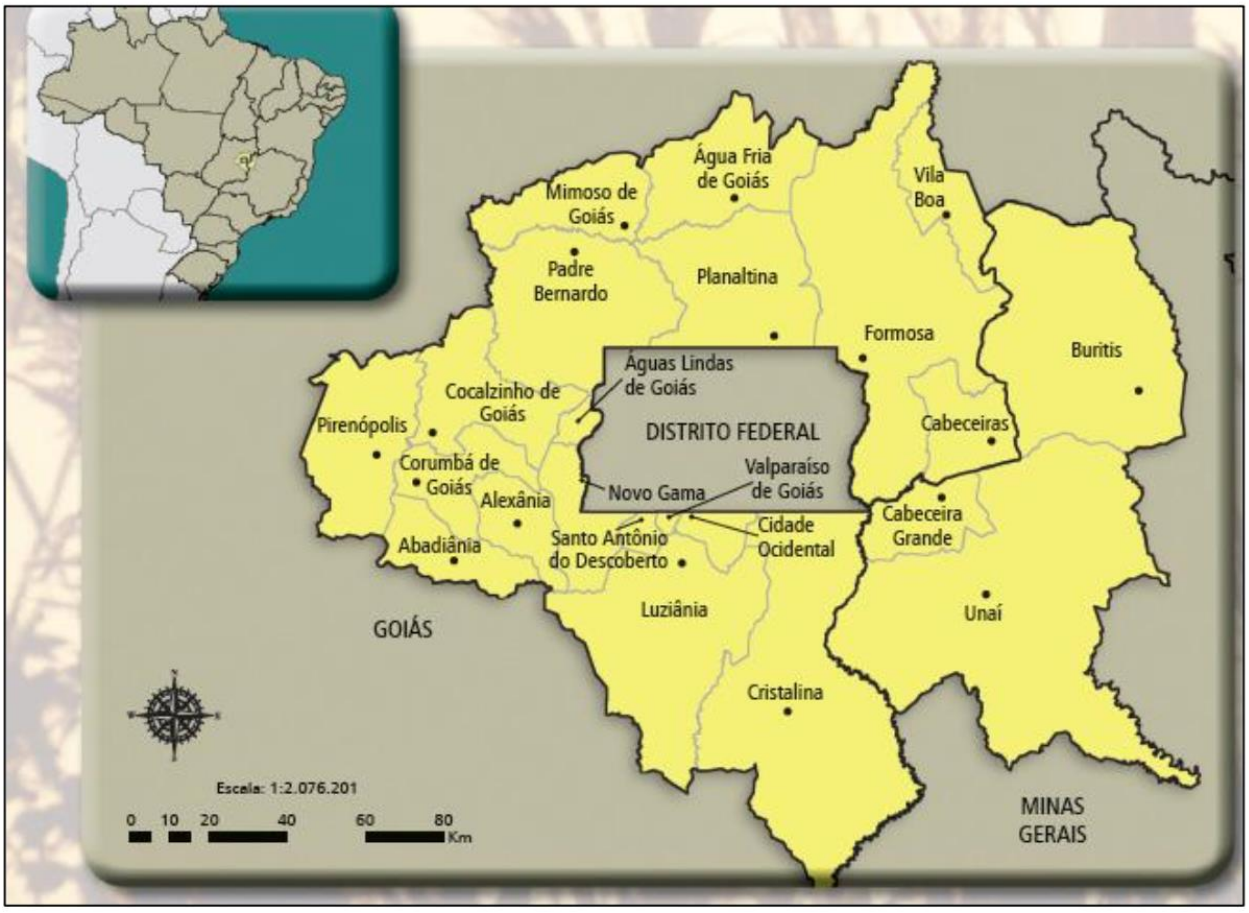

Figure 1. Location of the Federal District.

Figure 2. Health Regions - DF, 2016. Source: PDS / DF, 2016.

Sanitation

Based on data by service providers and also on the general results of the PDAD (DF, 2013), carried out by CODEPLAN, which covered the 31 Administrative Regions and 7 Health Regions (see Figure 2), with regard to data related to the infrastructure available for basic sanitation services that households and the urban population of the Federal District have, the high percentage of households served by the services stands out.

The coverage of water supply in DF, by general network, is 97.82%. Virtually all households have an urban garbage collection service. With a lower percentage, but still considered high in terms of care, 85.95% of households have a general sewage network with treatment. Some regions of more recent creation, notably high income, are generally served by septic tanks due to the low density. As for urban infrastructure served by a rainwater network, 85.71% of the urban population has this service. As a complementary information, the electricity network is present in 99.66% of the households.

With regard to solid waste, there is currently a great concern with the Landfill of the Jockey, because environmental impacts caused by the inadequate disposal of waste, potentiate alterations in the quality of the soil, air, and surface and groundwater, with effects on the environment fauna and flora, and on public health (disease proliferation).

The problem of urban households having the rainwater network infrastructure is that an inefficient rainwater drainage system can cause flooding and the superficial transport of waste, thus contributing to the proliferation of diseases. Another aspect is that there is no rain network, the population erroneously releases rainwater into the sewer pipe, causing serious risks of clogging and return of sewage to the homes.

Water supply

Public water supply services in the Federal District are provided by CAESB.

According to SNIS data, in 2015, the urban water service index in the Federal District reached 98.98%

Most occupied households, 78.25%, consume filtered drinking water and 8.85% consume mineral water. In addition, it is worth noting that 12.90% of households still did not have a filter, a situation notably verified in lower income places such as Varjão and SCIA / Structural. The data is worrying due to the consequences for the health of the population.

Administrative regions whose locations do not have a filter for drinking water, may be ingesting contaminated water, which can lead to various health problems, such as diseases ranging from repeated diarrhea to cholera, hepatitis and leptospirosis.

Sewerage

CAESB is responsible for sewage services in the Federal District. According to SNIS data, in 2015 the urban sewage service index for municipalities served with water reached approximately 84.51%.

Among the 31 Administrative Regions (RAs), Cruzeiro and Sudoeste / Octogonal stand out with 100% sewage by general network. However, most recently created RAs, notably high-income, are mostly served by septic tanks such as Vicente Pires (82.55%), Jardim Botânico (78.20%) and Park Way (73.09%). RA Fercal, notably low-income, is served by a septic tank (45.11%) and a rudimentary tank (47.78%).

In other places, septic tanks or rudimentary cesspits are used, often without inspection control. There is also a percentage with open sewage.

The percentage not attended is related to households in regions subject to regularization and irregular, low density regions (such as Park Way), remote areas and regions with network implantation works (such as Vicente Pires).

Urban cleaning and solid waste management in the Federal District are coordinated by the Urban Cleaning Service of the Federal District, subordinated to the State Secretariat of Infrastructure and Public Services of the Federal District, covering collection, treatment activities and final destination of household, commercial and hospital waste.

The collection service and proper disposal of waste has grown considerably in recent decades and, consequently, practices such as burning of waste (incineration) have been decreasing.

According to SNIS (2018), the coverage rate for the collection of Household Solid Waste in relation to the urban population is 100%.

The Jóquei Landfill has been used as an area for the final disposal of waste on the ground, which currently receives 100% of the waste collected in the Federal District.

The non-existent and adequate infrastructure for the final disposal of solid waste in the soil can cause several impacts on water, which is of concern, especially in view of the possibility of contamination of groundwater by leachate through infiltration into the soil.

Since the region's water sources are frequently used by local inhabitants and are part of an important hydrographic basin in the Federal District (the Lago Paranoá Basin), this situation ends up becoming increasingly critical.

The Jóquei Landfill has become a major focus of environmental degradation and a center of social conflict motivated by occupation in its surroundings by precarious housing inhabited by recyclable material collectors, homeless people and invaders.

Occupying an area of about 200 hectares, one of the most discussed issues is regarding its location bordering the Brasília National Park and the environmental impacts triggered by the percolated waters. We also observe the presence of recyclable material collectors who work without a formal relationship with the municipality, in a degrading way, being victims of numerous accidents, including fatal ones.

It can be said that the situation of Jóquei Landfill is still very precarious and incompatible with the pattern and importance of the Federal District in the national context.

Currently, it is planned to implement a new landfill in the Federal District, called Aterro Sanitário de Brasília.

In addition, clandestine waste disposal points have been identified, which require intervention, and their removal and final disposal in an appropriate location is recommended whenever possible.

Sanitary conditions

General information on pollution conditions of water resources in the Federal District

According to ADASA (2016a, b, c) the main causes of pollution of water resources are correlated to the polluting loads resulting from the deficit in sanitary sewage and rain, urban and rural drainage. Data on land use and occupation of hydrographic basins, indicate that there is also contamination of water by diffuse pollution, mainly by agricultural activities, such as pesticides and fertilizers.

Occurrence of waterborne diseases

WHO (2015) data indicate that about 85% of known diseases are waterborne.

The Table 1 below presents data referring to the number of registered cases of epidemiological diseases over the years 2008 to 2016. Documents published by SES / DF were consulted.

TABLE 1. History of cases by type of epidemiological diseases. Source: SES/DF 2018.

Type of diseases	Year (number of cases)								
	2008	2009	2010	2011	2012	2013	2014	2015	2016
Venomous animals	412	482	549	681	787	1.204	1373	-	-
Cholera	0	0	0	0	0	0	0	1	-
Dengue	3.411	1.982	20.332	6.985	3.669	18.016	17.772	11.009	18.187
Exathematic	723	321	204	186	127	99	133	-	-
Schistosomiasis	9	9	3	6	3	-	-	-	-
Yellow Fever	72	20	27	19	10	-	-	-	-
Chikungunya Fever	-	-	-	-	-	-	-	153	703
Hepatitis B	-	199	155	138	132	168	151	-	-
Hepatitis C	-	239	210	213	198	146	156	-	-
Leptospirosis	59	-	29	10	16	26	17	23	-
Malaria	-	-	-	-	36	-	-	-	-
Meningitis	30	60	42	20	18	20	14	9	-
Accidental Tetanus	0	1	0	2	0	0	1	1	-
Zika virus	-	-	-	-	-	-	-	3	732

Another relevant issue, becoming detrimental to the health of the population, is the consumption of unfiltered water, as the population may be ingesting contaminated water, which can lead to various health problems, such as diseases ranging from recurrent diarrhea to cholera, hepatitis and leptospirosis.

Water-borne diseases belong to the group of Infectious and Parasitic Diseases (IPD). Contaminated water usually causes infectious intestinal diseases characterized by diarrhea.

Contact with untreated sewage can cause diseases such as typhoid fever, paratyphoid fever, cholera, hepatitis A, amebiasis, giardiasis, leptospirosis, polio, virus diarrhea, among other diseases.

With regard to the urban cleaning and solid waste management system, disposal to the environment can cause damage, especially to public health, since it may constitute a breeding ground for aedes aegypti mosquitoes, which transmit the dengue, Chikungunya and Zika, when contaminated.

As for rain drainage, in times of rain, it is common flooding that can bring adverse consequences to the population. This fact can be aggravated by the drainage system if there are sizing problems related to it. Runoff waters can often be contaminated, since they leach the soil and can come into direct contact with poorly managed solid waste and irregular sewage system networks. That is, these conditions can drag oocysts and contaminate people, as for example in the case of toxoplasmosis.

In the period 2008-2014, the main causes of mortality from IPD in the population of children under 5 years of age in the Federal District, were bacterial diseases, infectious intestinal diseases, diarrhea and gastroenteritis.

The Federal District occupied the 1st position, in 2010, in relation to the 27 Brazilian federative units according to the Municipal Human Development Index (MHDI). Besides, the Federal District stands out with respect to economic aspects, as it has the highest Human Development Index (HDI) in the country. However, it is important to note that there is a great socioeconomic inequality between the inhabitants. Another negative aspect is the disorderly urban expansion.

One of the biggest problems found in the Federal District is the disorderly occupation of land, that is, non-regularized households. Thus, the parameters of land use and occupation are essential factors for adequate management for sustainable development.

The accelerated population growth and its high concentration contributed to the aggravation of the problems faced in the Federal District with the occupation in areas of environmental protection (APP) (water courses such as rivers banks, lakes, streams, springs, etc.). In such a way, the main environmental problems resulting from large-scale urban development in the Federal District, are correlated with the process of population growth and urban expansion and are well deserved, as well as in several other Brazilian cities, as they did not adequately follow the demand basic services of the population, such as housing, basic sanitation and public leisure areas.

These problems were intensified by the lack of implementation and planning of basic sanitation services that includes the collection, treatment and final destination for the sanitary sewage system, stormwater drainage and management, and solid waste management in an integrated manner, thus preventing degradation of water courses caused mainly by pollution and erosion with silting of the bed of water courses, one of the main socioenvironmental problems today.

It is important to highlight that in the question of the environmental issue, with the objective of solving or at least minimizing the problems caused by anthropic intervention to the natural environment. Due to the

lack of awareness of the population and the absence of urban planning, must, at present, be emphasized by means of public policies, specific legislation and mainly to put environmental education into practice, as mentioned in art. 225o, § 1, item VI of the Brazilian Federal Constitution of 1998 "to promote environmental education at all levels of education and public awareness for the preservation of the environment" (JACOBI, 2003).

As for the units with deficits in basic sanitation, it basically involves demands for lack of infrastructure. The District Housing Plan of Social Interest (PLANDHIS) considers inadequate housing "because it presents excessive density, inadequate coverage, lack of health facilities or other characteristics that point to the need to qualify the Housing Unit".

According to data from CODEPLAN and analyzing the data obtained from PLANDHIS (DF, 2012), it can be seen that there was a decrease by number of households without bathrooms in the Federal District, in which only 560 (0, 07%) households do not have a bathroom and 53.24% have a bathroom, 29.25% two bathrooms and 17.44% three or more bathrooms.

Health

The diagnosis of the population's health situation addresses the perspective of basic sanitation and the integrated management of solid waste as a promotion and prevention of diseases. For that, the following information was raised.

Morbidity is the state of being symptomatic or unhealthy for a disease or condition (Hernadez and Kim, 2020).

Within epidemiology, the relative rate of patients with a specific disease is called morbidity or morbidity compared to the number of non-sick inhabitants at any given time, collecting statistical data on individuals who fall ill of the same disease at defined intervals of time and in determined areas, whether regional, municipal, state or national. With this, data are obtained regarding the behavior of diseases and their implications for the health of a population as a whole.

With emphasis on the morbidity of diseases related to the lack of basic sanitation, more specifically, infectious and parasitic diseases, the occurrence of 4.33% of the total hospital morbidity by the Unified Health System (Sistema Unico de Saúde - SUS) is verified, highlighting the percentage of 16.33% for children under 1 year old and 15.79% from 01 to 04 years old. Source: Ministry of Health - SUS Hospital Information System (SIH / SUS), 2016.

From the data on hospital morbidity due to DIP in the Federal District, according to the second year of occurrence, in the period 2008-2016, it can be seen that bacterial diseases have an increasing trend since in 2008 there were 132 hospitalizations and in 2016, there were 163 cases reported.

Among the diseases with some DIP with 62.75% are related to intestinal infectious diseases (22.00% - diarrhea and gastroenteritis of presumable infectious origin), followed by other bacterial diseases (20.92%) and other fevers due to arboviruses and fevers hemorrhagic by virus (19.83%).

It appears that infectious intestinal diseases (diarrhea and gastroenteritis of presumable infectious origin) are found mainly in children under 1 year old (36.36%) and from 01 to 04 years old (48.72%) these diseases are related to the lack of adequate basic sanitation.

DISCUSSION

Basic sanitation in Brazil is defined by Law 11,445, of January 5, 2007 “as the set of services, infrastructures and operational facilities for the supply of drinking water, sanitary sewage, urban cleaning and solid waste management, rainwater management and urban drainage”.

Understanding this concept is possible due to the relationship that these factors have among themselves. It is common that floods spread pollution and transmit diseases through dirty water, in addition to interrupting the supply of drinking water to certain regions, for example. On the other hand, deposits of solid waste in improper conditions and locations contaminate several areas, be it soil or water, impairing the future use of these components and causing even greater complications by obstructing drainage networks and proliferating vectors. There are also cases where the sanitary sewage without proper treatment and maintenance ends up contaminating rivers, lakes and others.

Thus, the quality of life and health of citizens is directly linked to better conditions of basic sanitation. Under expected conditions, sanitation contributes to social, cultural and economic development. In the same way urbanization and the growth of cities impact on the health conditions of a region requires that its infrastructure keep pace with developments and new scenarios.

However, most cities are being occupied without following regulations and growing in a disorderly manner, also deteriorating the conditions of basic sanitation in that region. For this reason, public policies regarding basic sanitation have the duty to regulate the management of all processes related to this area.

Still following this north, according to the National Basic Sanitation Law of 2007, sanitation policies must “be linked to other policies to promote sustainable urban development, achieve adequate levels of health, reduce poverty, improve the quality of housing and live together in harmony with water resources and the environment”.

According to Instituto Trata Brasil (2020), "basic sanitation is one of the necessary conditions for the quality of life of a population and its absence compromises people's health and well-being".

Data from the World Health Organization (WHO, 2008), indicate that the lack of basic sanitation is one of the main causes of infant mortality in Brazil, caused by parasitic and / or infectious diseases.

Since the Ottawa Conference in 1986, the concept of Health Promotion proposed by WHO, is seen as the guiding principle of health actions worldwide. Thus, it is assumed that one of the most important determinants of health is environmental conditions.

According to studies carried out by the World Bank, it is estimated that approximately 30% of the occurrence of diseases in developing countries is responsible for the inadequate domestic environment. Diarrhea, Tropical Diseases and Worms: Lack of sanitation, water supply, hygiene.

Water-related diseases can be grouped as follows:

Transmitted via the fecal-oral route (food contaminated by faeces): Leptospirosis Amebiasis, Infectious hepatitis, Diarrhea and dysentery, such as cholera and giardiasis. Associated with water (part of the life cycle of the infectious agent occurs in an aquatic animal: Schistosomiasis.

Transmitted by vectors that relate to water: Malaria, Yellow Fever, Dengue and Elephantiasis.

Diseases Related to the Absence of Sewer:

Fecal-oral (non-bacterial): Poliomyelitis, Hepatitis type A, Giardiasis, Amoebic dysentery, Diarrhea due to viruses.

Fecal-oral (bacterial): Typhoid fever, Paratyphoid fever, Diarrhea bacterial dysentery, such as cholera. Helminths transmitted by soil Ascariasis (roundworm), Trichuriasis, Hookworm (yellowing), Tapeworms (solitary) in beef and pork: Teniasis, Cysticercosis. Helminths associated with water: Schistosomiasis

Insect vectors related to feces: Filariasis (elephantiasis).

With regard to the urban cleaning and solid waste management system, disposal to the environment can cause damage, especially to public health, since it may constitute a breeding ground for *Aedes aegypti* mosquitoes, which transmit the dengue, Chikungunya and Zika, when contaminated.

There are many diseases related to the accumulation of waste and its lack of treatment, such as Rats and Fleas: Bubonic plague; Little typhus; Leptospirosis. Flies: Typhoid fever; Cholera; Amoebiasis; Dysentery; Giardiasis; Ascariasis. Mosquitoes: Malaria; Leishmaniasis; Yellow fever; Dengue. Cockroaches: Typhoid fever; Cholera; Giardiasis. Pigs: Cysticercosis; Teniasis. Felines: (through urine and feces) Toxoplasmosis. It appears that most of these diseases are relatively related to the lack of adequate basic sanitation.

In order to minimize the problems, mainly of the DIP, due to the lack of basic sanitation, the national environmental education policy is applied, walking together with health education.

SUS was created by the Brazilian Federal Constitution of 1988. The main objective of such a project was to change the national scenario of the time, in which the services provided by the different health sectors were differentiated for each social class. With SUS, public service to all Brazilian citizens has become mandatory, regardless of economic level. According to art. 196 ° of the Constitution of 1988, “health is the right of all and the duty of the State, guaranteed through social and economic policies that aim to reduce the risk of disease and other diseases and universal and equal access to actions and services for their promotion, protection and recovery”.

As provided for in item IV, of art. 200o of the Federal Constitution, of 1988, “the single health system is responsible, in addition to other attributions, under the terms of the law: to participate in the formulation of the policy and in the execution of basic sanitation actions” (BRASIL, 1988). And, by health, it is understood not only the scenario of people already sick or in recovery, but also all aspects of possible prevention.

Thus, the precariousness of basic sanitation services with its four components: drinking water supply, sanitary sewage, urban cleaning and solid waste management, rainwater management and urban drainage, have proved to be determining and conditioning factors in quality of life of the city population.

As is known, the improvement of sanitation services is directly related to the promotion of health and the quality of life of the population, when related to waterborne diseases. Studies released by WHO (2014) show that for each US $ 1.00 invested in sanitation there is a corresponding reduction of US $ 4.30 in public health expenses. It is undeniable that sanitation will always result in health protection.

For WHO, “all people, at any stage of development and socioeconomic conditions, have the right to access an adequate supply of safe and safe water”, which places even more emphasis on the need for extra care with quality programs of water, its supply and sewage.

CONCLUSION

Brazil presents alarming data on access to basic sanitation services, with challenges to guarantee service to all and on an uninterrupted basis. Coverage by the water supply network is relatively high, although there are still about 35 million Brazilians without access to drinking water. The sewage collection and treatment service still presents worrying rates, revealing the harmful potential to the environment, especially due to the contamination of water bodies, which indicate how much the country still needs to move towards universal service.

Public health is listed as a fundamental and essential guarantee for the well-being of human beings. The extreme importance of basic sanitation services is evident, both in the prevention of diseases and in the preservation of the environment.

Public Basic Sanitation Policies are requirements to obtain quality of life and appropriate public health. This policy must be developed in partnership with organized civil society, observing the reality of each region and listening to its residents. It plays a crucial role in the projection of basic sanitation actions to be taken. Its execution is not immediate. The objectives are long-term and can still be changed along the way by the government, which makes it a State Public Policy and not a Government Policy.

According to the Trata Brazil Institute (2020), the Federal District in the sanitation ranking is ranked 27th among Brazilian capitals based on SNIS data (2018).

In order to reduce regional inequalities motivated by the lack of urban concentration resulting from the migratory flow between the Federal District and neighboring municipalities and seek solutions to the problems arising from the disorderly growth of Brasília / Plano Piloto and its surroundings, increasingly populated by migrants in search of better living conditions that ended up putting pressure on public services in the country's capital, the administrative action of the Union, the states of Goiás and Minas Gerais and the Federal District (RIDE) was promoted.

It is noted the importance that RIDE has in the Federal District and its surroundings, in order to plan the set of public services, mainly infrastructure and job creation.

The Public Consortium for the Management of Solid Waste and Rainwater in the Integrated Region of the Federal District and Goiás, is an example of implementation, composed of the Federal District, State of Goiás and 20 municipalities in Goiás constituting RIDE/DF, "whose proposal is to promote the associated and environmentally adequate management of solid waste and rainwater in the region, in addition to enabling the selective collection, recycling and final disposal of non-recycled waste".

The path to universal access and quality of basic sanitation services, as set out in Law No. 11,445 / 2007, will promote public health and environment and, consequently, improve the quality of life of the population.

Access to quality drinking water is a fundamental right indispensable to the health and well-being of the human person. In Brazil, the universalization of sanitation services and, consequently, the viability of drinking water is still a problem to be solved. It is important to emphasize that one of the causes of this problem is the management of water resources, which require treatment and protection of water, based on an adequate management policy that takes into account environmental protection and human needs.

A solution for water protection, for example, is the massive investment in sanitation and sewage treatment. The new Basic Sanitation Legal Framework signed on July 15, 2020 has as its main objective to universalize and qualify the provision of services in the sector. The Federal Government's goal is to achieve universal access by 2033, ensuring that 99% of the Brazilian population has access to drinking water and 90% to sewage treatment and collection. The expectation is that the universalization of water and sewage services will reduce annual health costs by up to US $ 290 million. In addition, for every US $ 1 invested in sanitation, savings of US $ 4 should be generated by preventing diseases caused by the lack of service, according to the World Health Organization (WHO). Let's follow.

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