

1723 - STATE OF THE ART ANALYSIS OF SANITARY EFFLUENT MANAGEMENT IN THE STATE OF MARANHÃO: RELIABILITY OF AVAILABLE DATA

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Abstract: The basic sanitation sector has been highlighted in recent years, with the discussion of the New Regulatory Framework for Basic Sanitation. Information on the sector in Brazil is mostly found in the National Sanitation Information System (SNIS), an extensive database that seeks to reflect the challenging reality of the low coverage indicators of these services in the country, in each municipality, among other information. and indicators. Faced with the political, administrative and institutional challenge presented by the New Sanitation Regulatory Framework, the availability of up-to-date information on basic sanitation systems in Brazilian municipalities is essential to devise strategies and achieve the goal of universalization of services, as projected by Agenda 2033. The compatibility of the data available on the SNIS with reality must be analyzed to ensure assertive strategies for achieving the goals established in the New Framework, especially with regard to the universalization of services. In order to bring the research closer to reality, the State of Maranhão was chosen as a case study in this work. The results indicate that there is a distortion, outdatedness and even lack of data in the SNIS compared to reality, a fact that directly impacts the planning of strategies for the sector. This situation may harm Maranhão in the design of its public policies, as well as it may be harming other states in the country.

Keywords: Domestic effluent, Data management, SNIS, Maranhão.

INTRODUCTION

In Brazil, currently, with the approval of the New Sanitation Legal Framework, Law No. 14,026/2020, the agenda on the critical situation of sanitary sewage in the country has gained prominence. According to the National Water Agency (ANA, 2017), 43% of the Brazilian population has access to a collective solution for sewage, with collection

and Sewage Treatment Station (ETE) and 12% has access to an individual solution, with a septic tank, for example. On the other hand, 18% of the population has collection without treatment, and 27% has neither collection nor treatment. Therefore, approximately half of the population, 45%, does not have adequate disposal for domestic sewage. According to the National Sanitation Information System (SNIS, 2019), the country's scenario shows approximately 53% of collection and 46% of treatment, in relation to the total amount of sewage generated. Based on these ANA and SNIS data sources, it is estimated that between 45-55% of the population does not have adequate disposal and treatment of domestic effluents.

In this panorama, the importance of reliable data can be observed to support the elaboration of public policies for the improvement of the sector. The availability of this information, periodically updated and correct, is of fundamental importance for the preparation of planning and the development of public policies that accompany the growth in demand, aiming to mitigate public health problems and improve the quality of life of the population (BREACH, 2018; SATO; QADIR; YAMAMOTO, 2013).

Thus, this research presents detailed and updated data on the situation of sewage collection and treatment in Maranhão. The State of Maranhão was chosen as a case study, as it is one of the poorest States in the country (IBGE, 2017), with a low rate of sewage collection and treatment, and where it is assumed that the adversities for the availability and reliability of information must be more explicit and challenging. With the data acquired and analyzed, future studies will be able to base themselves to reproduce the diagnosis and analysis in other Federative Units, as well as to deepen the studies in Maranhão itself. In the case of a State with

low levels of social development and a lack of information in several areas, such as sanitation, the presentation of these data can serve as a basis for future contributions.

This way, the general objective of this work is to generate data, analyze the current situation of domestic effluents in the State of Maranhão and compare with publicly available data.

MATERIALS AND METHODS

LITERATURE REVIEW

A survey of the main articles on the subject was carried out to be inserted in the bibliographic review and to support the work, in order to add the main perspectives of the Brazilian and world scenario.

CASE STUDY

Aiming to achieve the objective of analyzing the situation of sanitary sewage in Maranhão, the case study method was used. This method seeks to assist in decision-making through the analysis of data from the study unit. For this, it is necessary to elaborate a research question, which will serve as a guide for the entire development of the work content (YIN, 2014). In this case, the question that guides the study is: What is the real situation of domestic effluents in the State of Maranhão? In order to gather information for the case study, interviews were carried out using the Snowball sampling method, also known as non-probabilistic chain reference sampling, through which actors are selected to acquire information and these indicate other actors, as Figure 1. Therefore, this technique is based on the collection of primary information from interviews, in which other potential people are indicated who can provide more primary data, thus generating chain references (GOODMAN, 1961; SANCHES-PEREIRA et al, 2017). In this study, the method was used to find the representatives or those responsible

for the operation of the 217 sewage systems in all municipalities in Maranhão to carry out the diagnosis of the situation.

The interviews focused on the diagnosis of the sanitary sewage situation in the 217 municipalities to obtain an overview of the State of Maranhão, and were based on semi-structured questions, which did not need to be answered in order and referred to quantitative and qualitative data.

Other documents were consulted, in addition to the articles in the bibliographic review, in order to compose the information for the case study and development of the research methodology.

With regard to sanitation data, considering that the SNIS 2018 Diagnosis does not have information on all municipalities for 2018 and the ANA Sewage Atlas has information on the 217 municipalities for the year 2013, the information that was not found in the SNIS 2018, were obtained from ANA data.

RESULTS

The diagnosis shows that among the 217 municipalities in Maranhão, the responsibility for the water supply and sewage system of each municipality is under the concession of several institutions, among which are: Companhia de Saneamento Ambiental do Maranhão (CAEMA); Waters of Timon; BRK Environmental; Autonomous Water and Sewage Systems (SAAE); and City Halls (PM).

Among the entities responsible for operating sewage services in the municipalities of Maranhão, they are segregated as follows: 84.33% City Hall; 9.22% SAAE; 3.23% CAEMA/PM; 1.38% CAEMA; 0.92% BRK; 0.46% CAESI; 0.46% Waters of Timon. It is observed that in the case of Maranhão, sanitary sewage is not foreseen in most of the concession contracts with CAEMA. This way, most municipalities have their Water Supply Systems operated by CAEMA, while the

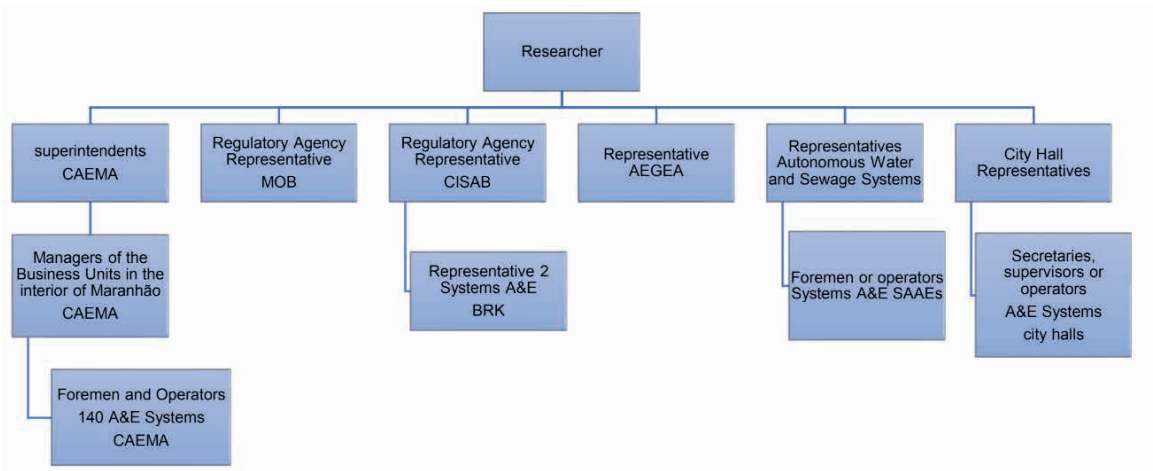


Figure 1 - Diagram of interviews using Snowball sampling.

Source: Prepared by the authors themselves.

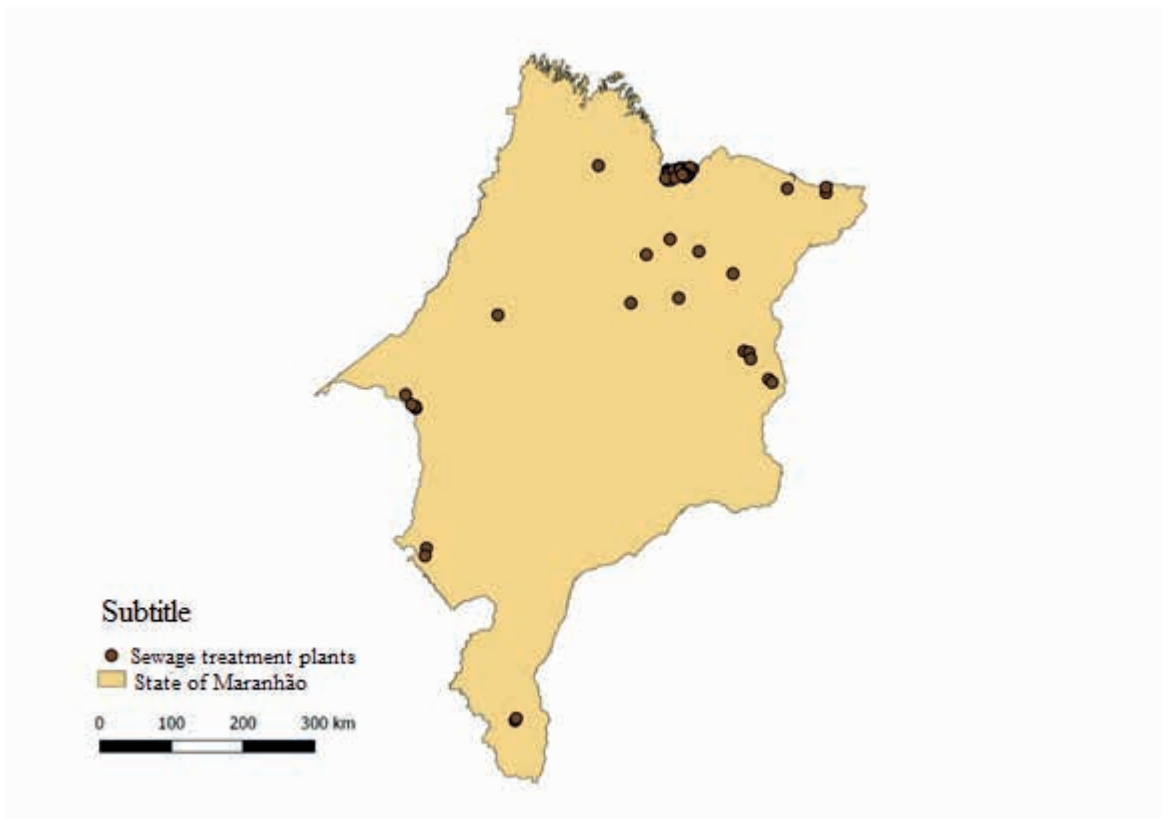


Figure 2. Distribution of ETEs in Maranhão.

Source: Prepared by the authors themselves.

responsibility for sewage rests with the City Hall.

With regard to the data found in the SNIS and ANA, a difference was observed, as part of the municipalities presented data on the existence of sanitary sewage systems where, in reality, they did not exist, for example. It is still necessary to analyze the percentage of error in the published data. The results of this comparison analysis of publicly available information and data collected in the interviews can indicate how well or badly public policies may be outlined, in addition to contrasting the quality of information provided by service providers. Among the results obtained, the number of Sewage Treatment Stations (ETE) existing in the State can be observed, as shown in Figure 2, which are not fully reflected in the SNIS data.

Under the New Regulatory Framework for Basic Sanitation, the National Water and Basic Sanitation Agency (ANA) has the new attribution of being the national agency for the sector, with the task of establishing reference standards and regulating basic sanitation in the country. This way, existing branches are subject to ANA guidelines, as provided for in Law No. 14,026/2020.

The new legislation also requires that service universalization targets be met, with 99% for water supply and 90% for sanitary sewage, encompassing the principles of loss reduction and control, promotion of energy efficiency, reuse of sanitary effluents and the use rainwater, among others. All these data are mostly from the SNIS, which can be monitored with the support of the ACERTAR Project and other initiatives, for example, with the improvement of reliability.

With the general panorama of the sanitary sewage situation in the State, it is possible to have a more up-to-date vision, which will serve to think about strategies to boost the sanitary sewage scenario in Maranhão, and may even

help in the perspective of the use of energy recovery. It is important to point out that, as provided for in the sector's New Regulatory Framework, solutions can be designed in a consortium, especially in the case of medium and small municipalities, something even driven by Regionalization, also provided for by law.

In addition, the reliability of the data varies depending on the Region, where it is assumed that in the North and Northeast regions the reliability is lower in relation to the rest of the country, an aspect that must be less aggravating in States of the Southeast and South Regions, which have greater track record and resources to produce more reliable information.

After diagnosing the situation of sanitary sewage in the municipalities of the State of Maranhão, it was noticed that the percentage of coverage per individual solution, with the use of cesspools and sinks, is expressive in the State, contrary to what official data express. This aspect must also be considered in relation to national data, in which problems may be occurring, such as in Maranhão, incurring in disclosure and decision-making based on inconsistent information. A very recurrent aspect is the fact that the SNIS data show a low percentage for individual solutions in the municipalities, while at the headquarters of the municipalities, the highest percentage of the population has solutions such as ditches, cesspools, among other resources. Therefore, a definition of what the concept of individual solution encompasses is also necessary.

This aspect is particularly worrying, as it is based on these official data from the SNIS and ANA that decisions are taken and public policies are designed. This way, it is necessary to understand how this information has been collected and, it is recommended to apply an audit plan, as suggested in the ACERTAR Project. Thus, it is assumed that the results of the study define the adherence of the available

information to the reality of Maranhão, and where it is necessary to subsequently carry out a cross-sectional study with validation by sampling in other States.

data panels and service provider focus on its indicators to improve its management.

CONCLUSIONS

At this time, with the New Sanitation Framework, in which the sector imminently requires management, monitoring and data control tools, it is essential to understand the information base on which initiatives are based and how they will be monitored over the years. Thus, according to the preliminary analysis of the results, it is possible to highlight the following aspects of the study: (i) there is a divergence between the available data and the current reality of sanitary sewage in Maranhão; (ii) the adherence value of the publicly available data and those collected in the interviews allows defining an average index of deviation; (iii) from the knowledge of the magnitude of the divergence, it is possible to explore its causes, thus avoiding the replication of these failures in the future; and (iv) it is assumed that States where Regulatory Agencies exist this deviation index is lower in relation to other States.

In this perspective, the definition of ANA as a federal agency in the sector, with the definition of Norms for the provision of services based on SNIS data, as well as ORDINANCE No. 490, of March 22, 2021, has implications for the importance given to this information, which favors a better understanding and, consequently, the design of public policies. The ACERTAR Project comes together with this objective, contributing to a more realistic panorama of the conditions of sewage collection and treatment in the country, and sanitation in general. Other initiatives such as the National Sanitation Quality Award (PNQS) also contribute to encouraging attention to data quality, ensuring greater social control through easy-to-interpret

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