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SCHOOLS AS A REFERENCE POINT FOR ACCESS TO POTABLE WATER IN THE MUNICIPALITY OF PEDRA BRANCA DO AMAPARI-AP

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INTRODUCTION

Access to basic sanitation services is a conditioning and determining factor for public health and quality of life, impacting on various other sectors of a society (economy, education, tourism), as well as being fundamental for preserving the environment. Access to drinking water and basic sanitation services is an essential, fundamental and universal human right, indispensable to life with dignity and recognized by the UN as “a condition for the full enjoyment of life and other human rights” (Resolution 64/A/RES/64/292, 28.07.2010). However, this guaranteed right has not been exercised by many countries, including Brazil, which has regions, mainly in the North and Northeast, with low levels of supply of these services, generating impacts on the environment and the health of the population. This is the scenario common to municipalities in the Amazon region: Pedra Branca do Amapari, which has very low levels of coverage of basic sanitation services.

Pedra Branca do Amapari, a municipality in the Amazon region, has a large territory (9,495 km²), a low population density (1.8 inhabitants/km²), an estimated population of 17,625 (2021), with around 45% living in rural areas and population growth rates above the average for Brazilian municipalities. The municipality has a panorama common to the northern region: a shortage of basic sanitation services. According to the IBGE, only 3.9% of permanent residences have adequate sewage disposal, and data from the water supply profile (SISÁGUA) shows that only 22% of the population has access to treated water. According to the municipal Primary Health Care reports: 67% of the population uses an Amazon well as a source of water supply and a large part of this population uses RAW WATER, i.e. they do not carry out ANY treatment of the water used for human

consumption.

Monitoring of epidemiological data shows a high incidence/prevalence of waterborne diseases in the municipality, a high rate of underreporting and a large proportion of the population unaware of the importance of and how to properly treat water for human consumption.

By inspecting the water supply system and carrying out physical-chemical and microbiological analyses, carried out by the municipal team of the VIGIÁGUA program in the communities and schools of the municipality of Pedra Branca do Amapari, it was possible to identify the general profile of the water used for human consumption: the majority of the population uses underground water (SAI - Poços Amazonas), a large part of this population uses RAW water: they do not carry out the minimum treatment recommended by Ordinance GM/MS N^o 888/21, thus being considered OUTSIDE the established potability standards and showed positive results of microbiological contamination (total Coliforms and *E. coli*). It was also noted that the wells were open and there was no water treatment system installed.

In the inspections carried out by the municipal team of the VIGIÁGUA Program, it was found that the physical structure of the supply systems of the municipal schools were in an IRREGULAR situation, since they do not carry out any mandatory water treatment stage as determined by current legislation: Annex XX of GM/MS Consolidation Ordinance No. 5, amended by GM/MS Ordinance NO. 888, of May 4, 2021.

According to data obtained from the Demographic Census and SNIS (IBGE), DATASUS (Ministry of Health) and the School Census (INEP), the conditions of access to basic sanitation services have a major impact on educational indicators:

school attendance, dropout rate and cognitive deficit. The hypothesis is that municipalities with poor basic sanitation conditions (which includes water supply, sewage collection and treatment) result in a higher incidence of Diseases Related to Inadequate Environmental Sanitation (DRSAI). Some examples of such diseases are diarrhea caused by bacterial intestinal infections, intestinal diseases caused by protozoa, amoebiasis, cholera, malaria, hepatitis A and typhoid fever. The impact of such illnesses causes 443 million school absences a year worldwide (Miguel and Kremer - 2004), impacts on children's cognitive development and also points out that there may be a considerable effect associated with illness to explain school dropout and low educational attainment. In other words, children, who are generally the most susceptible to waterborne infectious and parasitic diseases, are more likely to become ill and have poorer educational indicators.

As part of the situational diagnosis, we observed that a large part of the population, especially in rural areas and schools, uses water that is IMPROPER for human consumption, since they do not carry out ANY water treatment and most of the analyses carried out showed results that were OUTSIDE the established drinking water standards, with the PRESENCE of microbiological contamination (total *coliforms* and *E.coli*). These factors have had a negative impact on the health, education and quality of life of this population, given that access to drinking water is one of the conditioning and determining factors of health.

OBJECTIVES

The GOTAS DE VIDA (DROPS OF LIFE) project, drawn up by the municipal administration, aims to carry out actions to combat and prevent the transmission of waterborne diseases with a focus on municipal schools, by monitoring the quality of the water supplied for human consumption in these institutions, promoting alternatives for the supply of POTABLE WATER (adaptation of the schools' water supply systems: SACs) and carrying out environmental health education practices for managers, professionals, the population and students, with the following actions standing out:

- Routine monitoring and evaluation of supply systems and assessment of the quality of water supplied for human consumption in schools and communities;
- Adaptation of the municipal schools' water supply systems (SAC's), through the implementation of the Gotas de Vida system: an alternative solution that aims to comply with the requirements, treatment stages and practices of current legislation, as a way of guaranteeing the supply of POTABLE WATER in schools and also its promotion as an alternative access for the surrounding population, through a fountain system;
- Support and execution of Environmental Health Education actions and promotion of alternative access to DRINKING WATER through the Gotas de Vida Project's CHAFARIZ, with managers, municipal technicians, schools, students and their families and communities.

METHODOLOGY

With the structuring of the VIGIÁGUA Program, through the standardization of work routines and the implementation of the municipal water analysis laboratory (acquisition of equipment, adaptation of the physical structure, training of professionals). Inspections and analyses of the various water supply systems were carried out, obtaining a situational diagnosis that presents the following general profile: the physical structure of the water supply systems, mainly collective and individual (SACs and SAI), were in an IRREGULAR situation, a large part of the population uses RAW WATER with results OUTSIDE the potability standards, presenting risks and damage to public health.

The GOTAS DE VIDA Project, drawn up by the VIGIÁGUA Program team, provides for:

- Monitoring the quality of the water supplied for human consumption in the municipality's schools;
- Installation and management of collective water supply systems for municipal schools (SAC-Schools), in order to bring them into line with the requirements and practices of current legislation;
- Promoting schools as an alternative way for the surrounding population to access DRINKING WATER, by means of a fountain system;
- Support and execution of Environmental Health Education actions with managers, municipal technicians, schools and communities;
- Routine monitoring and evaluation of water quality and the operation of the GOTAS DE VIDA systems, with the aim of guaranteeing the continuity of the POTABLE WATER supply.

- The routine activities of monitoring and controlling the quality of the water in the Gotas de Vida systems, through the results of physical-chemical and microbiological analyses, have guaranteed the safety and continuity of the supply of DRINKABLE WATER to schools and the surrounding population.

RESULTS

- The Gotas de Vida (Drops of Life) project has already adapted 07 water supply systems in municipal schools (40%), with the aim of supplying POTABLE WATER to these institutions;

- The Gotas de Vida project has proved to be a successful alternative for the population's access to POTABLE WATER, as can be seen from the large number of people using the Gotas de Vida project's fountain systems; the average daily consumption of water in these systems shows that around 3,000 people (22% of the population) use the Gotas de Vida project as a source of water for human consumption.

- A 70% reduction in the incidence of water-borne diseases in the schools and communities benefiting from the implementation of the Gotas de Vidas system;

- Partnering health and education professionals to promote the school as a source of access to POTABLE WATER and in the construction of knowledge and practices of Health Education, related to stimulating the critical awareness of the community about the determining and conditioning socio-environmental and sanitary factors that affect human health and its quality of life.

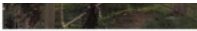
IMPLEMENTATION OF THE LIFE PROJECT IN MUNICIPAL SCHOOLS



LISTS OF WATER TREATMENT STEPS

SAC: DROPS OF LIFE

1. CAPTURING
2. COAGULATION
3. FLOCCULATION
4. SEDIMENT DRAIN
- 5-6. DISINFECTION
7. FILTRATION
8. MONITORING
9. DISTRIBUTION (KITCHEN, SINK, DRINKING FOUNTAIN AND FOUNTAIN)
10. DISINFECTION NETWORK



CONCLUSIONS

The implementation of the VIGIÁGUA Program proves to be an important tool capable of carrying out a situational diagnosis on a set of driving forces, pressures, situations and exposed populations, through the collection and analysis of different indicators, producing recommendations for actions to be adopted by managers, professionals and the population, and indicating ways and means to achieve universal, comprehensive and equitable access to drinking water.

The Gotas de Vida (Drops of Life) project, an initiative of the municipal administration, aims to carry out actions to combat and prevent the transmission of water-borne diseases, by adapting the water supply systems of municipal schools, implementing water quality control and monitoring activities, which have made it possible to guarantee the continuity of the supply of DRINKABLE WATER in schools and alternative access for the surrounding population. These actions, together with intersectoral partnerships and the promotion of health education practices, have made it possible to increase adherence and access to DRINKING WATER, which has contributed to improving the quality of life of students, school staff and the population who have started using this system as a source of access to DRINKING WATER.