



Use of meteorological stations in schools to reduce disaster risks in Macaé-RJ

Uso de estações meteorológicas nas escolas para redução de riscos de desastres em Macaé-RJ

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ABSTRACT

Acting to develop disaster information and monitoring systems is one of the premises of municipal civil defenses according to Law No. 12,608 of April 10, 2012 (BRASIL, 2012).

Keywords: Meteorological, Schools, Disaster Risks.

RESUMO

Atuar para desenvolver sistemas de informações e monitoramento de desastres é uma das premissas das defesas civis municipais segundo a Lei n. 12.608 de 10 de abril de 2012 (BRASIL, 2012).

Palavras-chave: Meteorológicas, Escolas, Riscos de Desastres.

1 INTRODUCTION

Acting to develop disaster information and monitoring systems is one of the premises of municipal civil defenses according to Law No. 12,608 of April 10, 2012 (BRASIL, 2012).

The Municipality of Macaé does not have its own weather telemetry network, according to information gathered from the Municipal Civil Defense, but it has currently signed an agreement with the Federal University of Rio de Janeiro (UFRJ) to develop telemetry automation applications for Meteorological Stations installed inside municipal schools for the implementation of the Municipal Civil Defense Monitoring and Operations Center (MACAÈ, 2023).

2 OBJECTIVE

Analyze the use of weather stations installed in municipal schools as a fundamental action to reduce disaster risks in the city of Macaé/RJ.



3 METHODOLOGY

In order to carry out the study, documentary and bibliographic research was carried out in open sources on the following topics: (1) Contingency Plans, (2) Warning Systems and Risk Maps and (3) Weather Stations, Schools and the Community.

In order to expand the data collection and analysis, the municipal Civil Defense agency was asked to look at documents, events and maps in order to understand the themes of (1) Macaé's Contingency Plans and (2) Macaé's Warning Systems and Risk Maps.

4 DEVELOPMENT

In this study, it was noted that Macaé's Civil Defense Department has signed an agreement with UFRJ to install weather stations in schools in the municipality (MACAÉ, 2023). The schools chosen are adjacent to risk areas according to the city's contingency plan for heavy rainfall or in a strategic location to monitor the entire municipality. It was noted that there is an intention to implement a Monitoring Center with 31 stations as instruments of the Municipality's Alert System.

It was found that the methods used by the local Civil Defense to issue early warnings to the population are: through the Interface System for the Dissemination of Public Alerts (IDAP), through the Short Message Service (SMS) signed up with the Ministry of Regional Development, the municipality's official website, social networks of the municipality and the Civil Defense body, based on reports received by bodies such as the National Meteorological Institute (INMET), the Center for Weather Forecasting and Climate Studies - National Institute for Space Research (INPE) and the National Center for Monitoring and Alerts of Natural Disasters (Cemaden/MCTI).

The parameters for classifying adverse events, such as rainfall, which indicate the alert and alarm frameworks for categorizing possible significant events in the municipality of Macaé and defining the operational protocols for Civil Defense responsibilities, attributions and stages of action, were found in the Municipality's Contingency Plan (MACAÉ, 2022), where a description of the areas susceptible to flooding, flooding and landslides in the municipality of Macaé was also identified through the local risk map, with a higher degree of frequency and severity for flooding triggered by heavy rainfall.

For Silvia Midori Saito (2018), one of the axes for the functioning of the alert system, in addition to science-based monitoring to predict threats in time for response actions, is dissemination and communication, which advocates that alerts must be understood and accessed by the target audience.

The school was the space chosen by the municipality to house the equipment, but this idea can be explored far beyond the physical space. School is an important place in young people's lives, where various types of learning and relationships take place (ABRAPEE, 1996).



The issuance of weather reports, data from rainfall stations in real time and an efficient alert and alarm system are basic inputs for minimizing disasters inherent to meteorological phenomena (SAITO, 2018). This information is useful for the population and all the agencies involved in emergency prevention and response actions.

Victor Marchezini (2018) points out that it is necessary to make the transition from the current warning system to a people-centered system, promoting the involvement of local actors in the formulation and implementation of strategies.

Lucilene de Freitas Baeta et al (2014) believes that by deepening and disseminating the technical knowledge acquired by the students, they will be encouraged to become multipliers of knowledge in their neighborhoods, allowing the local population to acquire a perception of geological risk and the socio-environmental problems they face, and to use this knowledge to prevent and manage the risks that affect the region.

She also advocates projects that involve students and, above all, parents, seeking to make the knowledge transmitted more concrete and enabling parents to engage in community mobilization processes through the Civil Defence Units (BAETA et al, 2014).

As a result, this research identified that the chosen format of installing weather stations in municipal schools with the implementation of the Civil Defense Monitoring and Operations Center of the city of Macaé aims, in addition to the operational activities of the secretariat, to create teaching, research, academic extension and training activities, with a focus on Civil Protection.

According to Macaé (2023), these results have prospects and goals:

- to train civil servants from the Civil Defense Department and other departments of Macaé City Hall in the use of automation and telemetry applications to operate the Meteorological Stations linked to the Monitoring and Operations Center;
- to include students and professionals interested in developing software and installing telemetry equipment to monitor sustainability indicators and prevent natural disasters;
- produce maps, reports and bulletins of historical rainfall data for the city of Macaé;
- drawing up parameters for the Alert and Alarm Framework and Risk Classification contained in the Municipal Contingency Plan;
- create local operational protocols for alerts and alarms;
- analyzing the data collected, geoprocessing and adapting or resizing the protocol models according to the needs of the Civil Defense Secretariat;
- produce data and information that can support the Municipal Disaster Risk Reduction Plan, the Civil Protection and Defense Contingency Plan, and the Master Plan for the city of Macaé, especially with regard to Civil Protection and Defense;



- develop or subsidize projects for disaster prevention, mitigation or control measures;
- produce, store and make available data from meteorological stations, equipment or technologies to support the decision-making processes of public authorities, at municipal or state level, especially in the area of Civil Protection and Defense;
- give university students the opportunity, with the agreement of the Partners, to carry out internships with activities linked to the purpose of the Agreement and Technical Cooperation Agreement;
- involve, train the school community and multiply the culture of Civil Protection and Defense in the municipal schools;
- create a favorable environment for researchers, students, teachers, volunteers and society to collaborate with the policy of protecting life.

5 FINAL CONSIDERATIONS

It is very necessary to install and use weather stations within the school environment, fostering the formation of community spirit and facilitating the construction of an awareness focused on collective interests, enabling students, teachers and the community to identify and prepare themselves to monitor and deal with risks. And thus transforming them into multipliers of protection and defense as citizens within the school, family and community.

Therefore, promoting integration between public agents, representatives of institutions, representatives of the private sector, representatives of the scientific community, community leaders and representatives of organized civil society aimed at reducing the risk of disasters in the municipality, bringing as a consequence the development of the resilience of the population as a whole in the region.



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