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AUTOMATED MONITORING OF ARTESIAN WELL

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ABSTRACT
The study aims to emphasize the importance of drinking water located in artesian wells for residents, used for both domestic consumption, plant and animal production. It will also help to make the population aware of the adequacy of the use of this resource, water, through the use of technology, which will display previously recorded data and perform processing, thus keeping consumers of this resource informed about daily consumption.
Keywords: Control. Technology. Water.

MONITORAMENTO AUTOMATIZADO DE POÇOS ARTESIANOS

RESUMO
O estudo visa enfatizar a importância da água potável localizada em poços artesianos para os moradores, utilizada tanto para o consumo doméstico, produção vegetal e animal. Também auxiliará a conscientizar a população na adequação do uso desse recurso, água, através do uso da tecnologia, o qual exibirá dados, previamente registrados, e realizará o processamento, assim mantendo os consumidores desse recurso informados sobre o consumo diária.
Palavras-chave: Água. Controle. Tecnologia.

INTRODUCTION

Drinking water, h2O that has sufficient quality to be ingested, is essential for life, but it is a finite resource and corresponds to only 3.5% of all terrestrial water, where 0.96% is water stored naturally in the subsoil (Diary of the Northeast, 2015). The indiscriminate use of water by the population, accompanied by the increase in pollution and climate change have caused its scarcity even more. Ceará, a northeastern state that annually experiences a lack of water, is a great user of water collected from underground wells, and the areas of greatest use are concentrated in the hinterland and coast. The lack of water from wells would have major consequences for these regions (CEPAS-USP, 2019). Therefore, the project aims to make society aware of the proper use of water collected in artesian wells through technology.

MAIN GOAL

Make students and the population aware of the risks that can be caused by the inappropriate and indiscriminate use of drinking water collected in artesian wells, through the development of a monitoring device that will display the amount of water used daily,

monthly and annually, thus informing users and assisting in the perception of their consumption, in order to notice if exorbitant use is occurring.

Specific objectives

• Develop a low-cost monitoring device.

• Monitor the amount of water collected from artesian wells.

• Automatically activate the artesian well suction pump.

• Make students and their families aware of the good use of water.

METHODOLOGY

Initially, the types of portable water wells were researched. After that, the possible damages caused by water scarcity were analyzed, a phase carried out based on the research materials. A brief survey was carried out in the school environment, where we found a large number of residences inhabited by students who have wells of different types and who found they were not aware of daily consumption, further emphasizing the importance of the project. Based on the information collected, we started to develop the monitoring device, using the components that the school institution already has (arduino, display, ultrasonic sensor, motor, cables, pots and tubes). In possession of the components, the assembly and creation of the algorithm for monitoring and activating the suction pump was carried out. After that, a simulation environment was set up (Figure 1) where the device remained in operation for a predetermined time and thus its efficiency was checked through the collection of recorded information.

Figura 1: Ambiente de simulação.

Figura 2: Arduino Due.

RELEVANCE OF THE PROJECT

Due to the high rate of waste of natural and essential resources for human survival and terrestrial life, including drinking water, caused by the uncontrolled use of the population, it is necessary to search for solutions that aim to assist in the awareness and preservation of the same. Among most of the water monitoring devices located and available on the market, many record the volume of water consumed through the cumulative sum of the previous value, thus making it difficult to interpret the information, and these equipments are usually coupled only to the collection of water from concessionaires and not in artesian wells. The current project will provide a low-cost device, easy to interpret and install, which in addition to raising awareness, monitoring and storing water consumption data, will also be responsible for the automated activation of the pump, further reducing water waste.

IMPACT OF THE RESEARCH/PROJECT

Discussing and alerting students about the risks caused by the waste of drinking water collected in artesian wells will make the information spread to the closest individuals, such as family, neighbors and friends, thus mobilizing citizens in the fight against water waste and other natural resources. Encouraging the student to adopt and unite technology in the development of solutions for society and the environment through scientific research and learning projects, in a practical and theoretical way. Thus emphasizing to the student the importance of the evolution and use of technology in any area of knowledge.

SEARCH RESULTS

The ultrasonic sensor used proved to be not ideal, due to the variation of data on the amount of water stored in the reservoir, which does not provide accurate information. Thus, it will be replaced by one of greater precision according to the evolution of the project. A major deficiency was found in the state of Ceará in relation to information on underground water wells. After the presentation of the project, we can see that there is interest in adopting the device, in order to monitor and verify the daily consumption of water.

FINAL CONSIDERATIONS

The development of research focusing on an environmental resource, using the aid of technology, was important to demonstrate to students the possible possibilities of interaction between areas of knowledge. Thus, strengthening the relevance of conducting technology courses that will possibly serve as a basis and support for future areas of knowledge chosen by students.

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