PRÊMIO JOVEM DA ÁGUA
DE ESTOCOLMO
Etapa Brasileira 2019

SIWI STOCKHOLM JUNIOR WATER PRIZE

Prêmio Jovem da Água de Estocolmo

STOCKHOLM JUNIOR WATER PRIZE – BRASIL

Etapa Brasileira 2019

ABES

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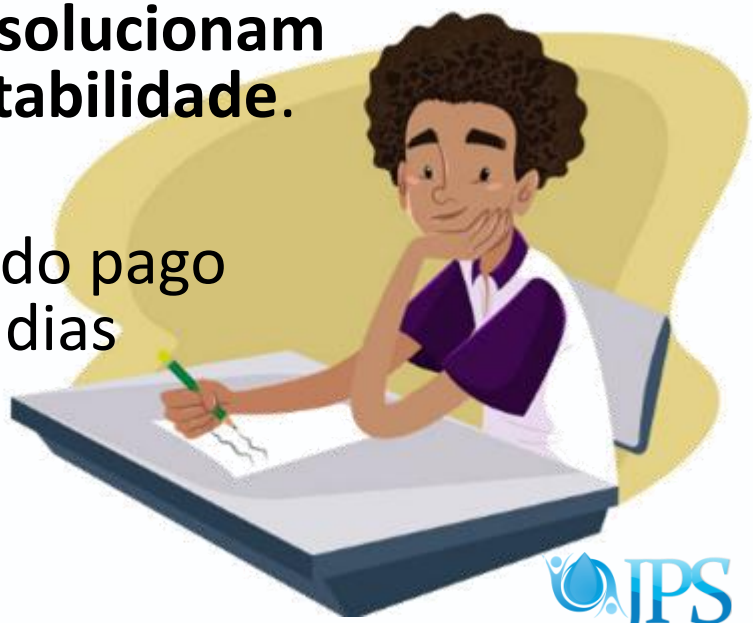
O Que é o Prêmio SJWP?

- O Prêmio Jovem da Água de Estocolmo (SJWP) reúne **jovens inovadores entre 15 e 20 anos** de todo o mundo (mais de 30 países).

- O prêmio reconhece **projetos que solucionam desafios ligados a água e a sustentabilidade**.

- A Premiação é uma viagem com tudo pago para Estocolmo na Suécia entre os dias 24 a29 de agosto de 2019.



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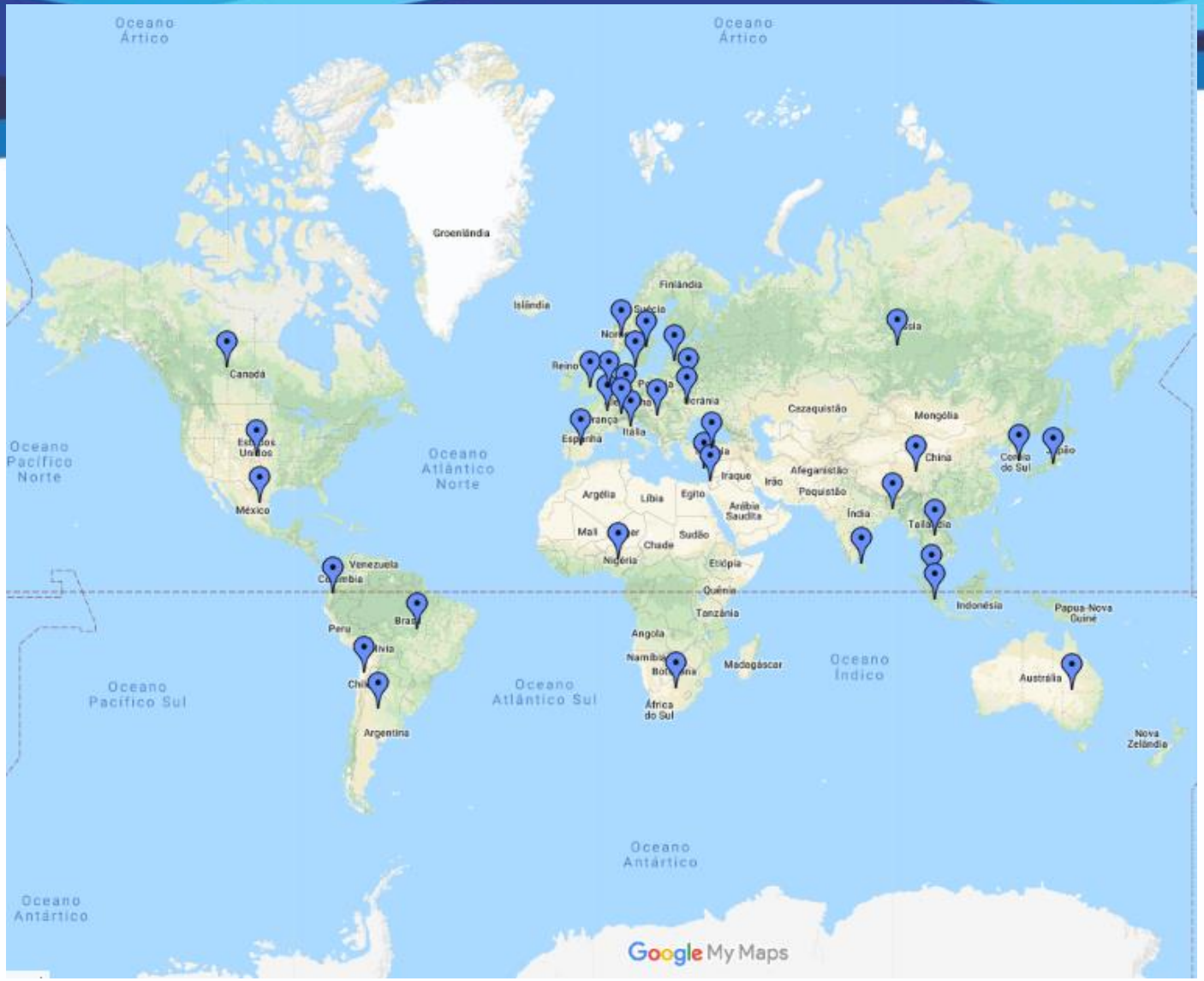

ABES

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Quais são os objetivos do prêmio?

1. **Incentivar a ciência** como alicerce para a resolução de problemas
2. Encorajar a **prototipação e empreendedorismo**
3. Desenvolver a **capacidade de expressão dos jovens** envolvidos
4. Mostrar ao mundo o **potencial criativo e inovador do Brasil**
5. Fomentar a criação de **redes de contatos**

Histórico do Prêmio

Prêmio foi criado em 1997 pelo **SIWI - Instituto Internacional de Águas de Estocolmo**, ocorre anualmente e é dividido em duas etapas:

I. **Uma nacional**, realizada em cada um dos países participantes
II. **Uma internacional** na cidade de Estocolmo.

Histórico do Prêmio

Na edição brasileira do SJWP de 2017 em São Paulo, estudantes de Campinas venceram e foram a Estocolmo para apresentar seu projeto - O **STAC-IBR: Solução para o tratamento de água das cisternas instaladas no Brasil.**

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BRAZILIAN SEMIARID

+27 Billion Liters of Water

+6,200,00 People Benefited

+1,500,000 Cisterns from 2003 to 2017

SIZE

Within the Brazilian semiarid there are about 1333 municipalities and their population is larger than the population of Sweden, Finland and Denmark together, with more than 23 million inhabitants. Its area is larger than most European countries, with more than 970 thousand Km^2.

MORTALITY

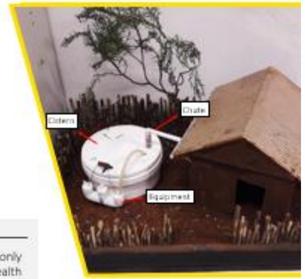
Despite all its size, the bitter Brazilian semiarid is a very sad reality, with the country's highest infant mortality rate at around 35% at the beginning of the decade according to the ministry of health.

ALARMING DATA

This population consume the contaminated water and they get sick like diarrhea, cholera, typhoid fever, hepatitis A, bacteria E.coli and others.

In Brazil 29 people die per day as a consequence of disiases caused by bad quality of the water and in the world, 6 thousand children younger then 5 years old die per day. Until 76 million people will die until 2020 because of disiases linked to the water, by Peter Gleick.

According to the WHO, every dollar invested in basic sanitation saves five dollars in the next 10 years in public health.



SOLUTION

Currently the population of this region goes through unimaginable difficulties, having to survive with only 16 thousand liters of water during a drought of more than 8 months, according to the ministry of health and in addition, a poor water generating even more the health risk of this people. The policies for the creation of cisterns helped a great deal to alleviate alarming mortality rates, but it was not enough.

With this proposed project we would complete this public health policy, with the appropriate treatment of this stored water, we could thus drastically reduce these numbers. A simple, low-cost solution for anyone in any location in the world to achieve this, to have the minimum, which is a quality water.

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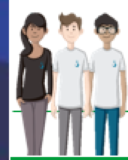
ACKNOWLEDGMENT

STAC-IBR



SOLUTION FOR THE TREATMENT OF WATER ON CISTERNS INSTALLED IN BRAZIL

Authors: Beatriz Ruscetto da Silva[1]; Gabriel Gertrudes Trindade[1]; Matheus Henrique Cezar da Silva[1]

Advisor: Prof. João Alexandre Bortoloti[2] Co-advisor: Prof. Edson Anício Duarte[2]

1 - Authors ETEC Bento Quirino, 2- Professor at Federal Institute of São Paulo – Campinas Campus

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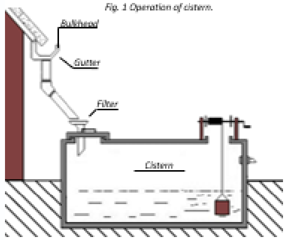
INTRODUCTION

Due to the worsening of the water crisis faced in the Northeast of Brazil, the installation of cisterns to capture and store water is becoming more popular; it has already been recognized as one of the most important public policies in the country: The Water for All Program [PAT] and the 1 Million Program of Cisterns [P1MC]. However, the quality of stored water can endanger the health of consumers, mainly because water is exposed to contaminants and it is often untreated. Currently, the water treatment is usually a mechanical filter to remove solid impurities from the water, and it does little in treating microorganisms. The project described here proposes the development of a low cost and portable water chlorination equipment. In places where rain is already irregular and/or scarce, the use of cisterns fulfills this role (Figure 1). The cisterns are usually connected to gutters of houses which collects the rainwater that reaches the roofs, although the quality of the water by the gutters may be inadequate for consumption, in most cases it only passes through a mechanical filter to remove, solid impurities.

Fig. 1 Operation of cistern.



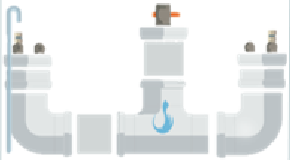
Source: Adapted from www.vilanarede.org.br

The water collected by the gutters can contain dust, animal feces, tree leaves, small dead animals and bacteria. In addition to the total and fecal coliform bacteria, there is also the possibility of contamination by Pseudomona aeruginosa (RUSKIN, 1988) and protozoa such as Giardia (CRABTREE, et al., 1996), which leads to the illness of people who consume contaminated water, in some cases to death. The non-disinfection of water generates a source of contamination, increasing health costs beyond disease, to treat them. Thus, this work aims to design an equipment that performs the treatment of this stored water using a process of chlorination to eliminate microorganisms

OBJECTIVE

The development of a low cost portable chlorine device was made by using largely available parts and materials, such as PVC pipes and fittings (Figure 2). The equipment will be developed to generate chlorine gas by electrolysis of a solution of H_2O + NaCl. The equipment will use inert electrodes of graphite and will be fed electrically by means of a small photovoltaic panel of 10W for off grid residences or through a source of 12V for residences that already have access to power grid.

Fig. 2 Equipment parts and assemble

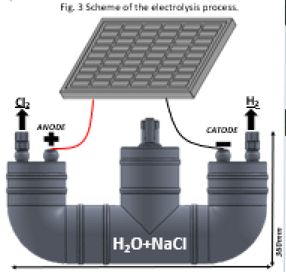


Source: Adapted from www.mec.gov.br

MATERIAL AND METHODS

The proposed chlorination device will use the electrolysis process for the generation of chlorine gas. It is proposed to be of low cost, using commercial components in its assemblage. The water reservoir has a volume of 16,000L, which corresponds to the volume of a domestic cistern. Thus, the device was scaled to have an internal volume of 14.2L of water for 5.5kg of salt, totaling 18L of solution. The prototype was designed in the mechanical modeling software Solids Works (Figure 3).

Fig. 3 Scheme of the electrolysis process.



Source: Own authorship

RESULTS AND CONCLUSION

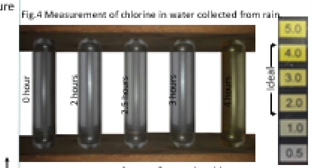
A prototype was constructed as in Figure 3 below. It was fully developed with PVC pipes and connections for the best accessibility. Composed by 15 pieces of PVC and a single hose and having a total cost of USD 192 plus solar panel, its estimated lifetime is about 100 years, due to the lifetime of the PVC. The equipment has the following dimensions: 76 cm, 36 cm, 15 cm

Fig. 3 Final prototype

Source: Own authorship

The results obtained are very satisfactory with regards to the production of Cl_2. The prototype shows functionality against microbiological organisms of cisterns, as it generates chlorine gas in great quantities. Figure 4 shows the amount of residual chlorine generated by the equipment and contained in the water. The different color levels are generated by the reagent GENCO Cl-OT. In the laboratory tests it was possible to carry out the chlorination of water collected from rain and lakes. Among the next steps is the optimization of the equipment, focusing on the chlorine measurement in the water. There is also a need to perform dimensional tests on a 16,000L real cistern to evaluate the efficiency of this treatment.

Fig.4 Measurement of chlorine in water collected from rain



Source: Own authorship

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ACKNOWLEDGEMENTS

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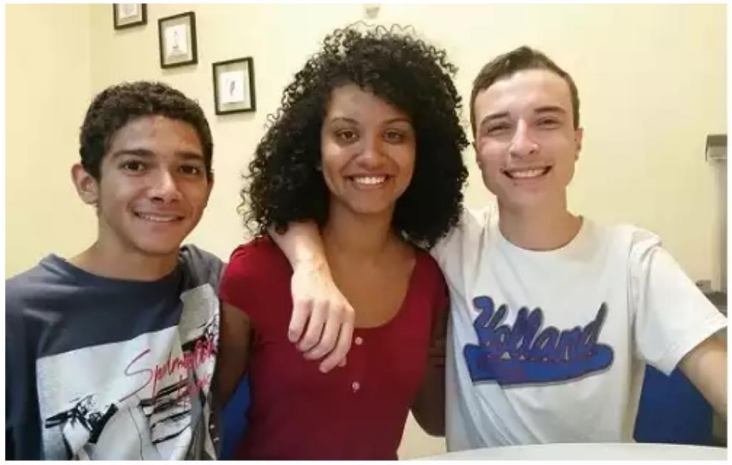
Jovens de Campinas representam o Brasil em prêmio de inovação

Por **Leandro Las Casas** - 8 de junho de 2017 313 0



Publicações

ONU Brasil Centro de Informação das Nações Unidas para o Brasil Unric Portugal Programa das Nações Unidas para o Desenvolvimento - PNUD Brasil ONU Meio Ambiente UN-Water

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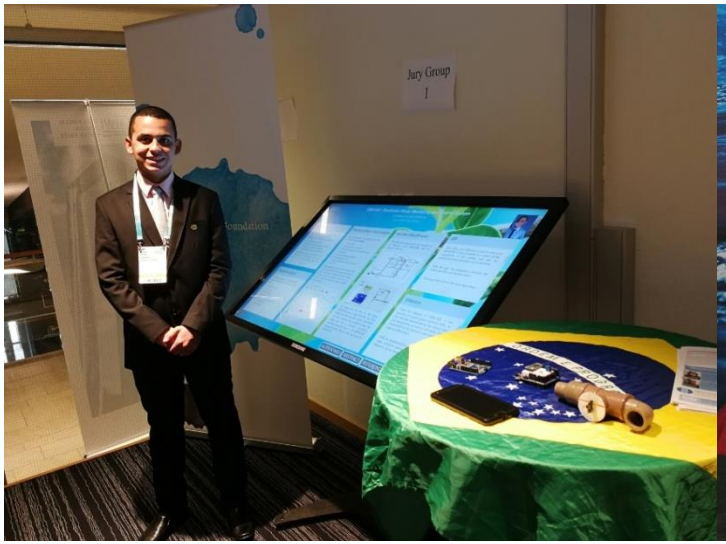
Cerimônia em homenagem ao prêmio realizada no Palácio do Planalto, com participação do embaixador sueco no Brasil, representantes do SIWI e empresas patrocinadoras.

Histórico do Prêmio

Em 2018, a edição brasileira ocorreu em Brasília, como parte da programação do 8º Fórum Mundial da Água.

O estudante da cidade de São Paulo venceu o prêmio com o projeto **SIMECHR- Sistema de Monitoramento e Comando Hídrico Residencial** e também foi a Estocolmo apresentar suas ideias.



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Histórico do Prêmio

Em 2019 pode ser você!

O que dizem os vencedores

- https://www.youtube.com/watch?v=vaperXBrwNo
- https://www.youtube.com/watch?v=PWJ2iZtFFd0

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Inscrições

Para participar da edição 2019 do prêmio

1. Acesse o Site: **www.premiojovemaguaestocolmo.confetti.events**
2. **Leia atentamente** as informações e **o regulamento** disponível.
3. Preencha a **ficha de inscrição.**
4. Baixe o **modelo de projeto.**
5. Escreva o projeto e **envie** no e-mail eletrônico **sjwp@brazilcham.se até o dia 31 de março de 2019** (horário de Brasília).
6. **Siga todas as redes sociais** do prêmio e aguarde o resultado.

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DICAS DE COMO ESCREVER UM PROJETO CAMPEÃO

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10 dicas infáliveis

1. Identifique **Problemas locais**
2. **Discuta sobre esses problemas** com o máximo de pessoas (professores, amigos, família)
3. **Pesquise sobre alternativas** que solucionam esses problemas
4. Faça uma **análise crítica das alternativas** existentes (chame colegas para te ajudar, crie uma equipe)
5. Pense em **como vocês resolveriam** esse problema
6. Levante os **pontos positivos** da ideia
7. Levante os **pontos frágeis** da ideia e tente melhora-los
8. Coloque tudo no papel seguindo o modelo do prêmio
9. Peça que seus professores e mentores leiam o projeto (o **feedback** é fundamental, aprenda com ele e melhore sua ideia)
10. Faça uma **leitura final com sua equipe** e submeta seu projeto

Siga Nossas Redes Sociais

sjwp@brazilcham.se

Prêmio Jovem da Água de Estocolmo

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Organização

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Brazilian Chamber of Commerce in Sweden

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