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The global water crisis: Be the change you want to see in the world

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ABSTRACT
The work is based on narrative description carried out through materials that have been pub-lished on the theme of water on a global and regional scale. The context presented is guided by the Declaration endorsed by the United Nations General Assembly establishing the dec-ade from 2018 to 2028 as the International Decade of Action "Water for Sustainable Devel-opment" in order to accelerate efforts to address water-related challenges. The theme "Ac-celerating Change – Be the change you want to see in the World" was also instituted as a Commemoration of World Water Day for the year 2023, with the aim of discussing ways to accelerate change to solve the global water and sanitation crisis. This narrative was prepared with the purpose of promoting knowledge of problems related to the global water crisis and, at the same time, seeks to sensitize the reader about their role in mobilizing and acting to face this crisis. Actions such as encouraging the participation of young people in Science, the popularization of Science through qualified information, and the awareness and support of the entire society in the face of the needs of conservation, preservation, restoration, and recovery of nature are some of the attitudes to minimize the effects of the global water cri-sis.

Keywords: Environment, Climate change, Pollution, Environmental impact.

1 INTRODUCTION

Why do we depend on nature to live? As living beings, we do not live without air, water, and food. Among the main elements that sustain life on Earth are oxygen and water. Our planet's atmosphere is the gaseous layer that surrounds the Earth and is composed of gases such as oxygen, hydrogen, and carbon dioxide. But how is oxygen present in the atmosphere? Forests and oceans are key to producing this chemical element composed of 2 oxygen atoms, which form a molecule. The vegetation that makes up forests is important for the maintenance of the oxygen cycle in the atmosphere, but its great relevance is the regulatory role of the hydrological cycle. This is because, through the processes of evaporation and precipitation, forests maintain a large part of the volume of water in the oceans as well as groundwater that is responsible for the formation of surface waters (rivers and lakes). The fundamental role of the oceans in the hydrological cycle is to generate oxygen for the atmosphere, which is capable of producing more than half of this element through the photosynthesis processes carried out by the primary producers that inhabit these waters. The oceans make up more

than 97% of all the water that exists on the globe, surface fresh waters (rivers and lakes) represent 0.03% of the 3% of fresh water because much of it (77%) is frozen.

The importance of the oceans to global climate change cannot be underestimated. The oceans regulate our climate and capture almost a third of our carbon emissions. Oceans, marine ecosystems, and coastal regions are undergoing major changes due to rising greenhouse gases, coastal pollution, overfishing, and population growth, among other factors (United Nations Educational, Scientific, and Cultural Organization, UNESCO).

Although surface freshwater represents a small part of the planet's water, it is of fundamental importance to all living beings that inhabit the Earth. A large part of the human population is dependent on surface water and many do not have access to water of quality or quantity. With the urbanization process, due to the reduction of green areas, the increase in waterproofing, channeling of water bodies, among other interventions in the environment, there have been changes in the hydrological cycle, such as increased surface runoff and reduced water infiltration into the soil. The changes in this cycle come from anthropic actions on nature. The burning of fossil fuels and deforestation cause the release of greenhouse gases. Both activities skyrocketed after the nineteenth century (Industrial Revolution), leading to the accumulation of these gases in the atmosphere, notably carbon dioxide. Climatic phenomena such as the greenhouse effect, acid rain, thermal inversion and heat islands are some of the consequences of the ecological imbalance caused by human actions. Changes in global rainfall patterns are causing lower-than-expected food production (crop failure) and, consequently, an increase in food prices, which means food insecurity and nutritional deprivation of the population living in poverty or extreme poverty. In addition, they also have the potential to destroy livelihoods, drive migration and conflict, and undermine opportunities for children, adolescents and young people (United Nations Children's Fund, UNICEF). Considering the intervention of humanity on nature bringing often unpredictable consequences on life on the Planet, the present work aims, from a narrative description, to present different aspects that are related not only to the global water crisis and its consequences, but also to highlight actions and attitudes that can minimize the negative effects of climate change. mainly, about the hydrological cycle.

2 THEORETICAL BACKGROUND

The Intergovernmental Panel on Climate Change (IPCC), created in 1988 by the United Nations Environment Programme (UN) and the World Meteorological Organization (WMO), aims to provide policymakers with regular scientific assessments of climate change, its implications and possible future risks, as well as to propose adaptation and mitigation options. Currently, the IPCC has 195 member countries, including Brazil (Ministry of Science, Technology and Innovations, MCTI). Climate change mitigation is achievable by limiting or preventing greenhouse gas emissions and strengthening

activities that remove these gases from the atmosphere. Greenhouse gases can come from a variety of sources, and climate mitigation can be applied across all sectors and activities, including energy, transport, buildings, industry, waste management, agriculture, forestry, and other forms of land management (IPCC). In this sense, international organizations are mobilizing to form frontlines to expand the dissemination of information generated by the scientific community and carry out campaigns to mobilize the entire society to face the consequences caused by the destruction of nature.

The first actions aimed at enlightening society about the consequences of the destruction of the environment began with the end of World War II (1945) due to the emergence of concerns about radiation pollution resulting from the nuclear age. In 1962, the environmental movement was again boosted with the publication of Rachel Carson's book, *"The Silent Spring,"* which warns against the agricultural use of synthetic chemical pesticides. Carson, a scientist and writer, pointed out that the protection of human health and the environment depends on respect for the ecosystem in which we live (Environmental Company of the State of São Paulo, CETESB, 2020). In 1969, the first photo of the earth seen from space (National Aeronautics and Space Administration, NASA) drew the attention of many to the fact that we live in a fragile and interdependent ecosystem. This has caused the need to protect the health and well-being of this ecosystem to emerge in the collective consciousness of the world. Environmental movements have been gaining ground in order to sensitize the entire society about the importance of preserving the environment. Reflecting the environmental movements and aware of the need for a global mobilization with the participation of as many signatory countries as possible, World Water Day was created by the UN on March 22, 1992, where the "Universal Declaration of Water Rights" was disseminated. And each year, this day is dedicated to the discussion of the various topics related to this important natural asset. For the year 2023, the UN has defined, for World Water Day 2023, the theme "Accelerating Change – Be the change you want to see in the World", with the aim of discussing ways to accelerate change to solve the global water and sanitation crisis.

3 METHODOLOGY

The present work is based on a narrative description made through materials that have been published on the theme of water on a global and regional scale. Extensive publications that focus on the description and discussion of the state of the art of the water crisis stand out. The context presented is guided by the Declaration endorsed by the UN General Assembly establishing the decade from 2018 to 2028 as the International Decade of Action "Water for Sustainable Development" in order to accelerate efforts to address water-related challenges. Also with the purpose of strengthening the Popularization of Science, the work highlights the Commemoration of World Water Day for the year 2023, where the theme "Accelerating Change – Be the change you want to see in the World" is

instituted, with the aim of discussing ways to accelerate changes to solve the global water and sanitation crisis.

4 RESULTS

Water is our most precious resource, a 'blue gold', to which more than 2 billion people do not have direct access. Not only is it essential for survival, but it also plays a sanitary, social and cultural role in human societies (Audrey Azoulay – Director-General of UNESCO). Water is a unique and irreplaceable resource of limited quantity. It sustains life, societies and the economy, carries multiple values and benefits. But unlike most other valuable resources, it has proven to be extremely difficult to determine its true 'value'. The ecological footprint is the balance between human demand for natural resources and the planet's regenerative capacity. It corresponds to the size of the productive areas of land and sea needed to generate products, goods and services that we use in our daily lives - and whether this consumption is within the ecological capacity of the planet. According to calculations by the Global Footprint Network (GFN), 1.7 planets would be needed to produce the ecological resources needed to support the current global ecological footprint. This is the consequence of the fact that humanity requires 70% more than the Earth's ecosystems are capable of regenerating (GFN).

The latest UN projections indicate that the world's population is expected to reach 8.5 billion in 2030 and 9.7 billion in 2050. In all, there are thousands of languages, ethnicities, traditions, cultures, religions, which denotes the remarkable diversity of societies around the globe. In 2023, we reached more than 8 billion people in the world. Among the various issues that involve the global water crisis, we can highlight the issue of sanitation, where it is known that around 70% of diseases come from water transmission. In the current world scenario, 40% of the world's population (3 billion people) does not have a washbasin with soap and water at home. And 47% of schools lack a washbasin with soap and water, affecting 900 million school-age children. Washing your hands with soap is one of the cheapest and most effective things you can do to protect yourself and others against the coronavirus, as well as many other infectious diseases. However, for billions of people, even the most basic measures are simply out of reach (UNICEF). UNICEF works around the world to ensure that children and their parents have access to appropriate handwashing facilities. In addition, it promotes handwashing in more than 90 countries, working with governments to develop policies, strategies, and action plans (Figure 1).

Figure 1. Access to appropriate handwashing facilities (Only for bona fide national/international media for specified use relating to UNICEF-supported issues, programmes, or campaigns. One Love album artwork. Unique identifier: UNI348647 and In-house Identifier: 202003101238_Jordan_JMC_7237).

Faced with alarming scenarios involving the global water crisis in relation to the environment, health and social well-being, and enhanced by the effects of climate change bringing water and food insecurity to billions of people, global campaigns seek to sensitize the different sectors of society to build together actions and attitudes that can minimize the consequences of this crisis.

The World Water Day 2023 Campaign uses as an awareness strategy the fable of a hummingbird that strives to put out a forest fire by carrying water through its beak. It is a story about dealing with crises presented in Figures 2 and 3.

Figure 2. The Fable of the Hummingbird (UN Campaign 2023) https://www.worldwaterday.org/share-2023.

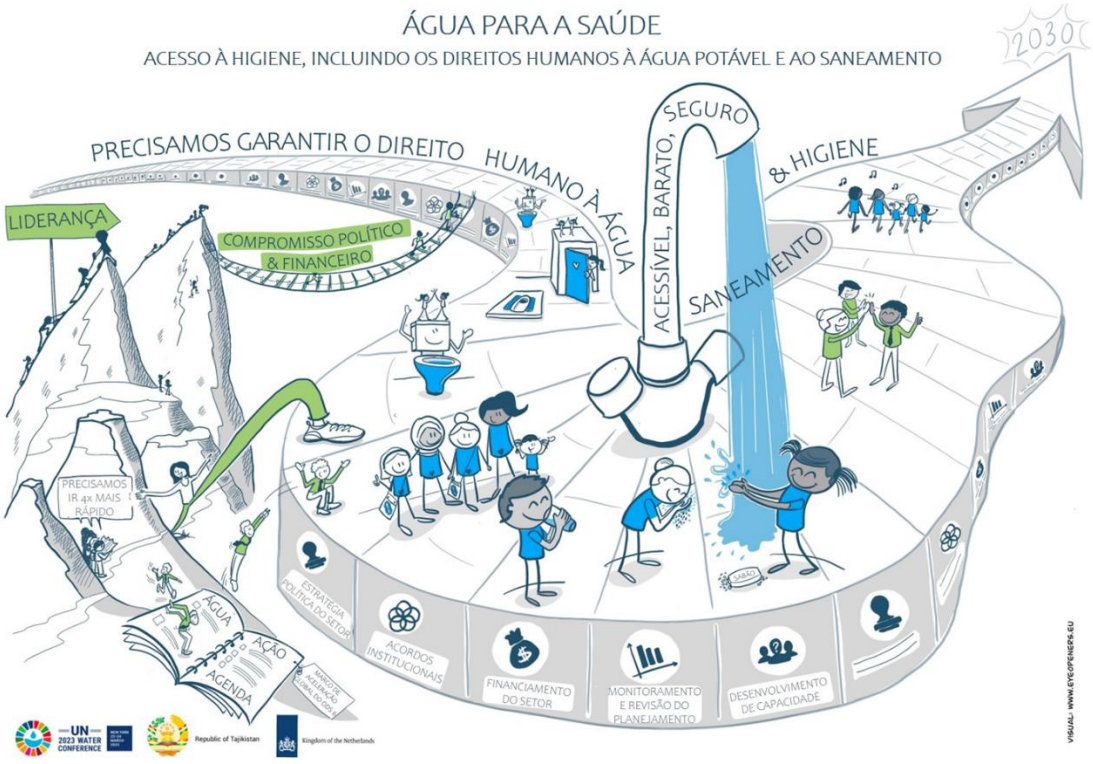
A fábula do Beija-flor

Era uma vez uma floresta, onde um incêndio teve início. Todos os animais fugiram para salvar suas vidas. Eles ficaram à beira do fogo, olhando para as chamas com terror e tristeza.
Acima de suas cabeças, um beija-flor voava de um lado para outro em direção ao incêndio, repetidamente. Os animais maiores perguntaram a ele o que estava fazendo:
– Estou voando até o lago para pegar água e usá-la no combate ao fogo.
Os animais riram dele e disseram:
– Você é louco! Você não vai conseguir apagar o incêndio!
E o beija-flor replicou:
– Estou fazendo aquilo que posso.
O Beija-flor está ajudando a solucionar o problema, gota a gota. Ele está sendo a mudança que deseja ver no mundo.
Você também pode ser um Beija-flor. Cada atitude sua, não importa quão pequena seja, ajudará a solucionar a crise global da água.

Figure 3. Symbol of the UN 2023 Campaign "Be the change you want to see in the world" https://www.worldwaterday.org/share-2023.

In order to achieve the goals contemplated in the 2030 Agenda, guidelines to accelerate changes to guarantee the human right to water were established (Figure 4).

Figure 4. Global campaign to achieve the Sustainable Development Goals (SDG 6) - translated (https://www.flickr.com/photos/undesa/52675742678/in/album-72177720305856698/).



In line with campaigns to involve society in the global water crisis, the popularization of science is fundamental for the dissemination of knowledge. In this sense, CAPES (Coordination for the Improvement of Higher Education Personnel) makes available on its website the Children's Science Today Magazine (https://cienciahoje.periodicos.capes.gov.br/revista-chc) Collection, facilitating access to qualified information on the different fields of Science, and opening space for the dissemination of the production of Brazilian researchers, as exemplified in Figure 5.

Figure 5. Example of Editions available on the Capes portal (https://cienciahoje.periodicos.capes.gov.br/revista-chc) supporting the popularization of Science by Brazilian researchers.

5 CONCLUSIONS

The global water crisis affects the environment and puts the planet's biodiversity at risk, as well as water and food security, as well as sanitary issues, which involve access to water in quantity and quality. When it comes to environmental issues, one must necessarily consider climate change caused by human actions, a fact that is contemplated in Article 4 of the "Universal Declaration of Water Rights" which establishes that the balance and future of our planet depend on the preservation of water and its cycles. These must remain intact and functioning normally to ensure the continuity of life on Earth. This balance depends, in particular, on the preservation of the seas and oceans, where the cycles begin. The global water crisis is exacerbated by the climate crisis, affecting thousands of people around the world. Actions and attitudes can help in coping with climate and health, and such actions include education, strengthening Science, generating more knowledge and technologies in the search for solutions for future scenarios, encouraging the participation of young people in science to train scientists, combating disinformation and false, manipulated or distorted information, which are harmful to society, and encouraging the popularization of Science through different dissemination mechanisms.

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