Committee: Environmental Commission (EC)

Topic: Measures to prevent the depletion of water sources

Student Officer: Vassiliki Vassiliou

Position: Deputy President

Personal Introduction

Dear Delegates,

My name is Vassiliki Vassiliou and I am currently a Year 11 student at Pierce - The American College of Greece. It is an honor and a privilege for me to serve as a Deputy President of the Environmental Commission in the 9th Campion School Model United Nations Conference as MUN is an ideal and quintessential way to acknowledge global humanitarian crises and take action towards sustainability. I started MUN about 1 year ago and this is actually my first chairing position! The combination of politics, international affairs and human rights utterly fascinated me from the beginning and, since then, I have attended almost every MUN conference that I possibly could. It is my utmost pleasure to be able to assist you all in this wonderful and educational experience. I really hope this conference is full of opportunities for all of you and that it will blossom your passion and interest for MUN in general.

This study guide will help you in thoroughly understanding the topic of: "Measures to prevent the depletion of water sources" in order for you to be able to prepare your own solutions and participate in the fruitful debate on the resolutions. You are highly encouraged to carry out your own research too. If any questions or problems arise, please do not hesitate to contact me! I am very excited to meet you all and I wish you the best of luck with your preparation!

Yours truly,

Vassiliki Vassiliou

vassiliouvassiliki70@gmail.com

Topic Introduction

The exact chronological period of the beginning of the global environmental crisis of water depletion is a topic frequently debated upon. Some scientists date it back to the creation of agriculture about 11,000 years ago, while others believe it began during the nuclear era in the 1940s. Nevertheless, the majority of scientists believe it dates back to the Industrial Revolution in the 18th century.[1] Since then, anthropogenic activities have created several problems such as pollution, global warming, loss of biodiversity and, most importantly, the depletion of natural sources.

Even though the dire need for water for human survival and the maintenance of biodiversity is an undeniable fact, unsustainable human activity has been vastly depleting water resources resulting in water scarcity. More than a billion people globally lack access to potable water and almost three billion experience water shortage numerous times each year.[2]

Throughout the Anthropocene epoch, water depletion has become one of the most severe issues globally, primarily due to human carelessness. First and foremost, the main cause of water depletion is water pollution. Industrial waste, oil leaks, marine dumping, global warming and radioactive waste all contribute to the issue. Additionally, the increase of agriculture has also played a crucial role. “At present, the agricultural production of biomass for food and fiber requires 86% of worldwide freshwater use.”[3] The increasing demand for agricultural crops for the creation of food and fuels has resulted in the acceleration of global agricultural production. Agricultural contaminants such as fertilizers and pesticides can easily impair the quality of surface water and groundwater. Furthermore, because of climate change, high air temperatures and

[1] Written by Paolo Gabrielli. “When Did Humans Start Polluting the Earth?” *World Economic Forum*, www.weforum.org/agenda/2015/02/when-did-humans-start-polluting-the-earth/.
[2]“Water Supply & Sanitation.” World Water Council, www.worldwatercouncil.org/en/water-supply-sanitation.
[3]Gerbens-Leenes, et al. “Water Footprint of Bio-Energy and Other Primary Energy Carriers.” Waterfootprint.org, Mar. 2008, https://waterfootprint.org/media/downloads/Report29-WaterFootprintBioenergy.pdf

extreme weather conditions will undoubtedly affect water quality as well as its availability. The distribution of groundwater, rainfall and snowmelt will be altered. Moreover, the increase of air temperature results in the constant evaporation of water bodies, both surface and groundwater. Lastly, not only has the water demand increased due to overpopulation but, regardless of the constant warnings, continue to use water excessively and arbitrarily.

The aforementioned phenomenon is the source of multiple issues. Primarily, the depletion of water sources results in the absolute destruction of biodiversity and ecosystems as a whole. It is impossible for living organisms to survive without water as the majority of both animals and plants' functions are completely dependent on it. Additionally, animals' cells consist of a large amount of water and without their constant replacement, fatal dehydration could occur. Furthermore, the depletion of water sources is a threat to food and nutritional security as they both solely depend on ecosystems that, as previously mentioned, will not be able to survive without sufficient water provision. Water scarcity and low water quality can cause multiple societal issues such as numerous health problems like diarrhoea and typhoid as well as gender discrimination issues. Despite the fact that water is necessary and vital for all environmental and human functions, both governments and their citizens continuously exploit water resources without taking into consideration the dire consequences that both our and all future generations will face due to unsustainability. Regardless, there are numerous ways in which nations could come together to address this issue.

Definition of key terms

Water Depletion

Describes the vast reduction of potable and usable water due to human activities.[4]

Water Scarcity

Water scarcity is a lack of sufficient water supply. It is a pressing need in many areas of the world as it is needed in various processes, such as energy creation and industry use. [5]

Wastewater

"Wastewater is the polluted form of water generated from rainwater runoff and human activities. It is also called sewage. It is typically categorized by the manner in which it is generated—specifically, as domestic sewage, industrial sewage, or storm sewage (stormwater)." [6]

The Anthropocene Epoch

The Anthropocene epoch is a unit of geological time that describes the period in Earth's history throughout which humans have started significantly impacting the planet. It started in the beginning of the Agricultural Revolution 12,000–15,000 years ago and is ongoing.[7]

---

[4] What Is Water Depletion, Causes and Effects and What Is Effective Water Management." *Natural Energy Hub*, 1 Mar. 2018, www.naturalenergyhub.com/environmental-hazards/water-depletion-causes-effects-effective-water-management/ .

[5] Team, Fluence News. "What Is Water Scarcity?" *Fluence Corporation*, 2 Nov. 2017, www.fluencecorp.com/what-is-water-scarcity/.

[6] "Wastewater Treatment." Encyclopædia Britannica, Encyclopædia Britannica, Inc., www.britannica.com/technology/wastewater-treatment#:~:text=Wastewater%20is%20the%20polluted%20form,or%20storm%20sewage%20(stormwater) .

[7] National Geographic Society. "Anthropocene." *National Geographic Society*, 5 June 2019, www.nationalgeographic.org/encyclopedia/anthropocene/#:~:text=The%20Anthropocene%20Epoch%20is%20an,the%20planet's%20climate%20and%20ecosystems .

Anthropogenic Droughts

Anthropogenic droughts are deficits in water caused by human actions. [8]

Waste-Water Treatment

"Wastewater treatment, also called sewage treatment, is the removal of impurities from wastewater, or sewage, before it reaches aquifers or natural bodies of water." [9]

Agriculture

Agriculture is the art and science of cultivating soil, growing crops and raising livestock. It includes the preparation of plant and animal products for people to use and distribute to markets. Agriculture provides most of the world's food and fabrics.[10]

Bioenergy

Bioenergy is a form of renewable energy found in biomass materials such as wood and methane gas. It has the ability to vastly improve the global ecological footprint as it can produce sustainable transportation fuels.[11]

Drought

A drought is a chronological period characterized by constant and dreadful shortages of water supplies. It refers to both surface and groundwater and can last from a few months up to whole years.[12]

---

[8] AghaKouchak, Amir. "Anthropogenic Drought: How Humans Affect the Global Ecosystem." Eos, 10 Feb. 2018, eos.org/editors-vox/anthropogenic-drought-how-humans-affect-the-global-ecosystem.
[9] "Wastewater Treatment." Encyclopædia Britannica, Encyclopædia Britannica, Inc., www.britannica.com/technology/wastewater-treatment#:~:text=Wastewater%20is%20the%20polluted%20form,or%20storm%20sewage%20(storm water) .
[10]National Geographic Society. "Agriculture." National Geographic Society, 9 Oct. 2012, www.nationalgeographic.org/encyclopedia/agriculture/ .
[11]"What Is Bioenergy?: How Biomass Generates Energy?" Renewable Energy Supplier, www.goodenergy.co.uk/our-energy/our-fuel-mix/what-is-bioenergy/#:~:text=Bioenergy%20refers%20to%20electricity%20and,fuels%20produced%20from%20organic%20matter .
[12]"Drought." Cambridge Dictionary, dictionary.cambridge.org/dictionary/english/drought.

Ecosystem

Ecosystems are biological communities that consist of living organisms and other non-living components that are needed for them to survive. All organisms are completely dependent on each other and act as a system.[13]

Biodiversity

Biodiversity is the array of plant (flora) and animal (fauna) life around the world or within a particular habitat. [14]

Background Information

Historical Background

The main issue that arose during the Anthropocene epoch, a time period throughout which humans started to negatively impact the environment, is water scarcity: a phenomenon existing as a consequence of the constant depletion of water sources.

It is believed that the first megadroughts in human history occurred between 135,000 to 75,000 years ago. [15] Numerous DNA research findings show that these megadroughts were the main reason why early humans migrated out of Africa in search of more appropriate living conditions. Despite this, the first time that water shortages appeared in historical records was during the 19th Century. The longest and deadliest drought recorded was the Dust Bowl Drought, a drought that took over the United States during the 20th century and, more specifically in 1930. The Dust Bowl lasted for about a decade and mainly affected the Midwest and Southern Great Plains. In 1931, the dust storms began, causing severe environmental disasters. It is

[13] "ECOSYSTEMS AND BIOMES." Web.ccsu.edu, https://web.ccsu.edu/faculty/kyem/GEOG110/Ecosystem/THE%20ECOSYSTEM.htm
[14] "Oxford Languages and Google - English." *Oxford Languages*, https://languages.oup.com/google-dictionary-en/
[15] Written by Douglas Broom, Senior Writer. "5 Droughts That Changed Human History." *World Economic Forum*, www.weforum.org/agenda/2019/05/5-droughts-that-changed-human-history/ .

suggested that by 1934, 35 millions acres of land had been “rendered useless for farming” while 125 million more were losing their topsoil. The Dust Bowl began due to several socioeconomic factors, climate change, federal land policies and agriculture. Another drought that changed human history was China’s most disastrous drought during 1928 to 1930. It caused severe famine and killed almost 10 million people. Currently, the US is experiencing what scientists call the worst drought the world has experienced in the last 1,200 years.

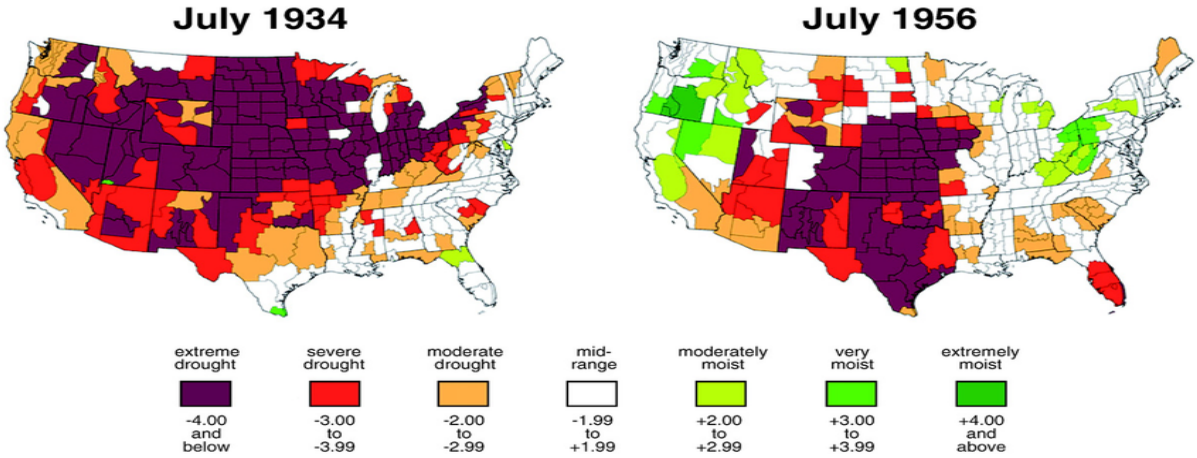

Figure 1: Maps showing the U.S. regions most affected by the Dust Bowl in 1934 and 1956

Environmental Impact

Destruction of Ecosystems and Biodiversity

It is a well-known fact that water is an absolute requirement for all living organisms, thus all ecosystems are completely dependent on water. The only way to maintain environmental balance is through photosynthesis, a procedure where plants absorb water and use it to create glucose, as it is necessary for them to survive. Additionally, the water that is absorbed serves as a medium in which nutrients, waste products and dissolved gases are transported through the plant’s roots. Furthermore, just like humans’ organs, animals’ organs consist of cells that are 70% water. If that water is not constantly replaced, the organism will simply not be able to survive.

In order for ecosystems to exist in the first place, biodiversity is necessary. Even if droughts are a natural phenomenon, anthropogenic droughts can seriously harm the environment as they contribute to the extinction of certain animal species. Currently,

more than 125,000 animal species live entirely in freshwater habitats, including 15,000 species of fish, 4,300 species of amphibians, and 5,000 species of mollusks, such as clams and oysters. If water shortages are frequent, these animals will not be able to survive as their natural habitat will be entirely destroyed. Additionally, as all animal species heavily depend on each other, the loss of a single one can prompt cascading effects throughout the food chain, thus all other species will be negatively impacted.[16]

Increased Salinity

When the level of salts in the soil are higher than normal, the water can easily flow back into the soil from the roots of a plant. Therefore, agricultural production is severely affected by increased salinity as it can cause reduce its growth, interfere with its nitrogen uptake or even stop the plant's reproduction completely. The extremely high temperature as a cause of anthropogenic climate change plays a significant role in the salinization of water. When water evaporates due to high air temperatures, the dissolved salts in water tables rise to the soil surface and accumulate. The urgency of Anthropogenic climate change is vastly increasing and therefore the growth of soils will be negatively affected if change does not occur. Additionally, human practices such as inappropriate irrigation practices and insufficient drainage can both increase the salinity levels of water. [17]

Socio Economic Impact

Social Impact

Water.org has noted that the water crisis is also a health crisis. It is estimated that 758 million people currently lack access to clean water and at least 2 billion use water sources that are contaminated with feces. Cholera, dysentery, typhoid, and

[16] UNEP, Samsung Engineering and. "Role of Water in Ecosystem - World Report - Our Actions." TUNZA Eco Generation, www.tunza.eco-generation.org/resourcesView.jsp?boardID=worldReport&viewID=52523&searchType=&searchName=&pageNumber=1 .

[17] Queensland;, c=AU; o=The State of. "Impacts of Salinity." *Queensland Government*, CorporateName=The State of Queensland; Jurisdiction=Queensland, 1 Oct. 2013, www.qld.gov.au/environment/land/management/soil/salinity/impacts.

diarrhea, the main causes of child deaths globally, can be easily transmitted through contaminated water. Every two minutes, a child dies from water related illnesses. Around 1 million people die of water and sanitation-related issues annually as 2 out of 5 people globally do not have access to sanitation and therefore are unable to protect themselves from the aforementioned illnesses and diseases.

It is believed that "better water, sanitation, and hygiene could save the lives of 297,000 children under the age of 5 each year." [18] However, global efforts to ameliorate the issue are low.

The health crisis caused by water scarcity is also a gendered crisis and, specifically, a women's crisis. Women in Less Economically Developed Countries (LEDCs) are usually responsible for collecting water for their families. The long and arduous distances to the closest water sources heavily affect their health as they cause physical and mental strain. Furthermore, women depend on sanitation more than anyone else due to their specific hygienic needs during menstruation and pregnancy.[19] Therefore, it is clear that measures to prevent the depletion of water sources are necessary to secure individuals, especially women's access to clean and plentiful water.

Economic Impact

The economic crisis due to water scarcity can also be categorized as a womens' crisis. As stated previously, women are mostly responsible for the collection of water. The time spent on the collection of water could be spent on education and work. Most women in LEDCs do not have access to education as they simply do not have enough time due to their domestic responsibilities, which include the collection

[18] "Water Charity for Safe Water & Sanitation." Water.org, www.water.org /.

[19] "Water Crisis - Learn About The Global Water Crisis." Water.org, www.water.org/our-impact/water-crisis/ .

of water. Therefore, they are not able to gain a stable income during their adult life. It is estimated that, due to the aforementioned, $260 billion is annually lost globally.[20]

Furthermore, improved water quality and sanitation could also result in the decrease of illnesses and therefore deaths and health care costs. It is estimated that $18.5 billion annually would be the economic benefit.

[20] "Water Crisis - Learn About The Global Water Crisis." Water.org, www.water.org/our-impact/water-crisis/ .

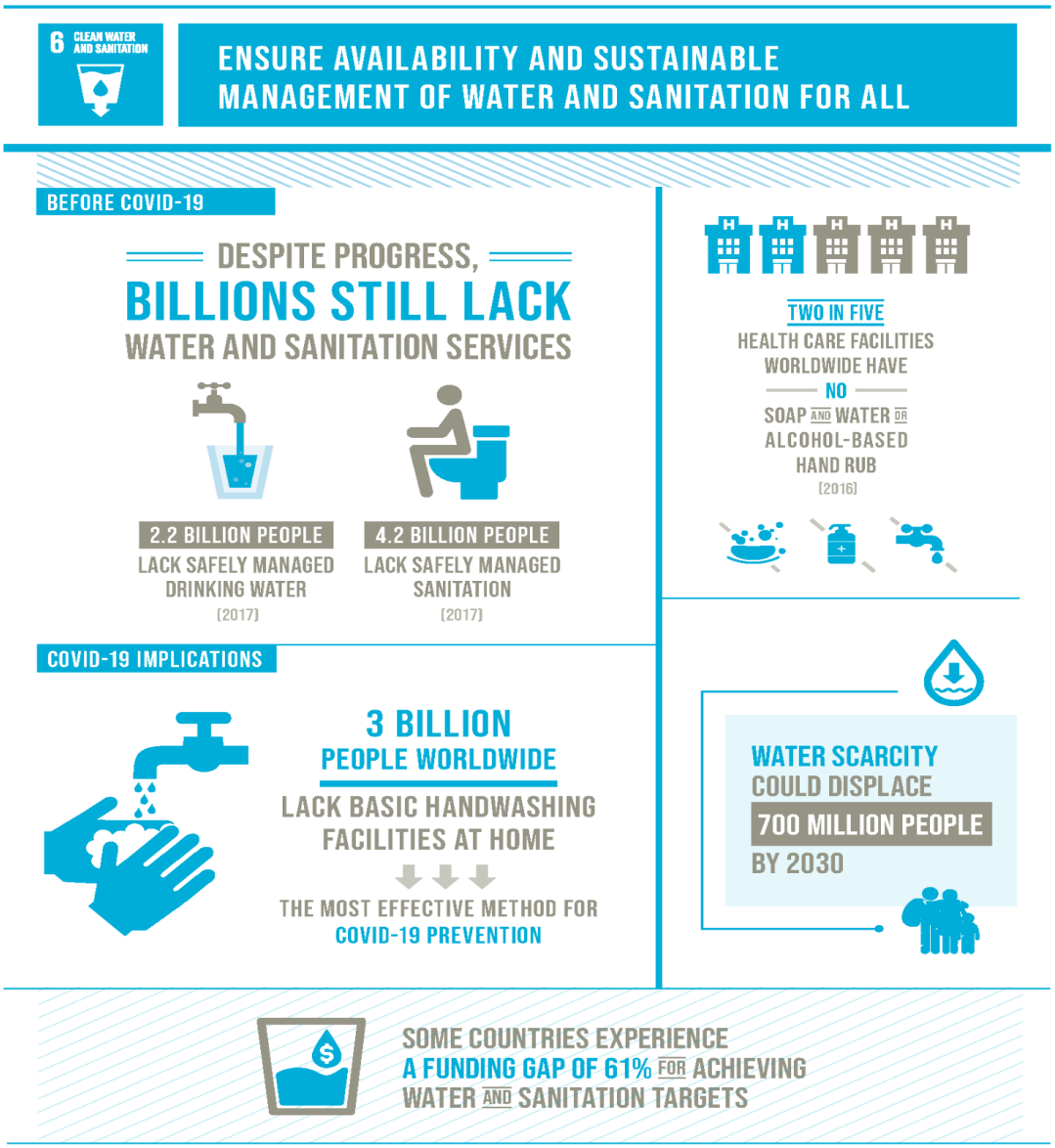

Figure 2: Infographic for United Nations SDG no. 6 [21]

Water sustainability in the present and future

The United Nations Sustainable Development Goals (SDGs)

The 17 Sustainable Development Goals are part of the 2030 Agenda for Sustainable Development, an agenda that ensures global peace and prosperity, and

[21] "Goal 6 | Department of Economic and Social Affairs." *United Nations*, United Nations, www.sdgs.un.org/goals/goal6 .

have been adopted by all UN member states since 2015. The SDGs' purpose is to "produce a set of universal goals that meet the urgent environmental, political and economic challenges facing our world." The 6th Sustainable Development Goal aims to "ensure availability and sustainable management of water and sanitation for all." It consists of 8 targets, 15 events and 400 publications all aiming to combat the water crisis. The water-related targets that the UN is trying to achieve by 2030 are the following: 1. Safe and Affordable drinking water, 2. End open defecation and provide access to sanitation and hygiene, 3. improve water quality, water waste treatment and safe reuse, 4. Increase water-use efficiency and ensure freshwater supplies, 5. Implement integrated water resources management, 6. Protect and restore water related ecosystems, 7. Expand water and sanitation support to developing countries and 8. Support local engagement in water and sanitation management.[22]

The United Nations Millennium Development Goals (MDGs)

The 8 Millennium Development Goals were established following the Millenium Summit of the United Nations in 2000 and were set to be achieved by the year 2015. The Millennium Development Goals' target on access to water and sanitation aimed for a 50% reduction in the lack of access to improved water sources and improved sanitation facilities by 2015. "The MDGs' clean water access target was achieved five

[22] "Goal 6 | Department of Economic and Social Affairs." United Nations, United Nations, www.sdgs.un.org/goals/goal6 .

years ahead of schedule in 2010. More than two billion people have gained access to safe drinking water since 1990." [23]

Figure 3: The United Nations Sustainable Development Goals

Figure 4: The United Nations Millennium Development Goals

[23] "Millennium Development Goals (MDGs)." World Health Organization, World Health Organization, www.who.int/news-room/fact-sheets/detail/millennium-development-goals-(mdgs)#:~:text=The%20United%20Nations%20Millennium%20Development%20Goals%20(MDGs)%20are%208%20goals,achieve%20by%20the%20year%202015.&text=The%20MDGs%20are%20derived%20from,these%20relate%20directly%20to%20health.

Major countries and organizations involved

China

Due to the increasingly growing population, China is currently the country with the largest water consumption globally. More specifically, 1,370 trillion liters of water are used each year. Despite the fact that China consists of almost 20% of the world's population, it has access to only 7% of the world's freshwater. Therefore, this has led to China facing one of the worst water crises worldwide. Studies suggest that 39,9% of Beijing's water is severely polluted to the point where it is functionless. According to the ministry of water resources, 320 million people in China lack access to safe drinking water - 1/4 of the Chinese population. China's most efficient water scheme is the South-North Water Transfer Project, an action that supplied water to Northern Chinese cities. Through this multi-million dollar project, the Chinese government is aiming to divert 44.8 cm^3 each year from the Yangtze River in southern China to the Yellow River Basin in northern China, in an attempt to tackle the issue of water depletion.[24]

The United States of America (USA)

The United States has the longest history of deadly droughts in the world. Although it is commonly believed that water scarcity is an issue that only affects LEDCs, the United States is currently facing the worst drought worldwide in the last 1,200 years.[25] The main cause is a heatwave in which high air temperatures are breaking historic records. Despite this, water scarcity is also affected by industrial pollution, agriculture and the excessive use of water by US citizens. It is estimated that almost 50% of American lakes are too polluted for aquatic life, as 1.2 trillion gallons of untreated usage and industrial waste are dumped in the water. Currently, 63 million

[24] "Water Transfer - Snwtp." *Coolgeography*, www.coolgeography.co.uk/gcsen/CRM_Water_SNWTP.php.
[25] "'Potentially the Worst Drought in 1,200 Years': Scientists on the Scorching US Heatwave." The Guardian, Guardian News and Media, 18 June 2021, www.theguardian.com/us-news/2021/jun/18/us-heatwave-west-climate-crisis-drought .

Americans are exposed to unsafe drinking water. Additionally, every American uses approximately 80 to 100 gallons of water daily. America's population will dramatically increase in the next decade , thus US water scarcity will gradually become an urgent issue. The US Government Global Water Strategy was introduced in 2017 and aims to increase sustainable access to safe drinking water and sanitation services, encourage the sound management and protection of freshwater resources, promote cooperation on shared waters, and to strengthen water-sector governance, financing, and institutions.

Switzerland

Switzerland is globally recognized for its extremely high quality water. Throughout the last few decades, the Swiss government has prevented the water quality decrease through wastewater treatment. The Swiss water suppliers collect water from three natural sources: Groundwater, Lake water, and Spring water (collected from the Swiss Alps). For Spring water waste treatment, the water is captured with drainage pipes and flows through a settling basin into a reservoir and into the supply system. For groundwater waste treatment, the water flows through a shaft, and is pumped through a reservoir and into the supply system. Lastly, for lake water waste treatment, the germs and bacteria are killed by ozonation. Additionally, carbon breaks down unnecessary active substances while chlorine dioxide averts the creation of microbes. When the filtration of the water is finished, the water reaches the supply network. Even without lake water treatment, it would still be suitable for drinking due to strict water protection laws.

Eritrea

Eritrea is the African country with the lowest quality of water as well as the one that is facing the most intense water scarcity. It is estimated that as of 2020, 80.47% of Eritrea's population lacks access to basic water services. Eritrea's drought began in 1999, a time period where its citizens had access to hardly any clean water sources. The country's terrain is dry and no rivers flow through it. Due to this, its citizens and,

more specifically women and children, are obliged to travel down to the Tezeka River. As a result of the lack of hydration and sanitation, Eritreans may struggle with multiple health problems such as diarrhea and typhoid, resulting in thousands of deaths annually. In order to combat the water crisis, the Eritrean Government has taken part in multiple UNICEF actions in order to meet the UN Sustainable Development Goal on sanitation.

Food and Agriculture Organization of the United Nations (FAO)

The Food and Agriculture Organization of the UN has a global information system specialized in water and agriculture. This information system, namely AQUASAT, monitors global water use, contributes to the development of prospective studies on agriculture and environment services and focuses on global warming and its effect on water depletion. Additionally, it provides technical assistance to help countries in strengthening their natural resources assessment and monitoring water usage. FAO's water activities have three main categories: information and knowledge, policy advice, and technical support to countries and their constituents.

Water.org

Water.org is a nonprofit American organization that focuses on ensuring clean water access and sanitation for all, an action succeeded through affordable financing with the help of their supporters. Since the creation of the organization 30 years ago, they have managed to provide water access and sanitation to more than 36 million people in 17 different countries.[26]

Timeline of events

1800s	Water shortages appear in historical records for the first time due to the beginning of the Anthropocene epoch.
1831	Modern hydroelectric power is first utilised.

[26] "Water Charity for Safe Water & Sanitation." *Water.org*, www.water.org/ .

1928	China's most disastrous drought begins. It ended in 1930 and it is estimated that 10 million people lost their lives. It is considered to be one of the five most disastrous droughts in human history.
1930	The US's Dust Bowl, the deadliest and most severe drought in human history, begins and lasts for about a decade.
1993	March 22 is designated "World Water Day" by the UN General Assembly.
2000	The Millenium Development Goals of the UN are created.
2003	The United Nations create an interagency mechanism called UN Water in order to coordinate global efforts towards ending water scarcity.
2010	On July 28, the United Nations recognizes water and sanitation as a Human Right.
2015	The UN's Sustainable Development Goal number 6 is introduced: "Ensure availability and sustainable management of water and sanitation for all."

Previous attempts to solve the issue

Companies and Charities

Water is life

Water is life creates portable water filters in the shape of a straw. The filters kill the bacteria that lead to illnesses and diseases such as diarrhea and typhoid. The organization has currently provided almost 6 million gallons of water in 15 different countries.

Valor Water

Valor Water monitors and controls global water waste through the data they collect from their customers. The Valor Water Analytics team transforms complicated water usage data into simple solutions that are later proposed to water utilities. This action is extremely significant as inefficient water measurement and management are two of the main causes of water depletion.

Planet Water Foundation

Planet Water Foundation is a nonprofit foundation that installs water filtration systems in places where water is scarce. They provide 10 thousand liters of clean water daily. The foundation has managed to assist more than 2 millions people in 15 different countries.

Treaties and Legislation

DIRECTIVE (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2020 on the quality of water intended for human consumption

This Directive aims to protect Europeans' physical health from uncontaminated water use. The rules it lays down ensure the cleanliness and high quality of the continent's water and aim to achieve the provision of water and sanitation for all in the Union.[27]

The Yangtze River Protection Law of the People's Republic of China

The purpose of this law is to strengthen both environmental and ecological protection of the Yangtze River Basin, to promote the sustainable use of resources in order to improve the global ecological footprint and to achieve harmonious coexistence of humans and nature in the Chinese nation.[28]

Saudi Arabia Water Law 2020

'This Law consisting of 77 articles divided in XVII Chapters aims to ensure water sustainability, to control the depletion of water sources through their constant protection, to provide access to safe drinking water, sanitation and water supplies for all, and to enhance the participation of private organizations in water projects.

[27] "Lex Access to European Union Law." *EUR*, eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020L2184.
[28] *The Yangtze RIVER Protection Law of the People's Republic of China*, www.npc.gov.cn/englishnpc/c23934/202103/8cccd3c25caf464d8ae3aedc66a21dd0.shtml.

Additionally, it focuses on the agricultural aspects of water use and aims for sustainability in this field.[29]

Relevant UN Resolutions, Events, Treaties and Legislation

Human Rights Council Resolution 7/22

A resolution created to ensure that all humans have access to safe drinking water and sanitation. It focuses both on local and national perspectives in combating the water crisis issue.[30]

UN General Assembly Resolution A/RES/64/292

This General Assembly Resolution recognizes both water and sanitation as human rights and acknowledges that both are essential to the realisation of human rights. It has been ratified by all UN member states and has made a significant universal difference in water management.[31]

Human Rights Council Resolution A/HRC/RES/15/9

This resolution provides measures and solutions to solve the global water crisis in order to ensure that all have access to potable water and sanitation. All member states of the UN have ratified it and are therefore currently following HRC's plan of action.[32]

[29] *Saudi Arabia*. extwprlegs1.fao.org/cgi-bin/faolex.exe?rec_id=000179&database=valid&search_type=link&lang=eng&format_name=@ESWAT.
[30] "Resolution 7/22. Human Rights and Access to Safe Drinking Water and Sanitation ." *Human Rights Council*, ap.ohchr.org/documents/E/HRC/resolutions/A_HRC_RES_7_22.pdf.
[31] "64/292. The Human Right to Water and Sanitation ." *A/Res/64/292 - e - a/Res/64/292 -Desktop*, undocs.org/A/RES/64/292.
[32] *Human Rights Documents*, ap.ohchr.org/documents/dpage_e.aspx?si=A%2FHRC%2FRES%2F15%2F9.

Possible solutions

Creation and improvement of policies and regulations

Currently, the main pollutants of groundwater are toxic emissions produced by industrial sources. Therefore it is necessary that governments take initiatives to control industrial sewage. Throughout history, it has become evident that the only way to control industries is through the creation of strict environmental laws and regulations. Unfortunately, it is noteworthy to mention that numerous legislations and policies already exist but, despite the urgency of the situation, most industries do not follow the protocols due to economic reasons. An efficient way to control them is through imposing fines on the ones that neglectfully produce the waste and rewarding the ones who act in accordance with current laws and policies.

Improvement of irrigation and agriculture use to ensure sustainable water management

In the last few decades, the expansion of the irrigation sector has severely increased global water stress. Irrigation is commonly used in agriculture as it improves the growth of crops in areas with irregular precipitation. Additionally, it improves the quality of crops and allows alternative ones to grow under all weather circumstances. As agriculture uses almost 70% of the world's freshwater, it is crucial that irrigation methods that are used become sustainable. An efficient way to do that is through drip irrigation. Drip irrigation is a process of irrigation where water and nutrients are slowly delivered across land through dripperlines (pipelines) watering only the soil where the roots grow. In that way, a large amount of water is conserved as it does not have to cover the plant as a whole.

Rainwater harvesting

Rainwater harvesting systems collect rainwater and store it for later reuse for human activities. Rainwater systems can vary from regular rain ballers to pump purification systems and, most importantly, dams. Dams collect water throughout

chronological periods with heavy fall and release it during periods of low flow. Additionally, each rain barrel can save about 1,300 of water during the summer months. Through rainwater harvesting, a single house can save up to 2 liters of water each year while it can replace about 40-50% of a house's water usage. With the use of rainwater harvesting technologies, global water stress levels are expected to rapidly decrease. Due to the use of rainwater harvesting, the global ecological footprint has already greatly improved. [33]

Individual attempts and educational awareness

Even though it's much more efficient to address the water depletion issue from a global and governmental perspective, it is important to note that individual attempts to control water depletion and conserve water are also highly necessary. Everyone can contribute through taking shorter showers, installing water saving shower heads, turning the sink off while brushing our teeth or shaving, only running the dishwasher when there is a full load and so on. In order to raise awareness amongst citizens, it is crucial to educate the youth by continuously emphasizing the extremely negative impact of daily actions and highlighting the harsh consequences that all future generations will bear due to unsustainable water management.

Bibliography

"What Is Water Depletion, Causes and Effects and What Is Effective Water Management." Natural Energy Hub, 1 Mar. 2018, www.naturalenergyhub.com/environmental-hazards/water-depletion-causes-effects-effective-water-management/

Team, Fluence News. "What Is Water Scarcity?" Fluence Corporation, 2 Nov. 2017, www.fluencecorp.com/what-is-water-

[33] {"@context":"schema.org", et al. "Save Water and Money with a Rain Barrel." *HouseLogic*, 14 Jan. 2021, www.houselogic.com/save-money-add-value/save-on-utilities/water-savings-barrel/ .

scarcity/#:~:text=Water%20scarcity%20can%20be%20defined,for%20a%20continually%20growing%20population.

"Wastewater Treatment." Encyclopædia Britannica, Encyclopædia Britannica, Inc., www.britannica.com/technology/wastewater-treatment#:~:text=Wastewater%20is%20the%20polluted%20form,or%20storm%20sewage%20(stormwater).

National Geographic Society. "Anthropocene." National Geographic Society, 5 June 2019, www.nationalgeographic.org/encyclopedia/anthropocene/#:~:text=The%20Anthropocene%20Epoch%20is%20an,the%20planet's%20climate%20and%20ecosystems.

National Geographic Society. "Agriculture." National Geographic Society, 9 Oct. 2012, www.nationalgeographic.org/encyclopedia/agriculture/.

"What Is Bioenergy?: How Biomass Generates Energy?" Renewable Energy Supplier, www.goodenergy.co.uk/our-energy/our-fuel-mix/what-is-bioenergy/#:~:text=Bioenergy%20refers%20to%20electricity%20and,fuels%20produced%20from%20organic%20matter.

"Drought." *Cambridge Dictionary*, dictionary.cambridge.org/dictionary/english/drought.

National Geographic Society. "Biodiversity." National Geographic Society, 5 June 2019, www.nationalgeographic.org/encyclopedia/biodiversity/#:~:text=Biodiversity%20is%20a%20term%20used,bacteria%2C%20animals%2C%20and%20humans

"'Potentially the Worst Drought in 1,200 Years': Scientists on the Scorching US Heatwave." The Guardian, Guardian News and Media, 18 June 2021, www.theguardian.com/us-news/2021/jun/18/us-heatwave-west-climate-crisis-drought.

https://www.herricks.org/site/handlers/filedownload.ashx?moduleinstanceid=140&dataid=442&FileName=how%20water%20loss%20affects%20biodiversity-.pdf

UNEP, Samsung Engineering and. “Role of Water in Ecosystem - World Report - Our Actions.” TUNZA Eco Generation, tunza.eco-generation.org/resourcesView.jsp?boardID=worldReport&viewID=52523&searchType=&searchName=&pageNumber=1.

“Water Crisis - Learn About The Global Water Crisis.” Water.org, water.org/our-impact/water-crisis/.

“Goal 6 | Department of Economic and Social Affairs.” United Nations, United Nations, sdgs.un.org/goals/goal6.

“Millennium Development Goals (MDGs).” World Health Organization, World Health Organization, www.who.int/news-room/fact-sheets/detail/millennium-development-goals-(mdgs)#:~:text=The%20United%20Nations%20Millennium%20Development%20Goals%20(MDGs)%20are%208%20goals,achieve%20by%20the%20year%202015.&text=The%20MDGs%20are%20derived%20from,these%20relate%20directly%20to%20health.

“Water Quality in Switzerland.” WfW, wfw.ch/en/water-facts/water-quality-in-switzerland?__geom=%E2%9C%AA#/.

Heggie, Jon. “Why Is America Running out of Water?” Science, National Geographic, 3 May 2021, www.nationalgeographic.com/science/article/partner-content-americas-looming-water-crisis.

Jaag, Otto. “Water Quality and Water Pollution Control in Switzerland.” Biological Conservation, Elsevier, 25 June 2003, www.sciencedirect.com/science/article/abs/pii/0006320772900493.

"FAO.org." Water | Land & Water | Food and Agriculture Organization of the United Nations | Land & Water | Food and Agriculture Organization of the United Nations, www.fao.org/land-water/water/en/.

Escher, Anna, and Lora Kolodny. "Causes of the Global Water Crisis and 12 Companies Trying to Solve It." TechCrunch, TechCrunch, 23 Mar. 2017, techcrunch.com/2017/03/22/causes-of-the-global-water-crisis-and-12-companies-trying-to-solve-it/?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAGHVlkLGVtsVC-SLC-vsMsmJlyzJZFuLycwOVzN-GrN952weyLEC7YkJeZj6Njh_jACsA9BYK7lg-GGmZtAck8yV-G21D2tQP3-U9FL5o7jlola_lLiZ59377ZUoya7mGOWDlepXhjFX38vHt51lsyNaUE1yA6jU87q-4EysXRQG.

Written by Paolo Gabrielli. "When Did Humans Start Polluting the Earth?" World Economic Forum, www.weforum.org/agenda/2015/02/when-did-humans-start-polluting-the-earth/.

CHAPTER 6. DRIP IRRIGATION, www.fao.org/3/s8684e/s8684e07.htm.

"Water Transfer - Snwtp." Coolgeography, www.coolgeography.co.uk/gcsen/CRM_Water_SNWTP.php.

"Overview." WATERisLIFE, waterislife.com/global/overview.