FORUM:	Environment Commission
ISSUE:	Measures to Resolve Damage and Mitigate Risk Factors of Increasingly Frequent Droughts
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Introduction

The containers in Taiwan are exposed after a national drought.

As Mami Mizutori, the UN's special representative for disaster risk reduction, rightly put, "Drought is on the verge of becoming the next pandemic and there is no vaccine to cure it." Amidst the global chaos faced by the world due to the outbreak of the Covid-19 pandemic, another issue, drought, is seen rising to the surface, requiring urgent and immediate actions to prevent an environmental pandemic from disrupting the world. Droughts are not novel; they have been present in the world for centuries, especially threatening arid areas. Recently, with continuous global warming, droughts are seen as a threat not only to the drylands but also to other places of the world. While the intensity of the occurring has continuously been increasing, the United Nations warns that more severe and frequent droughts are expected in nearly everywhere around the world, including most of Africa, central and south America, southern Europe, central Asia, southern Australia, Mexico, and the United States. Confronting droughts without proper infrastructure is indeed like attempting to solve pandemics without vaccines, and risk management methods must be steadily implemented in all nations, with developed countries not being exceptions, to prevent this natural crisis from arriving.

Background

Droughts have been affecting human lives for hundreds and thousands of years into history. The first-ever massive droughts seen to have affected human demographics is the megadrought series in Africa around 135,000 to 75,000 years ago. Such climate variation in African lands may have diminished the accessibility of resources, urging the inhabitants to migrate out of the inhospitable African lands for a more sustainable life. After tens of thousands of years, marking 4,500 years into the past, another severe drought seems to have hit areas of the Middle East and parts of Europe. Evidence of drought has led to the claim that this was what caused the demise of pharaohs, leading to the Roman annexation of Egypt. The Mayan civilization also met its demise due to lack of water when population growth halved the regional rainfall 1,200 years ago in Mesoamerica. More contemporarily, the infamous Dust Bowl in the Great Plains of the US and Canada in the 1930s led to the migration of two million people and caused diseases to break out, killing many who were already suffering from malnutrition. Near the same period, China also suffered from a massive disastrous drought from 1928 to 1930, which caused a large-scale famine, resulting in the deaths of millions of people. More recently, though perhaps not so disastrous to be marked in history, many regions have been experiencing droughts with greater risks than their historical counterparts.

Problems Raised

Shortage of Sustainable Drinking Water

Droughts, which are prolonged periods of dryness in the climate cycle, occur bringing a shortage in water due to low precipitation and are commonly accompanied by side-effects like forest fires. The lack of precipitation and increased evaporation due to higher global temperature results in the drying up of streams and rivers. With reduced water content in such areas, water quality greatly diminishes the concentration of pollutants in the water sources increases and causes stagnation, while reduced oxygen concentration due to high water temperature is fatal for aquatic life. In addition, forest fires, which commonly occur with droughts affect the water quality as burned areas will cause sediments,

Lack of water in Iran after a drought

ash, and other pollutants to be carried into the larger water sources through runoff. This decrease in healthy water bodies along with the rapid evaporation of groundwater reduces available freshwater content available for humans to use and drink. Such degradation not only affects the availability of healthy drinking water but may also highly affect hygiene and sanitation which is influences by the quality of water people use. Lowered sanitation due to polluted water sources may make people more vulnerable to diseases.

Air Quality Degradation

In addition to water sources being unhealthy for human life, air quality will also highly be diminished with the increased frequency of droughts, especially due to the consequent wildfires. Such wildfires and the dry duststorms accompanying droughts can increase the suspended particulates in the air, which can irritate human and animal respiratory systems. This may amplify the symptoms for patients with chronic diseases like asthma and also increase the risks of acute respiratory disease occurrences. The particulate matter is not the only substance harming the air quality; airborne toxins from freshwater cyanobacteria blooms, also a result of droughts, can be increasingly present in the air and cause lung irritation. This will also hinder the availability of outdoor leisure activities to prevent prolonged exposure to polluted air. This inactivity, however, could result in higher occurrences of negative psychological responses in residents such as depression and anxiety.

International Actions

United Nations Convention to Combat Desertification (UNCCD)

The United Nations Convention to Combat Desertification (UNCCD) is the only legally binding international agreement that connects the environment, development, and sustainable land management. This convention focuses mainly on the areas that are more vulnerable to droughts and desertification, which are the arid, semi-arid, and dry sub-humid areas. This convention consists of 197 parties that aim for improving living conditions for the residents in the drylands, managing land, and soil productivity, and mitigating drought consequences. Cooperation between the developed and developing countries

United Nations
Convention to Combat Desertification

Logo of UNCCD

especially centered on the share of knowledge and technology, is encouraged and facilitated to ensure sustainable land management in such areas. In the recent 13th meeting, the drought initiative was brought up, focusing on drought preparedness systems, reducing drought vulnerability and risk through regional efforts, and a drought toolbox for resilience.

UNESCO's Flood and Drought Policy

The Flood and Drought Policy of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) is aimed at enhancing the drought and flood risk management policies and strategies of involved individual nations, especially for supporting national and subregional scale developments, transferring knowledge and technology from stakeholders for climate services, developing proactive policies, and empowering local communities. This policy follows a three-step process. The first step consists of the development of a background document with listed current policies of pilot countries in Africa, Latin America, and the Caribbean. The second step is when a technical panel is involved in making improvements to the current policies to transition from crisis management to risk management. In the last step, a High-Level meeting will be held on the current strategies and policies and measures to move onto proactive management will be discussed.

Key Players

China

Southern Yangtze River hit by a drought

China is a key player when regarding the issue of droughts because it has seen many negative consequences, with a large number of people suffering from water shortages and droughts. The rainfall in the Yangtze River region has decreased to more than half the normal levels, with hundreds of thousands of people suffering from water shortages. China, which is a region with large areas of desert land, is more prone to droughts and desertification. Also, it has experienced large drought events in history, making it a vulnerable place for droughts. Also with a large population, China already lacks sufficient drinking water and clean water for sanitation or hygiene management. Thus, the droughts pose an even more drastic impact on water security in China.

United States of America (USA)

The United States of America (USA) is a nation of great concern regarding droughts as it has been experiencing extreme weather events, including droughts, for the past decades, and the severity and frequency of droughts have been increasing with global warming. In the past, the United States was also a nation to experience one of the most catastrophic droughts, the Dust Bowl in the 1930s. As a country serious about the issue, the US has a National Drought Policy that aims to shift the focus from policies on relief to readiness. The policy's final report had goals regarding the establishment of an effective national drought policy and collaboration among scientists to enhance technology for drought management. In addition to this policy, the US has the National Integrated Drought Information System (NIDIS) and other systems for early drought warning and adaptation. Like such, the US is a nation aiming to resolve problems resulting from droughts.

Possible Solutions

Water Desalination and Harvestation

As the main problem that droughts bring is water shortage due to lack of precipitation and high evaporation rates, a way to secure water supplies is essential for human usage. A renowned way of gathering water is desalinating the water from oceans, which covers up more than 70% of the Earth. There are different methods for desalination, such as distillation and reverse osmosis. However, a drawback of these methods of sequestering water sources is that they did not cost-effective enough to be implemented on a national scale. Also, the technology for such methods must be shared among developed and developing countries to ensure implementation around the globe. Additionally, on a smaller and more available scale, water can be harvested from rainwater and the air around us. Rainwater can be gathered and used by humans especially for agriculture. Furthermore, though harder on technology, water can be harvested from the air using devices to be used for later uses.

Water desalination fields

Crop Engineering

While technology can be used to ensure water security, it can also be used to modify or engineer the plants to ensure a more stable growth even in harsh dry circumstances. Genetic engineering can be

used to develop crops that are resilient and adapted to low water content to allow them to grow even when the soil drops in water concentration. As droughts can affect food production, which sets a basic resource for our lives, this method can be largely used to feed people even amidst catastrophic droughts. However, just like other technologies, this takes more cost and time to develop such modified crops and would be hard to establish in all nations. This would also require the nations with such crops to share them with regions that are more prone to experiencing droughts without steady infrastructure, which requires worldwide cooperation.

Glossary

Drought

A drought is a prolonged period of abnormally low rainfall, leading to a shortage of water.

Desertification

Desertificaton is the process by which fertile land becomes desert, typically as a result of drought, deforestation, or inappropriate agriculture.

Particulate Pollution

Particulate pollution is the pollution of an environment that consists of particles suspended in some medium. The type of particulate pollution caused by forest fires is the atmospheric type.

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