VOL. 25

CARICOM · ACS AEC · CDRM · The University of the West Indies · CARDIN · CDEMA The Caribbean Disaster Emergency Response Agency · UNAIDS · EIRD · Guardian Group · Make Gender a Crime Against Place

CARIBBEAN DISASTER READINESS MANUAL 25 1997 - 2022

CARIBBEAN/LATIN AMERICA DISASTER READINESS MANUAL 2022/2023

#CODE RED

















FOREWORD TO
THE 2006 EDITION OF THE CARIBBEAN DISASTER READINESS MANUAL

The 2006 edition of the Caribbean Disaster Readiness Manual is an appropriate, timely, relevant and extremely welcome document. The recent experiences of the Members of the Caribbean Community (CARICOM), as indeed of other countries in the wider Caribbean with devastating hurricanes and destructive floods have underlined the lesson that we, as individuals, as countries, and as a Community, are not fully prepared for, or totally ready to manage the extreme climatic events that are increasingly becoming the norm. Global warming, climate variability and change, are having a negative impact on this Region. Since CARICOM consists of Small Island and Low Lying Coastal Developing States (SIDS) with limited resources and capacity, we are among the most vulnerable and fragile of global groupings.

We in CARICOM have however, demonstrated our willingness to help ourselves in addressing the many challenges related to disaster management. We have put in place independent institutions such as the Caribbean Disaster Emergency Response Agency (CDERA) established in 1991and the Caribbean Environmental Health Institute (CEHI) - established in 1980, as well as projects like Caribbean Planning for Adaptation to Climate Change (CPACC 1997 to 2001) which was followed by the Adaptation to Climate Change in the Caribbean (ACCC 2001 to 2005) and most recently, Mainstreaming Adaptation to Climate Change (MACC 2005 to 2007). We have also since 1991, established the Caribbean Community Climate Change Centre (CCCCC) to spearhead our efforts to specifically addressing Climate Change and related issues. To this end, the Centre, inter alia, facilitates the mobilization of internal and international resources to assist us to in managing climate change and related issues that they will not jeopardise our combined efforts to achieve sustainable development.

We were among the first countries of the world to recognise the growing threat of climate change and the need to adapt. All CARICOM Member States are signatories to the United Nations Framework Convention on Climate Change (UNFCCC). Commenting on its mandate, the UNFCCC admits, "Global warming is a 'modern' problem – complicated, involving the entire world, tangled up with difficult issues such as poverty, economic development, and population growth. Dealing with it will not be easy. Ignoring it will be worse." CARICOM has taken steps to address this specific challenge through the work, not only of

adaptation process. I would like to see it provided to, and used by, all our stakeholders.

As Shakespeare said in his immortal work, Hamlet, "*the readiness is all.*" This Manual will add immeasurably to our existing and continuing efforts to be prepared for the worst even as we work and pray for the best.

EDWIN W. CARRINGTON
SECRETARY-GENERAL
CARIBBEAN COMMUNITY (CARICOM)















































Ready... Set... Protect!

Be Ready This Hurricane Season with Guardian General

Protect your home and its contents and guarantee your peace of mind in three easy steps:

1. **Insure your home** with the rebuilding cost in mind in the event it is damaged or destroyed
2. **Ensure that your contents are adequately covered** by reviewing the replacement value of your possessions
3. **Store your important documents** safely and maintain a digital copy where possible

For more information visit us at **myguardiangroup.com**

Find us in the following territories:

Anguilla	Belize	Jamaica	St. Vincent	Affiliates in Aruba,
Antigua	British Virgin Islands	Montserrat	Trinidad and Tobago	Bonaire, Curacao
Bahamas	Cayman Islands	St. Kitts	Turks and Caicos	and Guyana
Barbados	Grenada	St. Lucia	US Virgin Islands	

Guardian Group
Guardian General Insurance Limited

live safe | live easy

myguardiangroup.com

CARIBBEAN/LATIN AMERICA DISASTER READINESS MANUAL

CONTENTS

2022/2023 VOLUME 25



5 Climate Changes to Increase in All Regions in Coming Decades

Alexander Bagalue
Publisher/ Climate Change Analyst



7 Climate Change, Food and Water Insecurity: What we Need to Know

Goulda A. Downer PhD, FAND, RD, LN, CNS

12 Greenhouse Warming



15 The World's Food Systems are Under Threat. Partner with us to Prevent a Global Food Emergency



16 Leaving No One Behind: Lessons from the Covid-19 Pandemic

Dorlan Burrell
Director and Co-founder, Enablers of Community Advancement Projects and Initiatives Limited

28 Air Quality and Climate Bulletin

World Meteorological Organization (WMO)

31 Water Security and Climate Change

Rosanna Beharry, MSc.

EDITORIAL DEPARTMENT:
A. A. Bagalue
Publisher/Climate Change Analyst
cdrmaa@gmail.com

MARKETING:
Email: sunab.bagalue@gmail.com
P.O. Box 5958 UWI, St. Augustine,
Republic of Trinidad and Tobago

ART DIRECTION:
Kenneth Henry
khenry.6019@gmail.com

PHOTOGRAPHY:
A.A. Bagalue
The United Nations Photo Library.
NASA

Development Team Work Supported By: *NASA Science Mission Directorate (formerly NASA's Office of Space Science)

*United States Geological Survey - Flagstaff

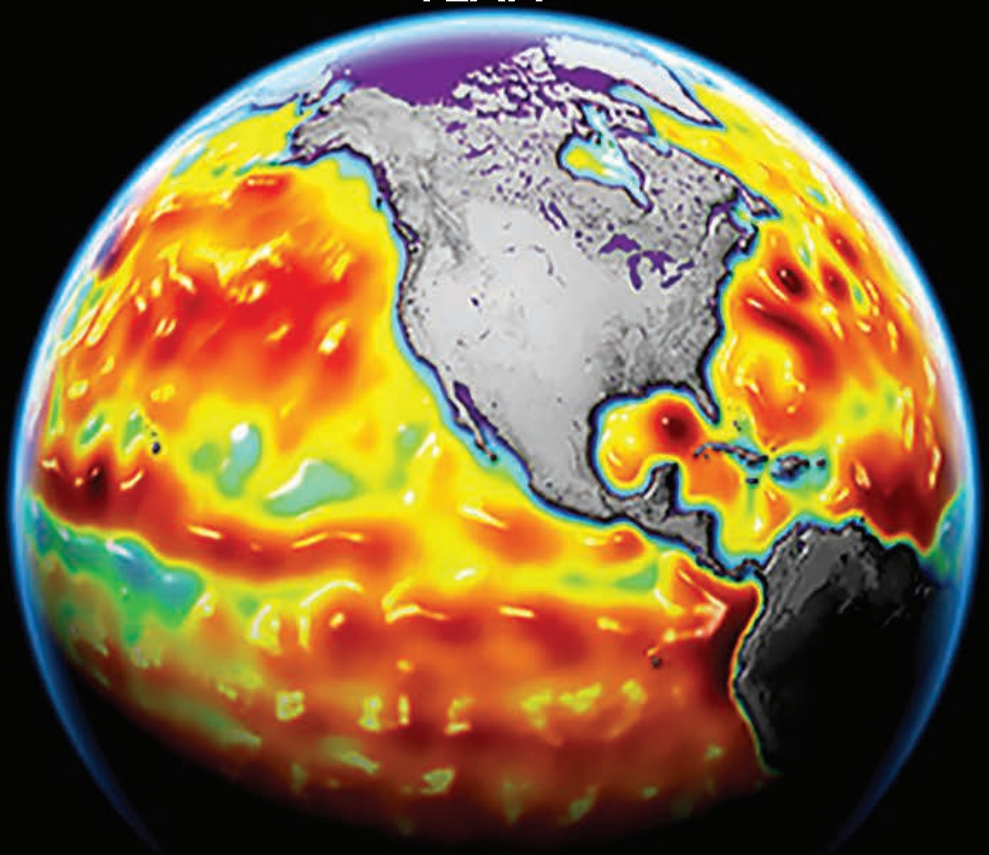
PRINTING:
Scrip-J, Republic of Trinidad & Tobago

ACKNOWLEDGMENTS
IPCC - The CARIBSAVE Partnership for UNDP Barbados and the OECS for CARICOM Member States
Caribbean Community Climate Change Centre (CCCCC)
Additional Administrator, Sarah Diouf (WMO Secretariat)

DISTRIBUTION:
Jamaica, Antigua, Cayman Islands, Trinidad and Tobago Barbados, Antigua, Grenada, Aruba, St. Lucia, Surinam, Guyana Belize, Bahamas Caribbean Community Climate Change Centre, TEMA -Tobago, ODPM -Trinidad, Guardian General Insurance Co. Ltd., Association of Caribbean States, Adaptation (Spain), UNISDR – Africa.

Caribbean disaster @AntonyBagalue

ONE CARIBBEAN ONE TEAM



If the planet warms by 4°C (as it is on course to do), an extreme heat event that would have occurred once in 50 years is 39.2 times more likely.
If it warms by 1.5°C, then the same event is 8.6 times more likely
You know what to do.

Caribbean Community Climate Change Centre

CARICOM

Funded by European Union Humanitarian Aid & Civil Protection

CDEMA CARIBBEAN DISASTER EMERGENCY MANAGEMENT AGENCY
Resilient States · Safer Lives

CARDIN

EIRD

dpm Office of Disaster Preparedness and Management

CRID Regional Disaster Information Center Latin America and the Caribbean

ACS AEC ASSOCIATION OF CARIBBEAN STATES ASOCIACION DE ESTADOS DEL CARIBE ASSOCIATION DES ETATS DE LA CARAIBE

Joint United Nations Programme on HIV/AIDS UNAIDS UNICEF • UNDP • UNFPA • UNDCP UNESCO • WHO • WORLD BANK

Guardian Group
Guardian General Insurance Limited

International Federation of Red Cross and Red Crescent Societies

CORE Communities Organized and Ready for Emergencies

TOBAGO HOUSE OF ASSEMBLY

TEMA

Foreword

Climate Change



This 25th Anniversary Edition of the Caribbean Disaster Readiness Manual (*the Manual, first published in 1992*), is a valuable addition to the global discourse on climate change and its impact on Latin America and the Caribbean region (the Region). In this manual, long before leaders and citizens of the Region became sensitized to the importance of climate change and the danger it poses, Dr. Antony Bagalue raised the alarm. He called for leaders of the Region to take steps to safeguard against the impact of climate change. In a 2019 report, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) noted that, from 2000 to 2019, 152 million people were impacted by 1,205 disasters worldwide; and that Latin America and the Caribbean is the second most disaster-prone region in the world.

Since the first publication of the Manual, other Readiness Manuals have also addressed climate change, especially the warming of global temperatures and the resulting increase of weather-related disasters. It is now acknowledged that increases in air and water temperatures will lead to rising sea levels, supercharged storms, higher wind speeds, more powerful and prolonged droughts, heavier rains, and flooding. This will result in the increased vulnerability of communities to natural hazards, mainly through ecosystem degradation, reductions in water and food availability, and changes in migration patterns.

I celebrate Dr. Bagalue's vision and genius, evidenced in this 25th Anniversary Edition of the Caribbean Disaster and Readiness Manuel. The scholarship, research, and thoughtfulness he brings to this project is outstanding. I admire his persistence in alerting Latin America and the Caribbean Region about the dangers of climate change, thereby ensuring that it is at the forefront of our consciousness. He should be commended for doing so.

Goulda A. Downer

Dr. Goulda A. Downer

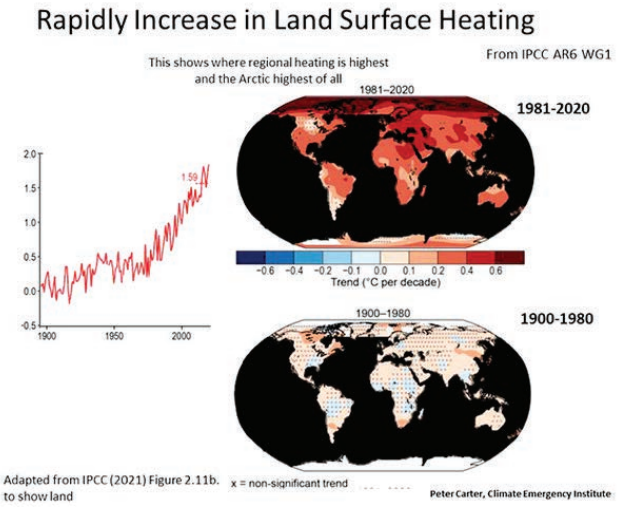
Principal Investigator/Associate Professor
Howard University College of Medicine
HU Telehealth Training Center
Director, National HIV Integration Project (H-NIP)
Director, Caribbean Clinicians Community of Practice (CCCoP)

Climate changes to increase in all regions in coming decades



Antony Alexander Bagalue, HDD
Climate Change Analyst

The latest Intergovernmental Panel on Climate Change (IPCC) report, emissions of greenhouse gases from human activities are responsible for nearly 1.1 degrees Celsius of warming since 1850-1900. It found that averaged over the next 20 years, global temperature is expected to reach or exceed 1.5 degrees Celsius of warming.



The world's leading scientists have projected that in the coming decades climate changes will increase in all regions, and there would be increasing heat waves, longer warm seasons and shorter cold seasons.

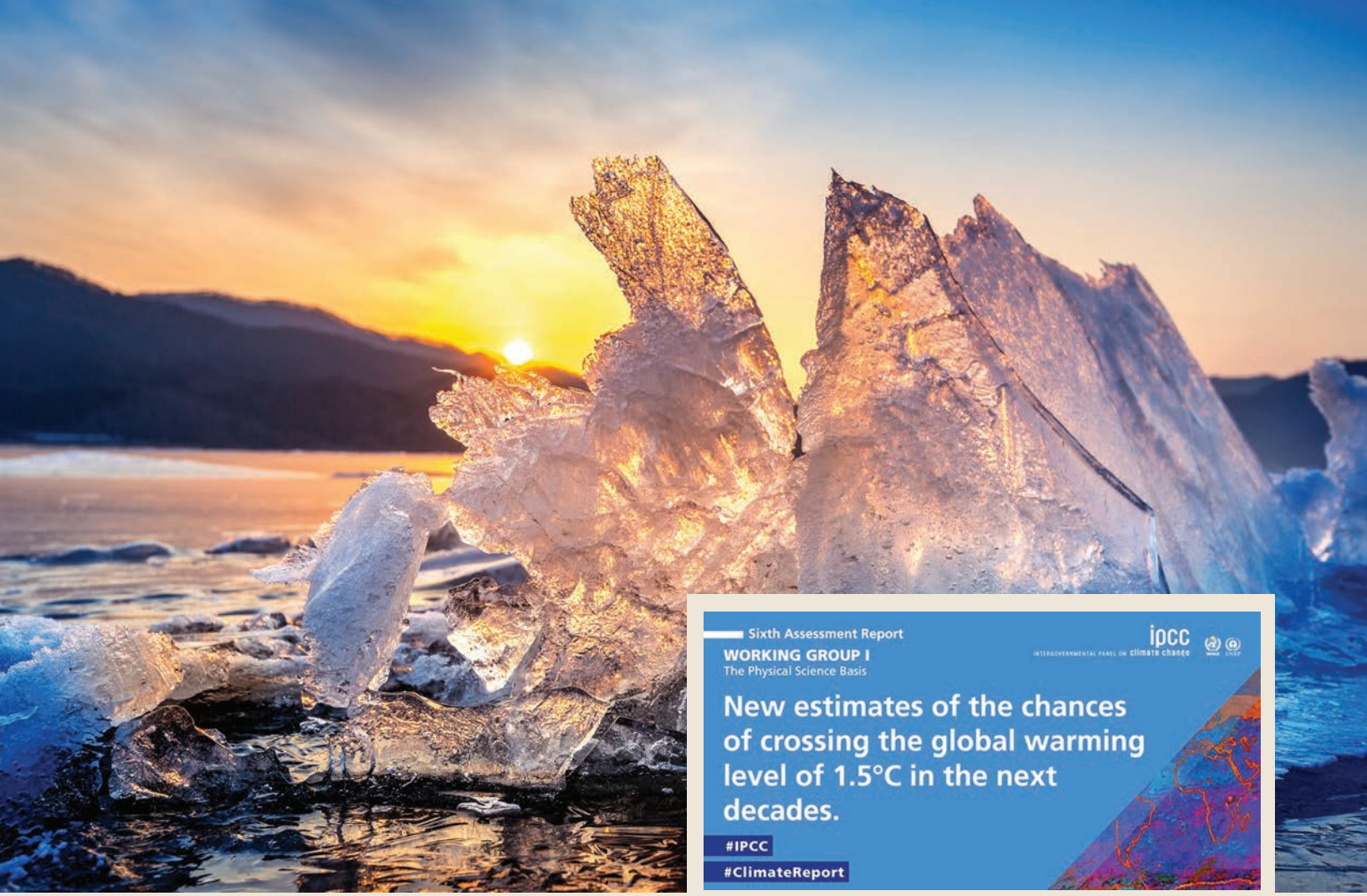
According to the latest Intergovernmental Panel on Climate Change (IPCC) report released, climate change is also intensifying the water cycle, bringing more intense rainfall and associated flooding, as well as more intense drought in many regions.

The report, titled "Climate Change 2021: the Physical Science Basis," was drafted by IPCC Working Group I and got approved on Aug. 6 by 195 members of the IPCC through a virtual approval session that was held over two weeks starting on July 26.

According to the latest report, coastal areas will see continued sea level rise throughout the 21st century, contributing to more frequent and severe coastal flooding in low-lying areas and coastal erosion.

Extreme sea level events that previously occurred once in 100 years could happen every year by the end of this century, the report projected.

The report provided new estimates of the chances of crossing the global warming level of 1.5 degrees Celsius in the next decades, and found that unless there are "immediate, rapid and large-scale reductions in greenhouse gas



emissions, – limiting warming to close to 1.5 or even 2 degrees Celsius will be beyond reach."

The report showed that emissions of greenhouse gases from human activities are responsible for nearly 1.1 degrees Celsius of warming since 1850-1900. It found that averaged over the next 20 years, global temperature is expected to reach or exceed 1.5 degrees Celsius of warming.

"Climate change is already affecting every region on Earth, in multiple ways," said Panmao Zhai, a climatologist and IPCC Working Group I Co-Chair. He added that "the changes we experience will increase with additional warming."

According to the report, changes to the oceans, including warming, more frequent marine heatwaves, ocean acidification, and reduced oxygen levels have been "clearly linked" to human influence.

The report emphasized that many of the changes observed in the climate are unprecedented in thousands, if not hundreds of thousands of years, and some changes already set in motion – such as continued sea level rise – are irreversible over hundreds to thousands of years.

However, the report said, strong and sustained reductions in carbon dioxide (CO_2) emissions and other greenhouse gases would limit climate change. While benefits for air quality would come quickly, the report said, it could take 20-30 years to see global temperatures stabilize.

"This report is a reality check," said IPCC Working Group I Co-Chair Valerie Masson-Delmotte.

"We now have a much clearer picture of the past, present and future climate, which is essential for understanding where we are headed, what can be done, and how we can prepare," the scientist concluded.

Note: IPCC AR6 WG1 Global land surface heating increasing fast at 1.59C for 2020. Heat waves will keep increasing fast in frequency intensity and duration- so long as governments keep pushing more fossil fuels. Policies of unprecedented evil

Global warming on land now averages 1.53 degrees Celsius: IPCC AR6 WG1 Rapid Increase in land surface heating (1.59C), showing which regions are heating fastest with the Arctic increasing fastest of all.



CLIMATE CHANGE, FOOD AND WATER INSECURITY:

What We Need To Know

It is anticipated that in the next several decades, more volatile food production and prices, as well as extreme weather events will become more severe and more frequent. Furthermore, in the next 40 years, agricultural lands will be lost to urbanization, desertification, sea level rise and increasingly saltwater intrusion in which few crops can grow. And the Food and Agriculture Organization (FAO) predicts that to feed a population of some 9 billion people worldwide, agricultural production will need to be increased by 60% by 2050. The challenge facing us all is how to effectively maintain an affordable, healthy food supply chain and to do so in a culturally competent manner.



Goulda A. Downer PhD, FAND, RD, LN, CNS
Principal Investigator/Associate Professor
Howard University College of Medicine
HU Telehealth Training Center
Director, National HIV Integration Project (H-NIP)
Director, Caribbean Clinicians Community of Practice (CCCoP)

A report from the Meteorological Society's State of the Climate most recent findings, shows that 2020 was among the top three warmest years on record . Results further revealed that i) greenhouse gases were the highest on record; ii) global surface temperature was near-record high; iii) global upper ocean heat content was record high; iv) global sea level was highest on record; v) arctic minimum sea ice extent was near-record low and vi) Antarctic is experiencing record-long ozone hole. The prevailing impact of these findings points to food and water insecurity. Food security and land required for food production largely depend on rate of yield gain of major cereal crops. There is evidence of yield plateaus or abrupt decreases in rate of yield gain, including rice in eastern Asia and wheat in northwest Europe, which account for 31% of total global rice, wheat, and maize production. Factors contributing to the declines or plateaus in food production rates include land and soil degradation, climate change and cyclical weather patterns, use of fertilizers and pesticides, and inadequate or inappropriate investment. As such, industrial agricultural productions run the risk of constraints in its capacity to produce sufficient crops to feed an expanding global population. If in fact food production will need to increase by about 60% by 2050 to meet demand, the estimating future food production capacity would benefit from an analysis of past crop yield trends based on a robust statistical analysis framework that evaluates historical yield trajectories and plateaus.

Like the rest of the globe, climate change and extreme weather are endangering Latin America and the Caribbean health, safety, food, and water security. Evidence of climate change is also visible in the environment as a noted in loss of forests, fires and vital carbon sink as reported by the World Meteorological Organization (WMO) recent report increasing temperatures and the resulting ever present threat of drought are clear indicators of deteriorating global climate change. Ongoing erosion of costal ecosystems and increasing threats from ocean acidification, heat and rising sea levels should serve as urgent warnings.



> The World Food Program (WFP) reports that about 9 percent of the world's population, equivalent to nearly 690 million people, go to bed hungry each night.

Food Insecurity:
Operational definitions of food security have continued to change as the multifactorial complexities girded in technical and policy issues continue to evolve. One of the most relevant definitions of food security is the one to have emerged in 1996 at the World Food Summit (WFS) which defines it as, **"when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life"**. Of course, the source and quality of the diet should be factored in. A family is, in fact, food secure when its members do not live in hunger or fear of hunger. The World Food Program (WFP) reports that about 9 percent of the world's population, equivalent to nearly 690 million people, go to bed hungry each night.

Acute food insecurity has soared 40 percent this year as recent food price hikes have exacerbated existing economic shocks, pressures from conflict, climate change and the COVID-19 pandemic to compound existing pressures on food security. As a consequence, 41 million people are now at imminent risk of famine without urgent funding and immediate humanitarian access.

While no one factor is responsible for food and water insecurity, climate change which fuels environmental deterioration; disasters, especially natural and man-made; large scale migration; increased frequency and severity of disease; limited socio-economic development and increased conflicts over restricted land and water resources are the driving forces that all play a role. In its 2019 report, the World Bank estimated that the three regions, (Latin America, sub-Saharan Africa and Southeast Asia) will generate 143 million more climate migrants by 2050. Of the 68.5 million people forcibly displaced in 2017, two-thirds of this was because of humanitarian crisis, climate change events such as ocean acidification, air pollution, sea-level rise, rain pattern shifts and loss of biodiversity. One third, however, were forced to move by "sudden onset" weather events. These events included flooding, forest fires after droughts and intensified storms. Ongoing deterioration is expected to further exacerbate many humanitarian crises and may result in more people being forced to move.

In an earlier account, the International Fund for Agricultural Development (IFAD) reported that the population in Latin America and the Caribbean, which is the third region globally, in which poverty persists, has grown rapidly from 244 million in 1966 to 515 million in 2000 and is expected to reach 705 million by 2030. About 11 million live in extreme poverty, but in contrast to Asia and Africa, most live-in urbanized areas.

A sustainable population is one that can survive in the long run; without running out of needed resources. As such, the numbers and level of activity must not generate more waste than natural processes can return to the biosphere. Moreover, the wastes generated should not destroy the biosphere, and the majority resources that we use should be either renewable through natural processes or entirely recycled if they are not renewable.

Reports show that over the past 25 years, except for Haiti, CARICOM countries have made progress towards meeting the global hunger targets as is evidence by the decline in undernourishment. Available estimates indicate that the number of undernourished persons in the Caribbean declined about eight percent, from 8.1 million in 1990-92 to 7.5 million in 2014-16. For Haiti undernutrition at the country level is represented by 53 percent of the population and 90 percent of the region's undernourished. Undernutrition among the population of other CARICOM countries ranges from 5 to 11 percent.

FAO reports that while remaining largely unchanged from 2014-2019 in the presence of the COVID-19 pandemic, hunger increased. The prevalence of undernourishment climbed to around 9.9 percent in 2020, from 8.4 percent a year earlier. It is estimated that between 720 and 811 million people in the world faced hunger in 2020. This pandemic along with several other major drivers have stymied efforts to end world hunger and malnutrition in all its forms by 2030.

> Of the 68.5 million people forcibly displaced in 2017, two-thirds of this was because of humanitarian crisis, climate change events such as ocean acidification, air pollution, sea-level rise, rain pattern shifts and loss of biodiversity



This situation now forces a broader, deeper, and more inclusive approach on how to more effectively tackle the global food security and nutrition state.

Water Insecurity

For every form of life, water is vital. This includes maintaining healthy ecosystems as well as for all aspects of socio-economic development. Covering about 70% of the earth's surface, water remains the world's most abundant resource. FAO reports that there are sufficient freshwater resources at the global level to enable continued agricultural and industrial development. The long-term sustainable use of water resources is of growing concern however. This is particularly the case when considering the intrinsic disparity in water quality and availability across regions. Yet, in many parts of the world water resources are already under stress while the demand for water has continued to increase substantially to meet the additional requirements for food and energy crops. Competition for water will inevitably intensify among the different water-using sectors such as municipalities, industry, agriculture, and the environment. The increasing pressures to divert land away from food production towards sources that will decrease in some critical regions as a result of climatic changes. The available land area for agriculture will consequently continue to decline because of land degradation and urbanization.

The United Nations World Water Development Report stated, in 2018, that nearly 6 billion peoples will suffer from clean water scarcity by 2050. It is further suggested that this number may be an underestimation, and scarcity of clean water by 2050 may be worse as the effects of the drivers of water scarcity, as well as of unequal growth, accessibility and needs, are underrated. This is the result of increasing demand for water, reduction of water resources, and increasing water pollution as a consequence of dramatic population and economic growth.

Of the global population, 3.6 billion people (47%) almost one-half live in areas that suffer water scarcity at least 1 month each year. Other research has shown that these figures may have been misrepresented with the global figures higher at 4.0 billion people, or 52% of the global population. Regardless, the demand for water along with its sources, demand, and quality will depend in large part on myriad geopolitical factors that are difficult to predict.

Research shows that where there is extreme poverty and migration, costly water deficits are more likely to trap people than induce them to migrate. Water shocks can also influence who migrates. Workers leaving regions because of water deficits are often less advantaged than typical migrants and bring with them lower skills, raising important implications for the migrants themselves and receiving regions. In urban areas, water shortage can lead to so-called day zero events, and can significantly slow urban growth and compound the vulnerability of migrants. Furthermore in recent years, investment in water for agriculture has been in decline. Conversely, population growth and rapid urbanization have continued to place considerable burden on water available for irrigation. The UN projects that 68% of the world population is projected to live in urban areas by 2050. This shift puts pressure to transfer water from agriculture to supply the growing urban populations.

A glaring pollution problem in some countries is runoff from agricultural land containing agricultural chemicals where fertilizer use has increased rapidly over the past 30 years. Furthermore, in many areas, water scarcity is exacerbated by severe water quality problems resulting from poorly treated domestic and industrial sewage along with mining wastes. The lack of effective drainage affects large areas of land and in many cases, this is compounded by salinization and water logging. Overall, in Latin America and the Caribbean, about 20 percent of all wastewater is treated while the existing infrastructure can theoretically treat around 35 percent of the wastewater.



> Nearly 6 billion peoples will suffer from clean water scarcity by 2050
>
> A United Nations World Water Development Report – 2018



Arguably, no single policy can completely and effectively protect people and their assets from water shocks. Strategies that broaden opportunities and build the long-term resilience of communities to reduce impacts

of water-induced crises are optionable solutions. The Caribbean islands are surrounded by water, and with over 30 percent of the available global water supply and only 9 percent of the world's population in the region, most Caribbean and Latin-American countries have considerable water resources. The region is fragile, however, since certain countries are plagued by drought which directly and severely impact economic growth. As such, more than half the renewable water supply in the region is concentrated in specific areas in the region which results in remarkable disparities both within and between countries.

IFAD, in one of their seminal reports revealed that fresh water is a challenge for Caribbean Island States. Over 60 percent of the population is concentrated on 20 percent of the land area which has only about 5 percent of the renewable water resources. The uneven distribution of people exacerbates this issue further. Overall, although the Latin America and Caribbean regions appear to have plentiful supplies of water, the drier regions are a cause for concern and so investment in irrigation to address water logged areas and salinization must be an important part of the region's strategy for both water and food security, as well as poverty reduction. By including technology, the impact of drought in the Caribbean can be lessened.

Food and water insecurity will be stressed over the coming decades as a consequence of climate change, environmental stressors, emerging pandemics, conflicts, global migration, and rising food prices. Policies and strategies around, land use patterns, water allocation, food trade, food prices, postharvest loss prevention, and food sanitation and safety are imperative as we respond to this global issue.

Bold, new innovative approaches to address water and food insecurity needs to be developed now. Investing in an approach for food security to include promoting technologies for sustainable agricultural, creating resilience to shocks, managing trade-offs in food security, such as balancing the nutritional benefits of preference for animal flesh against the ecological costs of its production; strengthening infrastructure for analysis of cash transfers should be advanced post haste. Solutions have already begun as in the report, "problem to plate" which touts eating invasive species that form environmentally destructive, non-native plants and animals. Collaborations between conservationists and chefs to serve up these food sources termed "invasivore" is one way to tackle the challenge of food insecurity.

Conclusion

Like food insecurity, water insecurity is becoming a major concern, driven in part by climate change, population growth, and social and economic change. Using water ecologically for agriculture is a key strategic approach to water and food security with a bonus of economic growth, and poverty reduction. The cascading impact of a disaster often gives rise to food and water insecurity as a consequence. And, an increase in severity and number of natural disasters is forecast. These natural disasters magnify the need for food and water security, especially in vulnerable communities where there is a dearth of sufficient resources. For resource-poor communities already experiencing food insecurity, the urgency is one of life and death. And while it may appear to be a luxury during food scarcity, providing food through the lens of cultural sensitivity by making sure the dietary preferences and restrictions of the community, by matching local cuisine, including vegetarian, halal, kosher, etc. is considered; nutritional needs not with-standing, is important. The destruction of supply chains and ruin of local ability to organize and distribute food rapidly and provide nutritious meals is therefore an essential part of the recovery and serves to prevent malnutrition and starvation.

What we know is that with climate change, there is an increase in the frequency and severity of disease outbreaks and that for our survival, inaction is not an option. In addition to increasing access to potable water and food production, cutting food waste, which is directly related to agriculture, is strongly urged. Additionally, more efficient use of water such as micro-irrigation , to address a potential water supply deficit of about 40% by 2030 should be implemented. Currently, agriculture accounts for 70% of global water demand. Thus, reducing dependence on fertilizers and replacing them with methods designed to decrease the amount of energy and water required is a feasible strategy. Reports show that about 53% of fertilizer nutrients remain in the ground post-harvest and as a result, contribute to soil degradation over time due to groundwater contamination, leaching, erosion, and global warming. As such, considerations should also be given to agroecology based on sustainable, small-scale, organic methods that can potentially double food production in entire regions facing persistent hunger, over a five to 10-year period. To help achieve public health benefits, environmental objectives, and to enhance the quality of urban life, investment in wastewater and other sanitation infrastructure are critical.

Arguably, details about the agricultural use of water are not appreciated by the public and development professionals alike. Therefore, a coordinated, accurate form of communication must be leveraged to help garner the attention and investment it sorely deserves. The community plays an important role in climate change and researchers must include their voices in the uptake and dissemination of information and knowledge to aid in their empowerment of this ongoing issue. This participatory community-driven approach will allow for the community to be empowered and be full partners in reducing the global carbon footprint as together we tackle climate change.

GREENHOUSE WARMING INTENSIFIES NORTH TROPICAL ATLANTIC SEA SURFACE TEMPERATURE ANOMALIES

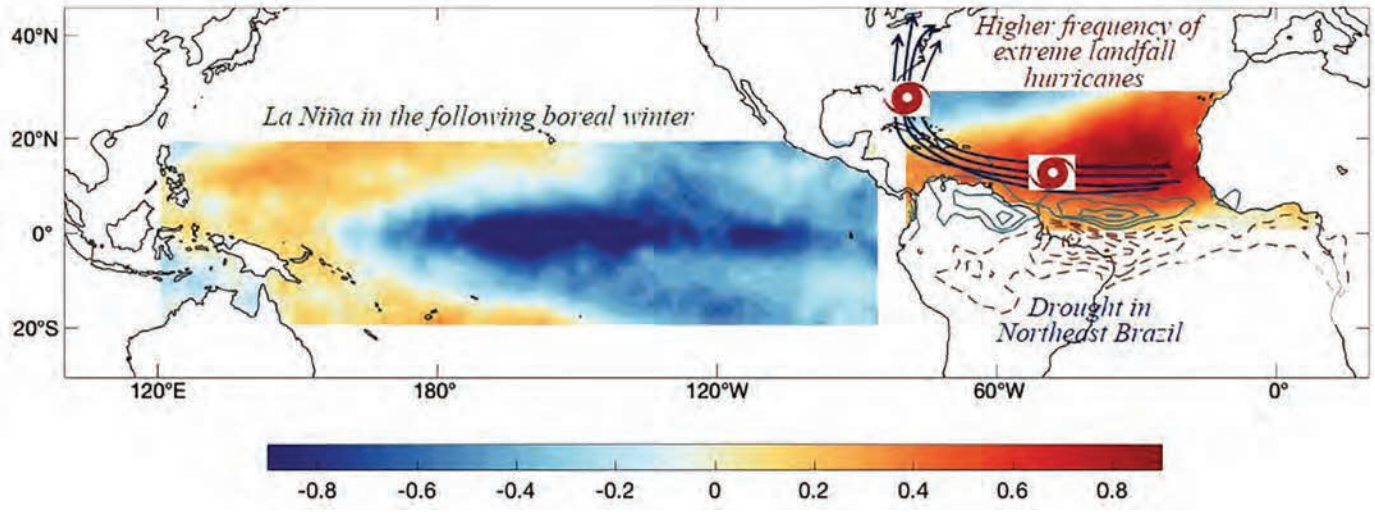


North Tropical Atlantic (NTA) sea surface temperature anomalies are among the dominant and most consequential climate variations on Earth.

NTA warming events increase occurrences of extreme hurricanes and their landfall frequency along the U.S. East coast, induce severe droughts in Northeast Brazil, boost phytoplankton blooms in the Guinea Dome, and trigger La Niña events the following winter. Up until now, future changes in NTA variability and its underlying mechanisms have remained unknown.

A new study, however, has recently revealed that NTA variability is projected to increase in a warming climate. The research was conducted by an international team of 12 scientists from nine institutes around the world and results were published in Science Advances on August 25th.

"The increase in NTA variability means not only strengthening of sea surface temperature anomalies but also increasing occurrences of extreme NTA events," said YANG Yun, associate professor at the College of Global Change and Earth System Science of Beijing Normal University and lead author of the study. The increase in NTA variability and occurrences of extreme events mainly arises from an intensification of El Niño-Southern Oscillation (ENSO) influence, including ENSO-forced Pacific-North American pattern and tropospheric temperature anomalies.





Coverage that's picture perfect!

Protect what you own, for those you love.

From Motor to Home to Marine, **Guardian General** will help you take care of the things you've worked hard to achieve. Experience reliable, prompt and efficient service that always puts you in a better frame of mind.

For more information visit us at **myguardiangroup.com**

Find us in the following territories:

Anguilla	Belize	Jamaica	St. Vincent	Affiliates in Aruba,
Antigua	British Virgin Islands	Montserrat	Trinidad and Tobago	Bonaire, Curacao
Bahamas	Cayman Islands	St. Kitts	Turks and Caicos	and Guyana
Barbados	Grenada	St. Lucia	US Virgin Islands	

Guardian Group
Guardian General Insurance Limited

live safe | live easy

myguardiangroup.com

The world's food systems are under threat. Partner with us to prevent a global food emergency



The **COVID-19 pandemic** is jeopardizing human health and disrupting the food systems that are the foundations of health. Unless we take immediate action, we risk a global food emergency that could have long-term impacts on hundreds of millions of children and adults.

FAO's is calling for **USD 1.3 billion in initial investments** to provide an agile and coordinated global response to ensure nutritious food for all both during and after the pandemic.

The **COVID-19 Response and Recovery Programme** enables donors to leverage the Organization's convening power, real-time data, early warning systems and technical expertise to direct support **where and when it is needed most.** Together, we can help the world's most vulnerable, prevent further crises, increase resilience to shocks, and accelerate the rebuilding and sustainable transformation of our food systems.



THE THREAT

Even before the **COVID-19 pandemic,** hunger continued to increase. In 2019, almost 690 million people – or nearly one in ten people in the world – went hungry. According to **The State of Food Security and Nutrition in the World 2020,** the pandemic may push an additional 130million people in the world into chronic hunger by the end of 2020.

Measures to control virus outbreaks are disrupting global **food supply chains**. Border restrictions and lockdowns are slowing harvests, destroying livelihoods and hindering food transport. **Food loss and waste** is increasing, as farmers must resort to dumping perishables, and many people in urban centres are struggling to access fresh food.

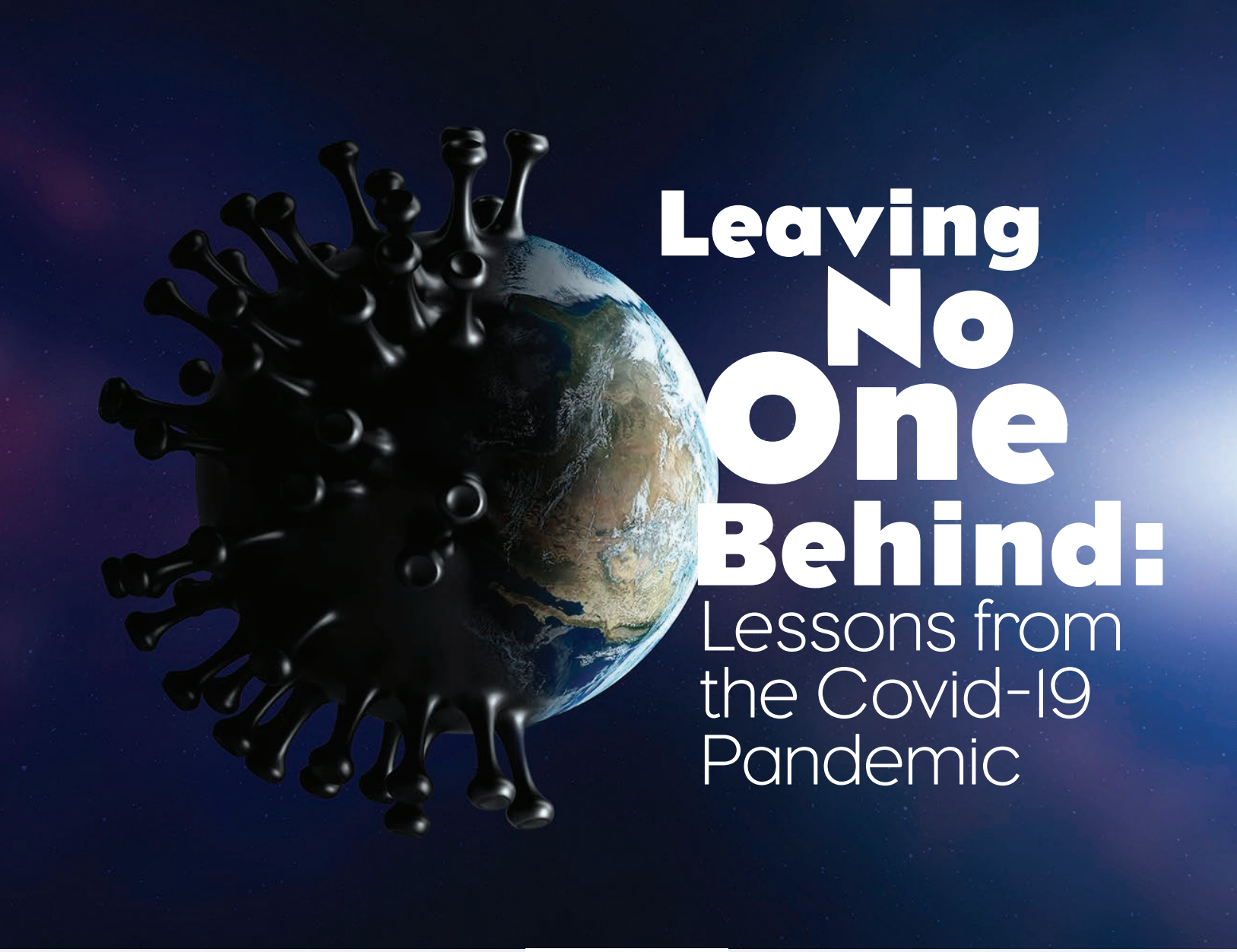
Simultaneously, according to the World Bank's estimates, the pandemic's economic impact could push about **100 million people** into extreme poverty. Soaring unemployment rates, income losses and rising food costs are jeopardising food access in developed and developing countries alike. Each percentage point drop in global GDP is expected to result in an additional 700,000 stunted children. **Smallholder farmers** and their families, **food workers** in all sectors, and those living in **commodity-and tourism-dependent economies** are particularly vulnerable.

Equally urgent is the compounding threat of the pandemic on **existing crises** - such as conflict, natural disasters, climate change, pests and plagues - that are already stressing our food systems and triggering food insecurity around the globe.

THE SOLUTIONS

FAO's comprehensive and holistic **COVID-19 Response and Recovery Programme** is designed to proactively and **sustainably address the socio-economic impacts of the pandemic.** In line with the UN approach to "build back better," and in pursuit of the **Sustainable Development Goals,** it aims to mitigate the immediate impacts of the pandemic while strengthening the long-term **resilience of food systems** and livelihoods.

Through extensive analyses, ongoing consultations with decentralized offices and bilateral discussions with resource partners, FAO identified seven key areas of action needed to ensure rapid and continued support to the most vulnerable while anticipating the secondary repercussions of the virus.



Leaving No One Behind: Lessons from the Covid-19 Pandemic

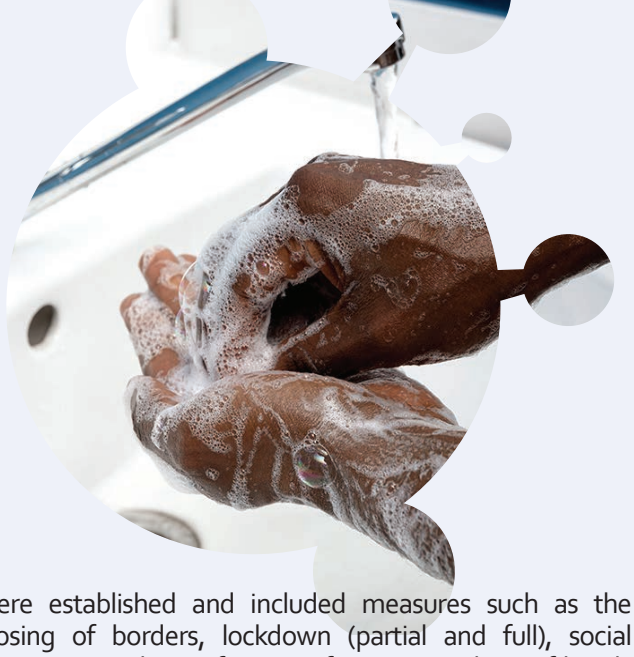


Dorlan Burrell
Director and Co-founder, Enablers of Community Advancement Projects and Initiatives Limited

In 2015, the United Nations General Assembly adopted the Sustainable Development Goals (SDGs) or Global Goals (GGs), which are a collection of 17 interlinked goals designed to "achieve a better and more sustainable future for all". According to the United Nations (UN), the SDGs are built on the principle of "leaving no one behind", the new Agenda emphasizes a holistic approach to achieving sustainable development for all. As we approach the midway point of the fifteen-year timeline for achieving the SDGs, we can only wonder what level of attainment will be realized at the end of 2030. Which begs the question, how well are we doing globally in leaving no one behind?

The advent of the coronavirus disease (COVID-19), an infectious disease caused by the SARS-CoV-2 in late 2019 has brought the achievement of the SDGs into focus as the world is experiencing a full-blown pandemic. The original source of viral transmission to humans remains unclear but the first known infections were discovered/reported in Wuhan, China. The virus is spread from an infected person's mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe. Majority of persons who are infected with COVID-19 only experience mild to moderate symptoms and recover without special treatment while others become seriously ill requiring medical attention and may recover or die. As of September 30,2021, total cases worldwide were 219 million with 4.55 million deaths.

During the onset of the pandemic, countries implemented various best practices to reduce the infection rate, number of cases, and the number of deaths as well as the impact on sustainable development activities. Covid-19 protocols



were established and included measures such as the closing of borders, lockdown (partial and full), social distancing (at least 6ft apart), frequent washing of hands and use of hand sanitizers, cleaning of surfaces with recommended chemicals, and vaccination.

The washing of hands with soap and water is one of the most efficient measures against COVID-19, but approximately 40 percent of the global population are unable to access clean water, which hinders basic sanitation. Goal 6 of the SDGs advocates for clean water and access for all but many regions are lagging behind. Frequent washing of hands can protect individuals from exposure to Covid-19 and limit human-to-human transmission. Without access to clean water and sanitation, millions are at risk of being infected with Covid-19. While it is important to have handwashing facilities in health centers, schools, and public spaces they should also be present in households to reduce the possibility of infections.

According to the World Bank, approximately 9.2% of the world, or 689 million people, live in extreme poverty on less than $1.90 a day. Within sub-Saharan Africa, 40% of the population is experiencing extreme poverty. Of the 2.2 billion children in the world, 1 billion live in poverty and about 22,000 die each day due to living in poverty (World Vision). It is hard to envision a world where no one is left behind, especially within the targeted timeline. The impact of the COVID-19 pandemic has pushed an additional 97 million people into extreme poverty, mostly within developing countries (World Bank). It is important to note that the root causes of poverty are not limited to a lack of access to water, food, shelter, education, or healthcare. Other factors such as gender or ethnic discrimination, poor governance, conflict, exploitation, and domestic violence also cause poverty. There is much to be done before we can collectively achieve Goal 1 of the SDGs which calls for no poverty, as all persons living in extreme poverty can be considered 'left behind'.

Having highlighted the poverty situation globally, we must also look at hunger which is directly related to poverty. Goal 2 of the SDGs aims to achieve zero hunger. However, millions of people around the world lack the resources necessary to grow their own food, such as arable land and/or inputs to grow, harvest, process, and store food while others are too poor to purchase food. Before the coronavirus pandemic, more than 820 million people went to bed hungry, including 110 million people who were living in acute food insecurity (United Nations). Several developing countries are now faced with a double crisis - hunger and COVID-19 – where the impact among the most vulnerable will be severe. The UNCCD stated that the pandemic has evolved into a complex emergency with the poor, vulnerable and marginalized communities suffering the most.



Based on the high levels of poverty and hunger as well as limited access to clean water, it is difficult to ensure good health and well-being at all ages as outlined by Goal 3, which is essential to sustainable development. With the ongoing nature of the COVID-19 pandemic, the world is facing a global health crisis that continues to spread human suffering, increase unemployment, destabilize local economies, and upending trade and investments around the globe. The lack the choices and opportunities to participate in and benefit from development progress will result in people getting left behind.

Goal 4 of the SDGs aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Before Covid-19, significant gains were made towards increasing access to education and school enrollment rates at all levels, especially in developing countries. At the time, approximately 260 million children were still out of school in 2018, which equates to one-fifth of the global population in that age group (United Nations). In 2020, the COVID-19 pandemic resulted in the majority of countries announcing the temporary closure of schools which caused more than 91 percent of students worldwide (close to 1.6 billion children and youth) to be out of school. Although an effort is being made to provide online teaching, disparities among students who are able to access lessons and those who lack the necessary access are contributing to a learning gap. In addition, the lack of face-to-face classes among children and youth may increase the risk of mental breakdown and fatigue while decreasing social interaction and skills.

Emergencies such as COVID-19 pose a global risk and have shown the critical need for partnerships and cooperation at all levels. However, huge disparities among countries to cope with and recover from the COVID-19 crisis provide a platform for the climate change agenda which continues to plot developed and developing countries against each other. Climate change will affect us all similar to Covid-19, so collective action is necessary to avoid the devastating impacts being predicted under the current models.

The Covid-19 Vaccine Global Access (Covax) is co-led by Gavi, the Coalition for Epidemic Preparedness Innovations (CEPI), and WHO. Covax aims to accelerate the development and manufacture of COVID-19 vaccines and to guarantee fair and equitable access for every country in the world. However, the initiative is falling well short of delivering 2 billion doses of Covid-19 vaccines to lower-income countries by the end of 2021 as projected. Covax was designed to ensure low-income countries are not left behind in the fight against Covid but currently failing.

Although the wealthier countries have pledged funds to Covax, they have entered into agreements based on self-interest with vaccine companies thereby out-bidding scheduled vaccine production for the year. Due to the strain on vaccine companies, Covax receives donations of surplus vaccines from wealthy countries which are often close to their time of expiration. In addition, individual countries have made donations to countries of their choice. This highlights Goal 17 of the SDGs which is underpinned by partnerships but greater effort is needed to ensure equitable distribution of vaccines across all nations.

Over some six billion doses of coronavirus vaccines have been administered, in over 196 countries worldwide.





Despite the level of vaccination, the pace of global vaccinations has slowed and there is inequity in accessing vaccines among poorer nations. Ghana was the first country to receive Covax vaccines in February 2021 and to date, more than 303 million doses have been shipped through Covax to 142 countries around the world, including Bangladesh, Brazil, Ethiopia, and Fiji.

China and India have administered over 2.2 billion and 906 million doses of vaccines respectively while the USA has administered more than 395 million doses. However, while some countries have fully vaccinated a large percentage of their population, many others have only just begun and in some cases, others are still waiting for their first doses to arrive. Countries in Europe and the Americas are progressing well with their vaccination campaigns but many states in Africa are experiencing some supply issues. The WHO's overall figure for those fully vaccinated in Africa is currently 4.4% while in wealthier countries like the UK, it is nearly 66%. The WHO has suggested that at least 70% of the population within countries would need to be vaccinated to have a level of immunity. There is also uncertainty around the need for booster doses to remain protected.

Leaving no one behind relies on the delivery of the SDGs which are geared toward achieving a better and more sustainable future for all. However, the goals are now at risk due to the Covid-19 pandemic. The impacts of the Covid-19 pandemic being experienced globally are likely to be repeated or exacerbated in the coming years by climate change. It is likely that people will become poorer, the population of hungry people will increase, access to clean water will decrease, health and well-being will decline among others. In looking forward to the climate change pandemic, we can learn from the current. Developed countries will feel the impacts of climate change but will be in a better position to respond and recover. On the other hand, developing countries will continue to be at the forefront and will be impact repeatedly, response and recovery efforts will rely on support from the developed countries. The basis on which leaving no one behind can be achieved and is currently beyond the mere commitment of world leaders, considerable action is needed.

WMO Secretary-General Prof. Petteri Taalas

statement at the release of the

IPCC AR6 Working Group1 Report

9 August 2021



WMO organized the First World Climate Conference in 1979 to establish IPCC. The risk of climate change caused by growing consumption of oil, coal and natural gas was recognized by the meteorological community. IPCC has been working under WMO and UNEP since then, and WMO has been proud to host the IPCC secretariat.

Now we are publishing the physical science part of the Sixth Assessment Report, which is summarizing the results published in peer-reviewed scientific literature during the last eight years. I would like to thank the hundreds of authors and reviewers of this massive report, and especially Valerie Masson-Delmotte and Panmao Zhai who have been leading the work, and have devoted several years of their career for IPCC.

You will soon hear the main findings of the report. The key messages are still the same as in the first IPCC report which was published already in 1988, namely:

- Climate change is already detected by using several measured physical parameters
- The human induced emissions of Greenhouse Gases, especially carbon dioxide, will pose a threat for human well-being and for the biosphere
- Reduction of the emissions of greenhouse gases would be needed and recommended to minimize the risks of future climate change

The report published today echoes the same messages with much higher urgency. Climate change is already more visible and the emissions have grown more rapidly than we ever expected in 1979. I had a chance to follow this personally as a scientists since 1980s. Natural variability has always been causing weather extremes, and will do so also in the future.

The Tokyo Olympic Games were just closed yesterday. By using sports terms one could say that the atmosphere has been exposed to doping, which means that we have begun observing climate extremes more often than before.

That means record breaking temperatures, drought and forest fires observed also this year in Greece, the Mediterranean and California. We have more water vapor in the atmosphere, which has led to severe flooding problems as observed in Central Europe and China recently. The warming of the oceans has affected the frequency and area of existence of the most intense tropical storms.

Have we lost the hope? No and yes. According to this report we are still having a chance to stop the negative climate trend during the mid 21st century by especially limiting the use of fossil fuels and by stopping deforestation.

Some changes will continue for centuries or even thousands of years, like sea level rise, melting of glaciers and shrinking of the Arctic ice and snow cover.

The report underlines the urgency to enhance the ambition level of climate mitigation. We are not yet heading towards 1.5-2.0 degrees warming by the end of this century.

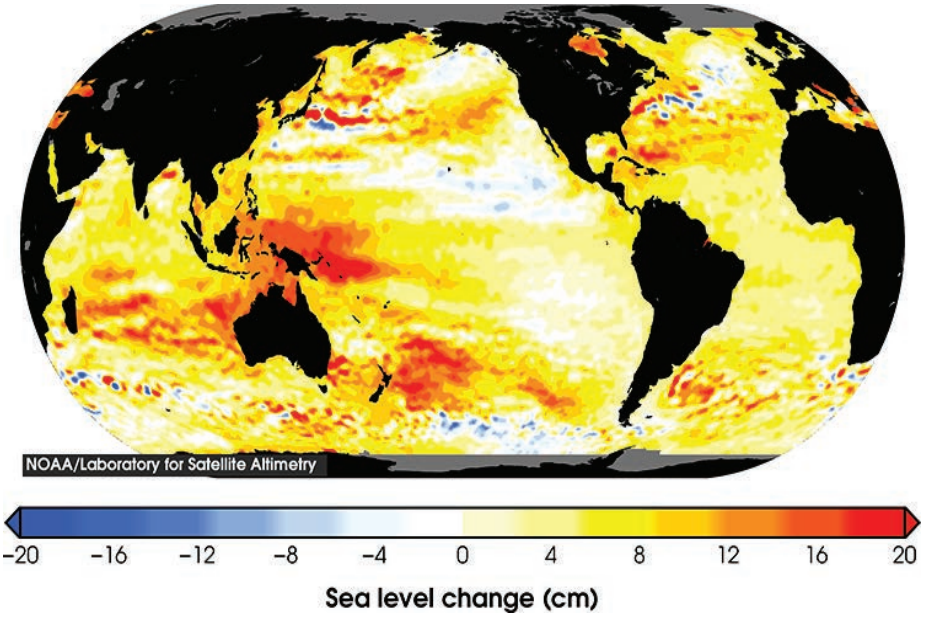
At the United Nations, our aim is to reach 1.5° C warming level which would be best for the future of mankind and the biosphere. Now we are heading towards 2-3° C warming instead.

We have received encouraging pledges by several countries, which would mean 2.1° C warming if materialized as promised. This is not enough to avoid several harmful impacts, like loss of food production capacity, water shortages, extremes heat, forest fires, continued sea level rise, refugee crisis and negative impacts on world economy and biosphere.

Besides climate mitigation, it is essential to pay attention to climate adaptation, since the negative trend in climate will continue for decades and in some cases for thousands of years.

One powerful way to adapt is to invest in early warning, climate and water services. Only half of the 193 members of

WMO have such services in place, which means more human and economic losses. We have also severe gaps in weather and hydrological observing networks in Africa, some parts of Latin America and in Pacific and Caribbean island states, which has a major negative impact on the accuracy of weather forecasts in those areas, but also worldwide.



The message of the IPCC report is crystal clear: we have toraise the ambition level of mitigation.

The forthcoming COP26 in Glasgow this November will be a critical milestone to combat climate change. By using sports terms again we need a spurt already during this decade, not just before the finish as we do at running competitions.

Thank you.

Business Supply Group LTD.

1 & 804 Fernandes Business Centre,
Laventille, Trinidad and Tobago.
(868) 235-3333
info@bsgl.biz
www.bosstrinidad.com • www.scripj.com

BSG
THE BUSINESS SUPPLY GROUP LIMITED

BOSS SCRIP·J



Jane Wight
Chief Executive Officer



Christine King
Group Executive Manager
H.R.



Wanda Phipps
Group Executive Manager
Finance



David Maharaj
Group Executive Manager
I.T.



Chris de Silva
Director, Sales & Marketing



Nicholas Mohammed
Head of Supply Chain
& Customer Experience

The Business Supply Group Limited **(BSG)** is located in Trinidad & Tobago and consists of two divisions: **SCRIP·J**, founded by Robert Campbell in 1978 and BOSS, founded by his brother, the late Christopher Campbell in 1991.

At BSG, our Mission is "To help businesses do business better" and our Vision is "To be the Region's most trusted supplier, offering timely and effective solutions for diverse business needs."

SCRIP·J excels at Printing & Packaging and is the final touch in satisfying your brand's total presence. Our experts will consult with you on structure, design, colour and varnish options so that your product carries the visual impact it deserves.

BOSS prides itself on being a leading distributor of Office & School Stationery, Craft Supplies, Office Furniture, Thermal & Bond Rolls and Interactive Technology. Customer satisfaction has always been and will always be our prime objective; we guarantee delivery of stocked items within 24 hours in Trinidad.

We also export to many islands across the Caribbean and we are ready to serve you. Get in touch with us today!

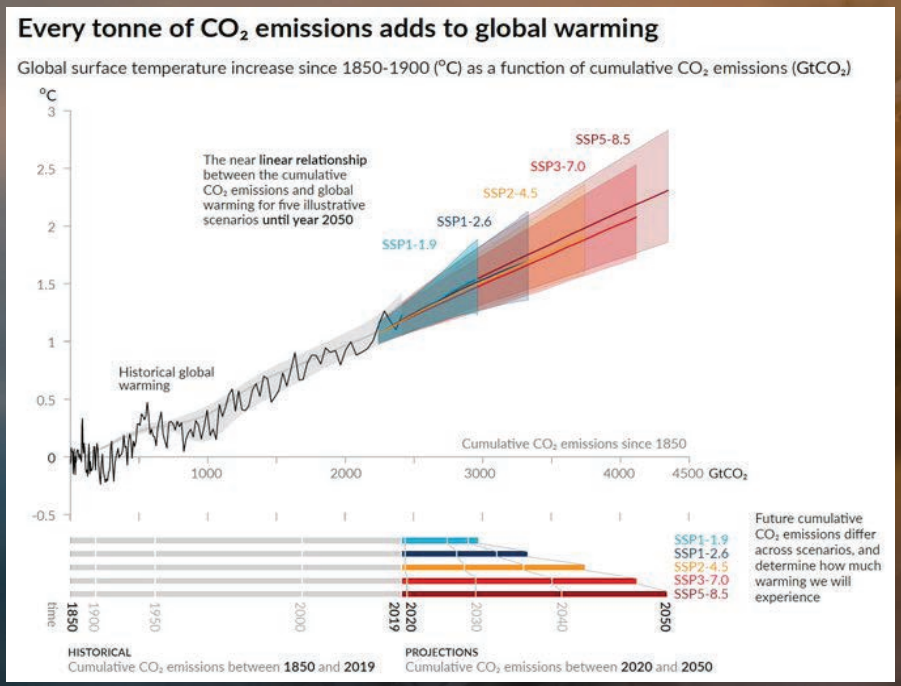
ONE TWEET IS WORTH A MILLION NEWSPAPER FRONT PAGES

In 2016, climate scientists warned calamitous 2°C global warming could be reached by 2050 even if the Paris Agreement pledges were fully implemented.

Now, after the release of the latest terrifying IPCC report which was all but ignored by mass media, they're warning about 2.5°C.

Remember:

01	Global crop failures by 2°C.
02	Most humans dead by 4°C.
03	Earth uninhabitable by 6°C.
04	We risk 2°C by 2035.
05	We risk 4°C by 2065.
06	We risk 6°C by 2095.



To Meet Paris Accord Goal, Most of the World's Fossil Fuel Reserves Must Stay in the Ground

A new study in Nature reports that oil, gas and coal production must begin falling immediately to have even a 50 percent chance of keeping global temperatures from rising more than 1.5 degrees Celsius.



MEASURING WHAT MATTERS:

A NEW APPROACH TO ASSESSING SOVEREIGN CLIMATE RISK

More frequent and severe extreme events driven by climate change pose a significant threat to nations around the world and understanding who and what is exposed to climate hazards is essential to pricing this risk and preparing for its impacts. This new report and underlying analytics assess sovereign exposure to floods, heat stress, hurricanes and typhoons, sea level rise, wildfires, and water stress based on the only known global dataset matching physical climate risk exposure to locations of population, GDP (Purchasing Power Parity) and agricultural areas within countries.

Globally, increasingly severe climate conditions impose growing pressure on populations and economies. The implications on economic growth, welfare, production, labor, and productivity are large, with potential material impacts on sovereign credit risk. However, assessing sovereign climate risk presents significant challenges. While most approaches to quantifying future climate risk exposure for sovereigns measure the average exposure over the entire territory of a country, this doesn't capture whether the populated or economically productive areas are exposed to extremes. Likewise, averages of exposures to several climate hazards can mask extreme exposure to a particular hazard in a certain area of a country.

We've mapped the co-occurrence of hazards and exposures, explicitly factoring in the spatial heterogeneity of both climate hazards and people and economic activities across a country. This new report, Measuring What Matters – A New Approach to Assessing Sovereign Climate Risk, provides an analysis of the data. We find that all nations face meaningful risks despite their variation in size and resources. Explore sovereign climate risk in the interactive map below, based on both total and percent of a nation's population, GDP (PPP) and agricultural areas exposed to climate hazards in 2040.

KEY FINDINGS:

- By 2040, we project the number of people exposed to damaging floods will rise from 2.2 billion to 3.6 billion people, or from 28% to 41% of the global population. Roughly $78 trillion, equivalent to about 57% of the world's current GDP, will be exposed to flooding.
- Over 25% of the world's population in 2040 could be in areas where the frequency and severity of hot days far exceeds local historical extremes, with negative implications for human health, labor productivity, and agriculture. In some areas of Latin America, climate change will expose 80-100% of agriculture to increased heat stress in 2040.
- By 2040, we estimate over a third of today's agricultural area will be subject to high water stress. In Africa, over 125 million people and over 35 million hectares of agriculture will be exposed to increased water stress, threatening regional food security.
- By 2040, nearly a third of the world's population may live in areas where the meteorological conditions and vegetative fuel availability would allow for wildfires to spread if ignited.
- Over half of the population in the most exposed small island developing nations are exposed to either cyclones or coastal flooding amplified by sea level rise. In the United States and China alone, over $10 trillion worth of GDP (PPP) is exposed to hurricanes and typhoons.

PLEASE NOTE: CONTENT IS DISPLAYED AS LAST POSTED BY A PREVENTIONWEB COMMUNITY MEMBER OR EDITOR. THE VIEWS EXPRESSED THEREIN ARE NOT NECESSARILY THOSE OF UNDRR, PREVENTIONWEB, OR ITS SPONSORS.

facts

There were more than 11,000 of disasters attributed to these hazards globally since 1970, causing more than two million deaths and some $3.64 trillion in losses.

The United Nations warned Wednesday that weather-related disasters have skyrocketed over the past half-century, causing far more damage even as better warning systems have meant fewer deaths.

A report from the UN's World Meteorological Organization (WMO) examined mortality and economic losses from weather, climate and water extremes between 1970 and 2019.

It found that such disasters have increased fivefold during that period, driven largely by a warming planet, and warned the upward trend would continue.



Headline Statements from the Summary for Policymakers

9 August 2021 (subject to final copy-editing)

A. The Current State of the Climate

A.1 It is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred.

A.2 The scale of recent changes across the climate system as a whole and the present state of many aspects of the climate system are unprecedented over many centuries to many thousands of years.

A.3 Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since the Fifth Assessment Report (AR5).

A.4 Improved knowledge of climate processes, paleoclimate evidence and the response of the climate system to increasing radiative forcing gives a best estimate of equilibrium climate sensitivity of 3°C, with a narrower range compared to AR5.

B. Possible Climate Futures

B.1 Global surface temperature will continue to increase until at least the mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in carbon dioxide (CO_2) and other greenhouse gas emissions occur in the coming decades.

B.2 Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in Arctic sea ice, snow cover and permafrost.

B.3 Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation and the severity of wet and dry events.

B.4 Under scenarios with increasing CO_2 emissions, the ocean and land carbon sinks are projected to be less effective at slowing the accumulation of CO_2 in the atmosphere.

B.5 Many changes due to past and future greenhouse gas emissions are irreversible for centuries to millennia, especially changes in the ocean, ice sheets and global sea level.

C. Climate Information for Risk Assessment and Regional Adaptation

C.1 Natural drivers and internal variability will modulate human-caused changes, especially at regional scales and in the near term, with little effect on centennial global warming. These modulations are important to consider in planning for the full range of possible changes.

C.2 With further global warming, every region is projected to increasingly experience concurrent and multiple changes in climatic impact-drivers. Changes in several climatic impact-drivers would be more widespread at 2°C compared to 1.5°C global warming and even more widespread and/or pronounced for higher warming levels.

C.3 Low-likelihood outcomes, such as ice sheet collapse, abrupt ocean circulation changes, some compound extreme events and warming substantially larger than the assessed *very likely* range of future warming cannot be ruled out and are part of risk assessment.

D. Limiting Future Climate Change

D.1 From a physical science perspective, limiting human-induced global warming to a specific level requires limiting cumulative CO_2 emissions, reaching at least net zero CO_2 emissions, along with strong reductions in other greenhouse gas emissions. Strong, rapid and sustained reductions in CH_4 emissions would also limit the warming effect resulting from declining aerosol pollution and would improve air quality.

D.2 Scenarios with low or very low greenhouse gas (GHG) emissions (SSP1-1.9 and SSP1-2.6) lead within years to discernible effects on greenhouse gas and aerosol concentrations, and air quality, relative to high and very high GHG emissions scenarios (SSP3-7.0 or SSP5-8.5). Under these contrasting scenarios, discernible differences in trends of global surface temperature would begin to emerge from natural variability within around 20 years, and over longer time periods for many other climatic impact-drivers (*high confidence*).



Regional fact sheet - Small Islands

Common regional changes

Observed warming (*high confidence*) in the Small Islands[1] has been attributed to human influence (*medium confidence*). Warming will continue in the 21st century for all global warming levels and future emissions scenarios, further increasing heat extremes and heat stress (*high confidence*).

Ocean acidification has increased globally as have the frequency and intensity of marine heatwaves in some areas of the Indian, Atlantic and Pacific Oceans except for a decrease over the eastern Pacific Ocean. Marine heatwaves and ocean acidification will increase further with 1.5°C of global warming (*high confidence*) and with larger increases at 2°C and higher.

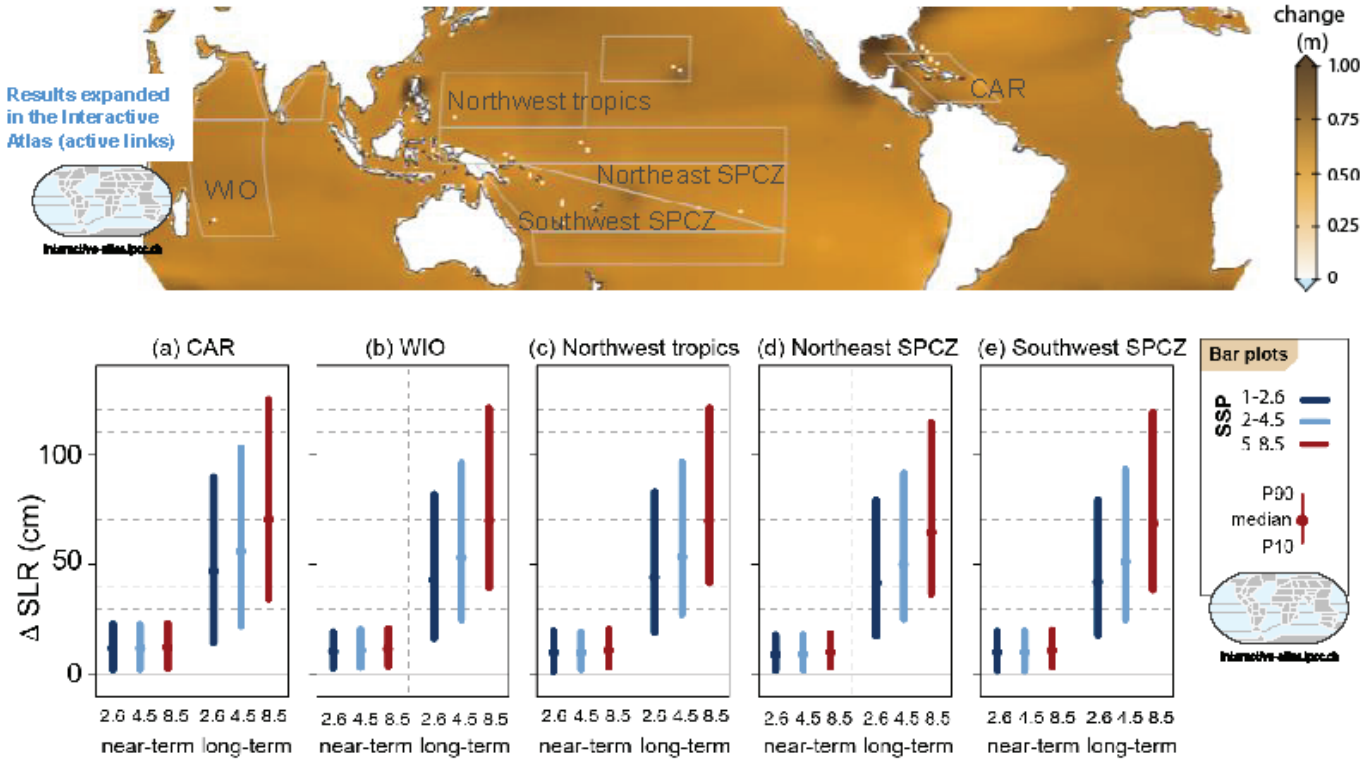
Sea levels will very likely continue to rise around Small Islands, more so with higher emissions and over longer time periods (*high confidence*).

Sea level rise coupled with storm surges and waves will exacerbate coastal inundation and the potential for increased saltwater intrusion into aquifers (*high confidence*).

Sea level rise will cause shorelines to retreat along sandy coasts of most Small Islands.

Small Islands will face more intense but generally fewer tropical cyclones, except in the central north Pacific where frequency will increase (*medium confidence* at a global warming level of 2°C and above).

Relative sea level rise projections for 2080–2100 (SSP3-7.0) relative to 1995–2014



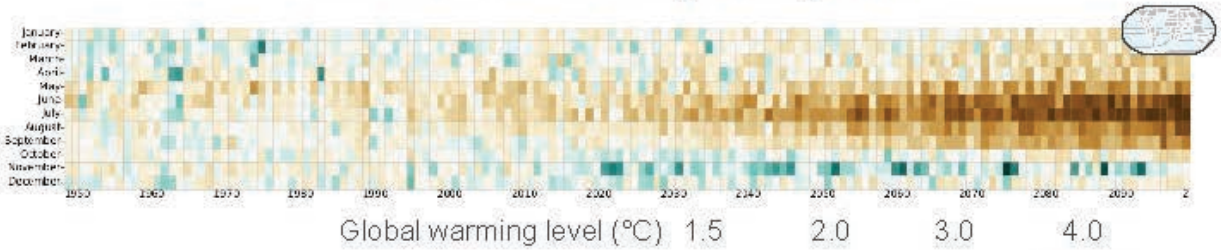
Regional mean changes in annual sea level rise in the near-term (2021–2040) and long-term (2081–2100) for three scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5) relative to 1995-2014 for some Small Island Regions. Bar plots indicate median (dots) and 10th–90th percentile range (bars) across each model ensemble.

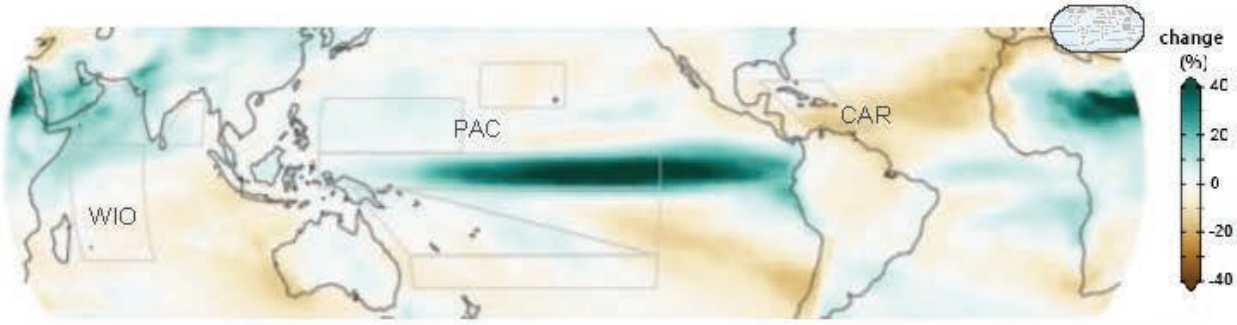
[1] The WGI AR6 assessment focused primarily on Small Islands in the Caribbean Sea (CAR), Pacific Ocean (PAC) and Western Indian Ocean (WIO).

Caribbean (CAR)

- Declining trend in rainfall during June–July–August in CAR will continue in coming decades (*high confidence* at 2°C global warming and above).
- Higher evapotranspiration under a warming climate will result in increased aridity and more severe agricultural and ecological droughts in CAR (*medium confidence* at global warming level of 2°C and above).

Change in monthly average precipitation relative to 1995–2014 for the Caribbean under increasing warming levels





Annual average precipitation change, mid-21st century relative to 1995–2014 (SSP3-7.0)

Western Indian Ocean (WIO)

- Declining trends in rainfall are observed in Western Indian Ocean islands over the past 50-60 years.

Pacific (PAC)

- Trends vary spatially and seasonally over Small Island regions in the Pacific. Rainfall has decreased in parts of the Pacific islands poleward of 20° latitude in both hemispheres (eastern Pacific and southern Pacific subtropics). This drying trend will continue in the coming decades, except in parts of western and equatorial Pacific.
- Heavy rainfall events will increase in the western tropical Pacific (*high confidence* at 2°C global warming and above).
- Higher evapotranspiration under a warming climate either amplifies or partially offsets respectively the effect of decreases or increases in rainfall resulting in increased aridity in parts of the Pacific (*medium confidence* at 2°C global warming and above).

Climate information for Small Islands

Though it is clear the climate of Small Islands has and will continue to change in diverse ways, constructing climate information for Small Islands is challenging due to lack of observations and high-resolution climate projections, as well as the representation and understanding of key modes of variability and their interplay with trends.

Links for further details

Common regional changes: Table 11.13, 12.4, 12.4.7, Atlas.10, TS.4.3.1, TS.4.3.2.7
Caribbean: Table 11.14, Table 11.15, 12.4.7, Atlas.10, Cross-Chapter Box Atlas.2
Western Indian Ocean: 12.4.7, Atlas.10, Cross-Chapter Box Atlas.2
Pacific: 12.4.7, Atlas.10, Cross-Chapter Box Atlas.2
Climate information for Small Islands: Cross-Chapter Box Atlas.2







Eruption at La Soufrière

Eruptions at La Soufrière volcano have propelled ash and gas high into the air over the Caribbean islands of Saint Vincent and Barbados. The eruption—the volcano's first explosive event since 1979—prompted thousands of people to evacuate.

The recent bout of explosive activity began on April 9, 2021. At about 10:30 a.m. local time that day, the Operational Land Imager (OLI) on Landsat 8 acquired this image of volcanic ash billowing from La Soufrière. The plume obscures the volcano below, a peak that stands 1178 meters (3,864 feet) above sea level on the northern side of Saint Vincent.

According to Jean-Paul Vernier, an atmospheric scientist with NASA's Earth Applied Sciences Disasters Program, activity was apparent months before the explosive eruptions. It started with an effusive eruption in which magma that reached the surface slowly built up a lava dome. In April, the dome "finally turned out a massive explosion without many precursor signs," Vernier said. Explosive eruptions result from the rapid expansion of pressurized gasses trapped in the rock or magma; the pressure violently breaks rocks apart and produces a plume of rock, ash, and gas.

Winds carried much of the ash and gas east from Saint Vincent. On the afternoon of April 10, 2021, the Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Aqua satellite acquired this image showing ash reaching Barbados, 190 kilometers (120 miles) away. Clouds (white) are also abundant in this view.

These images show ash aloft in the atmosphere, but some of it fell back to the ground. According to news reports, ashfall has blanketed parts of Saint Vincent and Barbados. It also has threatened food and water supplies on Saint Vincent and has reduced visibility, which can complicate evacuation efforts. People displaced to the island's southern side—away from the volcano and generally safer—still had to contend with falling ash and poor air quality.

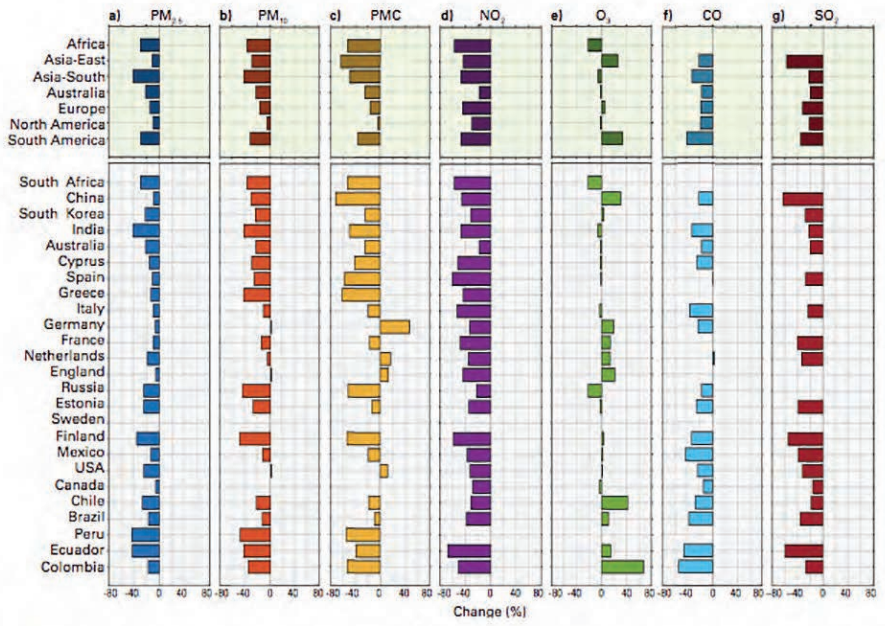
Scientists are investigating the extent and height reached of the ash and gas plume. They think some ash has risen all the way into the stratosphere, where strong winds can potentially carry it great distances. Other satellite instruments have detected sulfur dioxide reaching Cape Verde, an archipelago in the central Atlantic Ocean. Sulfur dioxide near ground level can irritate the human nose and throat; higher in the atmosphere it can make sulfuric acid aerosols and, in extreme cases, lead to a cooling effect.

The NASA Disasters team is working with several science institutions and agencies to continue assessing the eruption and to make data available to emergency responders and aid groups. "Our program has been working with stakeholders in the region since the first signs of the eruption," Vernier said.

NASA Earth Observatory images by Lauren Dauphin, using Landsat data from the U.S. Geological Survey and MODIS data from NASA EOSDIS LANCE and GIBS/Worldview. Story by Kathryn Hansen.

WMO PUBLISHES FIRST
Air Quality and Climate Bulletin

The COVID-19 lockdown and travel restrictions led to a dramatic short-lived fall in emissions of key air pollutants in 2020, especially in urban areas. Many city dwellers saw blue skies instead of the pollution cloud. But the reduction was not uniformly spread across all regions or all types of pollutants. And many parts of the world still fell short of air quality guidelines, according to a new report from the World Meteorological Organization (WMO).



Continental/countrywide average changes in air pollution (in %) shown as bar plots for the full lockdown period for (a) $PM_{2.5}$, (b) PM_{10}, (c) PMC (coarse fraction of PM), (d) NO_2, (e) O_3, (f) CO and (g) SO_2. *Source*: Modified from Sokhi et al., 2021

The Air Quality and Climate Bulletin – the first of its kind issued by WMO – highlights the main factors that influence air quality patterns in 2020, in comparison to other years. It shows how there were episodes of both improvement and deterioration of air quality in different parts of the world.

It demonstrates an intimate connection between air quality and climate change. While human-caused emissions of air pollutants fell during the COVID-19 economic turndown, meteorological extremes fuelled by climate and environmental change triggered unprecedented sand and dust storms and wildfires that affected air quality.

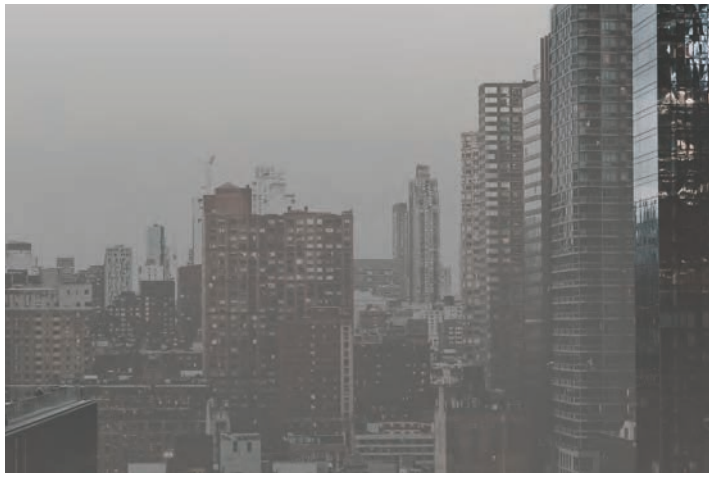
This trend is continuing in 2021. Devastating wildfires in North America, Europe and Siberia have affected air quality for millions, and sand and dust storms have blanketed many regions and travelled across continents.

"COVID-19 proved to be an unplanned air-quality experiment, and it did lead to temporary localized improvements. But a pandemic is not a substitute for sustained and systematic action to tackle major drivers of both pollution and climate change and so safeguard the health of both people and planet," said WMO Secretary-General Prof. Petteri Taalas.

"The impacts of air pollutants occur near the surface, on timescales of days to weeks, and are usually localized. By contrast, ongoing climate change, caused by the accumulation of greenhouse gases in the atmosphere, is happening on a timescale of decades to centuries and is driving environmental changes worldwide. Despite the differences, we need a coherent and integrated air quality and climate policy based on observations and science," he said.

Air pollution has significant impacts on human health. Estimates from the latest Global Burden of Disease assessment show that global mortality increased from 2.3 million in 1990 (91% due to particulate matter, 9% due to ozone) to 4.5 million in 2019 (92% due to particulate matter, 8% due to ozone), says the Bulletin.

The Bulletin and an accompanying animation was published ahead of International Day of Clean Air for Blue Skies on 7 September. This was established by the UN General Assembly to raise awareness and facilitate actions to improve air quality which is critical for human health and climate change mitigation.



The theme this year is Healthy Air, Healthy Planet.

The impact of COVID-19 on air quality
Many governments around the world responded to the COVID-19 pandemic by restricting gatherings, closing schools and imposing lockdowns. These stay-at-home policies led to an unprecedented decrease in pollutant emissions.

In areas such as China, Europe and North America, short-term COVID-related reductions in emissions coincided with long-term emission-mitigation measures that led to lower PM2.5 concentrations in 2020 compared to previous years. The increase in PM2.5 over India was less pronounced than in previous years.

However, some studies indicate that in many parts of the world, PM2.5 concentrations would be unlikely to meet World Health Organization guidelines, despite drastic reductions in mobility.

WMO/Global Atmosphere Watch programme examined the behaviour of key air-pollutants from over 540 traffic, background and rural stations, in and around 63 cities from 25 countries located in seven geographical regions of the world.

The data were used to analyse changes in air quality for the main pollutants, such as PM2.5, sulphur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO) and ozone (O_3).

Analysis showed decreases of up to approximately 70% in mean NO_2 and 30%–40% in mean PM2.5 concentrations during full lockdown in 2020 compared with the same periods in 2015–2019. PM2.5, however, exhibited complex behaviour even within the same region, with increases in some Spanish cities, for instance, which were attributed mainly to the long-range transport of African dust and/or biomass burning.

Changes in ozone concentrations varied greatly among regions, ranging from no overall change to small increases (as was the case for Europe) and larger increases (+25% in East Asia and +30% in South America). SO_2 concentrations were between ~25% to 60% lower in 2020 than during 2015–2019 for all regions. CO levels were lower for all regions, with the largest decrease for South America, of up to approximately 40%.

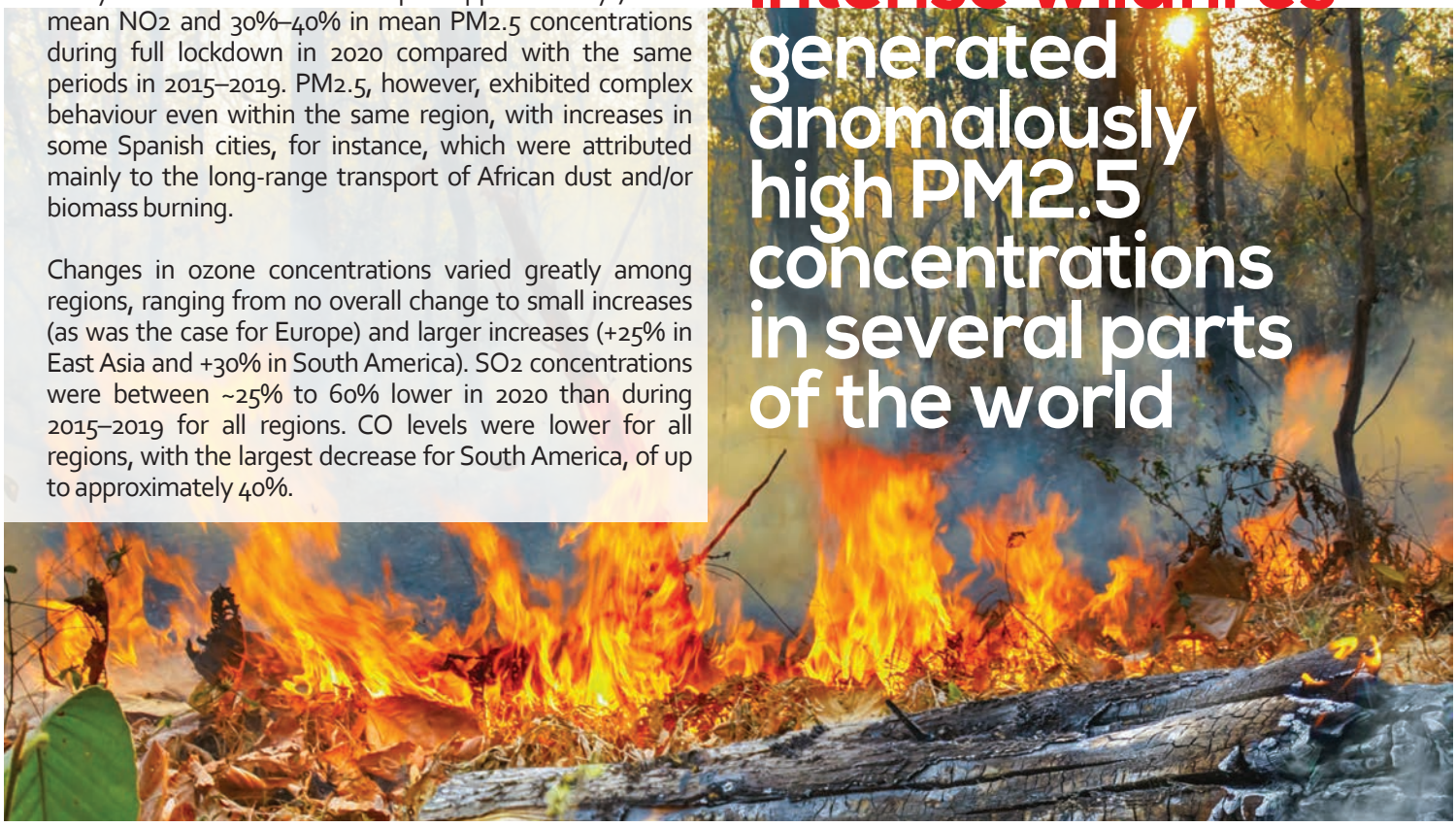
Climate, wildfires and air quality
Intense wildfires generated anomalously high PM2.5 concentrations in several parts of the world that were unusually dry and hot in 2020. In January and the preceding December, southwestern Australia was affected by widespread wildfires, which exacerbated air pollution.

Smoke from the Australian fires also led to temporary cooling across the southern hemisphere, comparable to that caused by ash from a volcanic eruption.

The 2020 wildfire season was marked by extreme fires in Siberia and the western United States, in terms of total pyrogenic carbon released into the atmosphere, with extremely dense and expansive smoke plumes visible from space. There was uncharacteristically weak fire activity in Alaska and **Canada,** compared with previous decades.

The NASA Global Modeling and Assimilation Office assessed the impact of the fires on outdoor air pollution across North America and estimated how many people were exposed to varying levels of pollutants. It found that the number of people who likely experienced unhealthy levels of air pollution increased during the fire season and peaked in the second week of September, when most of the intense fires occurred in the western United States. For more than a week, 20–50 million people – mostly in the western United States but also in regions downwind – were classified as having a "High" or "Very High" health risk.

Intense wildfires generated anomalously high PM2.5 concentrations in several parts of the world





The impacts of air pollutants occur near the surface, on timescales of days to weeks, and are usually localized

Climate change policy

Human activities that release long-lived greenhouse gases into the atmosphere also enhance the concentrations of shorter-lived ozone and particulate matter in the atmosphere. For example, the combustion of fossil fuels (a major source of carbon dioxide (CO_2)) also emits nitrogen oxide (NO) into the atmosphere, which can lead to the photochemical formation of ozone and nitrate aerosols. Similarly, agricultural activities (which are major sources of the greenhouse gas methane) emit ammonia, which then forms ammonium aerosols.

Traditional pollutants include short-lived reactive gases such as ozone – a trace gas that is both a common air pollutant and a greenhouse gas – and particulate matter – a wide range of tiny particles suspended in the atmosphere (commonly referred to as aerosols). Both are detrimental to human health and have complex characteristics, which can either cool or warm the atmosphere.

Policy changes that seek to improve air quality thus have repercussions on those policies that seek to limit climate change, and vice versa. For instance, a drastic reduction in fossil fuel combustion to reduce greenhouse gas emissions will also reduce air pollutants associated with that activity, such as ozone and nitrate aerosols.

Policies to reduce particulate matter pollution to protect human health may remove the cooling effect of sulfate aerosols or the warming effect of black carbon (soot particles).

Finally, changes in climate can influence pollution levels directly. For example, the increased frequency and intensity of heatwaves may lead to the additional accumulation of pollutants close to the surface. According to the recent Intergovernmental Panel on Climate Change report, the frequency and intensity of such events is going to increase in the future.

Observations of the atmospheric chemical composition such as those coordinated by the Global Atmosphere Watch of WMO are indispensable to understand its state and the trend. They help to improve forecasting systems and support integrated air quality and climate policies.

Notes for Editors

WMO wishes to thank the Bulletin Editorial Board and all contributors for their input. This Bulletin contains contributions from the WMO/GAW Scientific Advisory Group on Aerosols, the Scientific Advisory Group on Applications, the Scientific Advisory Group for GAW Urban Research Meteorology and Environment, the Scientific Advisory Group for Reactive Gases and the Steering Committee of Global Air Quality Forecasting and Information System. GBD mortality estimates due to ambient and household air pollution can be downloaded from https://www. stateofglobalair.org/.



Rosanna Beharry
MSc. Biomedical Physics
(Specialization in Medical Physics)

Water Security and Climate Change



Water is a dynamic and diverse commodity, its use and demand is the basis for sustainability in its entirety. Agriculture, industries and domestic are all sectors where water is essential. It is imperative to understand that without water there is little or no development. Water may seem to be easily accessible, in drains, rivers, seas, aquifers and glaciers.

Should water security be of significant concern?
Although water can be seen in abundance, how many people truly benefit from this seemingly limitless resource? Presently, approximately 2% of the total water on earth is actually usable while the remaining 98% is salt water and cannot be used directly (The Guardian; How will climate change impact on fresh water security, 2012). The United Nations indicates that although there has been increased access to improved water, there are still approximately 663 million people without this freedom while approximately 40% of the global population is still affected by lack of water security.

The United Nations Sustainable Development Goals (SDGs) listed at number 6 'Clean Water and Sanitation' geared to 'ensure access to water and sanitation for ALL'. The aim is to achieve equal access to safe and affordable drinking water, implement proper sanitation and hygiene for women and girls, reduce water pollution, increase water quality, increase water-use efficiency, integrate proper water resource management, protect water eco-systems, develop international co-operation and to strengthen participation of local communities.

Without proper water security, many sectors in society will be significantly affected. Loss of agriculture and live-stock, spread of diseases including vector borne, energy, lack of proper sanitation and contamination are only some of the affected areas. This natural resource is extremely important and is essential for life and progress, it must be protected. Unfortunately, water security depends on various factors including: location, ground water, contamination and sanitation and global temperature. The measure of damagethese factors have on human life and water security depends significantly on the extent of the rate of change of our environment.

Location
As a result of unequal distribution of water throughout the globe, some areas have more water availability than others. While some countries can easily sustain itself with its own water others are unable to do so, for example, Singapore has to purchase water from Malaysia *(BBC: Why 'hydro-politics' will shape the 21st Century, 2017)*. This limitationcan cause severe distress to a nation; sadly this limitation faces further uncertainties as weather patterns are altered due to climate change. For many countries, water security depends on annual rainfall; as weather pattern shifts, collection and distribution becomes affected. Areas that were once known to harvest abundant rainfall may now see very little rainfall while other areas may experience too much rainfall. The effects of both includes droughts and flooding, impacting negatively on agriculture and increases many types of diseases namely, cholera and hepatitis from ingesting contaminated water, diarrhea, respiratory infections, and even allergies from fungi growth found in multiple countries that suffered severe flooding *(IPCC: Working Group II: Impacts, Adaptation and Vulnerability)*.

Ground Water
Many people depend on groundwater for domestic purposes as well as agriculture, and is therefore, a major global contributor to water security. Although there is minimal data on groundwater, it is extremely important to protect these reserves as they can become easily contaminated and diminished. Groundwater depends on rainfall to recharge its supply, consequently shifts in rainfall patterns can cause scarcity of groundwater directly impacting overall water availability.

The Intergovernmental Panel on Climate Change (IPCC) indicates that groundwater recharge is expected to decrease by over 70% within the next 30 years for regions such as Northeast Brazil, Southwestern Africa and SouthernMediterranean Sea. But, it is expected to increase by approximately 30% for regions such as Sahel, Northern China, Siberia and Western USA.

In addition, overdrawn groundwater poses a serious threat

to some cities as many countries depend on groundwater as a means of livelihood in agriculture and farming; India, Pakistan and Eastern China are victims of stressed and overdrawn groundwater *(Yale Environment 360, 2017)*. These countries are from a region where majority of the world's rice and wheat are harvested therefore, a domino effect can be observed by affecting food security. Another issue observed is, overdrawn ground water can cause cities to sink. Mexico is affected by this problem *(The Economist: For a want of a drink, 2010)*.

Contamination/Sanitation

Proper hygiene and sanitation is essential for a better quality of life. Water is made unusable when diseases are spread throughout the region, making water contaminated. Water can also become contaminated by polluted run off or by salt water intrusion. The IPCC states that approximately 69% of the population in the African region live within areas that have a high supply of water but, face the challenge of access to clean drinking water. Contaminated water is very serious and has a profound limitation on water security, thus, proper sanitation must be recognized to be equally important when compared to easily available water for the health and well being of the global population. The World Bank: Reaching the last mile in Latin America and the Caribbean: How to provide sustainable water supply and sanitation to Indigenous Peoples, indicates that indigenous people have a 26% less chance to access of improved sanitation while, worldwide approximately 2.6 billion people are deprived of proper sanitation. Health issues include infectious diseases including cholera, cryptosporidiosis and typhoid fever *(IPCC: Human Health).*

Global Temperature

Increased global temperature has many side effects including: glaciers melting, oceanic thermal expansion, increased evaporation rate, droughts and heat waves but most importantly many of these factors contribute to water insecurity. As glaciers melt, fresh water is lost into the sea (salt water) rendering it non-potable, and also affecting sea level rise. Together with thermal expansion these can contaminate aquifers by salt water intrusion. Surface water can be reduced, as water is evaporated at a faster rate as droughts and heat waves are constantly affecting countries throughout the world at what some might now consider an alarming rate. Since the beginning of 2017, temperatures have been soaring throughout the world; Japan experienced its highest temperature for the year in July (2017) also causing unstable atmospheric conditions. In May 2017, parts of India recorded temperatures reaching 43.8-47.4 degrees Celsius; as a result over 167 people died of sunstroke. The World Meteorological Organization (WMO) stated that the 'earth was experiencing another exceptionally warm year'. Counties such as 'Europe, the Middle East, North Africa and the United States have seen record breaking temperatures in May/June 2017'. This effect caused flights to be grounded and tarmac roads to melt but most importantly such temperatures can cause immense threat to water security.

Additionally, there is a distinct relationship between water security and food security; Food insecurity is directly proportional to water insecurity. In 2015/2016 the agriculture sector suffered immensely as several countries experienced losses while millions of people suffered from malnutrition. Recently China, one of the world's top grain producers experienced delays in planting and stunted crop development. As the global population is expected to increase, food demands will also increase, as a result it is mandatory to ensure our water reserves are protected and properly managed.

Conclusion

In the Caribbean region, islands are prone to coastal erosion and sea level rise. The Inter American Development Bank (IDB) estimates that 4.2 million people in Small Islands Development States (SIDS) are living in areas susceptible to flooding as a result of sea level rise. This will ultimately affect water security by the encroachment of salt water into groundwater. In addition the Caribbean region is expected to experience increase sea surface temperature (SST), since 1971 to 2004 the region has experienced warming, ranging 0-0.5 degree Celsius per decade. Also, the number of days recording a warm high or low has increased thus decreasing the number for cold temperatures (IPCC, Small Islands). Water quality is of major concern as 80% of coral reefs was lost in approximately 30 years; this affects water quality by pollution, sedimentation, marine diseases and overfishing.

Natural disasters is also a factor that contribute to reduced water quality; in the Caribbean and Small Islands droughts and storms are prominent. With increase SST the intensity and strength of storms also increase. In 2017, unprecedented storm strength and development was observed off the Atlantic. In August, saw the formation of Hurricane Harvey followed by Irma (which developed into a hurricane status within 24 hours) and was so severe, that officials were not able to predict the damages it would cause. Houston was flooded with over 9ft of water while dams and houses were damaged and destroyed. On another hand, as droughts and dry conditions have become more intense in the Caribbean, models predicted severe water stress for future water security among small islands in the Caribbean.

It is key to understand that although potable water seems limitless at times, there are many factors that can impair this vital resource. Measures must be implemented to keep the integrity of water at all times. In order to protect water, countries must acknowledge sea level rise and protect reserves from salt water intrusion and storm surges. The Caribbean Community Climate Change Centre in partnership with GWPC's Water, Climate and Development Programme (WACDEP) engaged water initiatives such as rainwater harvesting, wastewater recycling and saltwater reverse osmosis.

It is necessary for all persons to become knowledgeable about water, safe water practices and make a concerted effort to manage water distribution to avoid wastage.

Guardian Group

Guardian General Insurance Limited

YOUR SURVIVAL KITS

YOUR FAMILY DISASTER SUPPLIES KIT

Water

- Store water in plastic containers. Avoiding using containers that will decompose or break, such as milk cartons, or glass bottles. A normally active person needs to drink at least two quarts of water each day. Hot environments and intense physical activity can double the amount. Children, nursing mothers and ill people will need more.
- Store one gallon of water per person per day (two quarts for drinking, quarts for food preparation/sanitation).
- Keep at least a seven-day supply of water for each person in your household. Don't forget your pets.

Food

Store at least seven-day supply of non-perishable food. Select foods that require no refrigeration, preparation or cooking and little or no water. If you must heat food, pack a can of sterno. Select food items that are compact and lightweight.

- Ready-to-eat canned meats, fruit and vegetables.
- Canned juices, milk, soup.
- Staple-sugar, salt pepper.
- High energy foods-peanut butter, jams, crackers, granola bar.
- Vitamins.
- Food for infants, elderly persons or special diets.
- Comfort/stress food- cookies, candy, sweetened serials, coffee, tea bags.

First Aid Kit

Assemble a first aid kit for your home.

A first aid kit should include:

- Adhesive bandages in assorted sizes.
- 2-4 inch sterile gauze pads.
- Hypoallergenic adhesive tape.
- 2-3 sterile roller bandages.
- Scissors • tweezers • Needles • Moistened towelettes.
- Antiseptic.
- Thermometer • Tongue Blades • Tube of petroleum jelly.
- Assorted safety pins • Cleaning agent/soap • Glycerin soaps.
- Sunscreen.
- Bug repellent, water purification tablets.

Non-prescription drugs

- Aspirin or nonaspirin pain relief.
- Anti-diarrhoea medication.
- Antacid (stomach upset).
- Syrup of Ipecac (use to induce vomiting if advised by the poison control centre).
- Laxative.
- Activated charcoal.

Tools and Supplies

- Mess Kits, or paper cups and plastic utensils
- Emergency preparedness manual
- Battery operated radio and extra batteries, candles, lanterns
- Flash light
- Cash
- Can opener, utility knife • fire extinguisher • Tube tent
- Pliers • Tape • Compass • Matches • Aluminium foil
- Signal flare • Paper and pencil • Needle and thread
- Plastic sheeting

Sanitation

- Toilet paper • Soap, liquid detergent
- Feminine supplies • Personal hygiene
- Plastic garbage bags • Plastic bucket with tight lid
- Disinfectant • Household chlorine bleach.

Clothing and Bedding

- Include at least three complete change of clothing and footwear per person.
- Sturdy shoes or work boots
- Rain gear
- Blankets or sleeping bags
- Hats and gloves
- Thermal underwear
- Sunglasses

Special Items For Baby

- Formula • Diapers • Bottles • Powdered Milk • Medications.

For Adults

- Heart and high blood pressure medication.
- insulin • Prescription drugs • Denture needs • Contact lenses and supplies.
- Entertainment - Cards, games and books
- Important Family documents Wills, insurance policies, contact, deeds, stocks and bonds, passport, immunization records, bank account, credit cards.
- Inventory of valuable household goods, telephone numbers
- Family records (Birth, Marriage, death certificates).

Store your kit in a convenient place known to all family members. Rethink your kit and family needs at least once a year.



Guardian Group

Guardian General Insurance Limited

2022 ATLANTIC TROPICAL STORM/ HURRICANE NAMES

Alex	Hermine	Owen
Bonnie	Ian	Paula
Colin	Julia	Richard
Danielle	Karl	Shary
Earl	Lisa	Tobias
Fiona	Martin	Virginie
Gaston	Nicole	Walter

Atlantic Tropical Storms had been named from lists originated by the National Hurricane Center. They are now maintained and updated through a strict procedure by an International committee of the World Meteorological Organization.













While nature may take its course,

We'll help you rebuild your peace of mind.

Choose Guardian General's Home and Contents Insurance coverage.

For more information visit us at **myguardiangroup.com**

Find us in the following territories:

Anguilla	Belize	Jamaica	St. Vincent	Affiliates in Aruba,
Antigua	British Virgin Islands	Montserrat	Trinidad and Tobago	Bonaire, Curacao
Bahamas	Cayman Islands	St. Kitts	Turks and Caicos	and Guyana
Barbados	Grenada	St. Lucia	US Virgin Islands	

Guardian Group
Guardian General Insurance Limited

live safe | live easy

myguardiangroup.com