

Conference Report

Climate Conversations: A One Day Virtual Symposium on the Impact That Climate Change Has on the African Diaspora [†]

Camellia Moses Okpodu ^{1,*}, Bernadette J. Holmes ², Myron N. V. Williams ³, Pamela Waldron-Moore ⁴,
Pearline Tyson ⁵ and Charles K. Twesigye ⁶

¹ College of Arts and Sciences Deans Office, University of Wyoming, Laramie, WY 82071, USA

² Department of Sociology, Norfolk State University, Norfolk, VA 23504, USA

³ Department of Chemistry, Clark Atlanta University, Atlanta, GA 30314, USA

⁴ Department of Political Science, Xavier University of Louisiana, New Orleans, LA 70125, USA

⁵ United States Agency for International Development, Research Technical Assistance Center, Washington, DC 20004, USA

⁶ Department of Biological Sciences, Kyambogo University, Kampala P.O. Box 1, Uganda

* Correspondence: cokpodu@uwyo.edu; Tel.: +1-307-766-2486

[†] Presented at the Climate Conversations: A One Day Virtual Symposium on the Impact that Climate Change has on the African Diaspora.

Abstract: The first virtual Climate Conversations workshop was held on 23 April 2021. The conference was supposed to be an in-person conference on the campus of Xavier University of Louisiana. However, the pandemic posed a challenge. The organizers pivoted and offered the event as a virtual workshop that allowed for international participation from seven different countries. The online opportunity was an all-day thought-provoking workshop where challenges and opportunities presented by climate change and environmental justice scholars were explored.

Keywords: climate change; African diaspora; sustainability and economic resources; health disparities; environmental justice



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1. Introduction

The Climate Conversation for the African Diaspora (a one-day virtual workshop held on 23 April 2021) was opened by Camellia Moses Okpodu, who was then Dean of the College of Arts and Sciences at Xavier University of Louisiana and the State of Louisiana's Endowed Chair of Science. She informed all participants that the sessions were being recorded for the purpose of sharing what was learned with future audiences.

Since spring 2006, Dr. Okpodu has offered an environmentally focused lecture series with the primary goal being to expose students to the needs of the Black and Indigenous People of Color (BIPOC) community. She has worked most of her life at Historically Black Colleges and Universities (HBCUs) and knows the importance for people, especially scientists, to have an informed understanding of broader issues that may inadvertently affect them but they never think about in their professional lives. Dr. Okpodu challenged students to consider how they might use design-thinking to intentionally create a foundation for sustainable growth but empower it through clean water, reliable energy, healthy landscapes, and jobs for the future. She charged the faculty and mentors to educate and provide the next climate research scientists for a resilient world focused on the needs of the diaspora.

She stated, “the goal is that we leverage our relationships between like-minded organizations, both state and private universities, governments and nonprofit organizations to provide, especially those who are leaders in the Geosciences, Agricultural, and Environmental Sciences, to start now creating the Climate Champions and acknowledge those who have set the course, for more support of a more just and equitable environment where scientists are able to provide inputs for the future.”

In the past, the Climate Conversations have been co-sponsored with the Ecological Society of America and their SEED program, which stands for Sustainability Strategy for Environmental Education Diversification. This year we partnered with the African Scientific Institute (ASI) Climate Crisis Committee and focused on beginning forums with connections that embraced the African diaspora. This year's symposium examines climate change issues through several lenses to broaden perspectives. The questions addressed how we can actualize what President Biden stated on Earth Day 2021 with the re-entry of the United States as a world leader in action on climate change and how we will, as Americans, decrease emissions and increase resources available to vulnerable countries to fight climate change. This workshop was an intersection of the natural, political, social, and behavioral sciences, which allowed an examination of the global changes that affect the diaspora today. The workshop consisted of three panels, and the presenters shared their thoughts on these areas. As a form of recognition, we honored our own Climate Champion and made presentations to three students from Xavier University for their research on "Earth, Water, and Fire (EWF): Using the African Diaspora to teach and support a Diverse, Equitable, and Inclusive Environment to enhance interest in the GeoSciences." As of 22 April 2021, there were 157 registrants on the online webinar site. They represented 40 different universities and seven different countries.

2. Keynote Presentation

2.1. Introduction

The keynote address was given by Mr. Lee Cherry. His address covered three areas: (1) the meaning of the word "climate"; (2) the role of ASI and how climate will impact black people in Africa and the African diaspora; and (3) the opportunities to become involved in addressing issues related to the climate. In July 2021, Mr. Cherry died at the age of 76. Dr. Okpodu wrote a summary of his presentation and with additional references to concepts and ideas that were presented in his talk. Mr. Cherry's keynote address provides an overview of climate, and Dr. Okpodu includes two additional comprehensive reviews of the topic which can be found in the Intergovernmental Panel on Climate Change (IPCC) report [1]. These consist of a description of the current and future research agenda for the world as it relates to the impact of climate change and a four-volume anthology entitled, "Research Anthology on Environmental and Societal Impacts of Climate Change" [2]. The anthology covers the latest research on key elements of society that are affected by a rapidly increasing climate, e.g., plants and animals' reproduction, energy demands, policies, disaster and crisis management and emerging research on the numerous impacts of climate change.

What Is Climate?

When we talk about the climate, we must consider the oceans, the atmosphere, and the land. The ocean influences weather and climate by storing solar radiation, distributing heat and moisture around the globe, and driving weather systems. The ocean covers 70% of the global surface and exchanges heat, moisture, and carbon with the atmosphere, driving weather patterns and influencing the slow, subtle changes in the climate. The oceans influence climate by absorbing solar radiation and releasing heat needed to drive the atmospheric circulation, releasing aerosols that affect cloud cover, emitting most of the water that falls on the land as rain, absorbing carbon dioxide from the atmosphere, and storing it for years to millions of years. Oceans absorb much of the solar energy that reaches the earth's surface, and thanks to the high heat capacity of water, the oceans can slowly release heat over many months or years.

The atmosphere is composed of five major layers that are based on changes in temperature. The troposphere, the lowest layer, is associated with weather and is where most of the visible clouds are observed. Extending up to 10 miles above Earth's surface, the troposphere contains a variety of gases: water vapor, carbon dioxide, methane, nitrous oxide, and others. These gases help retain heat, a portion of which warms the surface of

Earth (greenhouse effect). Changes in the composition of these atmospheric gases have a dramatic impact on Earth's climate.

The changes in climate over land masses is influenced by the geographical location. The climate over small islands has a different vulnerability that highlights the multidimensional nature of climate change compared with large land masses. The idea of climate change is multifaceted; thus, modeling and scenario-building have to take this principle of place into consideration, especially when exploring adaptation and sustainability strategies. As sea level rises, the response to climate change will need to be both conceptual and operational.

Thus, climate is defined as the average behavior of the land–ocean–atmosphere–cryosphere system over relatively long periods rather than the detailed daily fluctuations that we call “weather” [3]. We find that the temperature changes impact the currents in the ocean. The groundbreaking work of Jacob Bjerknes theorized that weather was concentrated in the narrow space between warm and cold masses of air. His work as a meteorologist developed the theoretical cyclone model [3]. His work was the first to describe the El Niño and the Southern Oscillation phenomena. It was his description of a feedback loop between the oceanic and atmospheric circulation that led to our better understanding and forecasting of weather changes [4]. When there are changes in the currents in the ocean that impact how the currents, the atmosphere and the clouds move, which then impact how the rain, and particularly how the air flows back to Earth from the Sahara and ends up in the Amazon, feeding the nutrients in the Amazon, it becomes clear that everything is dynamic [5–7]. Nothing is static. Climate is regulated by complex interactions among Earth's systems. The changes in climate over land masses are influenced by the lens that is being considered. The climate over small islands has a different vulnerability that highlights the multidimensional nature of climate change. Therefore, the multifaceted nature of climate change becomes evident, and modeling and scenario building have to take these principles into consideration, especially when exploring adaptation and sustainability.

2.2. What Is the Role of ASI and How Will Climate Impact Black People in Africa and the African Diaspora?

A number of members of the African Scientific Institute (ASI) have been working over the past fifty years in attempts to mitigate some of the adverse impacts of climate in Africa. Throughout its history, the ASI has been involved in working with Africa and the African diaspora. They have networked with people throughout the diaspora and within Africa and have always sought activities they can engage in to help sustain and develop Africa, as well as provide jobs and opportunity for people throughout the diaspora.

One exciting development is how the environment is changing and how Black ASI members are researching questions that are germane to the African diaspora. The ASI fellows have termed their methodological approach as “GOOS” (Geographic Oceanographic Observation System). GOOS is a monitoring system observing the oceans adjacent to the shorelines of Africa. In 2010, UNESCO's GOOS-Africa project convened a pan-African conference in the Republic of Benin, and ASI participated in this event. They spoke to students at the University of Benin about developments in science and technology and the importance of pursuing courses in these areas for personal opportunities and supporting the Republic of Benin. ASI arranged a third meeting of the Sub-Sahara International Hydrological Program (IHP) National Committees, organized jointly with an Intergovernmental Oceanographic Commission (IOC) workshop from 15 to 17 February 2010 in Cotonou, Benin. The meeting was organized with the support of the Government of Benin, UNESCO and Global Water Partnership-West Africa (GWP-AO). The meeting aimed to promote better understanding of climate change impacts on water resources and coastal zones in order to assist countries in better managing water resources towards the Millennium Development Goals (MDGs). The overall themes of the joint event were climate change, water resources, and coastal zones management in Africa. The two events (IPH and GOOS) ran in parallel, focusing on two sub-themes: (1) climate change and water resources management

in Africa; and (2) strengthening observing systems capacity for managing the impacts of human activities and coastal inundation in the African regions [8].

Another approach ASI has taken is working with NASA and NOAA to establish methodologies for better monitoring of vegetation systems globally, and particularly in eastern Africa. Using NASA remote sensing data, drought can be monitored [9]. This method of measuring drought provides increased certainty and is a technique that can be adapted to other parts of the world.

Besides a focus on Africa, the United States has an international interest in what occurs in the Indian Ocean. When we consider the diaspora we often overlook the role of the Indian Ocean. African cultures have survived in the corridor of the Indian Ocean with connections through culture, religion, language, music, dance and food that have persisted for nearly 20 centuries [10]. As it relates to climate change, the Indian Ocean region is warming at a higher rate than other oceans, which means the relative sea level will increase over this region. The Indian Ocean is important to maintaining security for international commerce; accessing to geopolitically important areas, such as the Gulf of Aden, the Strait of Hormuz and the South China Sea; and is the main access point for Sino-Indian relations. There is a need for ASI fellows to contribute to policy advice. AAAS Science and Technology Policy fellowships may be an avenue for ASI fellows as scientists and engineers to gain first-hand knowledge about policymaking while contributing their knowledge and analytical skills to the federal policymaking process.

The African Scientific Institute has always been engaged with networking between Africa and the African diaspora. They are one of the parties responsible for persuading the African Union to make a statement recognizing that the six regions of Africa must be involved in the climate discussion. The organization and its members have been involved in providing the science and technology component of the next 50-year manifesto for the continent of Africa. It has been argued that the first 50-year manifesto was developed by Dr. Kwame Nkrumah [11]. Dr. Nkrumah advocated a political independence as the first step to realizing social justice and improved living standards for Africans. At midnight on March 5, 1957, he did not use the term climate change, but his argument laid the foundation for what we now call environmental social justices, a concept popularized by Robert Bullock, the father of environmental justice [11–13]. In a 2021 book entitled the African Handbook of Climate Change Adaptation, the editors compiled the work of over 100 African researchers, all of which was peer-reviewed by an international group of editors. The handbook highlights the work being conducted in Africa in all corners of the continent and the approaches that have been taken to address some of the pressing issues facing the African diaspora [14]. However, people of color globally are adversely affected as they receive funding from some institutions in Europe which has recently been reduced because of coronavirus.

2.3. Where Are the Opportunities to Become Involved in Addressing Issues Related to the Climate?

Beyond the academy, other kinds of organizations including faith communities and professional organizations can be involved in this work. There is a movement called “creation care”, a movement credited to Carl Sagan (ca. 1990) in an effort to win over evangelicals [15]. Sagan is described as spearheading an effort to integrate concern over climate change into the church’s agenda.

Another effort for environmental justice and faith was established through the work of Dr. Faith Harris, a theo-ethicist, grassroots organizer, and faith leader whose service is a model for womanist and practical theology methodology at the Samuel DeWitt Proctor School of Theology of Virginia Union University (STVU) in Richmond, VA. For more than 20 years she has provided leadership for the idea of environmental justice and faith in the Virginia Interfaith Power and Light (VAIPL) organization. A state affiliate, Interfaith Power and Light is dedicated to bringing together all faith communities to mobilize a religious response to climate change through energy conservation, energy efficiency, and renewable

energy. It advocates that religious institutions promote the education of others who are traditionally outside the focus of science [16–18].

Not everybody goes to college, but non-college-educated people could also create grassroots organizations to work in the environmental justice sector. We also need to leverage our academic education from kindergarten to doctoral programs. Not only should our universities educate students, but these same students need to be educating our children in K-12 education.

Well established professional organizations such as the National Society of Black Engineers (NSBE), which started in the 1960s and accelerated its activities during the 1970s, persuaded various universities to set up programs relating to Blacks in science. Collectively, they came together and formed what is called today NSBE. This organization can be a force in climate education. There are now more than twenty-nine thousand NSBE students and alumni throughout the United States and other areas of the world. We need community-based organizations to partner with each other, and they in turn to partner with the religious and academic sectors. We also have to engage our politicians, who seem to only find us when they need money or votes, but we need to be able to find them when communities need support. The international policies and framework to implement change and outcomes will be important. We need management policy for land use and water relations. These are nature resources that will be affected by a changing climate. Politics is local but we must be involved in the global politics, especially to address climate consequences that do not respect borders. There remain unanswered questions about how we enforce rules and laws and who determines what the national interest is in each country of the world. When each country has its own interest, it may lead to conflict. As some developing countries are building capacity, they may put little emphasis on the climate consequences of their policies. For example, Guyana, has recently discovered petroleum deposits and they are motivated to use that resource to help develop the country. Nonetheless, we should engage with them to ensure that the activities of oil companies are conducted in a way that minimizes impacts on the environment and on climate change.

The African and diasporan people also have cultural resources that can be used. People of the diaspora in the entertainment sectors, for example, are a very valuable resource for promoting the message about how the climate has been adversely impacted by our actions. We need people to show through music, film, dance, artwork and entertainment in general that we all are impacted by adverse climate conditions.

When we talk about the adverse impacts on Black people, we need to think about the food supply. We have to consider agricultural development and the sustainability of both human and animal migrations. For example, 5% of land in Bangladesh is less than 2 m above sea level, and those regions most subject to flooding carry the densest populations. As a result, many people in this area have attempted to enter India but India does not accept them. A rising sea-level is also a problem in the Republic of Benin where one-third of the country's coastal land is underwater. A large amount of the nascent tourist infrastructure in West Africa has been destroyed, with hotels collapsing into the sea.

2.4. Concluding Thoughts

Climate change will also have adverse impact on overall human health. We have an opportunity to interface with some of the oil producing entities and advocate for cleaning up the atmosphere and redirecting some of the energy, not necessarily the products. We have to remind corporations that an interest in sustaining economic conditions has to be balanced with the impact of these new technologies on the most vulnerable people of the world. Companies and organizations that take this charge seriously will have the opportunity to profit but also contribute to the common good, creating good on a global scale. ASI has over 2000 members as Fellows around the world. These are scientists throughout the United States and 65 other countries, and many are involved in climate related data and science. If all those 2000 members could multiply their influence one hundred-fold, you may imagine the impact that we can have.

3. Symposium Structure

After the keynote address, three panels were convened with discussions on three broad areas related to the diaspora.

3.1. Panel 1—*Health, Political and Social Impacts of Global Climate Change for the Diaspora*

Panel 1 provided insights into how we can develop a greater focus on diaspora health-related research by including our students; becoming more interdisciplinary; and understanding the broader implications of environmental justice.

3.1.1. Race, Place, and Health: The Fight for Environmental Justice

Sacoby Wilson (Public Health, University of Maryland)

Racism comes in various forms, particularly environmental racism. In the US, racism can be demonstrated by structural violence. There is violence against people of color in the health care industry and around the world, so social movements such as Black Lives Matter are now a global movement. This violence may take the form of the murders of young Black people or transgender youth, whether it be through over-policing, police brutality or the school-to-prison pipeline in the US. These are examples of structural violence, which is a form of trauma. In the history of America, we realize that this structural impediment of racism is baked into the walls of this country. We must talk also about what occurred with the enslavement of Africans and the labor used to build America. That is all connected to what is happening today related to environmental injustice and refers to climate change. Racism globally is a public health problem. How race is weaponized against people is at the root of the problem. Dr. King was assassinated 53 years ago while in Memphis, Tennessee, working with sanitation workers exposed to contaminants on the job. They had poor labor conditions and were being mistreated. They carried signs that stated, “I am a man recognized by humanity.” We are still saying “recognize our humanity” as members of the African diaspora.

Climate change is the world’s greatest existential challenge, and its solution will require one of the world’s greatest collaborative and innovative responses. It creates an opportunity to address both economic and environmental justice for people of color. Therefore, true empowerment for people of the diaspora is needed. Considering injustice, the framework examines how some communities are overburdened by hazards such as incinerators, power plants, landfills, climate change, as well as the extraction of fossil or their transport through pipelines. In Louisiana, there is a connection between black people and Cancer Alley where people live with petrochemical refineries, or in the most significant petrochemical corridor, the Houston Ship Channel in Texas. People are saying recognize our humanity and environmental justice is about what we live. We know the health effects of climate change. Those who live in urban environments or coastal communities deal with the impacts of extraction, greenhouse gas emissions, and sea-level rise. Waterborne illnesses such as malaria will increase over time because of climate change. We also have heatwaves, and people do not have access to potable water or sanitary sewage disposal, which threatens groundwater contamination or rivers and streams, as witnessed in Brazil. We can think about using the 17 Justice Principles created 30 years ago by the People of Color Summit Research. We can use them as a framework to build bridges across the diaspora [19].

3.1.2. Environmental Stewardship and Its Social Impact

Bernadette Holmes (Sociology, Norfolk State University)

The Department of Homeland Security funded our current research on environmental sociology. We focus on sea level rise, flooding, and marginalized communities in Hampton Roads, Virginia, and the social dynamics that influence planning and evacuation. We received a grant from the Department of Homeland Security, which was aimed at a small project at minority-serving institutions. We used the funding to support the creation of courses on environmental racism, specifically related to environmental crime and justice.

Our research project expresses the importance of trans-disciplinary collaboration. This effort trained both sociology and biology students in interdisciplinary environmental research. Our understanding of these issues allows for a broader conceptualization of climate change and how it disproportionately impacts minority and marginalized communities. Robert Bullock, an environmental sociologist, has been at the forefront of the environmental justice movement regarding equitable development and the impact of environmental racism on environmental inequality or marginalized communities. The Hampton Roads area has major naval operations with one of the largest naval bases in the area. It is located on the Chesapeake Bay, the Elizabeth River, and the Atlantic Ocean, and these issues very much affect the surrounding communities. Environmental sociology has not been given the level of prominence within the discipline and how we examine systemic issues impacting Black environments. The research is at a nexus involving a model and framework that brings sociology students together for cross-training. We have enhanced the curriculum at HBCUs to broaden the participation of students who are not STEM majors but are interested in environmental issues. We talk to them and train them in understanding issues of systemic inequality, racism, sexism and classism. As such, there is a need for a cadre of Black students and scholars to provide a critical lens on the social dynamics of the environment. We need to have students who are trained across disciplines and who can have a seat at the table to continue pursuing advanced degrees. Students love to be engaged in community action, research and public service. Sociology is essential for them to see how the community operates. These sacrifice zones often develop under the guise of creating jobs in the African American community. The issue of trauma is an integral part of the conversation on environmental justice. If a person needs to evacuate but has nowhere to go nor the economic resources to evacuate, it exacerbates the trauma. We have not paid enough attention to this issue in environment and climate change discussions. Accordingly, in a comprehensive approach to dealing with environmental problems, social and behavioral scientists must be brought to the table to provide a holistic approach. Indeed, HBCUs must contribute to the dialogue and be a part of the solution.

3.1.3. Global Climate Change: Political Challenges and Opportunities for the Black Diaspora

Pamela Waldron-Moore (Political Science, Xavier University of Louisiana)

Climate change is increasingly becoming a universal existential crisis. It is, however, more negatively impactful for the Black diaspora, whose vulnerabilities are specifically related to global injustice throughout the history of the diaspora. Acknowledging the political and economic foundations of the problem and addressing its causes and potential solutions, it is important to identify the challenges and opportunities facing the diaspora. It is recognized that since the advent of industrialization, global temperatures have risen by at least 1 °C (18 °F). The shift in temperatures has led to changing rainfall patterns, intensifying aridity in the southern hemisphere while making the northern hemisphere wetter. These changes have a dramatic, differential impact on the Global North and South. In the Global South, where there is reliance on agricultural production, a lack of access to potable water and healthy local ecosystems challenges the diaspora's search for development. Weather changes impact marine life, food security, healthy lifestyles and the overall development of diasporic peoples. These challenges complicate the potential for adaptive measures to mitigate climate risks sustainably. In the Global North where agricultural resources are converted into manufactured goods, the aim of globalization to broaden and deepen international collaborations is also challenged. These challenges to the single ecosystem that sustains life in both the North and South lead to uneven development globally, exposing a deep chasm in the potential for sustainability between the hemispheres. The problem is further complicated by the lack of strong political leadership, which would require that hemispheric regions find mutually advantageous solutions to the world's crisis. Since the diaspora has experienced inequities resulting from centuries of colonization, many agree that this is a burden with the greater responsibility falling on the North. For if

globalization can be credited with the success/development of the North and the poverty of the South, corrective action should come from those who have the wherewithal politically and economically to ameliorate the problem. A potential solution for the vulnerabilities of the South is to transform the nature of political and economic interactions with the North by adapting to the environment in innovative ways. The diaspora has an opportunity to exploit its indigenous knowledge capital, build capacity for green infrastructure, adopt new paradigms of development, advocate and empower entrepreneurial leadership within communities, and engage bottom-up collaborations. These can produce knowledge economies of scale that utilize grassroots capital and resources for building better, more resilient communities connected in the spirit of regenerative practices with roots in indigenous cultural wisdoms. Targeting specific areas for equitable growth, where gender equality, economic security, and environmental justice become the foundations for sustainable development, is a plausible starting point to meet the UN's goals of sustainable development while mitigating the risks of climate change. Given its climate vulnerability, Africa and its diaspora would be best served by developing innovative strategies to mitigate the risks of climate change.

3.2. Panel 2—Economics, Sustainability and Managing the World's Natural and Native-Based Resources

This panel focused on the intersectionality of the use of natural resources and sustainability strategies that have been adopted in the last fifty years. The panelist discussed various strategies for the diaspora. To learn additional information on the economics of sustainable natural resources, review the Organization for Economic Co-operation and Development (OECD) report entitled "Natural Resources and Pro-Poor Growth, The Economics and Politics" [20].

3.2.1. A Call to Action

LaTonia Batiste (WSP, Project Director of Sustainability Energy and Climate Change)

This presentation focused on sustainability, energy, and climate change for global professional service corporations. WSP provides technical expertise and strategic advice to clients in the transportation and infrastructure, property and buildings, environment, industry, resources (including mining and oil and gas) and energy sectors, as well as offering project and program delivery and advisory services. Its experts include engineers, advisors, technicians, scientists, architects, planners, surveyors and environmental specialists, as well as other design, program and construction management professionals [21]. This presentation describes the work of disciplinary and multidisciplinary teams to help navigate complex sustainability issues, unlock opportunities, mitigate risk, and build environmental literacy. It describes the ways to become a champion for climate sustainability and resilience for underserved communities. The research explores innovative solutions to reduce the carbon footprint of the minority-serving institutions and small businesses. This presentation describes how companies engage with and fix problems that they have created. One way to approach how we can be involved is referring to the seventeen UN sustainability goals. We can work with commercial clients using the UN framework to deal with issues to ensure we are all conserving resources and addressing the issues systematically.

3.2.2. The Three Economies and Their Role in Balancing Sustainability in the Face of Climate Change

Charles Kakuhikire Twesigye (Department of Biological Sciences, Kyambogo University, Uganda)

This presentation is about three economies: (1) the bioeconomy, (2) the blue economy, and (3) the hydrogen green economy. It discusses their role in balancing sustainability in Africa, with specific reference to the Lake Victoria Region in East Africa. Lake Victoria is the second largest fresh water lake in the world and the source of the longest river in the world, the Nile River. Lake Victoria has had significant fluctuations in lake levels in the

past century. These fluctuations in the lake's levels affect the Nile flows, which in turn may have significant consequences on the countries dependent on the Nile. Climate change caused by the increase in the concentration of greenhouse gases poses global challenges for the economies that depend on these water resources. An overall sustainable development will stem from a holistic energy system driven by renewable energy. **Bioeconomy:** This is a new model for industry and the economy. It involves using renewable biological resources sustainably to produce food, energy and industrial goods. It also exploits the untapped potential stored within millions of tons of biological waste and residual materials. The transition from a fossil fuel-based to a bio-based economy is expected to reduce our dependency on fossil fuels and achieve more sustainability as well as contribute to climate and environmental protection. The bioeconomy includes the agriculture, forestry, fisheries, food and pulp and paper production sectors, as well as parts of the chemical, biotechnological and energy industries. **Blue economy:** This is an economic term linked to the exploitation and conservation of water resources. This is supported by scientific findings showing that the Earth's resources are limited and that greenhouse gases are damaging the planet. Additionally, pollution, unsustainable fishing, and habitat destruction harm marine life and are increasing day by day. The blue economy can create green energy and fight climate change. It has the power to achieve better governance of marine and fresh water ecosystems and lower emissions. **Green hydrogen economy:** In a new initiative, Germany is collaborating with African countries in a joint effort to explore the utilization of green hydrogen as an energy option. The aim is to support sustainable and economic development through a viable hydrogen economy with a high potential to make Africa an exporter of green hydrogen, hence gaining relevance in international energy markets. In Africa, the green hydrogen economy has the potential to enhance the renewable energy utilization and capacity of the continent, create jobs and support sustainable development. The potential for the green hydrogen economy in Africa is high due to abundant sunshine, wind, land, water resources in lakes and rivers, and deep-sea ports. The concept of sustainability will change and be refined in the course of time, and sustainability criteria will have to be modified to follow suit. Sustainability is not a static achievement but a dynamic learning process. Political commitment, stakeholder engagement, enhanced capacity and a shared vision will be needed for the three economies to deliver on the promises of sustainable development.

3.2.3. Using Special Bio-Crops to Mitigate CO₂ Emissions and Creating Green Economies for the African Diaspora

Joseph James (CEO, Agri-Tech Producers, LLC)

This presentation focused on an invented process called combined remediation biomass and bioproduct production process (CRBBP), a process which involves the planting of special bio crops to mitigate CO₂ emissions. The process captures, reuses and sequesters as much carbon as possible. The plants can also be used to remediate contaminated air, soil, and water. The crops convert the resulting material, which is called biomass, into various forms in the circular economy. Such bio-products are both good for the economy and good for the environment. The circular economy means the by-products never have to end up in landfill. Instead, the carbon is captured and used to make other products. It is used to make plastics and composites that are stronger and more heat resistant. Alternatively, when we grind up our crops, the by-products can make a superior poultry house bedding, and it turns out that they are better at controlling ammonia and moisture. After harvesting, the carbonized materials can form a nutrient-rich biochar soil amendment.

There are companies, which extract large amounts of CO₂ from the open atmosphere and others which grow plants to do remediation. Our company is interested in identifying ways that poor rural communities of color could use the bioeconomy and the utilization of biomass to create jobs. We would like to emphasize a great desire to do things in Africa. This process is flexible in that it can create the economic and environmental benefits across Africa by doing things in different ways. For example, we can preserve forest by using our

materials for making cooking fuel or other uses. Our crops are also suitable for use in the last cleanup of wastewater in wastewater treatment facilities.

3.3. Panel 3—Funding, Research and Publishing to Support Climate Change Education

This panel provides insights on educational and research initiatives focused on climate change impacts or mitigation applicable to the African continent and diaspora. The NSF panel provides a general overview of the NSF process. We have added additional resources specific to members of the diaspora. The NSF opportunities for Enhancing diversity in the Geosciences (OEDG, 2002–2013) is aimed at increasing the diversity of the geosciences [22]. A more recent program sharing opportunities for minority students is called GEO Paths. More information can be found at geopaths@nsf.gov (accessed on 21 July 2022).

3.3.1. Opportunities with the U.S. National Science Foundation

Candace Major (NSF, Geosciences)

NSF supports all fields of fundamental research in science and engineering (except for medical sciences). Proposals are submitted to core programs and interdisciplinary programs. The proposal review takes about six months on average from the time the proposal is submitted through external peer review and then a full merit review by the program directors. NSF is constantly looking for ways to engage a broader cadre of scientists in the review process. Those who have not participated in the NSF review process as an ad hoc reviewer or panelist and are interested in doing so should consider reaching out to a Program Director in their area of expertise.

All proposals to NSF are evaluated with respect to two criteria: intellectual merit and broader impacts. While most researchers and reviewers feel comfortable with the intellectual merit criterion, there is often some confusion about what is meant by broader impacts. NSF guidance defines broader impacts as follows: “*Broader impacts may be accomplished through the research itself, through activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to, the project. NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes.*” (NSF Proposal and Award Policies and Procedures Guide).

There are a number of career-stage targeted funding opportunities. Many NSF divisions have fellowships to support postdoctoral researchers. CAREER awards (<https://beta.nsf.gov/funding/opportunities/faculty-early-career-development-program-career> (accessed on 21 July 2022)) provide five years of support for pre-tenured professors in tenure-track positions. The Mid-Career Advancement program (<https://beta.nsf.gov/funding/opportunities/mid-career-advancement-mca> (accessed on 21 July 2022)) has been designed for post-tenure researchers who are looking to expand their research into new and exciting directions. Finally, there is the Graduate Research Fellowship Program (<https://beta.nsf.gov/funding/opportunities/nsf-graduate-research-fellowship-program-grfp> (accessed on 21 July 2022)). GRFP is run as a cross-foundation program outside of the disciplinary programs. It provides three years of support for graduate students. It is quite prestigious and a wonderful opportunity for student fellows.

NSF has also designed many cross-cutting interdisciplinary programs that address priority research topics that are broader in scope than what would be supported within the individual disciplinary core programs. The NSF public website (<https://www.nsf.gov> (accessed on 21 July 2022)) is an excellent resource to explore funding opportunities (<https://beta.nsf.gov/funding/opportunities> (accessed on 21 July 2022)), employment opportunities (<https://beta.nsf.gov/careers> (accessed on 21 July 2022)), and upcoming events (<https://www.nsf.gov/events/> (accessed on 21 July 2022)). Below are a few current programs that are particularly relevant to climate and global change research.

- **Coastlines and People (CoPe)** (<https://beta.nsf.gov/funding/opportunities/coastlines-and-people-hubs-research-and-broadening-participation-cope> (accessed on 21 July 2022)): CoPe funds interdisciplinary research hubs focused on fundamental

science at coastlines, the impacts on people, the impacts of the built environment and the choices that people make. It is a very interdisciplinary program.

- **Dynamics of Integrated Socio-Environmental Systems (DISES)** (<https://beta.nsf.gov/funding/opportunities/dynamics-integrated-socio-environmental-systems-dises> (accessed on 21 July 2022)): The DISES Program supports research projects that advance basic scientific understanding of integrated socio-environmental systems and the complex interactions (dynamics, processes, and feedbacks) within and among the environmental (biological, physical and chemical) and human (“socio”) (economic, social, political, or behavioral) components of such a system.
- **The Belmont Forum** (<https://belmontforum.org/cras> (accessed on 24 October 2022)): The Belmont Forum is an NSF-supported international partnership that mobilizes funding of environmental change research and accelerates its delivery to remove critical barriers to sustainability.
- **Global Sustainability Scholars** (<https://www.gsscholar.org/scholars-program> (accessed on 24 October 2022)): The GSS program is run through the Belmont Forum and trains and supports rising young professionals with diverse backgrounds, disciplines, and world views. They are a professional community, working on global sustainable development challenges that face communities and environments.

3.3.2. Helping HBCUS Communities plan for Climate Change

Melissa L. Finucane (RAND Corporation)

This presentation focused on the opportunities for training undergraduate and graduate students in the context of transdisciplinary research collaborations such as the NOAA-funded Mid-Atlantic Regional Integrated Sciences and Assessments Program. With the demand for use-inspired science on the rise, students need to understand complex environmental health issues such as climate change from multiple, interacting perspectives. This presentation described how a transdisciplinary setting offers a unique training environment for students to advance science while also building their professional networks and consider career paths that might not have occurred to them before. The students worked with experts from diverse physical, natural, and social science fields to expand their understanding of disaster recovery and community resilience, learn new problem-solving skills, and develop the tools necessary to work with disciplines outside their own field.

3.3.3. Current Landscape of Engagement between USAID and Historically Black Colleges and Universities

Pearline Tyson (RTAC Network)

This presentation provides an analysis of the current landscape of USAID’s engagement with Historically Black Colleges and Universities (HBCUs). Although HBCUs represent only 3 percent of all four-year nonprofit colleges and universities, they enroll 10 percent of all Black students nationwide, award 26 percent of all Black bachelor’s degrees, and 32 percent of all Black bachelor’s degrees in science, technology, engineering, and mathematics (STEM) fields in the U.S. HBCUs also employ 96 percent of Black tenured faculty. These percentages suggest that by increasing partnerships with HBCUs, USAID has the opportunity to engage underrepresented students in their hiring pipelines and underrepresented faculty in development and research projects. Researchers examined the barriers that limit USAID funding to HBCUs and explored internationalization efforts HBCUs have undertaken to enhance their eligibility for USAID funding. Thus, the primary aim of this study is not only to strengthen the partnership between USAID and HBCUs, but also to assess the international and transnational partnerships HBCUs have established with governmental and non-governmental entities around the world. This study obtained rich data pertaining to HBCU experiences with USAID and vice versa. Future research should advance this study by comparing the barriers experienced by HBCUs with the barriers experienced by non-HBCUs. Additionally, an assessment of HBCU institutional capacity for USAID funding could entail campus visits and reviews of HBCU annual reports, strategic

plans, mission statements, budget documents, staffing levels, and other documents. It is our hope that this study adds insights to the body of knowledge on HBCU barriers to federal funding opportunities, upon which future research can build. USAID has the opportunity to develop and harness the skills and expertise of HBCU faculty, staff, and students who can provide culturally competent practices to USAID M/B/IOs as they become the next generation of USAID civil and foreign service employees. HBCUs have established national partnerships with governmental and non-governmental entities around the world. The benefits of partnering with these institutions are timely and boundless.

4. Special Recognitions

Awards and recognitions are important to create long-term sustainability. Dr. Okpodu created the Climate Conversation Champions awards to spotlight efforts of various from all levels of achievement.

4.1. Professional Recognition

Dr Beverly Wright was recognized as a Climate Conversations Champion. Dr. Wright is an environmental justice scholar and advocate, author, civic leader and Professor of Sociology and the founder and executive director of the Deep South Center for Environmental Justice—a Center that addresses environmental and health inequities along the Louisiana Mississippi River Chemical Corridor and the Gulf Coast region. Dr. Wright has conducted groundbreaking and significant research in the area of environmental justice and developed a curriculum for use at the elementary school level that has been used by New Orleans public schools. She manages worker health and safety training programs that embrace a work-based curriculum and a holistic approach to learning for young men and women living near Superfund and brownfield sites, resulting in their employment. She has won numerous awards and accolades for her achievements. She is the author of numerous scholarly books and articles. She co-authored *Race, Place and the Environment After Hurricane Katrina* from Westview Press, and *The Wrong Complexion for Protection: How The Government Response Endangers African-American Communities* from New York University. She received a BA from Grambling College and an MA and Ph.D. in Sociology from the State University of New York in Buffalo. Currently, Dr. Wright is serving as a member of the White House Environmental Justice Advisory Council under the Biden–Harris Administration. She is also a member of the Justice 40 Initiative Workgroup.

4.2. K–12 Recognition

Dr. Myron Williams from Clark, Atlanta, worked with K–12 students as part of preparation for a Fulbright fellowship. During a visit to Senegal in April 2021, he collaborated with an elementary school teacher, university instructors and an entrepreneurship incubator in a variety of sustainability and educational activities. He developed a hands-on science and environment teaching module (Passive Solar Distillation) with third grade classes in Dakar and has begun to establish Panafri-GLOBE, a “Weather Station” program (that is being expanded to include similar grade-level classrooms in Georgia, North Carolina, Wyoming, Ghana, Burkina Faso and Haiti) for measuring, recording and direct interpersonal exchange of weather data. With partial funding from the HBCU Green Fund, he imported a household-scale portable biogas digester to a rural village (Yene), which is currently producing cooking gas for a family of seven. They are monitoring the inputs and performance of the digester, while a small business incubator in Dakar is developing the capability to locally manufacture portable digesters. He is helping to create the next generation of climate scientists.

4.3. Undergraduate Recognition

We recognized Climate Champions at every stage of their professional development. We had three Xavier undergraduates who received special recognition for their work as part of a class where they learned about the African diaspora. Each student prepared a

Powerpoint presentation examining the topic “Earth, Water, and Fire (EWF): Using the African Diaspora to Teach and Support a Diverse, Equitable, and Inclusive Environment to Enhance Interest in the GeoSciences.” The top three posters are shown in the Supplementary Materials section of this paper.

The first place paper was presented by Jada Blocker (Figure S1). She was awarded a USD 100.00 book scholarship from the Center for Sustainable Communities for her PowerPoint on Uganda as it relates to water, soil, and fire issues.

The second place paper was presented by Jaiya Brown (Figure S2). She was awarded a USD 50.00 book scholarship from the Center for Sustainable Communities for her PowerPoint on Libya as it relates to water, soil, and fire issues.

The third place paper was presented by Dakota Baxter (Figure S3). She was awarded a USD 25.00 book scholarship from the Center for Sustainable Communities for her PowerPoint on Libya as it relates to water, soil, and fire issues.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/environsciproc2022020002/s1>, Figure S1: First Place, Jada Blocker (Uganda); Figure S2: Second Place, Jaiya Brown (Libya); Figure S3: Third Place, Dakota Baxter (Mali). Refs. [23–36] were cited in Supplementary Materials.

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