



**AIMSWIS**

African Institute for  
Mathematical Sciences  
WOMEN IN STEM INITIATIVE

**NEW INTERVENTIONS  
FOR A CHANGING WORLD**

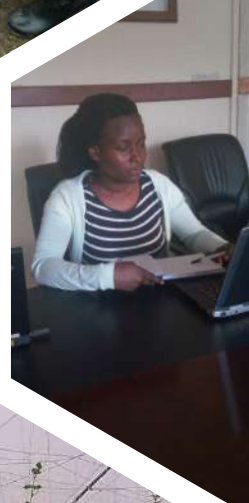
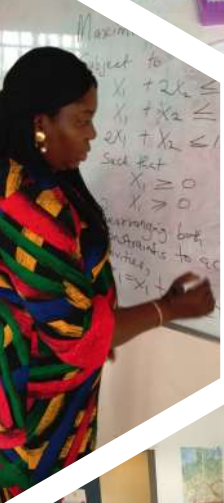
**CELEBRATING AFRICAN WOMEN SCIENTISTS  
ON THE FRONTLINES OF CLIMATE CHANGE**

**2019**  
Second Edition



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## Foreword from Interim CEO

Welcome to the second edition of *New Interventions for a Changing World: Celebrating African Women Scientists at the Frontlines of Climate Change*, a publication highlighting the accomplishments of African women working in climate science.



Lydie Hakizimana

In this edition, we have selected twenty women spanning from early career scientists to seasoned professors at the forefront of climate change research across the continent.

While Africa contributes less than four per cent of the world's greenhouse gas emissions, it remains one of the most vulnerable regions to the impacts of climate change. Rising temperatures, severe drought, and flooding are leading to famine, disease outbreak and increased poverty, threatening the livelihoods of millions of people who are heavily dependent on agriculture for survival. It is predicted that by the year 2020, countries across Africa could experience up to a 50 per cent loss of yields from rain-fed agriculture. This undoubtedly will have a detrimental impact on food security across the continent, affecting women disproportionately and putting them at increased risk for gender-based violence.

To tackle these challenges head-on, AIMS is pleased to have partnered with the International Development Research Centre (IDRC) and Global Affairs Canada (GAC). Together, we are implementing an innovated five-year program, Mathematical Science for Climate Resilience (MS4CR), to increase the critical mass of mathematical scientists contributing to sustainable development in Africa in the face of a changing climate through training, internships, and research. We are investing in women who are undertaking climate

change research to promote a gender-responsive and inclusive approach to climate change mitigation and adaptation efforts. As we know that women are adversely effected by climate change, it is critical that they are in the driver's seat to develop impactful solutions to this climate emergency.

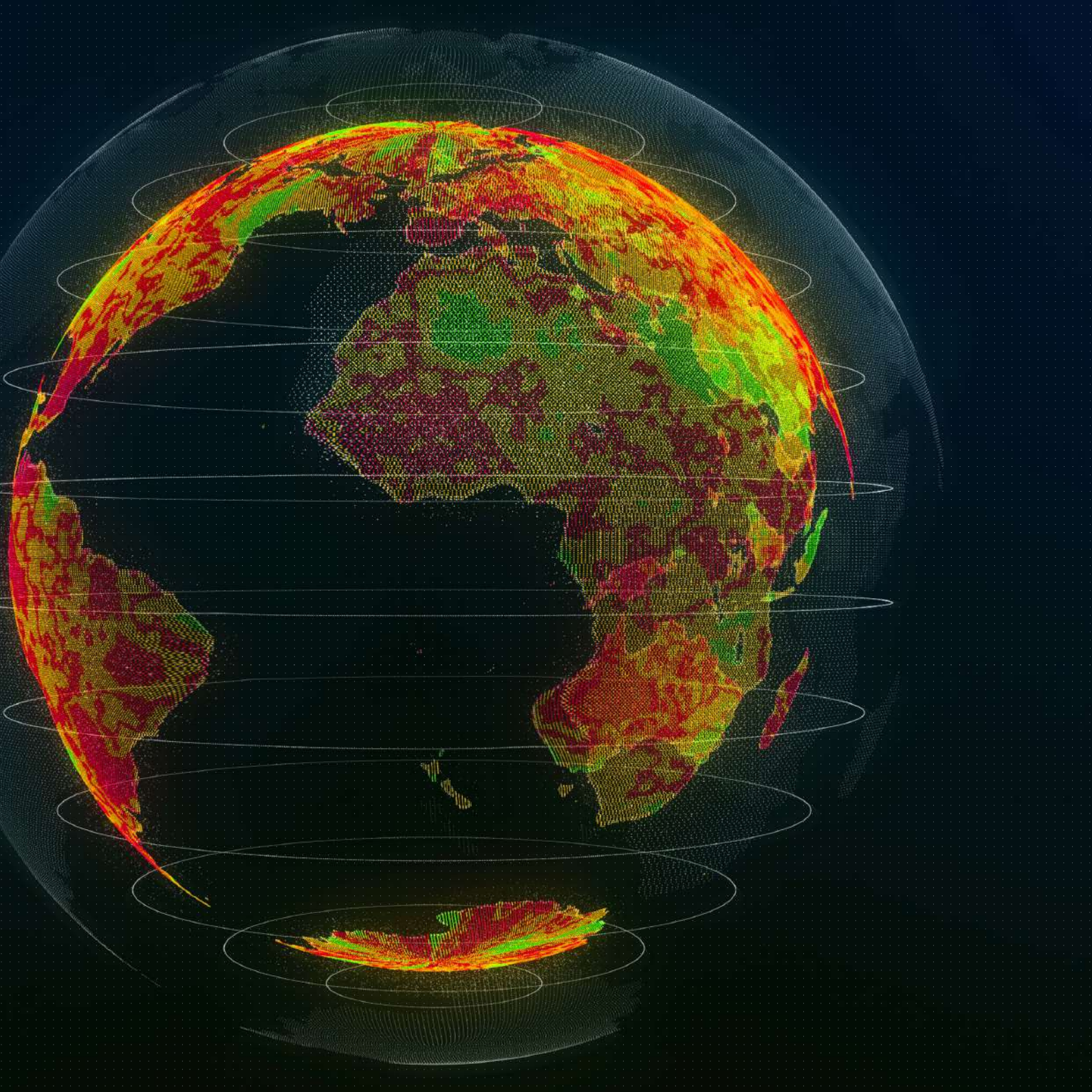
This publication directly supports African women climate scientists by showcasing their accomplishments to further increase the reach of their work and to inspire future generations to take up the mantle. This publication serves as a reminder to young people, and especially young women, that a career in STEM opens many doors. The stories shared with you here embody the spirit, determination and sacrifice it takes to make the world a better place for future generations. I hope that their work inspires you to take action on climate change and that together we can create a more sustainable green future. Perhaps one day, you may even see yourself on one of these pages.

*Lydie Hakizimana*  
Interim CEO, AIMS

# WIS in Pictures









## Adanna Henri-Ukoha

### Nigeria

Lecturer, Department of Agricultural Economics & Extension, University of Port Harcourt, AIMS Small Research Grant Recipient

## Climate Change Stance

“ [Climate change] will ultimately affect society and the generations unborn,” she says.

Global issues of the changing climate and its devastating effects on humans and livelihood call for urgent action to address it.”

# Dr. Adanna Henri-Ukoha

Dr. Adanna Henri-Ukoha is a lecturer with the Department of Agricultural Economics and Extension at the University of Port Harcourt in Nigeria. With an expansive list of climate research publications, Henri-Ukoha is also a recipient of the AIMS Small Research Grant for her project identifying adaptation options used by cassava farmers in Southern Nigeria.

Henri-Ukoha has participated in many environmental causes starting in her early years. As a young student she joined several committees advocating for sanitation and sustainability. When choosing a career, she knew she wanted to make a difference in people’s lives by helping to put food on their table. She chose to study Agricultural Economics, completing her PhD at the Federal University of Technology in Owerri Imo State, Nigeria.

When she learned that the greenhouse gases emitted by agricultural activities were a large cause of climate change, Henri-Ukoha decided she wanted to be part of the solution. Her research on food systems and security in Sub-Saharan Africa led to her PhD thesis analysing crop farmers’ adaptation to climate change and community-based strategies for sustainable farming.

Using her AIMS grant, Henri-Ukoha is continuing her research by conducting a cost-benefit analysis of climate change strategies used by cassava farmers. Her goal is to determine if the climate change strategies used by cassava farmers are economic, sustainable and efficient. By adopting viable strategies, the agricultural industry would experience an increase in productivity, leading to reduced poverty and enhanced food security.

“ [Climate change] will ultimately affect society and the generations unborn,” she says.

“Global issues of the changing climate and its devastating effects on humans and livelihood call for urgent action to address it.”





## Adejoke Akinyele

### Nigeria

Senior Lecturer, Department of Forest Production and Products, University of Ibadan

## Climate Change Stance

Climate change is one of the most serious environmental threats to the fight against hunger, malnutrition, disease and poverty in Africa,” she says.

[Indigenous tree planting] will improve the livelihoods of rural dwellers and alleviate poverty, especially for rural women, who are mainly involved in the production, processing and marketing of Africa’s forest products.”

# Dr. Adejoke Akinyele

Across the globe, deforestation is contributing to climate change. In Africa, a history of over-exploitation of forest resources coupled with extreme weather events has resulted in the major loss of functional biodiversity. This has dramatically impacted the many rural communities that rely on the forest’s ecosystem to maintain their livelihoods.

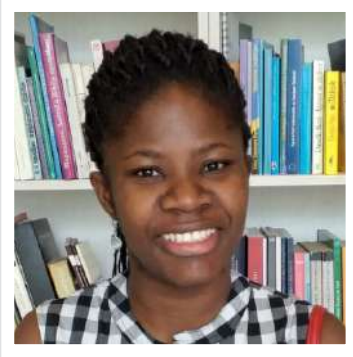
Dr. Adejoke Akinyele is a climate scientist specializing in the conservation of indigenous African tree species. A Senior Lecturer with the Department of Forest Production and Products at the University of Ibadan in Nigeria, her first foray into forestry was during her bachelor of science in Forest Resources Management, where interactions with lecturers and field trips strengthened her resolve.

Undertaking her Masters in Forestry Biology and Silviculture at the University of Ibadan, followed by her Doctor of Philosophy in Forest Biology, Akinyele realized there was very little ongoing research on the domestication of underutilized and threatened indigenous trees. The sustainable growing of indigenous trees could lead to the restoration of degraded forests and alleviation of poverty in rural communities. Akinyele’s research identifies species that would adapt best to climate change and thrive in regions with low rainfall across the continent.

Akinyele hopes strategic conservation could provide an alternate source of income and enhance agricultural productivity for millions of farming families in Nigeria. She believes forest science is critical to mitigating climate change, and that scientists in developing countries have a key role in conducting research to help impoverished communities.

“Climate change is one of the most serious environmental threats to the fight against hunger, malnutrition, disease and poverty in Africa,” she says.

[Indigenous tree planting] will improve the livelihoods of rural dwellers and alleviate poverty, especially for rural women, who are mainly involved in the production, processing and marketing of Africa’s forest products.”



## Ama Kissiwah Boateng

Ghana

PhD Candidate, National University of Public Service, Budapest Hungary

### Climate Change Stance

Boateng hopes to advise city administrators on eco-friendly urban projects, which reduce greenhouse gas emissions.

With the proper tools and knowledge, city administrators will be able to leverage meaningful adaptation and mitigation strategies in order to reduce climate risks, whether now or in the future.”

# Ama Kissiwah Boateng

It is projected that by the year 2050, 2.5 million people will migrate to urban areas across the globe, mainly in Africa and Asia. Since the cities that will house these growing populations are yet to be built, there is an opportunity to transform how governments respond to climate change.

Ama Kissiwah Boateng is a Ghanaian PhD candidate who is researching the prioritizing and planning of climate change initiatives in African cities. Prior to completing a Master’s Degree in Climate Change and Sustainable Development at the University of Ghana, she worked as a Municipal Liaison Officer for the Environmental Protection Agency in the country’s Eastern Region, overseeing environmental awareness programs in the various Municipalities and District Assemblies and investigating environmental complaints.

Ghana has one of the fastest urbanization rates in Sub-Saharan Africa, which has resulted in several environmental and socio-economic challenges, including deforestation and land degradation, air pollution, and other health-related diseases. Boateng noticed that while many Ghanaian cities have committed to addressing climate change, there is still a growing gap between formal and informal climate initiatives and how they are being implemented. In addition, women and children living in poverty in these areas are disproportionately affected by climate change. She became more interested in climate change policy planning and how adaptive programs can be developed for the urban poor.

Now a PhD candidate in Public Administration and Governance at the National University of Public Service in Budapest, Hungary, Boateng’s research is focused on ensuring effective Institutional Governance of urban climate change responses (adaptation and mitigation).

Her research will be undertaken in four Ghanaian cities: Accra, Koforidua, Sunyani and Tamale.

Boateng hopes to advise city administrators on eco-friendly urban projects, which reduce greenhouse gas emissions.

“With the proper tools and knowledge, city administrators will be able to leverage meaningful adaptation and mitigation strategies in order to reduce climate risks, whether now or in the future.”





## Arielle Stela Nkwinkwa

Cameroonian

Postdoctoral scientist at GEOMAR  
Helmholtz Centre for Ocean Research  
Kiel, AIMS Scholarship Recipient

## Climate Change Stance

“We all need to act now if we want our future generation to live on this planet,” she says.

# Dr. Arielle Stela Nkwinkwa

Dr. Arielle Nkwinkwa always dreamed about becoming a meteorologist. Hailing from Cameroon, Nkwinkwa received an AIMS scholarship to pursue her PhD at the University of Cape Town. She has witnessed the impacts of climate change across the world: from speaking with communities in Benin faced with severe erosion, to visiting melting glaciers in Norway, and most recently, seeing the destruction of South Africa’s largest harbor, Richards Bay, due to extreme rainfall. Her travels inspired her to take action.

While completing her masters in Oceanography in Cotonou, Benin, Nkwinkwa realized that the atmosphere and ocean are intrinsically linked, and that it is difficult to forecast the weather in many African countries due to a lack of information and investment in climate change research.

Nkwinkwa decided to pursue her PhD in Physical Oceanography at the University of Cape Town in South Africa, a country surrounded by both the Atlantic and Indian oceans. Her research shows that the Agulhas Current, the strongest western boundary current in the Southern Hemisphere, has an impact on South Africa’s rainfall along the Eastern coast. Evidence from her study also shows that there could be similarities to the Northern Hemisphere’s Gulf Stream.

Stressing the need for further research around the driving forces of climate change, Nkwinkwa hopes her work will help other scientists better understand the ocean’s impact on South Africa’s climate.

Now a postdoctoral scientist at GEOMAR Helmholtz Centre for Ocean Research Kiel, Nkwinkwa researches global ocean circulation and the impact meltwater from the Antarctic has on rising sea levels. She is returning to the University of Cape Town in 2020 to speak

at an environmental research symposium and hopes to meet with some of the young women she helped mentor.

“We all need to act now if we want our future generation to live on this planet.”



## Asmaa Omer Tirab T.

Sudan

PhD Candidate, Biomathematics,  
Stellenbosch University

### Climate Change Stance

“My goals are to help women and girls to access their right to take action and make their own decisions,” she says.

“I have to demand the rights for, inspire, encourage, and educate other girls and women in my community.”

# Asmaa Omer Tiraab Tbaeen

As the realities of global climate change begin to take effect, the need to understand population dynamics is more urgent than ever. From Tsetse fly extinctions in Zimbabwe’s Zambezi Valley, to record-breaking droughts in Cape Town, South Africa, questions of environmental fluctuations and their effects on population dynamics are becoming increasingly relevant across a wide range of fields.

Asmaa Omer Tiraab Tbaeen is a Sudanese scientist, mathematician and masters graduate from AIMS South Africa. Tbaeen grew up in Darfur, determined to succeed despite her country’s constraints on women’s autonomy. She not only completed her undergraduate degree in Mathematics in Sudan, but came top in her class. Inspired by what she learned, she decided to pursue further education and enrolled at AIMS to get her Master’s degree in Mathematical Sciences.

She continued on in her studies and is now completing her doctoral degree in biomathematics at Stellenbosch University in South Africa. Tbaeen is researching the relationship between population management and climate change, relying on current and forecasted climate conditions to examine local extinction risk and inform conservation efforts.

Her work will help policymakers, farmers, conservation researchers and game-park managers dealing with severe resource constraints make modern and well-informed decisions around stock-management and pest control. In addition to predicting whether a population is endangered, her research could inform how many members of a species to release when establishing a new reservation, and help set regulatory limits on the harvesting of plant and animal populations.

Outside of her formal studies, Tbaeen is passionate about promoting girls in STEM. She is working to encourage girls like her back in Darfur to pursue studies in STEM by teaching them basic ICT skills.

Tbaeen’s accomplishments are the result of her determination and desire to make a difference in the lives of others.

“My goals are to help women and girls to access their right to take action and make their own decisions,” she says.

“I have to demand the rights for, inspire, encourage, and educate other girls and women in my community.”





## Caroline Mulinya

### Kenya

Lecturer and Chair, Department of Geography, Masinde Muliro University of Science & Technology

## Climate Change Stance

Climate change has to be tackled by all of us, from our different perspectives,” she says.

This can be done using locally available techniques and locally available materials that are environmentally friendly and easily accessible.”

# Dr. Caroline Mulinya

When she graduated with her PhD in Geography from Jaramogi Oginga Odinga University of Science and Technology in Kenya, Dr. Caroline Mulinya knew she wanted to have an impact on society. Educating people about the impacts of climate change became her main priority.

Mulinya is a lecturer at Masinde Muliro University of Science & Technology in Kakamega, Kenya, and has previous experience conducting climate change adaptation trainings across East Africa on topics ranging from rainwater harvesting techniques to conflict mitigation.

Her current research project seeks to improve food security and nutrition for smallholder farmers through climate change adaptation. When choosing a population to work with, Mulinya felt it was important to provide training and support to women in her community.

Mulinya helped create ten demonstration plots used to train women to be smallholder farmers. They are shown how to grow indigenous vegetables to feed their families and communities and generate income for their farms. The farmers are briefed on the benefits of planting crops that can withstand harsh weather, such as sweet potatoes and cassava, and of water harvesting in an effort to reduce the amount of food they purchase from the market. To address food security, Mulinya has talked to the farmers about changing their diets and consuming more of the food they grow themselves.

Mulinya’s hope is that the project can one day be replicated across the country.

“Climate change has to be tackled by all of us, from our different perspectives,” she says.

“This can be done using locally available techniques and locally available materials that are environmentally friendly and easily accessible.”



## Eburn Akinsete

### Nigeria

Researcher, International Centre for Research on the Environment & The Economy and United Nations Sustainable Network

## Climate Change Stance

“I now understand that there is no single ‘solution’ to address the challenge [of climate change],” says Akinsete

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The only way to achieve a way forward is through communication and dialogue; while re-assessing the status quo which has failed us up until now.”

# Dr. Eburn Akinsete

Dr. Akinsete was eight years old when she first learned about the devastating impacts of climate change. Her teacher informed the class about the consequences of Chlorofluorocarbons (CFCs) causing a hole in the ozone layer, and Akinsete wondered why people were not taking this threat more seriously.

This ‘light bulb’ moment became the catalyst for her future career and her passion carried her through an impressive academic career. Today, Akinsete has a PhD in Urban Regeneration and Sustainable Communities and works with a variety of stakeholders and communities from across the globe to co-create sustainable solutions to climate-driven challenges. Her goal is to make climate change relatable.

Akinsete now works with the International Centre for Research on the Environment and the Economy and the United Nations Sustainable Network based in Athens, Greece on groundbreaking EU funded research projects. She has played a leading role in award-winning projects such as the EU-funded CO2 mitigation project, and ‘Makoko Sustainable Urban Regeneration Plan’ which focused on innovative and resilient slum redevelopment in Lagos, Nigeria.

She is also a consultant with GEN Sustainable Solutions, based in Nigeria. A founding partner of GEN, she builds local partnerships to develop off-grid, renewable energy solutions for marginalized communities in West Africa.

Splitting her time between two continents gives Akinsete the opportunity to see common challenges and leverage the knowledge exchange between Europe and Africa. By empowering local communities to find their own solutions, and re-imagining traditional ways of living as their own forms of technology, she hopes to see a shift in the way we approach climate change.

“I now understand that there is no single ‘solution’ to address the challenge [of climate change],” says Akinsete.

“The only way to achieve a way forward is through communication and dialogue; while re-assessing the status quo which has failed us up until now.”





## Esther Onyango

### Kenya

Postdoctoral Research Fellow,  
Planetary Health Environmental  
Futures Research Institute and  
Griffith Climate Change Response  
Program, Griffith University

## Climate Change Stance

“Women need to be leading in research proposals, teams and to have more involvement in decision-making at all levels – from the community to the global stage at the climate change negotiations to ensure that our needs are well represented,” she says.

“I recognise the urgent need to provide more evidence to the understanding of the impact on climate change and vector borne diseases in order to develop and strengthen adaptation efforts to protect human health.”

# Dr. Esther Onyango

Ten years ago, Dr. Esther Onyango was working as a microbiologist in the United States. At the time, the Kenyan researcher had a Bachelor’s and Master’s degrees in biological sciences, but she couldn’t see herself working in the field long term.

Onyango moved back to Kenya, where she was hired as a research associate for a project on weather and climate information needs of small-scale farmers and artisanal fishers in rural communities. It was a steep learning curve, but Onyango was eager and determined to make the most out of the opportunity. She immersed herself in climate change literature and decided to research its human health impacts.

Onyango was accepted to Griffith University’s School of Environment in Australia for her postdoctoral degree, where she studied the impacts of climate change on vector borne diseases. She chose to research the bio-physical and social drivers of malaria, due to its high burden of disease in sub-Saharan Africa, and was nominated for the Chancellor’s Medal for Excellence Award for her thesis titled, *Climate Change and Malaria: An Integrated Risk Assessment of Rural Communities in East Africa*.

Onyango currently works at Griffith University as a postdoctoral research fellow, focusing on the human health implications of climate change on vector borne diseases. Her innovative research has led to speaking engagements at local and international conferences, and she plans to mentor young African women in science who are interested in the intersection between disease ecology and climate change.

“Women need to be leading in research proposals, teams and to have more involvement in decision-making at all levels – from the community to the global stage at the climate change negotiations to ensure that our needs are well represented,” she says.

“I recognise the urgent need to provide more evidence to the understanding of the impact on climate change and vector borne diseases in order to develop and strengthen adaptation efforts to protect human health.”



## Fauste Ndikumana

### Rwanda

Researcher, National Industry of Research and Development Agency, AIMS Cameroon Alumni & AIMS-NEI Mathematical Sciences for Climate Change Resilience Intern

## Climate Change Stance

I am very passionate about climate science because I want to use my skills and knowledge for the development of our community as well as Africa,” she says. “I want to give back to my community by looking for the solutions of these challenges.”

# Fauste Ndikumana

Climate change is affecting farming communities across Africa, but in Rwanda, a country where agriculture makes up a large portion of the economy, it has been historically difficult to measure the impact. For farmers to practice productive farming activities, they require reliable information on variability and change in climate.

Rwanda’s weather tracking system was almost completely destroyed during the genocide, leaving a 15-year gap in data on temperature and rainfall patterns. A lack of information meant the country could not predict extreme weather events, like floods or drought.

Fauste Ndikumana is a Rwandan climate change researcher and African Institute for Mathematical Sciences (AIMS) Cameroon alumna. She interned at the Rwanda Meteorology Agency in Kigali as an undergraduate student in mathematics at the University of Rwanda. When she moved to the forecasting department, she realized just how much she could do with a degree in mathematics and statistics.

For her Master’s thesis in mathematical science at AIMS, Ndikumana compared data from the climate service project Enhancing National Climate Services (ENACTS) and station data from Nyamasheke district, in western Rwanda. Organized by the International Research Institute for Climate and Society, ENACTS creates integrated datasets by combining information from weather stations and satellite estimates. Her research determined that ENACTS data has the same seasonality as the station data. Overall ENACTS improves the ability of smallholder farmers to cope with climate change.

Ndikumana received the National Council for Science and Technology Women in STEM Rising Star Award for her thesis work. The project led

to an AIMS internship as a climate science researcher with the International Center for Tropical Agriculture in Kigali, where she generated rainfall data to improve decision-making for smallholder farmers.

She now works at Rwanda’s National Industry of Research and Development Agency as a Product and Technology Development Specialist (STEM), researching how technology and innovation, such as artificial intelligence, can improve agricultural output.

“I am very passionate about climate science because I want to use my skills and knowledge for the development of our community as well as Africa,” she says. “I want to give back to my community by looking for the solutions of these challenges.”





## Ibidun Adelekan

Nigeria

Professor of Geography, University of Ibadan

## Climate Change Stance

“Local actors cannot be excluded in the quest for knowledge or solutions needed to address most of the environmental challenges that humans encounter.”

# Prof. Ibidun Adelekan

Professor Ibidun Adelekan has been a climate change researcher since the early 1990's. While doing her undergraduate degree in physical geography, she was introduced to the study of climatology, a subject that quickly sparked a lifelong passion.

Since obtaining her PhD in Climatology from the University of Ibadan in Nigeria, Adelekan has both taught and worked in community engagement to advance climate change science around the world. Currently a professor of geography at the University of Ibadan, she has had an illustrious career, with more than forty publications on topics ranging from flood risk for artisanal fishing communities in southwest Nigeria to the impact climate has on migration and human health in Africa. She has also worked as an investigator on several climate change projects in Nigeria. Adelekan received an award of recognition for her work as a research and gender programme officer for Building Nigeria's Response to Climate Change, a project funded by the Canadian International Development Agency.

Adelekan has taught climatology courses to hundreds of people, passing the torch along to some of her former students who now teach climate science at high schools and universities across the country. Over the years she has noticed a shift in climate research, from focusing on statistical analysis of climate data to looking at its human impact, such as a community's vulnerability to flooding.

Adelekan is happy to see an increase in research coming from the Global South, which has led to enhanced policies and practices in combatting climate change. The biggest lesson she has learned is that it is not just up to scientists to solve climate change: everyone must do their part.

“Local actors cannot be excluded in the quest for knowledge or solutions needed to address most of the environmental challenges that humans encounter.”



## Madalitso Magombo C.

### Malawi

Fish Biology Lecturer, Lilongwe University of Agriculture and Natural Resources; PhD Candidate, Fisheries Biology and Management, Michigan State University

## Climate Change Stance

**“If you come to Africa you’ll notice most girls are not into science, they think that it’s something hard,” she says.**

**As they are growing we have to instill in them the spirit that this is something they can do. Mathematics and science are not just for men.”**

# Madalitso Magombo Chatsika

Lake Malawi borders Malawi, Tanzania and Mozambique and is home to more distinct species of fish than any other lake in the world. Many African communities depend on it for their livelihoods. Madalitso Magombo Chatsika remembers a time when the lake was abundant with fish. While growing up in Malawi’s lake district, she noticed the fish gradually getting smaller and smaller. Fishermen were no longer able to consistently feed their families.

Chatsika wanted to know the cause. During her Bachelor of Science in Aquaculture and Fisheries Science at the University of Malawi, she learned about fish population dynamics, stock management and sustainable fishing. Despite these conservation efforts, she discovered there was still a decline in freshwater fish. For her Master’s thesis at the University of Bergen in Norway, Chatsika examined the connection between climate change and fish production.

Chatsika has been a fish biology lecturer in the Faculty of Environmental Sciences at Lilongwe University in Malawi for over ten years. She is also researching the effects of climate change on Lake Malawi fisheries for her postdoctoral degree at Michigan State University. While temperatures are on the rise, they are still within a comfortable range for the tropical fish. A lack of rainfall, however, is having a large impact. When water levels are low, so is fish reproduction. During a drought, fisheries greatly struggle to recruit fish. Climate change is also affecting the diversity of fish species, as Chatsika has explored in Malawi’s Lake Chilwa.

Her ground-breaking research will help smallholder fish farmers, who are facing increased supply demands due to the ever-increasing human population, prepare for and adapt to climate change.

Chatsika is grateful for the support of her

parents, both teachers, who encouraged her to follow her dreams and work hard.

“If you come to Africa you’ll notice most girls are not into science, they think that it’s something hard,” she says.

“As they are growing we have to instill in them the spirit that this is something they can do. Mathematics and science is not just for men.”





## Modupe Timothy

Nigeria

PhD Student, Entomology,  
University of Ibadan

### Climate Change Stance

“It’s a good thing to put in what we can to preserve our environment,” she says.

For everybody pursuing a career in climate science or any other field, always bear in mind that we are stronger together.”

# Modupe Timothy

Modupe Timothy grew up in a farming community in Nigeria that sustained itself on its agricultural production. When it came time to harvest, people knew when the rain would start and stop. As long as the ground was tilled and fertilized, food would grow. Farmers did not need to spray their plants with chemicals or wonder if diseases would kill their crops.

These days when the farmers plant their seeds, unexpected rain sweeps them away. Prolonged dry spells are equally devastating. Due to an influx of pests, farmers now rely on synthetic chemicals to grow their crops. The community’s food supply is under threat, and at the centre of it all is climate change.

Timothy wanted to do something to help her community and country. She studied agriculture at Ahmadu Bello University in Zaria, Nigeria, then pursued a Master’s degree in crop protection at the University of Ibadan in Nigeria.

As a PhD student in Entomology at the University of Ibadan, Timothy is working on a food security project using seven different species of cowpea. Cowpea is a major crop and source of affordable protein in Nigeria, but is difficult to grow without the use of pesticides. Timothy is experimenting with a natural solution: extracting the odor from cowpea to lure pests into a trap. Based on her findings, she hopes to develop a new technology for pest control using compounds of cowpea, and decrease reliance on synthetic pesticides.

Timothy will be finishing her doctorate degree next November. She plans on advancing her career in agricultural research.

“It’s a good thing to put in what we can to preserve our environment,” she says.

“For everybody pursuing a career in climate science or any other field, always bear in mind that we are stronger together.”



## Mojisola O. Adeniyi

Nigeria

Senior Lecturer, Department of  
Physics, University of Ibadan

### Climate Change Stance

Climate impacts all economic sectors such as water, energy, health, and agriculture, and can mar the economy of the affected countries," she says.

"I have to play my own part in reducing the negative impacts of climate change, to allow for sustainable development of West Africa and Africa at large."

# Mojisola Oluwayemisi Adeniyi

As a female atmospheric physicist and lecturer at the University of Ibadan in Nigeria, Dr. Mojisola Adeniyi is working to reduce gender inequality, improve education and build capacity for research. She is a member of the Nigerian Institute of Physics, The Organization for Women in Science for the Developing World, and is the 2015 winner of the physical sciences and mathematics Elsevier Foundation Awards for Early Career Women Scientists in the Developing World.

Adeniyi has taught in the University of Ibadan's Department of Physics for twenty years. In 2004, she obtained her doctorate in physics, specializing in atmospheric electricity. Her thesis was titled, Radioactive Air Pollution in Ibadan City. Over the span of her distinguished career, Adeniyi's research on climate change in West Africa has appeared in numerous international publications. She has presented her work and spoken at conferences in Africa, Asia, the United States and Europe, including a career development workshop for women in physics, held in Trieste, Italy.

She is currently working on three climate change projects: modeling the climate of West Africa, which studies the relationship between climate indices and the country's existing climate (drought, temperature, precipitation); statistical prediction and downscaling of precipitation over West Africa, and; earth-atmosphere interaction in the tropics, a project evaluating surface energy budget models in Southwestern Nigeria for improving the yield of vegetation and crops such as pineapple and cassava. She is also researching deforestation and the benefits of paper recycling.

Adeniyi's findings will be made available to policy makers and other researchers in West Africa.

"Climate impacts all economic sectors such as water, energy, health, and agriculture, and can mar the economy of the affected countries," she says.

"I have to play my own part in reducing the negative impacts of climate change, to allow for sustainable development of West Africa and Africa at large."



## Myriam Mujawamariya

### Rwanda

Instructor, Department of Biology, Botany and Conservation, College of Science and Technology, University of Rwanda; PhD Candidate, Biology, University of Rwanda

## Climate Change Stance

“Plants provide oxygen, food and medicine,” she says.

—  
And I think if we make an effort to study them in this changing or warming world, we can come up with strategies to conserve them, to preserve them, and to take care of them so that they continue providing their services to animals and humans.”

# Myriam Mujawamariya

Rwanda has experienced heavy deforestation and an infiltration of exotic tree species in its tropical rainforests, resulting in soil erosion, drought and a loss of biodiversity. Conservation efforts include introducing native tree species into plantations, but this is currently hampered by limited knowledge of the climate sensitivity of these species. Myriam Mujawamariya is a Rwandan researcher who is investigating the physiological responses of tropical tree species to global warming.

Mujawamariya graduated with a degree in education, specializing in biology. She found work as an assistant for the National University of Rwanda-Butare's biology department, her alma mater. Inspired by her colleagues' research in botanic conservation and climate change, she applied for a Master's degree in Plant Sciences at Wageningen University in the Netherlands.

Mujawamariya felt her Master's, which focused on natural resources management, lacked in-depth discussion on climate change. She decided to focus on this aspect during her postdoctoral degree in biology at the University of Rwanda, as part of an ongoing project called Tropical Montane Forests in a Warming World. For her PhD, she is researching the climate change sensitivity of a broad range of tropical tree species in Rwanda, and hopes to determine whether photosynthesis and dark respiration can acclimate to elevated temperature. The results will help inform which species of tree are suitable for plantation in different areas of the country. They will also have a positive impact on protecting biodiversity in the montane forests, including 13 species of primates dependent on specific tree species for sustenance.

Mujawamariya is teaching a new crop of plant scientists. She is an instructor in the Department of Biology, Botany and Conservation, at the University of Rwanda's College of Science and Technology.

“Plants provide oxygen, food and medicine,” she says.

“And I think if we make an effort to study them in this changing or warming world, we can come up with strategies to conserve them, to preserve them, and to take care of them so that they continue providing their services to animals and humans.”





## Oluyemisi Adebisi-Adelani Nigeria

Assistant Director Research, Farming  
Systems and Extension, National  
Horticultural Research Institute

### Climate Change Stance

“I feel there should be a synergy between meteorologists, farmers and agricultural extension, so that farmers at the receiving end will be better off.”

# Dr. Oluyemisi Adebisi-Adelani

Dr. Oluyemisi Adebisi-Adelani is a research scientist for the National Horticultural Research Institute in Ibadan, Nigeria whose work in climate change is primarily focused on rural populations and farmers. She completed all three of her degrees, most recently her doctorate, in Agricultural Extension and Extension and Rural Development at the University of Ibadan.

Nigerian farmers were once able to predict rainfall patterns, but unpredictable weather caused by climate change has resulted in yield losses and crop failure. Between 2000 and 2009, there was a significant decline in the production of citrus and tomato plants due to climate change, affecting food security and farmers' livelihoods. Increasingly, Nigerian farmers are approaching Adebisi-Adelani, wanting to know when they should be planting their crops.

To tackle these challenges, Adebisi-Adelani's PhD project addressed sweet orange and tomato farmers' perceptions of climate change. Her research included identifying adaptation strategies, like digging wells and constructing ridges across slopes, and developing communication tools in local languages to disseminate her findings to the farmers. She has also researched adaptation strategies by arable farmers in Akinyele local government, and climate change and home gardening in Nigeria.

At the National Horticultural Research Institute, Adebisi-Adelani is addressing gender gaps related to sweet orange and tomato value chains. She wants to keep learning about sustainable agricultural practices and continue providing support to farmers, as well as to youth and women in horticultural crop production.

“I feel there should be a synergy between meteorologists, farmers and agricultural extension, so that farmers at the receiving end will be better off.”



## Queensley Chukwudum

### Nigeria

PhD Candidate, Financial Mathematics, Pan African University Institute for Basic Sciences, Innovation and Technology

## Climate Change Stance

When a woman decides to do climate research, there is a higher probability that she'll be more motivated to look at how the women are affected by this change," she says.

They begin to dig up issues that are specifically targeting women and bringing them to the forefront, so that the government can start taking measures to correct it."

# Queensley Chukwudum

In 2011, a drought hit East Africa, causing a severe food crisis across Somalia, Djibouti, Ethiopia and Kenya and claiming up to 100,000 lives. When Dr. Queensley Chukwudum moved from Nigeria to Kenya for her postdoctoral degree, she experienced the impacts firsthand.

The country was facing a water shortage and Chukwudum wanted to know what had caused the drought to spread so quickly. For her PhD in financial mathematics at the Pan African University Institute for Basic Sciences, Innovation and Technology (PAUISTI) in Nairobi, she decided to research the impact climate change was having on extreme weather in East African countries.

Chukwudum looked at the correlation between low rainfall and high temperatures to estimate risk of drought among neighboring countries. A strong correlation, or temperature dependency, means once a drought starts in one country, it is likely to quickly spread to its neighbour. She concluded that the pair with the strongest dependency is Kenya and Sudan, while the weakest is Kenya and Somalia. This information could be used to forecast a drought, and drastically reduce the amount government and insurance companies spend on these types of disasters.

Chukwudum received first place in the African Union's My Thesis in 180 Seconds PanAfrican competition. She will be returning to Nigeria to lecture in the Department of Insurance at the University of Uyo, and plans on doing more in-depth climate change research, including on weather-related insurance and displacement due to disasters and conflicts.

As a songwriter, Chukwudum also uses music and poetry to educate the public about climate change. Research shows that women are disproportionately affected by climate change, and she wants more young women

to consider a career in climate science, including her four daughters. Her dream is that they will all have a solid knowledge of mathematics.

"When a woman decides to do climate research, there is a higher probability that she'll be more motivated to look at how the women are affected by this change," she says.

"They begin to dig up issues that are specifically targeting women and bringing them to the forefront, so that the government can start taking measures to correct it."



## Rahma A. Mohamoud

### Somalia

Climate Change and Environmental Sustainability Master's Graduate  
Amoud University, Somaliland

## Climate Change Stance

The current drought will increase the vulnerability of some farmers. I want to improve the ability of my community to overcome the challenges of climate risk and achieve a sustainable environment.

# Rahma Abdullahi Mohamoud

Somalia is facing a climate-change related humanitarian crisis in the wake of the country's most recent drought. This year, Somalians experienced their worst harvest since 2011, causing a food shortage that is expected to heavily impact more than two million people.

Rahma Abdullahi Mohamoud recently graduated with her Master's degree in Climate Change and Environmental Sustainability from Amoud University in Borama, Somaliland.

Prior to this, Mohamud worked as a secondary school teacher and for Somalia's National Electoral Commission. After learning how climate change is affecting her country, she wanted to make a change in her career.

Somalia is still feeling the effects of another lengthy drought that ended in 2017, but many people remain unaware of the role climate change is having on their livelihoods.

During her Master's program, Mohamoud worked as a food security project assistant in north-west Somalia's Baki district. Her role included giving subsidies to smallholder farmers, providing extension agricultural services, like fertilizers and credit to increase food production in the community, and providing training to enhance food security in the communities.

Mohamoud completed her Master's degree in June 2019, and plans on continuing to help Somalian communities cope with climate change. She wants those most vulnerable to live a life free of hunger and poverty.





## Rosemary Musesengwa Zimbabwe

Assistant Director Research, Farming  
Systems and Extension, National  
Horticultural Research Institute

### Climate Change Stance

“I believe using a framework of community engagement, that informs, involves, collaborates, and empowers communities, will help build bridges for scientists and communities to carry out much more focused, community driven adaptation solutions to climate change.”

# Dr. Rosemary Musesengwa

Dr. Rosemary Musesengwa is passionate about empowering underserved communities to combat climate change using citizen science. Originally from Zimbabwe, she has a doctorate in public health from the University of KwaZulu-Natal in South Africa and is an African Science Leadership Programme Fellow at the University of Pretoria's Future Africa campus.

Rosemary believes local climate change issues can be solved by training communities in climate research. In her previous role as a Community, Public & Stakeholder Engagement PhD Fellow for the World Health Organization's Special Programme for Research and Training in Tropical Diseases, she helped carry out a citizen science project in Zimbabwe, Botswana and South Africa, entitled Malaria and Bilharzia in Southern Africa (MABISA).

In the MABISA project, community members from all three countries received training in areas relating to climate change and science engagement. Using indigenous knowledge systems, they collaborated with health workers, agricultural workers, NGOs and businesses to develop sustainable, community-based solutions to disease control and agricultural production.

Musesengwa recently moved to the U.K. to work as a senior researcher with Oxford University's psychiatry department. As part of a project that looks at the intersection between climate change and mental health, she is developing an ethics framework for engaging adolescents from low and middle-income countries in digital health innovations.

Musesengwa is hopeful her work will have a lasting impact. She is happy to have chosen a career that is making a tangible difference in people's lives, but acknowledges that effective change can only happen when everyone, particularly those most vulnerable to climate change, are involved.

“I believe using a framework of community engagement, that informs, involves, collaborates, and empowers communities, will help build bridges for scientists and communities to carry out much more focused, community driven adaptation solutions to climate change.”



## Theonille Mukamana

### Rwanda

AIMS Tanzania Alumni, former MS4CR intern with the International Centre for Tropical Agriculture (CIAT). Currently Researcher with the Rwanda Revenue Authority (RRA).

## Climate Change Stance

It is easy to talk to farmer groups and say climate information is useful because they can see that themselves, how it is beneficial,” she says.

The economic value of farmers’ decisions will help to produce a reliable high resolution for a better understanding of climate services for Rwanda.”

# Theonille Mukamana

When Theonille Mukamana started her Bachelor of Science in applied mathematics at the University of Rwanda, she knew what her research topic would be. A district in her country’s eastern region was experiencing a rain shortage, and farmers and their families were starting to go hungry. The problem with analyzing environmental data was that there were missing values. Small weather stations were abandoned during the Rwandan genocide, and very little information was being recorded until 2010.

Rwanda started to rebuild its datasets using satellite images, but by the time Mukamana started her Bachelor’s degree, there were still some gaps.

When she graduated, Mukamana could not stop thinking about the missing data. She applied to the African Institute of Mathematical Sciences (AIMS) in Tanzania and wrote her thesis on the difficulties of data analysis when there are missing values. She has presented her work at several conferences, and has since become an ambassador for the Committee for Women in Mathematics in Rwanda.

Mukamana is now a researcher at the International Centre for Tropical Agriculture in Kigali, Rwanda where she had worked as an AIMS intern. Her project models and quantifies the economic value of climate services for bean farmers, but she has recognized that they do not always trust the information because they still believe in their traditional ways. During the study, farmers who adopted climate services harvested more beans. Mukamana shares these results with other farmers to build their capacity for using climate change adaptation strategies.

“It is easy to talk to farmer groups and say climate information is useful because they can see that themselves, how it is beneficial,” she says.

“The economic value of farmers’ decisions will help to produce a reliable high resolution for a better understanding of climate services for Rwanda.”



## Tonjock Rosemary Kinge

### Cameroon

Senior Lecturer, Botany and  
Mycology, University of Bamenda

## Climate Change Stance

“There are many career opportunities. Follow your passion and your dreams.”

# Tonjock Rosemary Kinge

Tonjock Rosemary Kinge first heard about plant pathology while at the Cameroon Biosciences Society’s annual conference. At the time, she was finishing her Master’s degree in botany at Cameroon’s University of Buea. It was during a conference presentation that she first learned about the link between climate change and plant disease.

This sparked Kinge to research plant pathology and mycology for her postdoctoral in botany at the University of Buea. She investigated the spread of disease and basal stem rot among Cameroon’s oil palms, and presented her results at the Divecha Centre for Climate Change in Bengaluru, India. Her work was published in the American Journal of Agriculture and Forestry.

Today, Kinge is an African Science Leadership Programme (ASLP) Fellow at the University of Pretoria’s Future Africa campus in South Africa, a Fulbright Visiting Scholar the University of Florida and a Senior Lecturer in botany and mycology at the University of Bamenda in Cameroon. For her research on food security, she is studying the effect climate has on fungal disease incidence in crops such as maize, beans, vegetables and fruits, as well as on mushroom biodiversity and conservation in Cameroon and South Africa.

“The most surprising thing I’ve learned in my research, getting into the molecular aspect of the work, [is that] in plant pathology once you identify the pathogens, we always think that is enough,” says Kinge. “But using sophisticated equipment in South Africa, in the US, in China, we can identify these pathogens and their epidemiology: how they cause disease and how they evolve.”

Kinge is one of few women conducting climate change research in Cameroon. As part of her ASLP fellowship, she and colleagues started a mentoring program for women interested in researching plant pathology, and plan to develop an app to link women researchers with mentors.

Her hope is that in the next ten to 15 years more women will be empowered to pursue careers in Science, Technology, Engineering and Mathematics (STEM).

“There are many career opportunities. Follow your passion and your dreams.”



# Contact us

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“We all share one planet and are one  
humanity; there is no escaping this reality.”

~ Wangari Maathai





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