

# THE TIMES OF AFRICA

Bringing **AFRICA** to the World

THE TIMES OF AFRICA » BRINGING AFRICA TO THE WORLD



## *Environment & Climate Action*



**44** *Advancing Oncology*  
Hope, Innovation & Global Collaboration

**16** *Zimbabwe Rising*  
Building Pathways to Progress

**12** *Climate Change*  
Bold Steps Towards Greener Future

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# EDITOR'S MESSAGE

Editor,  
**Khushboo Chauhan**  
The Times of Africa



***"The greatest threat to our planet is the belief that someone else will save it."***

— Robert Swan

In this edition of The Times of Africa, we turn our focus to one of the most urgent challenges of our time: the climate crisis. As the world collectively grapples with its consequences, Africa stands at the crossroads of immense challenges and unparalleled opportunities. Home to some of the planet's most diverse ecosystems and vibrant communities, the continent has a pivotal role to play in shaping a sustainable future.

This issue delves into stories of resilience, innovation, and collaboration as Africa takes bold steps to address climate change. From groundbreaking renewable energy initiatives and reforestation efforts to sustainable waste management practices and the empowerment of local communities, Africa's contributions are redefining what it means to lead in sustainability.

The magazine also celebrates the voices of changemakers—individuals, organizations, and policymakers—who are paving the way for a greener tomorrow. It sheds light on critical areas such as carbon markets, sustainable agriculture, and circular economy practices, offering fresh perspectives on how Africa is leveraging its resources to drive impactful solutions for a global cause.

As always, The Times of Africa remains a platform to connect ideas, cultures, and opportunities. Thank you for being a part of our journey and for supporting the voices and initiatives that are making a difference.

To our valued partners, collaborators, and readers—thank you for being an integral part of this journey. Your support has been instrumental in bringing this vision to life. Together, we are more than witnesses to change; we are contributors to a movement that seeks to redefine Africa's role in a sustainable future.

Here's to a year of bold ideas, transformative actions, and a shared commitment to a better world. With this edition, The Times of Africa becomes your companion in understanding, celebrating, and driving solutions for a sustainable tomorrow.

Warm regards,  
Khushboo Chauhan  
Editor, The Times of Africa

## PORTRAIT OF *The Times of Africa*

THE TIMES OF AFRICA is an international publication, which aspires to bring the stories of the economic, social and political fabric of the 54 nations of Africa to the World. For over a decade, we have been defying stereotypes and redrawing the lines to provide extensively researched reliable content for our robust readership network.

Headquartered in New Delhi, the capital of India, we have our overseas offices in Burkina Faso, Niger, Cameroon, Ghana, Kenya and Senegal. Our distribution network covers metro cities, diplomatic missions, national organizations, foreign agencies, corporate and export houses, business class hotels and airlines, both within the country and offshores.

The circulation of our magazine is wide-ranging and our readership profile includes Presidents and Senior Government Ministers and Officials, Chief Executive Officers, Chairpersons, Managing Directors, Policy-makers, Technical and General Managers, Students, Think Tanks, Academia, Foreign Correspondents and local media, Captains of Indian Industry and other prominent dignitaries, among others.

As we evolve, our mission remains unchanged: to serve as a bridge between Africa and the world, showcasing the continent's vibrant spirit, limitless opportunities, and unwavering resilience in the face of global challenges like the climate crisis.

## THE TIMES OF AFRICA

The cover of The Times of Africa magazine. At the top, it says "Bringing AFRICA to the World". The main image is a close-up of a water droplet resting on a surface, with a city skyline reflected in its center. Below the image, the title "Environment &amp; Climate Action" is written in large, white, serif capital letters. To the right of the title, there are three small green boxes containing text and a barcode. The first box says "44 Advancing Oncology Hope, Innovation &amp; Global Collaboration". The second box says "16 Zimbabwe Rising Building Pathways to Progress". The third box says "12 Climate Change Bold Steps Towards Greener Future".

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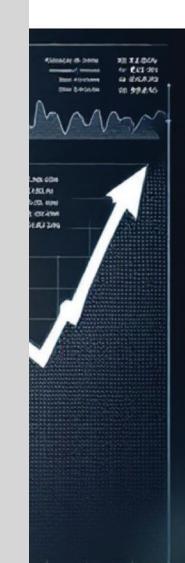
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## GHANA'S CARBON MARKET: PIONEERING SUSTAINABILITY AND CLIMATE RESILIENCE IN AFRICA



Ghana's carbon market is rapidly emerging as a cornerstone of sustainable development and climate action in Africa. With its rich ecosystems, strong policy commitments, and innovative approaches, Ghana has positioned

A Commitment to Climate Leadership  
Ghana's climate strategy is anchored in its Nationally Determined Contributions (NDCs), which prioritizes emission reductions across key sectors like forestry, energy, agriculture, and water. These commitments underpin NDCs as a blueprint for achieving climate goals, reflecting Ghana's dedication to mitigating greenhouse gas emissions and building a sustainable future. The government's alignment with the Paris Agreement and active participation in global climate forums showcase its leadership and determination to contribute meaningfully to international climate efforts.

SPOTLIGHT COUNTRY

### Tackling Plastic Waste: A Missed Opportunity with Massive Potential

With over 1.1 million tons of plastic waste generated annually, Ghana faces a significant environmental challenge.

Shockingly, only about 5% of this waste

is collected for recycling, with over

95% managed by the informal sector.

This highlights a major gap in the

formalized waste management system

and a tremendous opportunity to harness

the untapped potential of the plastic

recycling sector.

Success Stories: REDD+ and

Structured recycling systems,



ent for Eurovent Middle East; most on for EUROVENT. Dr. Al-Attar is ologies for International Filtration or global government to play a sign y monitoring and enhancement as ny articles addressing filter media, s turbine applications, emphasizing pollutants.

(Sc, Ph.D.) from the University of ough University (UK), respectively, arvard Business School, specializing reading for an MSc in sustainable able cities at the University of Oxford. Oxford addresses the importance urban development. His research is stems to enhance IAQ through pping infrastructure, and sharing data s to know the air quality they are

in News (IFN) USA, EUROVENT magazin, and Caloryfrio, Spain. He tation + Separation, UK, and ES En for air quality, physical and chemi performance. His work has also been Al-Attar is also an editorial member al of Cleaner Production.

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# AFRICA'S CLIMATE CRISIS:

## HOW EXTREME WEATHER IS RESHAPING LIVES AND LIVELIHOODS

Ghana celebrates a historic moment as John Dramani Mahama emerges victorious in the 2024 general elections, marking a triumphant return to the presidency after an eight-year hiatus. His win is not just a personal achievement but a resounding declaration of the Ghanaian people's trust in his vision and leadership. With approximately 56% of the vote secured on December 7, 2024, Mahama's re-election underscores the enduring strength of his political legacy and his ability to resonate with the aspirations of the populace.

This victory is more than a political comeback; it is a testament to Mahama's resilience, steadfast determination, and unwavering commitment to Ghana's progress. After a narrow defeat in 2016, Mahama remained a force to be reckoned with in Ghanaian politics. Over the years, he transformed challenges into opportunities, using his time away from office to connect with citizens, understand their evolving needs, and refine his approach to governance.

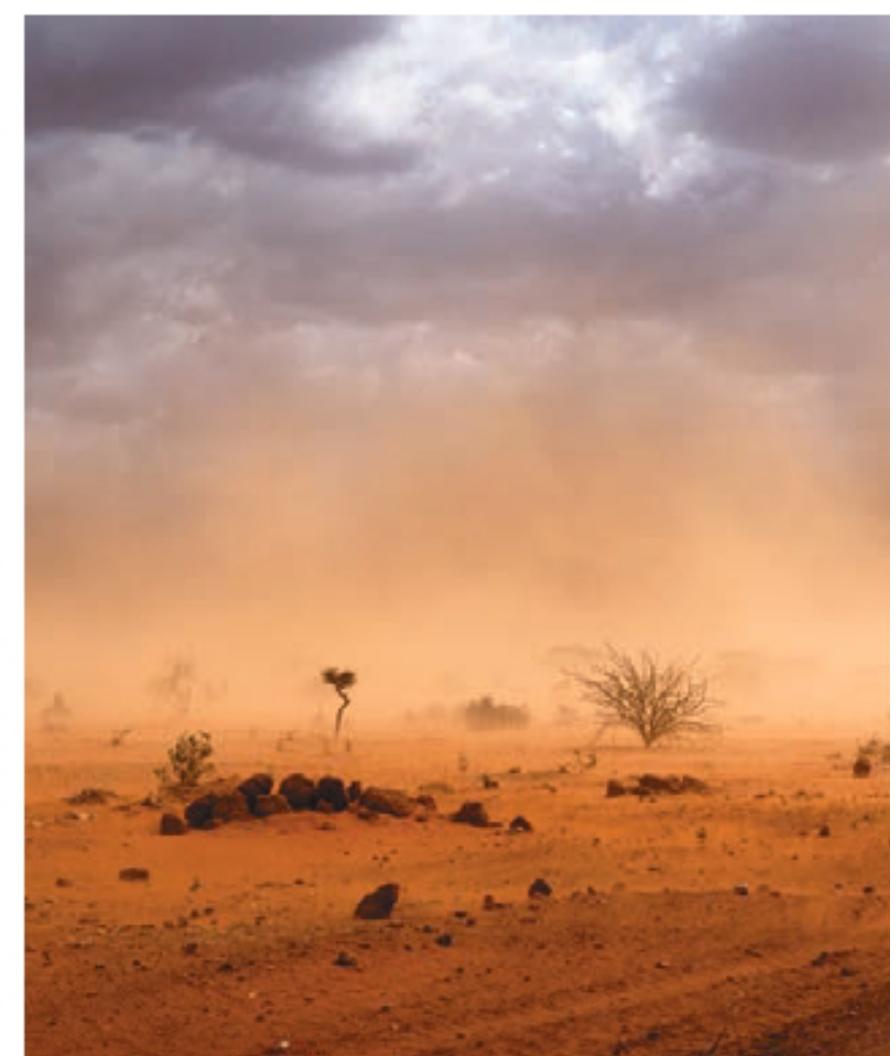
### A Leader Who Listens, Learns, and Leads

Mahama's return signals a leader deeply attuned to the pulse of the nation. He has consistently demonstrated an ability to adapt and innovate, addressing Ghana's pressing issues with clarity and purpose. His campaign, rooted in themes of economic revitalization, social equity, and transparency, struck a chord with Ghanaians across all demographics.

This victory represents a renewed mandate for Mahama to steer the nation toward a brighter future. His ability to unite diverse communities and foster a collective vision of progress has redefined leadership in Ghana. As he prepares to assume office on January 7, 2025, the nation looks forward to a new era under his stewardship, marked by both continuity and transformation.

### Celebrating a Visionary Leader

Mahama's win is a reminder of the power of perseverance and the enduring strength of democratic values. It celebrates a leader who has continually





placed the needs of his people at the forefront, advocating for policies that uplift communities and create opportunities for all. His resilience in the face of adversity serves as an inspiration, not only to Ghanaians but to leaders across Africa and the world.

#### A Return to Transformational Leadership

During his previous tenure from 2012 to 2016, Mahama left an indelible mark on Ghana's development. His administration focused on infrastructure development, energy reforms, and social programs that improved the lives of countless citizens. Now, with the benefit of hindsight and renewed public support, he is poised to build on this legacy.

This victory provides him with an opportunity to address critical challenges such as economic instability, unemployment, and environmental sustainability. It also reaffirms his role as

a unifying figure capable of bridging divides and fostering national cohesion.

#### A Force for the Future

John Mahama's return to power is not merely a comeback; it is a resurgence of hope and possibility. His leadership symbolizes a forward-looking Ghana, ready to tackle contemporary challenges while remaining rooted in its rich heritage. His resilience has proven that true leaders are not defined by their setbacks but by their ability to rise above them and continue to serve with unwavering dedication.

As Ghana embarks on this new chapter under Mahama's leadership, The Times of Africa celebrates his historic win and wishes him a transformative tenure. His journey exemplifies the essence of leadership – to listen, to serve, and to inspire. The world watches with admiration as Mahama once again steps into his role as a catalyst for Ghana's growth, progress, and unity.

# 100 DAYS OF DONALD TRUMP 2.0

**D**onald Trump's return to the White House has been marked by bold leadership, decisive action, and a commitment to restoring America's global standing. In just 100 days, the president has set the nation on a new trajectory, focusing on economic growth, border security, technological advancement, and national unity. His administration has acted swiftly to implement key reforms that reflect his vision of prosperity, security, and American excellence.

With a clear mandate from the American people, Trump's second term is shaping up to be even more impactful than the first. His administration has prioritized economic expansion, energy independence, immigration reform, and global leadership, ensuring that the United States remains a beacon of strength and innovation in an evolving world.

## Swift Executive Action for a Stronger America

Trump wasted no time in delivering on his promises, signing over 40 executive orders that address key national priorities. His "America First Economic Plan" has focused on boosting job creation, cutting red tape for businesses, and encouraging investment in American industries.

A major highlight of his early policies is the "American Energy Independence Act," which prioritizes domestic oil, natural gas, and clean coal production. This move has lowered fuel prices, revitalized American energy jobs, and reduced reliance on foreign energy sources, ensuring long-term economic stability.

## Partnering with Elon Musk for Innovation & Technological Growth

One of the defining aspects of Trump's return





to office has been his strategic alliance with Elon Musk. Recognizing the importance of technological advancement, Trump appointed Musk as the Head of the American Innovation and Technology Council, a move aimed at accelerating U.S. leadership in artificial intelligence, space exploration, and clean energy solutions.

Under Musk's leadership, the administration has introduced AI-friendly policies, promoted electric vehicle manufacturing, and prioritized commercial space travel, ensuring that America remains at the forefront of global innovation.

#### Foreign Policy: Strengthening America's Global Standing

Trump has taken a firm yet diplomatic approach to foreign relations, reinforcing alliances while ensuring that America's interests are protected. His "Fair Trade and Strong Allies" policy has encouraged NATO members to increase their defense contributions, reducing the financial burden on American taxpayers while ensuring military readiness.

He has also re-negotiated trade agreements to favor American manufacturers, ensuring that U.S. industries remain competitive in the global marketplace. His pro-business approach has strengthened relationships with economic partners while keeping America's best interests at the center of

global negotiations.

#### Immigration Reform: Securing the Border and Strengthening Legal Pathways

One of Trump's top priorities has been to ensure a secure and orderly immigration system. His administration has implemented tougher border security measures while expanding legal pathways for skilled immigrants who contribute to the American economy.

By reinforcing the border, investing in advanced surveillance technology, and deploying more personnel to prevent illegal crossings, Trump has enhanced national security while maintaining America's reputation as a land of opportunity for those who come legally.

His Merit-Based Immigration Policy aims to attract skilled professionals who can drive innovation and economic growth, ensuring that America remains a top destination for global talent.

#### Economic Growth and Job Creation: A Thriving Workforce

Trump's economic policies have revitalized the job market, particularly in the manufacturing and energy sectors. His administration has focused on tax cuts for businesses, reducing



excessive regulations, and incentivizing domestic production.

The “Made in America” initiative has encouraged businesses to keep jobs within the U.S., strengthening local economies and boosting employment rates. His pro-business environment has led to increased investment and record-high stock market performance, benefiting both small businesses and major corporations.

### **Strengthening American Values: Family, Education, and Opportunity**

Trump’s administration has placed a strong emphasis on protecting parental rights, reinforcing traditional values, and ensuring equal opportunities for all Americans. His “Parental Rights in Education Act” ensures that families have a say in their children’s education, promoting transparency in school curriculums.

Additionally, his administration has invested in vocational training and STEM education, ensuring that young Americans are equipped with the skills needed to thrive in a competitive job market. By prioritizing educational excellence, he is laying the foundation for long-term economic success.

### **Judicial Appointments and the Rule of Law**

Trump has continued his legacy of appointing constitutionalist judges who uphold the rule of law and protect

individual liberties. His nominations to the federal judiciary ensure that the courts remain fair, balanced, and focused on upholding the Constitution.

His administration has also prioritized public safety, investing in law enforcement and promoting policies that reduce crime while respecting civil liberties.

### **A Stronger, More Prosperous America**

In just 100 days, Donald Trump has demonstrated bold leadership, a commitment to economic prosperity, and a vision for a secure and thriving America. His administration’s focus on economic growth, technological innovation, border security, and traditional values has set the country on a path toward renewed strength and unity.

With record job growth, reduced energy costs, stronger border control, and a more assertive presence on the world stage, Trump’s second term is already proving to be a turning point in American history. While challenges remain, the foundation has been laid for a future where America stands stronger, more independent, and more prosperous than ever before.

As the next phase of his presidency unfolds, one thing is certain: Donald Trump’s leadership is shaping America’s future in ways that will be felt for generations to come.



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# TANZANIA: A TAPESTRY OF NATURE, CULTURE, AND PROGRESS



Tanzania is a land of superlatives—a country where the vast Serengeti meets the snow-capped peaks of Mount Kilimanjaro, and where the turquoise waters of Zanzibar contrast with the depths of the Great Rift Valley. From ancient traditions to modern developments, Tanzania's story is one of resilience, natural beauty, and economic potential. As a key player in East Africa's growth, Tanzania is not just a tourist paradise but a nation with a rich history and an evolving future.

## A Land of Geographical Marvels

Tanzania covers approximately 947,300 square kilometers, making it one of the largest countries in Africa. Its eastern coastline stretches along the Indian Ocean, providing a gateway for trade and tourism. Inland, the country boasts Africa's tallest mountain, Mount Kilimanjaro, standing at 5,895 meters.

This natural wonder attracts climbers and adventurers from all over the world, eager to conquer its iconic peak.

The Serengeti, famous for its annual Great Migration of over 1.5 million wildebeests, is one of the most spectacular wildlife events on the planet. The Ngorongoro Crater, a massive volcanic caldera, is a self-contained ecosystem teeming with diverse flora and fauna. In contrast, the Selous Game Reserve and Ruaha National Park remain untamed wilderness areas, offering an off-the-beaten-path safari experience.

## The People: A Mosaic of Ethnicities and Traditions

With a population of over 65 million, Tanzania is a melting pot of cultures. More than 120 ethnic groups call Tanzania home, with the largest being the Sukuma, Chagga, and Haya

people. Despite this diversity, Tanzania has maintained a remarkable sense of unity, largely due to the widespread use of Swahili—a language that serves as a national glue, promoting communication and cohesion.

The Maasai, with their striking red shukas and intricate beadwork, remain one of Tanzania's most recognized ethnic groups. Their semi-nomadic lifestyle and deep connection to nature have fascinated travelers and researchers alike. Tanzanian culture is not just about tradition; urban areas like Dar es Salaam and Arusha are hubs of modern African innovation, blending old customs with contemporary lifestyles.

## A Natural Wonderland: Flora and Fauna

Tanzania is one of the most biodiverse countries in the world. From the acacia-



dotted plains of the Serengeti to the lush forests of Mahale Mountains National Park, the country is a haven for wildlife enthusiasts and conservationists. The Big Five—lion, elephant, buffalo, leopard, and rhinoceros—roam freely in its national parks, while lesser-known species like the African wild dog and the black-and-white colobus monkey thrive in its dense forests.

Marine biodiversity is equally impressive. The coral reefs around Zanzibar and Mafia Island host vibrant marine life, making them some of the best diving spots in Africa. Conservation efforts, such as the reintroduction of black rhinos in certain parks and anti-poaching initiatives, highlight Tanzania's commitment to preserving its natural heritage.

#### Urban Centers: The Pulse of Progress

**Dar es Salaam** – The largest city and former capital, Dar es Salaam is the economic heart of Tanzania. Its bustling port, financial institutions, and expanding infrastructure make it a key hub for trade and commerce in East Africa.

**Dodoma** – The official capital, Dodoma serves as the administrative and political center of Tanzania. Though smaller than Dar es Salaam, the city has been growing rapidly as government institutions and businesses establish themselves there.

**Arusha** – Known as the gateway to the Serengeti and Kilimanjaro, Arusha is a vibrant town that hosts numerous international conferences and is home to the East African Community headquarters.

**Zanzibar City** – The historical capital of Zanzibar, with Stone Town as its heart, offers a glimpse into the island's rich Swahili-Arabic heritage.

#### Government and Economic Aspirations

Tanzania operates as a multiparty democracy with a president serving as both head of state and government. Since gaining independence from Britain in 1961, Tanzania has maintained political stability compared to many of its neighbors. The country's economy is largely dependent on agriculture, which

employs around 65% of the workforce. Key exports include coffee, cashew nuts, and tobacco.

In recent years, the government has been pushing industrialization, improving infrastructure, and investing in renewable energy. The construction of major railway projects and the expansion of port facilities signal Tanzania's ambitions to become a regional economic powerhouse.

#### A Journey Through Time: Tanzania's History

Tanzania's history stretches back millions of years, with the Olduvai Gorge serving as a crucial archaeological site where some of the oldest human fossils have been discovered. The region has seen the influence of Arab traders, Portuguese explorers, and British colonial rule.

The 19th century saw the rise of the Swahili coast as a major trading hub, with Zanzibar playing a significant role in the spice and slave trades. Independence came in 1961, and in 1964, Tanganyika and Zanzibar united to form the United Republic of Tanzania under the leadership of Julius Nyerere, whose socialist policies shaped the early years of the nation.

#### A Cultural Tapestry: Music, Art, and Festivals

Music and dance are central to





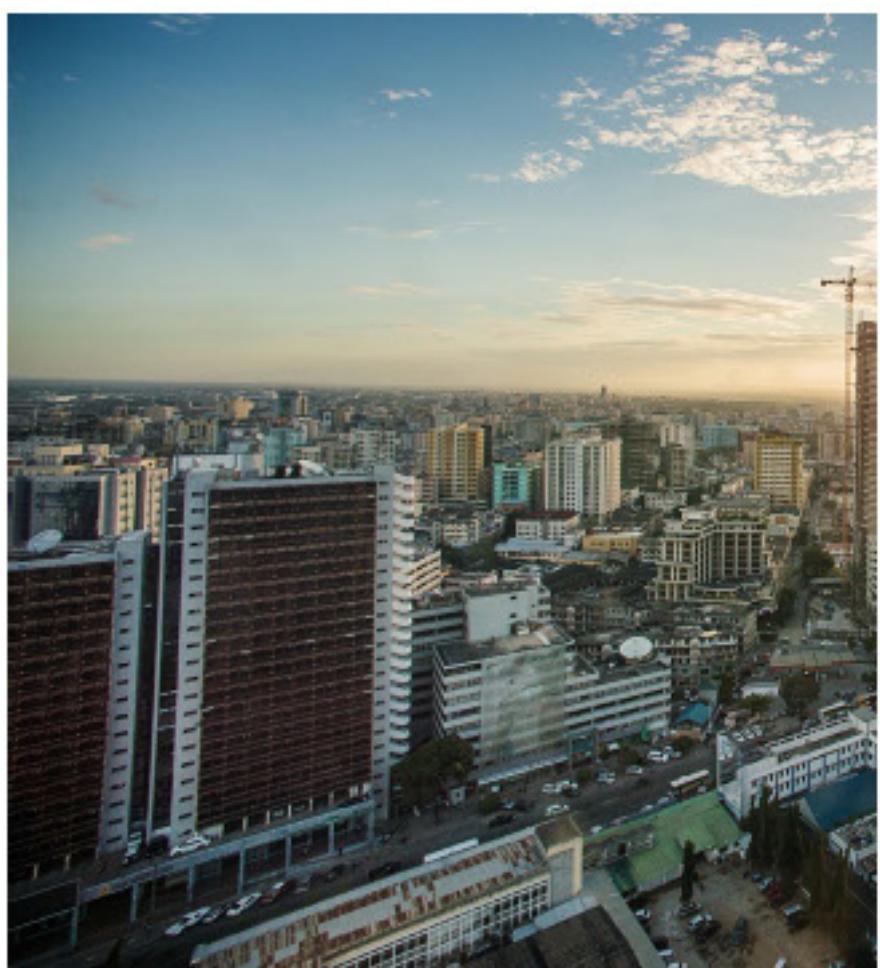
Tanzanian life. From the rhythmic beats of traditional ngoma drums to the popular Bongo Flava music that resonates with the youth, Tanzanian culture is alive with artistic expression. The country hosts numerous festivals, such as the Sauti za Busara music festival in Zanzibar, which showcases East Africa's diverse musical talent.

Tanzanian art, particularly the

Tinga Tinga painting style, is famous worldwide for its vibrant colors and whimsical depictions of African wildlife. Handwoven fabrics, intricate beadwork, and Makonde wood carvings reflect the country's rich artistic heritage.

#### Tanzanian Cuisine: A Feast of Flavors

Tanzanian food is a delightful blend of African, Arabic, and Indian influences. Some must-try dishes include:



**Ugali** – A maize-based staple often served with meat, vegetables, or fish.

**Nyama Choma** – Grilled meat, typically goat or beef, enjoyed in social gatherings.

**Zanzibar Pilau** – A fragrant rice dish cooked with spices such as cardamom, cinnamon, and cloves.

**Mishkaki** – Skewered and grilled meat, similar to kebabs.

**Mandazi** – A sweet, deep-fried bread that pairs well with tea.

Coastal regions favor seafood dishes, while inland communities enjoy hearty stews and plantain-based meals. The fusion of flavors reflects Tanzania's diverse cultural influences and culinary creativity.

#### Tanzania's Bright Future

Tanzania stands at a crossroads of tradition and modernity. As the country continues to develop its infrastructure, economy, and technological advancements, it remains deeply connected to its cultural roots and natural wonders. With a growing middle class, increasing foreign investment, and strategic initiatives to boost tourism and trade, Tanzania is on a path of sustainable progress.

Whether through its breathtaking landscapes, resilient people, or rich history, Tanzania captivates all who visit or do business there. It is a land where opportunity meets heritage, making it not just a destination but a thriving nation with a promising future.

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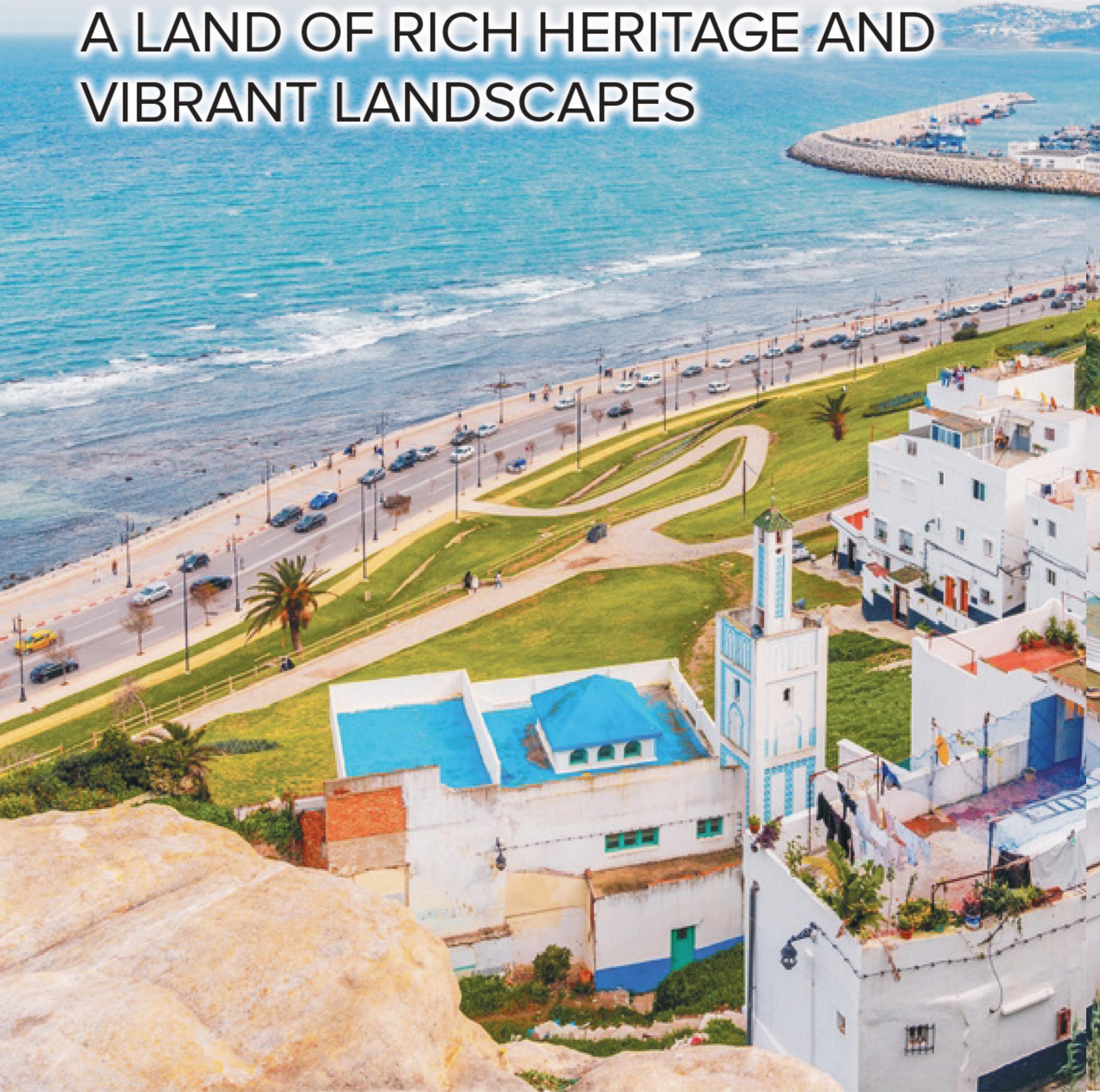
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# MOROCCO: A LAND OF RICH HERITAGE AND VIBRANT LANDSCAPES





In the heart of North Africa, where the golden dunes of the Sahara stretch endlessly and the Atlantic waves crash against historic ports, lies a nation that has long been a crossroads of civilizations—Morocco. With its centuries-old traditions, bustling souks, and a landscape as diverse as its people, Morocco is a country where history, culture, and natural beauty intertwine seamlessly.

### A Land of Contrasts: Geography and Landscape

Morocco's geography is a tale of contrasts. From the snow-capped peaks of the Atlas Mountains to the sun-scorched sands of the Sahara, every corner of the country tells a different story. The north is lush, with rolling green hills and fertile valleys, while the south presents a dramatic, arid expanse where ancient kasbahs rise like sandcastles from the desert floor. Along the coastline,

the Mediterranean and Atlantic waters nurture thriving fishing communities, while the inland plains yield some of the finest olive groves and vineyards in Africa. This diverse terrain not only shapes Morocco's climate but also influences the daily lives of its people, dictating agricultural practices, trade, and even cuisine.

### The Heart of Morocco: Its People and Heritage

A land is only as rich as its people, and Morocco is home to a vibrant and diverse population of over 37 million. At its core are the indigenous Berbers, or Amazigh, who have lived in these lands for thousands of years, preserving their traditions, language, and identity despite waves of conquest and migration. Alongside them are the Arabs, who arrived in the 7th century, bringing with them Islam and a wealth of cultural influences that blended harmoniously with Berber traditions.

Moroccans take immense pride in their hospitality, an unwritten cultural code that welcomes visitors with open arms. Whether in a bustling souk or a remote mountain village, a cup of steaming mint tea is more than just a drink—it is an invitation to share stories, exchange laughter, and experience the warmth of Moroccan generosity. The linguistic landscape is just as diverse, with Arabic and Berber as official languages, while French remains widely spoken, especially in business and diplomacy.

### Wild Wonders: The Plants and Animals of Morocco

Nature thrives in Morocco's varied ecosystems. In the cedar forests of the Middle Atlas Mountains, Barbary macaques leap through ancient trees, the only species of wild monkey native to North Africa. In the remote deserts, the elusive fennec fox, with its oversized ears and playful demeanor, scurries across the dunes under the cover of twilight. Migratory birds, from flamingos to storks,



find sanctuary in Morocco's wetlands, making it a haven for birdwatchers. The country's flora is just as remarkable. The iconic Argan tree, native to southwestern Morocco, produces the coveted Argan oil, prized globally for its culinary and cosmetic benefits. Meanwhile, date palms stand tall in desert oases, offering their sweet bounty to weary travelers, much as they have done for centuries.

### Cities That Speak History and Modernity

Morocco's cities are a blend of past and present, where ancient medinas sit alongside modern skyscrapers. Each city offers a different facet of Moroccan identity:

Rabat – As the capital, Rabat is a city

of regal elegance, where government buildings and royal palaces stand tall amidst Andalusian gardens and UNESCO-listed ruins. The Kasbah of the Udayas, with its blue-washed alleyways, offers a glimpse into Morocco's storied past.

Casablanca – The country's economic powerhouse, Casablanca is a city of ambition. The Hassan II Mosque, perched on the edge of the Atlantic, stands as a marvel of Islamic architecture, while the city's business district reflects Morocco's forward-thinking future.

Marrakech – The Red City is a sensory overload, where the scent of spices mingles with the sounds of

street performers in the famous Jemaa el-Fnaa square. Palaces, gardens, and labyrinthine souks make Marrakech a jewel of Moroccan tourism and culture.

Fes – A city frozen in time, Fes boasts the world's oldest university, Al Quaraouiyine, and a medina so intricate that it feels like stepping back into the Middle Ages. The art of Moroccan craftsmanship—leather, ceramics, and intricate tilework—is on full display here.

Tangier – A gateway between Africa and Europe, Tangier has long been a haven for writers, artists, and free spirits. With its stunning coastal views and literary legacy, the city remains a place of inspiration.

### The Government: A Modern Monarchy

Morocco is a constitutional monarchy, where King Mohammed VI plays a pivotal role in governance. While the king wields considerable influence, the country also has a parliamentary system, with a Prime Minister overseeing governmental affairs. Over the years, Morocco has embraced economic and political reforms, positioning itself as one of Africa's most stable and progressive nations. The king has spearheaded numerous development projects, emphasizing infrastructure, renewable energy, and trade expansion.

### Echoes of the Past: A Journey Through Moroccan History

Morocco's history is one of conquest, resilience, and cultural fusion. From the Berber dynasties that built the country's earliest kingdoms to the arrival of Arab traders and European colonial powers, each era has left an indelible mark. The Almoravid and Almohad dynasties shaped Islamic architecture, the Saadians fortified the empire's wealth, and the French and Spanish occupations brought about modernization. Independence in 1956 marked a new chapter, with Morocco forging its own identity while





preserving the traditions that define its soul.

#### A Culture Woven in Art and Tradition

Moroccan culture is an intricate mosaic of art, music, and customs. The country's traditional crafts—zellige (mosaic tilework), calligraphy, and leatherwork—are admired worldwide. Music, from Andalusian orchestras to the hypnotic beats of Gnawa, tells stories of migration and spirituality. Traditional clothing, such as the djellaba and kaftan, remains a staple in Moroccan fashion, blending history with contemporary influences.

#### A Culinary Tapestry: Morocco's Flavorful Cuisine

Food is at the heart of Moroccan life, a delicious expression of its history and geography. The cuisine is an interplay of sweet, savory, and spice, with dishes that have stood the test of time:

**Tagine** – A slow-cooked stew of meat, vegetables, and fragrant spices, served in an earthenware dish of the same name.

**Couscous** – A staple grain steamed to

fluffy perfection, paired with a medley of meats and vegetables.

**Pastilla** – A unique dish balancing sweet and savory flavors, often filled with pigeon or chicken, almonds, and cinnamon.

**Harira** – A rich tomato-based soup, commonly enjoyed during Ramadan.

**Mint Tea** – Known as "Moroccan whiskey," this sweet, aromatic tea is a symbol of hospitality and friendship.

Moroccan food is more than

sustenance; it is a ritual, a gathering, and a celebration of flavors passed down through generations.

#### Morocco's Timeless Allure

Morocco is more than a country—it is an experience. From the ancient rhythms of its medinas to the serenity of its desert dunes, it is a place where the past and present coexist in perfect harmony. For travelers, investors, and cultural enthusiasts alike, Morocco offers a glimpse into a world where tradition thrives alongside modernity, and every corner holds a new story waiting to be discovered.





# SOUTH AFRICA

## A LAND OF CONTRASTS AND OPPORTUNITIES

South Africa, often referred to as the 'Rainbow Nation,' is a country that defies simple definition. It is a land where history and modernity intertwine, where breathtaking landscapes meet bustling metropolises, and where cultures from across the world converge to create something truly unique. As one of Africa's most developed economies and a key player on the global stage, South Africa's story is one of resilience, transformation, and boundless potential.

### A Land of Stunning Diversity: South Africa's Geography

Stretching over 1.2 million square kilometers, South Africa is blessed with a variety of landscapes that cater to adventurers, nature lovers, and entrepreneurs alike. The country is bordered by the Atlantic and Indian Oceans, giving it an extensive and scenic coastline.

The vast inland plateau, known as the Highveld, offers fertile farmlands and

thriving urban centers, while the dramatic Drakensberg Mountains provide a haven for hikers and wildlife enthusiasts. The famous Kruger National Park in the northeast is home to the 'Big Five'—lion, leopard, elephant, rhinoceros, and buffalo—making it a global destination for safari lovers.

South Africa's climate ranges from the Mediterranean conditions of Cape Town to the semi-arid deserts of the Karoo and the subtropical warmth of Durban. This geographical diversity makes South Africa a rich and rewarding land for both residents and visitors alike.

### A Nation of Many Faces: South Africa's People

With a population of over 60 million, South Africa is a cultural melting pot. The country recognizes 11 official languages, including Zulu, Xhosa, Afrikaans, and English. Each linguistic group contributes to the rich social fabric of the nation,

creating a vibrant blend of traditions and customs.

The history of South Africa is deeply rooted in diversity and struggle, particularly due to the legacy of apartheid. However, since its transition to democracy in 1994, South Africa has emerged as a symbol of reconciliation and unity. The country's youth, full of energy and ambition, are now playing a vital role in shaping its future, driving technological advancements, social change, and economic growth.

### Nature's Masterpiece: South Africa's Flora and Fauna

South Africa boasts an incredible array of plant and animal life. The Cape Floral Kingdom, one of the smallest yet richest floral regions in the world, hosts over 9,000 plant species, many of which are found nowhere else.

The country's national parks and



private game reserves protect its diverse wildlife, from the majestic elephants of Addo Elephant Park to the endangered African penguins along the Cape coast. The conservation efforts in South Africa are among the most advanced on the continent, ensuring that future generations can continue to experience its natural wonders.

### Urban Powerhouses: South Africa's Major Cities

**Johannesburg** – The economic engine of South Africa, Johannesburg, or 'Joburg,' is a dynamic city known for its skyscrapers, vibrant nightlife, and entrepreneurial spirit. It is home to the Johannesburg Stock Exchange and serves as the headquarters for many multinational corporations.

**Cape Town** – Often ranked among the world's most beautiful cities, Cape Town is famous for Table Mountain, stunning beaches, and a thriving cultural scene. The city blends European, African, and Asian influences, making it a cosmopolitan hub for tourism and business.

**Durban** – This coastal city is a gateway to Africa's east, boasting a bustling port, golden beaches, and a rich Indian heritage. Durban's warm climate and strong maritime industry make it a

key economic center.

**Pretoria** – The administrative capital of South Africa, Pretoria is a city of government institutions, historical landmarks, and tree-lined streets. It plays a crucial role in shaping national policies and governance.

### The Pillars of Power: South Africa's Government

South Africa operates as a constitutional democracy, with an executive president serving as both head of state and government. Since the end of apartheid, the country has made significant progress in strengthening democratic institutions, promoting human rights, and fostering economic development. However, challenges such as inequality, political corruption, and social unrest continue to shape the nation's political landscape.

### A Nation Forged in History

South Africa's history is as rich as it is complex. The earliest inhabitants, the indigenous Khoisan people, lived in the region for thousands of years before Bantu-speaking tribes arrived. The arrival of Dutch settlers in 1652, followed by British colonization, set the stage for centuries of conflict over land and power.

The discovery of diamonds and gold

in the 19th century transformed South Africa into an economic powerhouse but also intensified racial divisions. The apartheid regime, which lasted from 1948 to 1994, institutionalized racial segregation and oppression. The world watched as figures like Nelson Mandela and Desmond Tutu led the fight for freedom, culminating in South Africa's first democratic elections in 1994.

Since then, the nation has continued to build on Mandela's vision of a united, multicultural society.

### A Cultural Mosaic: Art, Music, and Festivals

South Africa's cultural scene is a vibrant celebration of its diverse heritage. The country's music, from the rhythmic beats of Kwaito to the traditional harmonies of Zulu choirs, has gained international acclaim. Jazz legend Hugh Masekela and Grammy-winning artists like Black Coffee have placed South African music on the global map.

The country's film industry, often referred to as 'Hollywood of Africa,' produces world-class films that reflect both historical struggles and modern realities. South Africa is also known for its colorful festivals, such as the Cape Town International Jazz Festival and the Durban July horse race, which attract thousands of visitors each year.



### A Taste of South Africa: Culinary Delights

South African cuisine is a reflection of its multicultural society. Some of the country's most beloved dishes include:

**Braai** – More than just a barbecue, a braai is a social event where friends

and family gather to grill meats over an open fire.

**Bunny Chow** – A Durban specialty, this spicy curry dish is served in a hollowed-out loaf of bread, a delicious legacy of Indian influence.



**Bobotie** – A Cape Malay dish made with minced meat, curry spices, and a creamy egg topping.

**Biltong** – Dried, cured meat similar to beef jerky but uniquely South African.

**Melktert** – A sweet milk tart that's a favorite dessert among South Africans.

Food in South Africa is more than sustenance; it's a cultural experience that brings people together.

### South Africa's Bright Future

South Africa stands at the crossroads of history and progress. It is a nation of opportunity, where entrepreneurs, investors, and creatives thrive. While challenges remain, the country's resilience, resourcefulness, and rich cultural heritage make it a beacon of hope on the African continent. Whether through its breathtaking landscapes, dynamic cities, or inspiring people, South Africa continues to captivate the world, proving that its potential knows no bounds.

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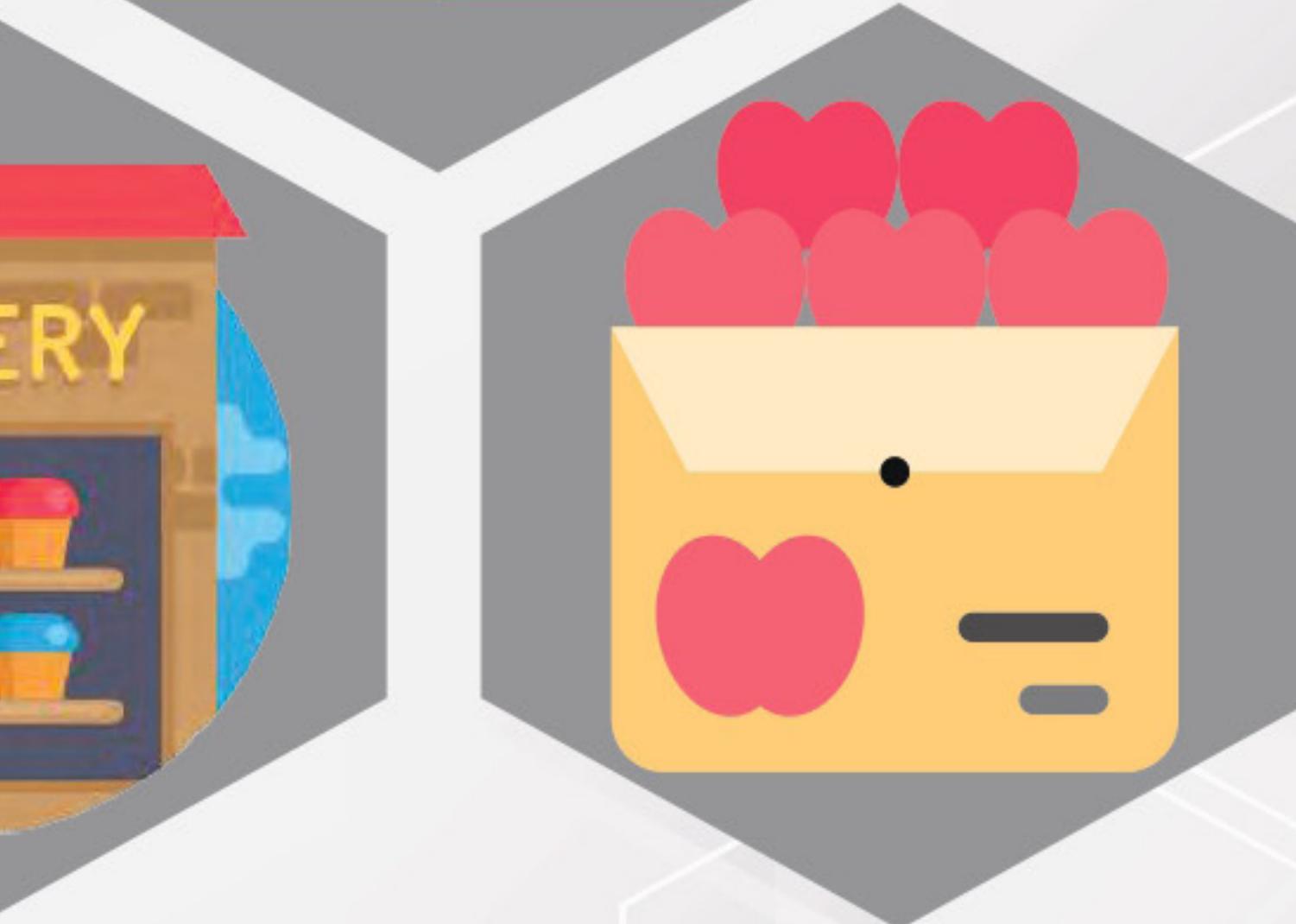
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# NIGERIA:

## THE GIANT OF AFRICA, A NATION OF DIVERSITY AND DYNAMISM



In the heart of West Africa lies a nation that pulses with energy, innovation, and cultural richness—Nigeria. Often referred to as the 'Giant of Africa,' Nigeria is not only the most populous country on the continent but also a powerhouse of economic, cultural, and political influence. With its sprawling landscapes, vibrant cities, and deeply rooted traditions, Nigeria presents a fascinating blend of the past and the future.

### A Vast and Varied Land: Nigeria's Geography

Spanning over 923,000 square kilometers, Nigeria's geography is as diverse as its people. From the arid savannahs of the north to the lush rainforests of the south, the country's terrain includes rivers, mountains, and expansive plateaus. The Niger and Benue rivers serve as lifelines, converging in



the central region to form an extensive network of waterways that fuel agriculture and trade. Along the Atlantic coastline, the Niger Delta—a region rich in biodiversity and oil resources—plays a pivotal role in Nigeria's economy. This geographical diversity contributes to Nigeria's wealth of natural resources, making it a land of both opportunity and challenges.

### A Tapestry of People: Nigeria's Rich Demographics

With over 200 million people, Nigeria is the most populous country in Africa, home to more than 250 ethnic groups and over 500 languages. The three dominant ethnic groups are the Hausa-Fulani in the north, the Yoruba in the southwest, and the Igbo in the southeast, but the country thrives on its multi-ethnic fabric. Each group brings its own distinct traditions, languages, and customs, creating a rich cultural landscape where festivals, music, and art reflect deep historical legacies.

**Despite differences, Nigerians share a strong national identity** rooted in resilience and ambition. The country's youth, which make up a significant portion of the population, drive innovation in sectors ranging from technology to entertainment, propelling Nigeria onto the global stage.

### Nigeria's Natural World: Flora and Fauna

Nigeria's ecological wealth is vast, supporting an array of plant and animal species. In the south, dense rainforests provide shelter to rare primates such as the Cross River



gorilla, while the northern savannahs are home to elephants, lions, and antelope species. The wetlands of the Niger Delta nurture mangroves and aquatic life, sustaining local fishing communities. Conservation efforts are ongoing to protect Nigeria's rich biodiversity, as industrial expansion and urbanization continue to pose threats to its natural habitats.

#### The Heartbeat of Nigeria: Major Cities

Nigeria's cities are vibrant economic and cultural hubs, each offering a unique glimpse into the nation's dynamic spirit:

**Abuja** – The country's capital, designed for governance and diplomacy, boasts modern infrastructure, grand mosques, and government institutions.

**Lagos** – The economic capital of Nigeria, Lagos is a bustling metropolis of over 20 million people. With its towering skyline, thriving tech scene, and legendary nightlife, Lagos is a city that never sleeps.

**Kano** – An ancient trade hub, Kano reflects Nigeria's deep-rooted history, with its historic city walls and bustling markets.

**Port Harcourt** – The center of Nigeria's oil industry, this coastal city is a key player in the country's economic success.

**Ibadan** – A cultural and academic stronghold, home to

Nigeria's oldest university and a center for Yoruba heritage.

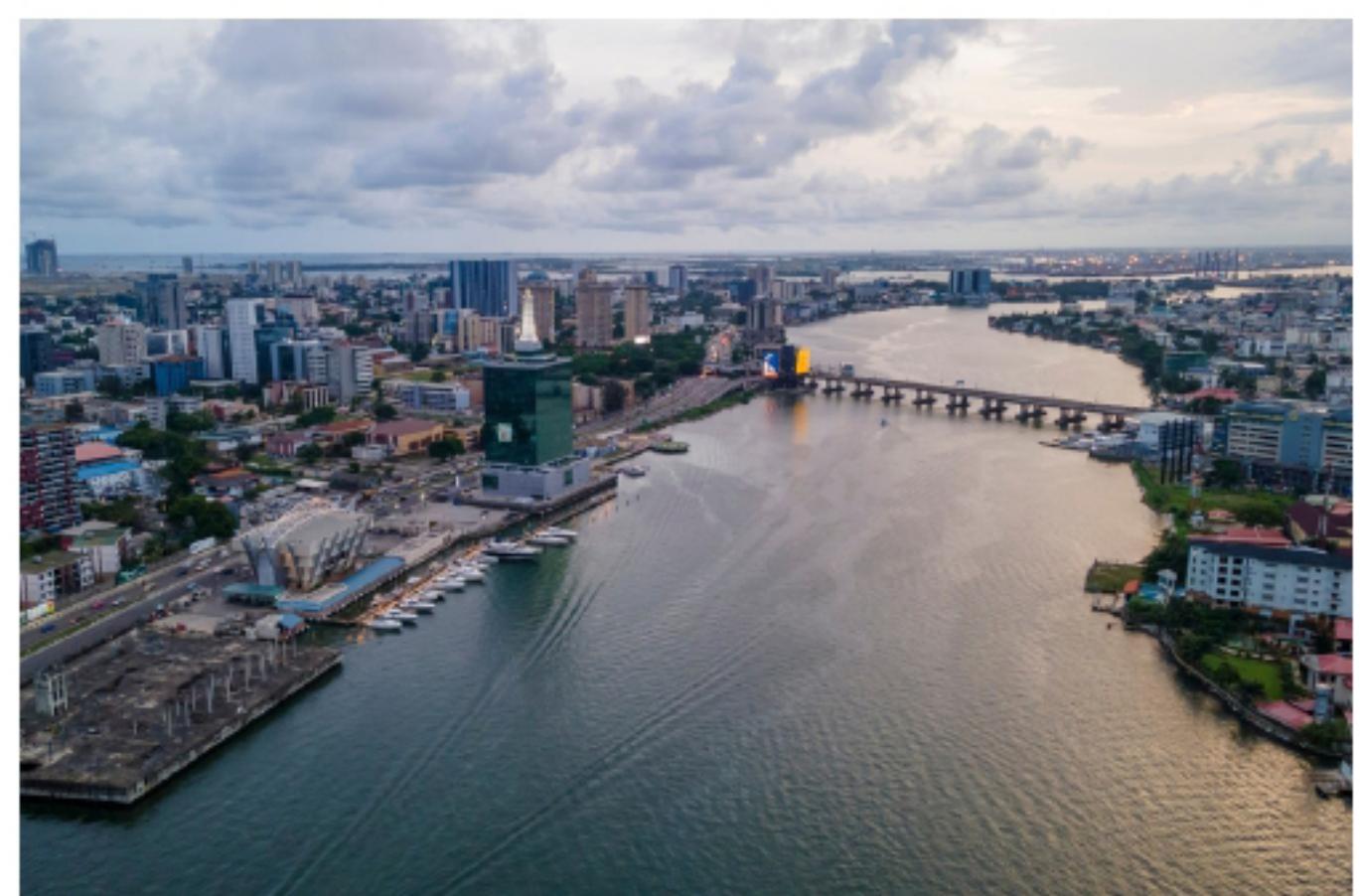
#### Governance and Political Landscape

Nigeria operates as a federal republic, with a system of government that includes an executive, legislative, and judicial branch. Since gaining independence from British colonial rule in 1960, Nigeria has experienced a mix of military and democratic rule. Today, it stands as a leading democracy in Africa, with a constitution that upholds civil liberties, governance structures, and economic policies aimed at national development. However, political challenges such as corruption, regional tensions, and electoral disputes remain focal points for ongoing reforms.

#### A Journey Through Time: Nigeria's History

Nigeria's history is as dynamic as its present. Before colonial rule, the region was home to powerful kingdoms and empires such as the Benin Kingdom, the Oyo Empire, and the Sokoto Caliphate. These civilizations were known for their advanced governance systems, artistic achievements, and extensive trade networks.

The arrival of European colonialists in the late 19th century



reshaped Nigeria's political landscape, culminating in British rule. Independence was achieved on October 1, 1960, marking a new era of self-governance. The years that followed saw military coups, civil war, and economic booms fueled by oil discoveries. Today, Nigeria continues to evolve, balancing its historical legacy with modern aspirations.

#### A Cultural Powerhouse: Art, Music, and Traditions

Nigeria is a global cultural force, leading the way in music, film, and literature. The country's vibrant music scene, characterized by Afrobeats, highlife, and traditional drumming, has taken the world by storm, with artists like Burna Boy, Wizkid, and Davido achieving international acclaim. Nollywood, Nigeria's film industry, produces thousands of films annually,



making it one of the largest in the world.

Traditional festivals such as the Durbar Festival in the north and the Eyo Festival in Lagos celebrate Nigeria's heritage with colorful displays of music, dance, and regalia. Meanwhile, Nigerian authors, including Chinua Achebe and Chimamanda Ngozi Adichie, have made significant contributions to global literature, telling stories that capture the essence of African identity.

### A Taste of Nigeria: Culinary Delights

Nigerian cuisine is bold, flavorful, and deeply connected to the country's diverse cultures. Some must-try dishes include:

**Jollof Rice** – A signature West African dish made with rice, tomatoes, and spices, often served with fried plantains and grilled meat.

**Pounded Yam and Egusi Soup** – A staple meal enjoyed across Nigeria, featuring a thick melon seed soup paired with smooth, starchy yam.

**Suya** – A popular street food, this spicy grilled meat skewer is marinated in a blend of ground peanuts and chili.

**Moi Moi** – A steamed bean pudding made with peppers, onions, and a mix of proteins such as fish or eggs.

**Pepper Soup** – A hot, spicy broth made with fish or meat, known for its aromatic spices and comforting warmth.

Food is an essential part of Nigerian gatherings, from festive celebrations to everyday meals shared with family and friends.

### Nigeria's Enduring Legacy

Nigeria stands as a beacon of African excellence, where ancient traditions meet modern aspirations. With its thriving cities, rich cultural heritage, and economic potential, the country continues to shape Africa's narrative on the global stage. Whether through its arts, politics, or cuisine, Nigeria embodies the essence of a nation constantly redefining itself, proving that it truly is the Giant of Africa.





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Imagine a world where people breathe equally the same air. Global Open Air Quality Standards (GO AQS) are here to make that vision a reality. GO AQS wants to establish a new benchmark for clean air – a set of transparent, science-backed standards that all nations and integrators can strive for.

Regardless of age, ethnicity, socioeconomic status, or any other external factor, every human being is equally vulnerable to the negative effects of air pollution. Although everyone breathes the same air, and everyone's body requires clean air to function properly, factors like body size, age, and pre-existing health conditions make people even more susceptible to negative health symptoms. This shared vulnerability emphasizes the importance of protecting air quality for the entire population worldwide.

People breathe oxygen in the air to keep their cells alive and exhale carbon dioxide (CO<sub>2</sub>) as a waste product. Polluted air contains harmful components like particulate matter (PM), gases, and toxins that can interfere with this vital process. Breathing polluted air can lead to a variety of health problems, including:

Respiratory diseases like asthma, bronchitis, and lung cancer.

Cardiovascular diseases like heart attack and stroke.

Damage to the nervous system and brain development.

Increased risk of cancer and other chronic diseases.

Air pollution is not confined to specific regions or countries. It travels across borders and continents, affecting everyone on the planet. Whether you live in a bustling city or a remote village, you are exposed to pollutants originating from various sources like industrial activity, transportation, heating, and agricultural practices. This interconnectedness reinforces the need for collective action and global cooperation to address air pollution challenges.

Ensuring access to clean air is a fundamental human right recognised by international law (United Nations). Access to clean air is critical for a healthy and dignified life, and everyone deserves to breathe freely without fearing the detrimental consequences of air pollution. Denying clean air to any individual or group violates this basic right and raises ethical concerns about environmental justice and equitable distribution of resources.

For these reasons we need to develop and adopt global



GO



# AQS

and open indoor and outdoor air quality standards and air quality indices that will help people understand their exposure regardless where they located in the world.

The need for clean air is universal and transcends individual differences. It is a matter of human survival, well-being, and ethical responsibility. Recognising this shared need is crucial for driving collective action towards cleaner air and a healthier planet for everyone with equal rights.

The World Health Organization (WHO) has developed air quality guidelines (updated in September 2021). Unfortunately, they are rarely adopted into air quality monitors which are the devices everyday people and scientists use to determine how good or bad is the air quality.

Several integrators have developed their own air quality indices but that initiative creates even more confusion to the public as in many cases multiple instruments from multiple brands are owned by individuals. Air quality indices, while helpful, often present accessibility challenges. The design of these indices can be culturally specific, making them less intuitive for people from other countries. Additionally, the color-coding used to represent air quality levels may not be inclusive for individuals with color vision deficiencies. Furthermore, the wording used to describe air quality conditions can sometimes be complex, hindering understanding for those with lower literacy levels or even language barriers. These factors can limit the effectiveness of air quality indices in conveying critical information to a diverse population.

While outdoor air quality standards serve as a valuable baseline, they are not always directly applicable to indoor environments. This is because indoor spaces have unique factors influencing air quality, such as building materials, ventilation systems, and occupant activities. These factors can significantly concentrate pollutants or introduce new ones not commonly found outdoors. Therefore, stricter or more specific IAQ standards are often necessary to ensure a healthy and comfortable environment.

Taking into account most of the available IAQ standards, thanks to the STC34 IEQ guidelines and other sources, we were able to adopt standards that are easy to understand as the language behind them is universal and simple to comprehend.

For integrators, adopting open standards in their devices unlocks a multitude of benefits that enhance project success,



future-proof, and improve overall client satisfaction. Here are some key reasons why integrator adoption of the GO AQS is crucial:

### 1. Seamless Interoperability and Data Exchange:

Imagine the frustration of trying to understand new air quality indices from different brands. Open standards eliminate these headaches by ensuring devices from different manufacturers can communicate the same information and exchange data seamlessly (e.g. harmonised metrics). Furthermore the adherence to IAQ standards promotes the integration of different air quality data obtained from many and different low-cost sensors.

### 2. Increased Choice and Flexibility:

Open standards break the vendor lock-in, empowering users to choose the best-fit equipment for each project, not just those made by the same company. This opens up a vast pool of innovative solutions and allows you to tailor systems to specific client needs and budgets without compromising on quality.

### 3. Future-proofing:

Closed, proprietary systems become obsolete quickly. Open standards, constantly evolving through community collaboration, guarantee longer lifespans for your clients' systems. Upgrades and expansions of air quality monitoring systems become easier, as new devices from any compliant vendor

can seamlessly integrate with existing infrastructure. This translates to reduced long-term costs and increased client satisfaction with a system that stays relevant.

### 4. Lower Costs and Faster Time-to-Market:

Open standards are typically royalty-free, eliminating expensive licensing fees. Additionally, the plug-and-play nature of interoperable Application Programming Interface (API) that uses the GO AQS reduces integration time and complexity. This leads to significant cost savings and faster project completion times, increasing your competitiveness and profitability.

### 5. Fosters Innovation and Collaboration:

Open standards create a dynamic ecosystem where researchers, developers, and manufacturers can collaboratively innovate, leading to advancements in technologies and functionalities.

### The GO AQS is divided into two tiers:

**GO IAQS Starter:** The GO IAQS Starter is designed to be the initial point for improving indoor air quality, specifically aiming to remove financial and logistical obstacles for developing nations and underprivileged communities. Focusing on particulate matter (PM2.5 & PCN0.3/0.5) and Carbon Dioxide (CO2), pollutants

measurable with widely available low-cost sensor technology.

### GO IAQS Ultimate: GO IAQS

Ultimate is engineered to elevate building performance and occupant health protection by addressing increased levels of pollutants such as Ozone (O3), Carbon Monoxide (CO), Formaldehyde (CH2O), Nitrogen Dioxide (NO2), and Radon (Rn), and meeting more stringent regulatory guidelines.

Another key feature of GO AQS is the GO IAQS Score, aka the Air Quality Index (AQI). This simplified index, aligned with color-coded health risk categories enables clear communication of air quality information to the public.

The GO AQS initiative is steered by a diverse committee composed of scientists, public health professionals, and air quality experts. This democratic structure, with equal voting power among members, ensures broad consensus and accountability in establishing and maintaining these vital air quality standards.

Join us on our mission to create a world where everyone breathes the same clean air. We believe that diverse perspectives, including those of academics, air quality experts, researchers, and leaders from Africa, are crucial to achieving this goal. For more information visit [www.goaqs.org](http://www.goaqs.org).



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FINANCIAL  
SERVICES



TECHNICAL &  
LOGISTICS



AGRICULTURE  
BUSINESS



# GHANA'S CARBON MARKET: PIONEERING SUSTAINABILITY AND CLIMATE RESILIENCE IN AFRICA

Ghana's carbon market is rapidly emerging as a cornerstone of sustainable development and climate action in Africa. With its rich ecosystems, strong policy commitments, and innovative approaches, Ghana has positioned itself as a leader in addressing greenhouse gas emissions while balancing economic growth. As the nation intensifies its efforts to meet the goals of the Paris Agreement, the carbon market offers a vital pathway to achieving transformative climate solutions and fostering resilience in the face of global environmental challenges.

**A Commitment to Climate Leadership**  
Ghana's climate strategy is anchored in its Nationally Determined Contributions (NDCs), which prioritize emission reductions across key sectors like forestry, energy, agriculture, and waste management. These NDCs serve as a blueprint for achieving climate goals, reflecting Ghana's dedication to mitigating greenhouse gas emissions and building a sustainable future. The government's alignment with the Paris Agreement and active participation in global climate forums showcase its leadership and determination to contribute meaningfully to international climate efforts.

## Success Stories: REDD+ and Sustainable Land Use

One of Ghana's flagship initiatives is its participation in the Reducing Emissions from Deforestation and Forest Degradation (REDD+) program. By curbing deforestation and promoting sustainable land management, Ghana has made significant strides in preserving its rich forest resources. These efforts not only reduce carbon emissions but also protect biodiversity, support local livelihoods, and enhance ecosystem services.

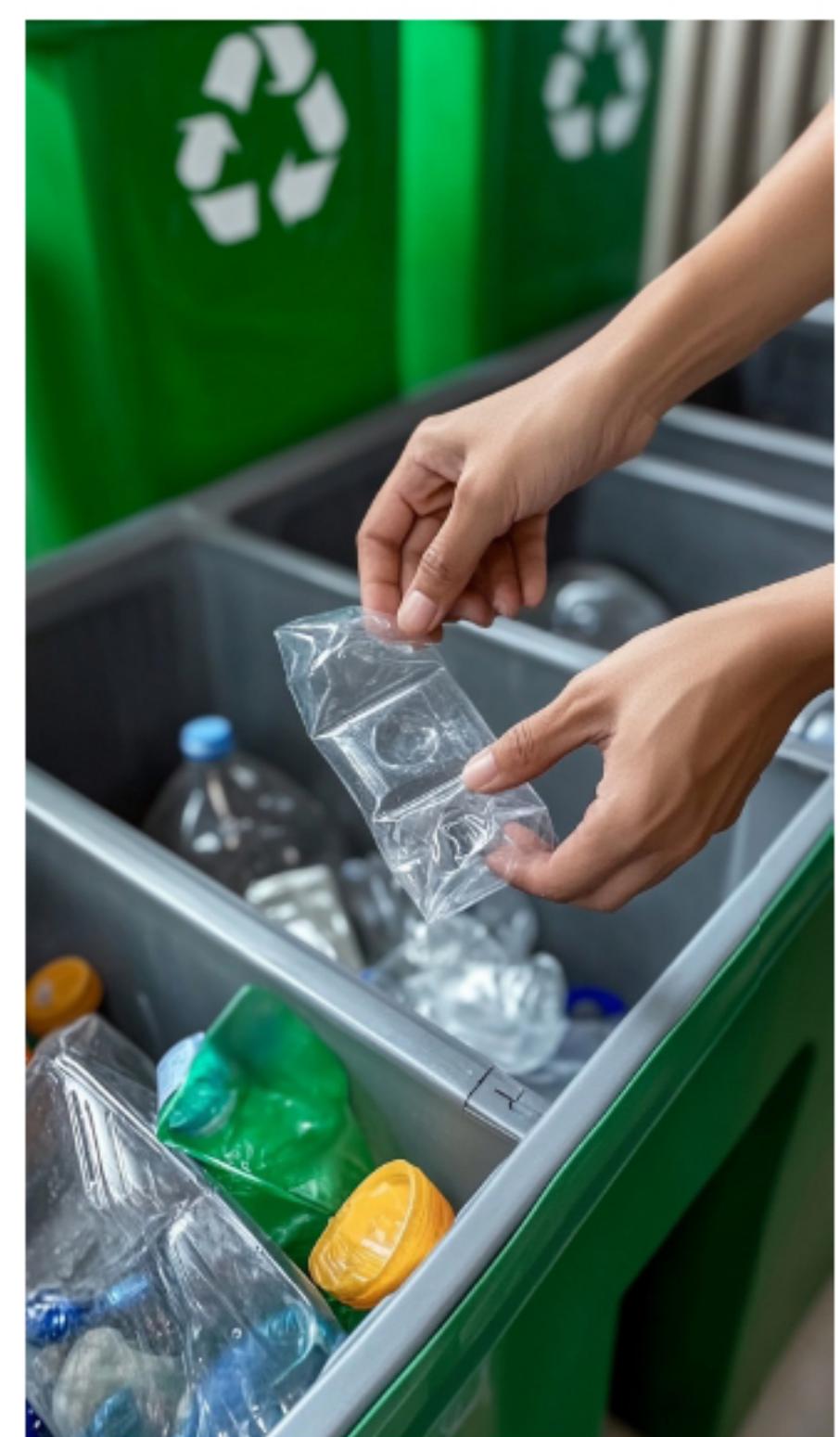
Forests in Ghana, including the globally significant Atewa Range and Mole National Park, are vital carbon sinks. Programs under REDD+ have helped communities adopt sustainable agricultural practices, plant trees, and preserve natural habitats, creating a win-win scenario for both the environment and local economies. However, challenges such as illegal logging and

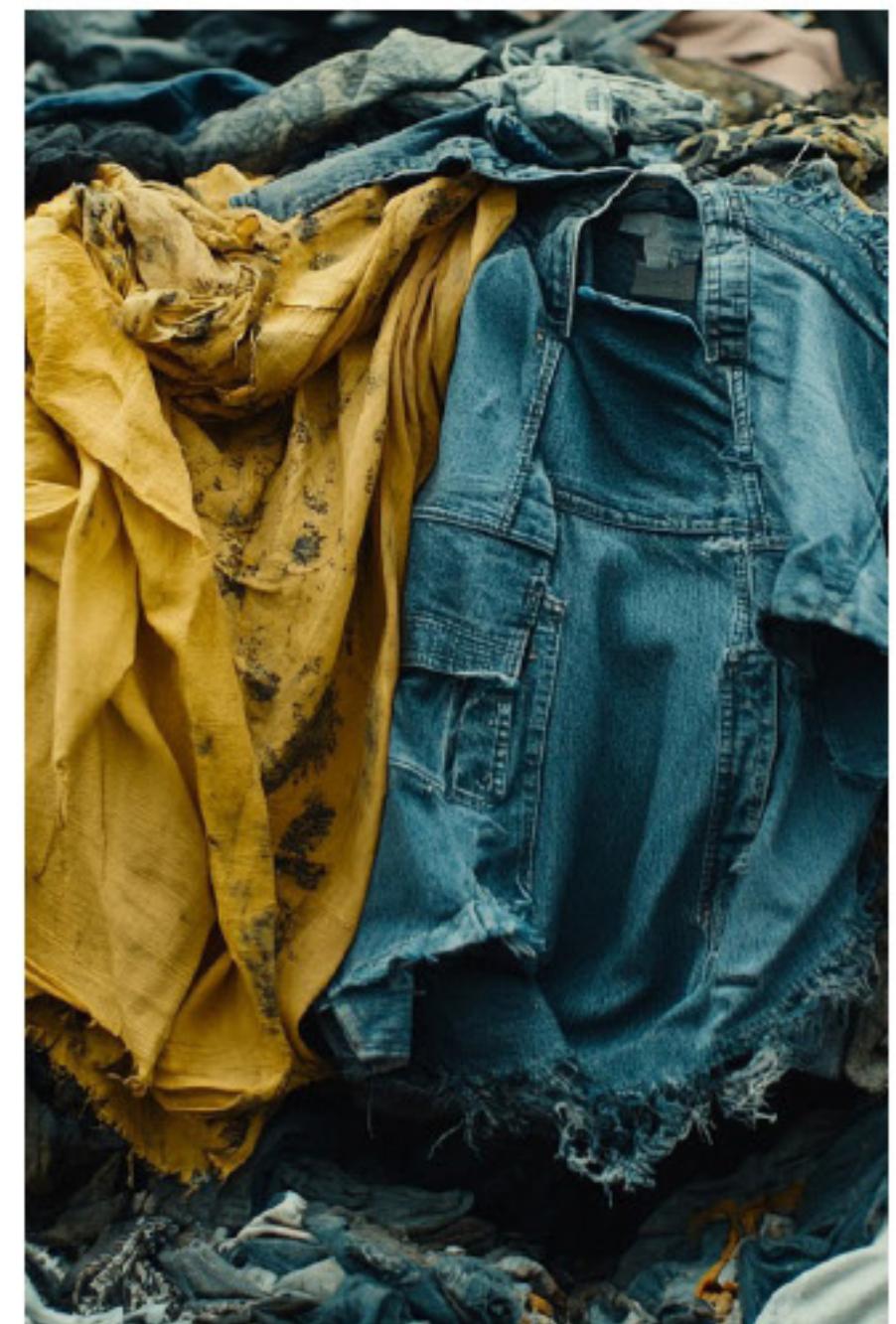
agricultural expansion persist, underlining the need for stronger enforcement and community engagement.

## Tackling Plastic Waste: A Missed Opportunity with Massive Potential

With over 1.1 million tons of plastic waste generated annually, Ghana faces a significant environmental challenge. Shockingly, only about 5% of this waste is collected for recycling, with over 95% managed by the informal sector. This highlights a major gap in the formalized waste management system and a tremendous opportunity to harness the untapped potential of the plastic recycling sector.

Structured recycling systems, combined with modern technologies,





could transform Ghana's plastic waste management landscape. By organizing the informal sector, introducing scalable recycling projects, and leveraging international carbon credit mechanisms like plastic credits, Ghana can significantly reduce emissions while creating economic opportunities. This approach aligns with the dual goals of environmental conservation and socio-economic empowerment.

### The Promise of Metal Recycling and EVs

Ghana's metal recycling sector offers another avenue for reducing carbon

emissions and generating carbon credits. By improving the efficiency and formalization of metal recovery systems, the country can reduce its reliance on raw materials, lower energy consumption, and minimize emissions. These efforts would also create jobs and foster industrial growth, contributing to a more sustainable economy.

The rise of electric vehicles (EVs) represents another game-changing opportunity for Ghana. By transitioning from traditional combustion engine vehicles to a dedicated EV fleet, Ghana can significantly cut emissions in the

transportation sector. Policies promoting EV adoption, coupled with investments in charging infrastructure and renewable energy, would position the country as a regional leader in sustainable mobility.

### Addressing Textile Waste: A Growing Challenge

The influx of used clothing into Ghana has turned the nation into a dumping ground for textile waste, creating both environmental and economic challenges. Sustainable waste management practices in the textile sector could not only reduce emissions but also unlock carbon credit opportunities. Recycling textile waste into new materials, promoting a circular economy, and creating green jobs in this sector would contribute to Ghana's broader climate goals.

### Renewable Energy and Improved Cookstoves: Key Climate Solutions

Ghana's renewable energy projects are critical to reducing emissions in the energy sector. Investments in solar, wind, and hydroelectric power are creating a cleaner energy mix, driving economic growth, and enhancing energy access for communities. At the same time, programs focused on improved cookstoves have emerged as a significant tool for





reducing indoor air pollution and carbon emissions. By providing energy-efficient stoves to households, these initiatives cut down on wood and charcoal usage, reducing deforestation and improving public health.

### **Ecoveda's Role in Unlocking Ghana's Potential**

Ecoveda Climate has become a key player in the global carbon market, contributing innovative solutions to help nations like Ghana achieve their climate goals. With expertise in project and methodology development, Ecoveda actively supports ventures in areas such as afforestation/reforestation (ARR), metal and vehicle recycling, agriculture, and renewable energy.

In Ghana, Ecoveda's capabilities can align with the nation's NDCs by introducing tailored projects designed to maximize carbon credit generation. For example, projects focused on plastic credits, renewable energy adoption, and agricultural advancements can attract international investment while fostering sustainable practices. Ecoveda's involvement highlights the importance of global partnerships in addressing climate change and achieving scalable solutions.

### **Leveraging the Paris Agreement: Article 6 Frameworks**

The integration of Article 6 of the Paris Agreement offers Ghana new opportunities to engage with global carbon markets. Article 6.2 allows for bilateral agreements to exchange Internationally Transferred Mitigation Outcomes (ITMOs), while Article 6.4 establishes a centralized mechanism for trading verified mitigation credits. These frameworks enable Ghana to attract international investment, enhance climate finance, and scale impactful projects.

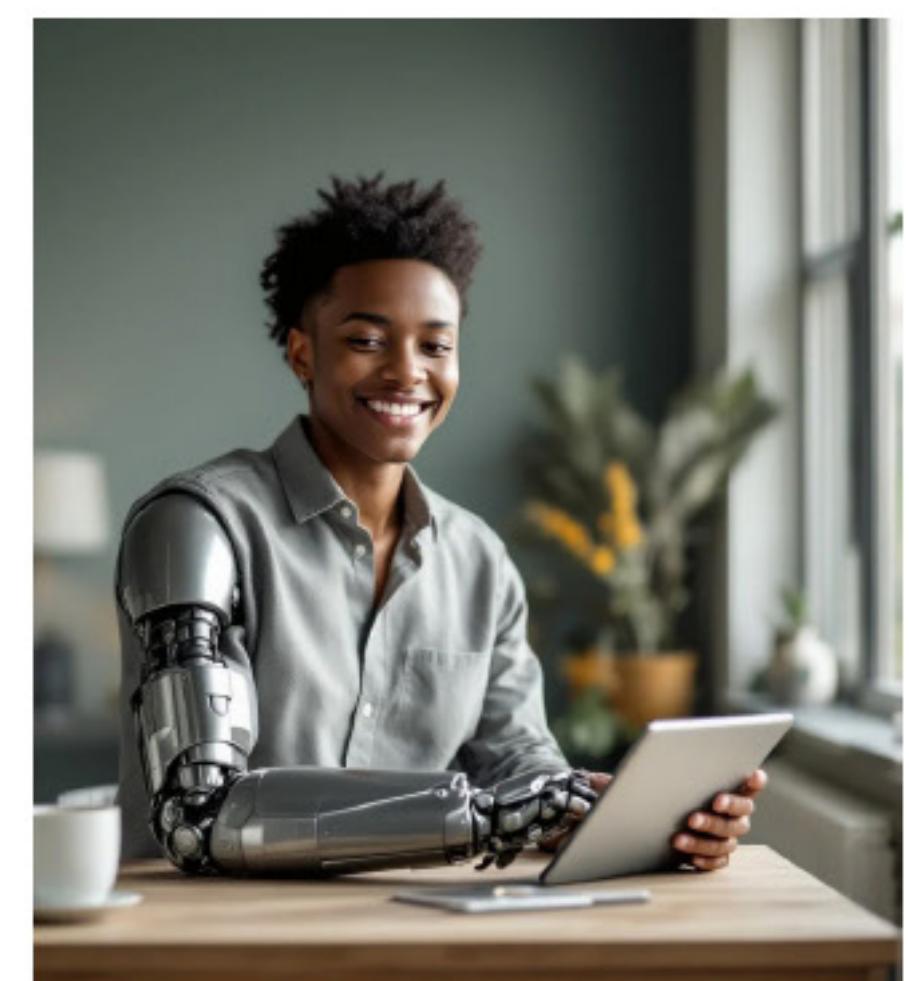
However, Ghana's carbon market must adhere to principles of integrity, accountability, and transparency. Ensuring that credits represent genuine emission reductions, establishing clear governance structures, and maintaining open access to project data are essential for building trust among investors and stakeholders.

### **A Path to a Sustainable Future**

As Ghana navigates its carbon market journey, it faces both challenges and opportunities. Strengthening policies to align with international standards, building local capacity, and fostering private-sector engagement will be critical

to its success. Equally important is the need to empower communities, promote equitable benefit-sharing, and prioritize inclusive development.

Ghana's commitment to sustainability, innovation, and climate resilience positions it as a beacon for other nations. The carbon market represents more than just an economic tool; it is a pathway to growth, resilience, and a sustainable future for all. By embracing bold initiatives and leveraging international partnerships, Ghana can lead Africa's transition to a low-carbon economy while inspiring the world to act decisively on climate change.



# Biography

## Dr. Iyad Al-Attar

A professional portrait of Dr. Iyad Al-Attar. He is a middle-aged man with a shaved head, wearing black-rimmed glasses and a light beard. He is dressed in a dark blue suit jacket over a light blue plaid shirt. He is standing with his arms crossed, looking directly at the camera with a slight smile. The background is a plain, light color.

Dr. Iyad Al-Attar is a mechanical engineer, air quality consultant, and a Visiting Academic Fellow in the School of Aerospace, Transport, and Manufacturing at Cranfield University for air quality and filter performance relevant to land-based gas turbines.

Dr. Al-Attar is the first associated air filtration consultant for Eurovent Middle East; most recently, he became the Indoor Air Quality (IAQ) patron for EUROVENT. Dr. Al-Attar is the Global Correspondent for Innovations and Technologies for International Filtration News (IFN) Magazine, USA. He is a strong advocate for global government to play a significant role in the governance of embedding air quality monitoring and enhancement as a pillar of the built environment. He has published many articles addressing filter media, design, and performance for HVAC and land-based gas turbine applications, emphasizing the chemical and physical characterization of airborne pollutants.

Dr. Al-Attar received his engineering degrees (BSc, MSc, Ph.D.) from the University of Toronto (Canada), Kuwait University, and Loughborough University (UK), respectively. He received his executive education from MIT and Harvard Business School, specializing in sustainability, business, and strategy. Dr. Al-Attar is reading for an MSc in sustainable urban development for air quality governance in sustainable cities at the University of Oxford. Dr. Al-Attar's current research at the University of Oxford addresses the importance of air quality inclusion as a rudiment of sustainable urban development. His research is expected to provide guidelines for engaging HVAC systems to enhance IAQ through appropriate filtration, the deployment of air quality sensing infrastructure, and sharing data with concerned authorities, enabling human occupants to know the air quality they are exposed to.

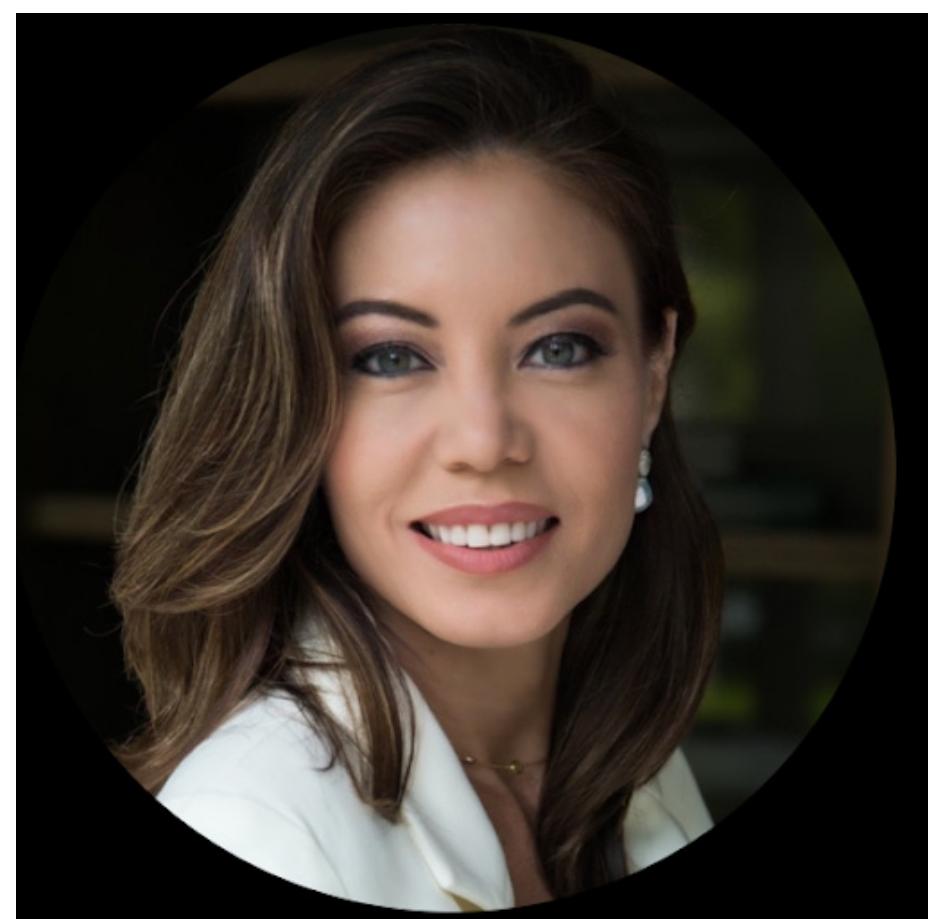
Dr. Al-Attar is a columnist for International Filtration News (IFN) USA, EUROVENT Middle East Newsletter, Climate Control Middle East Magazine, and Caloryfrio, Spain. He has also published numerous articles and blogs in Filtration + Separation, UK, and ES Engineering, USA. His publications cover urban and indoor air quality, physical and chemical characteristics of particles, and sustainable filter performance. His work has also been translated into Spanish, Portuguese, and Arabic. Dr. Al-Attar is also an editorial member and referee for the Filtration Society (UK) and the Journal of Cleaner Production.



# Utilizing Geographic Information Systems (GIS) for Climate Change Adaptation:

## *Floods, Droughts, and Resilience*

As climate change accelerates, the frequency and intensity of extreme weather events such as floods and droughts are increasing globally. These phenomena pose significant threats to human life, ecosystems, and economies. Adapting to these impacts requires robust, data-driven strategies, and Geographic Information Systems (GIS) have emerged as essential tools in climate adaptation planning. By integrating and analyzing spatial data, GIS helps identify vulnerable areas, optimize resource allocation, and support early warning systems. This article explores how GIS is being used worldwide to adapt to climate-related floods and droughts, complete with real world data and case studies.



Content Credits-Naomi Nyambura Gitiba, Sustainability and GIS Expert

### The Role of GIS in Climate Change Adaptation

GIS provides a spatial framework for analyzing climate risks, assessing vulnerability, and implementing adaptation strategies. Through layered mapping, GIS enables stakeholders to visualize relationships among climate variables, socio-economic data, land use, and infrastructure. These insights are crucial for both short-term disaster response and long-term resilience building.

In adaptation contexts, GIS applications commonly include:

- Risk and vulnerability mapping
- Hydrological and meteorological modeling
- Infrastructure and land-use planning
- Early warning and decision support systems
- Community engagement and awareness

### Flood Risk Mapping and Management

Floods are among the most devastating natural disasters, exacerbated by rising sea levels and erratic rainfall. GIS helps authorities assess flood-prone areas, simulate inundation scenarios, and plan mitigation infrastructure.

#### Case Study: Bangladesh; Community Flood Resilience Using GIS

Bangladesh experiences severe monsoon floods annually. The Institute of Water Modelling (IWM) developed a GIS-based flood forecasting and warning system integrated with mobile alerts.

- Data Insight: The system integrates data from 400 hydrological monitoring stations and remote sensing sources, including MODIS and Sentinel-1 imagery.
- Impact: With 72-hour flood forecasts, vulnerable communities receive early warnings, enabling timely evacuation and safeguarding of assets. The UNDP reported a 30% reduction in flood-related fatalities in pilot regions.

#### Urban Flooding and Drainage Planning

Urbanization increases impervious surfaces, intensifying surface runoff and urban flooding. GIS models runoff patterns, evaluates drainage system capacity, and suggests improvements.

#### Example: Lagos, Nigeria

In Lagos, the government used GIS to identify neighborhoods vulnerable to flash floods. Data layers included rainfall intensity, topography, population density, and stormwater drainage networks. These insights led to the redesign of drainage systems in high-risk areas such as Ikoyi and Victoria Island.

#### Drought Monitoring and Agricultural Planning

Droughts reduce water availability and agricultural productivity, threatening food security and livelihoods. GIS supports real-time drought monitoring, agricultural planning, and water resource management.

#### Case Study: United States; US Drought Monitor

The U.S. Drought Monitor combines satellite imagery, climate data, and GIS to provide weekly maps of drought conditions.

- Data Insight: Sources include NASA's SMAP satellite (Soil Moisture Active Passive), NOAA precipitation data, and ground-based sensors.
- Impact: The data is used by federal agencies to trigger drought relief programs and by farmers to make irrigation and planting decisions. In California's Central Valley, targeted water-saving measures reduced agricultural water usage by 20% during the 2012–2016 drought.

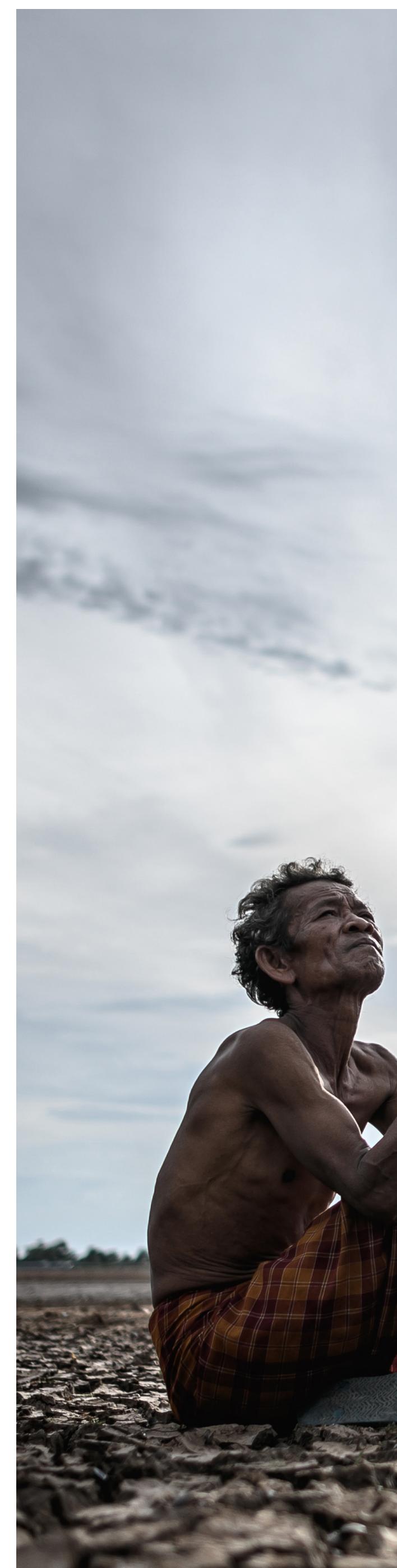
#### Case Study: Kenya; GIS for Drought Preparedness in Arid Lands

Kenya's National Drought Management Authority (NDMA) uses GIS to assess vegetation health, monitor rainfall trends, and manage water points in arid and semi-arid lands (ASALs).

- Data Insight: NDMA integrates MODIS NDVI (Normalized Difference Vegetation Index), CHIRPS rainfall data, and community survey data.
- Impact: The system supports the Hunger Safety Net Programme, which provides early cash transfers to households in drought-affected counties. In 2022, over 100,000 households benefited from early interventions.

#### Water Resource and Infrastructure Management

Drought adaptation requires careful management of water infrastructure such as dams, boreholes, and irrigation canals. GIS helps map water assets, monitor usage patterns, and optimize distribution.





### Example: Australia; Murray-Darling Basin Management

Australia's Murray-Darling Basin Authority (MDBA) uses GIS for integrated river basin management. By analyzing spatial data on rainfall, river flow, soil moisture, and water demand, MDBA coordinates water allocations during drought periods.

- Impact: GIS-enabled monitoring has contributed to water use efficiency improvements of up to 30% in irrigated agriculture.

### Early Warning Systems and Emergency Response

Timely warning and response are critical for climate adaptation. GIS is central to designing early warning systems (EWS) by integrating meteorological forecasts, sensor data, and geospatial analytics.

#### Case Study: India; Integrated Flood EWS in Assam

India's Central Water Commission partnered with Google and the World Bank to launch an AI driven flood forecasting system in Assam using GIS.

- Data Insight: The system uses Sentinel-2 imagery, Google Earth Engine, and hydrological models to forecast floods in real-time.
- Impact: In 2021, over 200 villages received early flood alerts, reducing economic losses and casualties.

### Climate Vulnerability and Adaptation Indexing

GIS is instrumental in creating vulnerability indices that combine physical exposure, socio economic sensitivity, and adaptive capacity.

#### Example: South Africa; Vulnerability Mapping for National Climate Adaptation Strategy

South Africa's Department of Environment, Forestry and Fisheries (DEFF) developed GIS-based vulnerability maps to guide resource allocation.

- Data Insight: Indices incorporated population density, poverty levels, water availability, land cover, and climate projections.
- Impact: These maps informed climate-smart investments in agriculture, health, and infrastructure in high-risk municipalities.

### Community Engagement and Participatory Mapping

GIS also supports participatory adaptation planning by involving local communities in mapping their risks and resources.

#### Case Study: Nepal; Participatory Flood Mapping in Terai Region

The International Centre for Integrated Mountain Development (ICIMOD) trained local communities in the Terai region to use GPS devices and mobile GIS apps to map flood-prone areas.

- Impact: The resulting community maps were incorporated into district disaster preparedness plans, enhancing local ownership and responsiveness.

### Challenges and Limitations

Despite its benefits, GIS-based climate adaptation faces several challenges:

Data Gaps: In many developing regions, spatial data is limited or outdated.

Capacity Constraints: Technical expertise is needed to manage GIS platforms and interpret results.

Funding and Sustainability: Long-term operation of GIS systems requires investment and institutional support.

Ethical Considerations: Mapping vulnerable populations must be done with respect for privacy and community rights.

### Future Directions

The future of GIS in climate adaptation lies in technological convergence. Innovations such as AI, machine learning, and IoT are enhancing the predictive power of GIS. For example, AI can identify early patterns of drought stress from satellite imagery faster than traditional methods.

Cloud GIS platforms (e.g., ArcGIS Online, Google Earth Engine) are improving accessibility, especially for low-resource settings. Mobile-based GIS apps are empowering communities to contribute to data collection and monitoring.

Additionally, open-source platforms like QGIS and open data portals (e.g., Copernicus, OpenStreetMap) are democratizing access to spatial tools for climate adaptation.

### Conclusion

Geographic Information Systems have proven indispensable in adapting to the impacts of climate change, particularly floods and droughts. From predictive modeling and early warning systems to community mapping and infrastructure planning, GIS provides actionable insights that enhance resilience. As the climate crisis deepens, scaling up GIS applications while addressing challenges of access, data quality, and capacity will be critical to safeguarding communities and ecosystems worldwide.

With case studies from the Netherlands, Bangladesh, the U.S., Kenya, and beyond, it is clear that GIS is not just a technical solution but a transformative approach to climate adaptation. By continuing to innovate and invest in geospatial intelligence, we can build a more prepared and resilient world.



By Ana Catalina Suárez Peña, Senior Director, Strategy and Innovation,  
The Global FoodBanking Network  
Special Contribution to The Times of Africa

# Feeding Africa's Future:

## *How Food Banking Systems Are Addressing Climate Change and Food Security*

In a continent where climate change threatens agricultural productivity and food security for millions, an innovative approach is creating a triple win for communities, the environment, and sustainable development. Food banking networks across Africa are demonstrating how recovering surplus food can simultaneously address hunger, reduce greenhouse gas emissions, and create resilient food systems—a model that deserves greater attention in our collective climate action strategy as we approach critical global forums including UNFSS+4 and COP30 in Belém.

### The Challenge: Food Loss and Waste in Africa

According to FAO (2019), the food loss and waste situation in Africa represents both a significant challenge and a potential solution. Their research indicates that Sub-Saharan Africa loses approximately 37% of its food production, equivalent to 120-170 million tonnes per year with an estimated value of US\$48 billion—comparable to the region's food import expenditure and theoretically sufficient to nourish 300 million people. Unlike medium and high-income countries where consumer waste predominates, African food losses occur primarily (up to 95%) within production and distribution chains before reaching consumers (World Bank, 2020). Small-scale farmers, who constitute approximately 70% of Africa's food producers, experience 30-40% losses mainly during harvesting and storage phases. Nutritionally crucial foods experience the highest loss rates: fruits and vegetables (40-50%), roots and tubers (30-40%), and grains (15-25%) (APHLIS, 2022).

This paradox has significant economic potential. A 2023 study by the International Food

Policy Research Institute found that halving food loss and waste could contribute an additional 2% increase in GDP, lift millions out of poverty, and improve diets—with the greatest gains coming from reduced on-farm losses.

Despite these challenges, food banking in Africa has experienced remarkable growth. In 2019, GFN supported just 7 countries with 7 food banks that distributed 4.5 million kilograms of food. By 2024, this network has expanded to 15 countries with 16 food banks, distributing more than 26 million kilograms annually—a nearly sixfold increase. While food banking as a climate and hunger solution is still relatively new to Africa and requires continued advocacy, it benefits from aligning with deeply ingrained cultural traditions of food sharing. This overlap between modern food banking and traditional practices creates natural synergies that honor indigenous knowledge while building community-led solutions to contemporary challenges.

### The Hidden Climate Solution in Food Recovery

When food is wasted and sent to landfills, it doesn't just represent lost nutrition—it actively contributes to climate change. Decomposing food in landfills produces methane, a greenhouse gas 25 times more potent than carbon dioxide. The environmental impact is particularly severe in Africa, where waste management infrastructure is often limited. Food banks, community-based organizations, address this challenge by recovering surplus food from various sources—including farms, manufacturers, retailers, and distributors—that would otherwise go to waste. African food banks focus heavily on agricultural recovery—working directly with smallholder farmers who produce most of the region's food. These organizations collect, sort, store, and redistribute food through networks of community partners like schools, healthcare facilities, and social service organizations. Many African food banks operate with limited infrastructure, developing innovative solutions like mobile collection units and community-based preservation methods. They often integrate with existing community structures and traditional food sharing practices, creating an effective blend of modern logistics and indigenous approaches to address both food waste and hunger simultaneously.

To demonstrate this impact, The Global FoodBanking Network developed the FRAME methodology (Food Recovery and Measurement) to quantify this often-overlooked aspect of climate action. The FRAME methodology transforms food banking from a purely humanitarian effort into a measurable climate and social solution. By quantifying the contribution to four Sustainable Development Goals - SDG, SDG 2 (Zero Hunger), SDG 12 (Responsible Consumption) and SDG 13 (Climate Action), it provides the hard data

stakeholders need to evaluate and scale interventions. Two African food banks, Banque Alimentaire Côte d'Ivoire and FoodForward South Africa, are currently piloting this approach, helping build a robust evidence base that will strengthen the case for food recovery as a critical climate and development strategy.

The significance of this work is highlighted by the fact that currently, GFN and its member food banks recover less than 1% of global food waste—revealing the enormous untapped potential for climate impact through scaled food recovery operations.

As climate change disrupts African agricultural systems through erratic rainfall, rising temperatures, and extreme weather, food banks serve as critical intermediaries by providing consistent access to nutritious food, maintaining distribution channels during disruptions, building community resilience, and supporting social protection systems.

## African Success Stories: Food Banking in Action

Food banking organizations across Africa are demonstrating the powerful potential of this model. Two standout examples show how comprehensive food recovery systems are transforming local communities while addressing climate imperatives:

Food Banking Kenya has developed an innovative multi-faceted agricultural recovery program consisting of three pil-

lars: collecting surplus product from commercial farms (12 farms across three countries), partnering with 600 smallholder farmers who collectively produce 80% of Kenya's agricultural output, and recovering surplus from five packhouses that primarily serve the export market. Since 2022, Food Banking Kenya has served over 811,000 people and recovered more than 1.5 million kilograms of food through their virtual and warehouse-based model. More than 80% of this recovered food comes from agricultural recovery programs—highlighting the tremendous potential in preventing on-farm waste. Across South Africa, Food Forward SA has built an impressive food recovery system that serves 920,000 beneficiaries daily through 2,500 vetted beneficiary organizations. They recover food from across the supply chain—from farms to retail—providing 87 million meals annually at a remarkably low cost of just R0.47 (approximately \$0.03 USD) per meal.

Their operations have saved 113,152 tons of greenhouse gas emissions while distributing 21,760 tons of food. More than 85% of their beneficiary organizations offer vital services such as education, skills development, healthcare, and support for vulnerable populations.

## Scaling the Solution: What's Needed Next

Through cross-sector collaborations, food banks strengthen food recovery initiatives with a particular focus on high nutritional value foods that experience high rates of loss. Recent success stories include Ecuador's food bank being recognized by the government as a climate initiative, Thailand's Scholars of Sustenance food bank being invited by the Ministry of Natural Resources and Environment to help reconfigure the country's Food Waste Management Plan, and South Africa's Food Forward working to include food loss and waste reduction in the country's updated Nationally Determined Contribution.

To scale this approach across the continent, several key investments and policy changes are needed:

**For Government Partners**, regulatory frameworks that encourage food donation while maintaining safety standards are essential. The Global Food Donation Policy Atlas, de-

veloped by GFN and Harvard Law School, provides recommendations for effective legislation. Tax incentives for corporate food donors can dramatically increase available food resources, while formal recognition of food banks within national climate strategies (including NDCs) ensures institutional support.

**For Corporate Leaders**, move beyond CSR to strategic partnerships that create shared value. Address internal logistical challenges that inhibit efficient donation, companies



can contribute logistics expertise, cold chain technology, and management systems. Consider “insetting” models where food companies invest directly in improving the capacity of food banks within their supply chains, allowing them to claim associated emissions reductions while strengthening food recovery infrastructure.

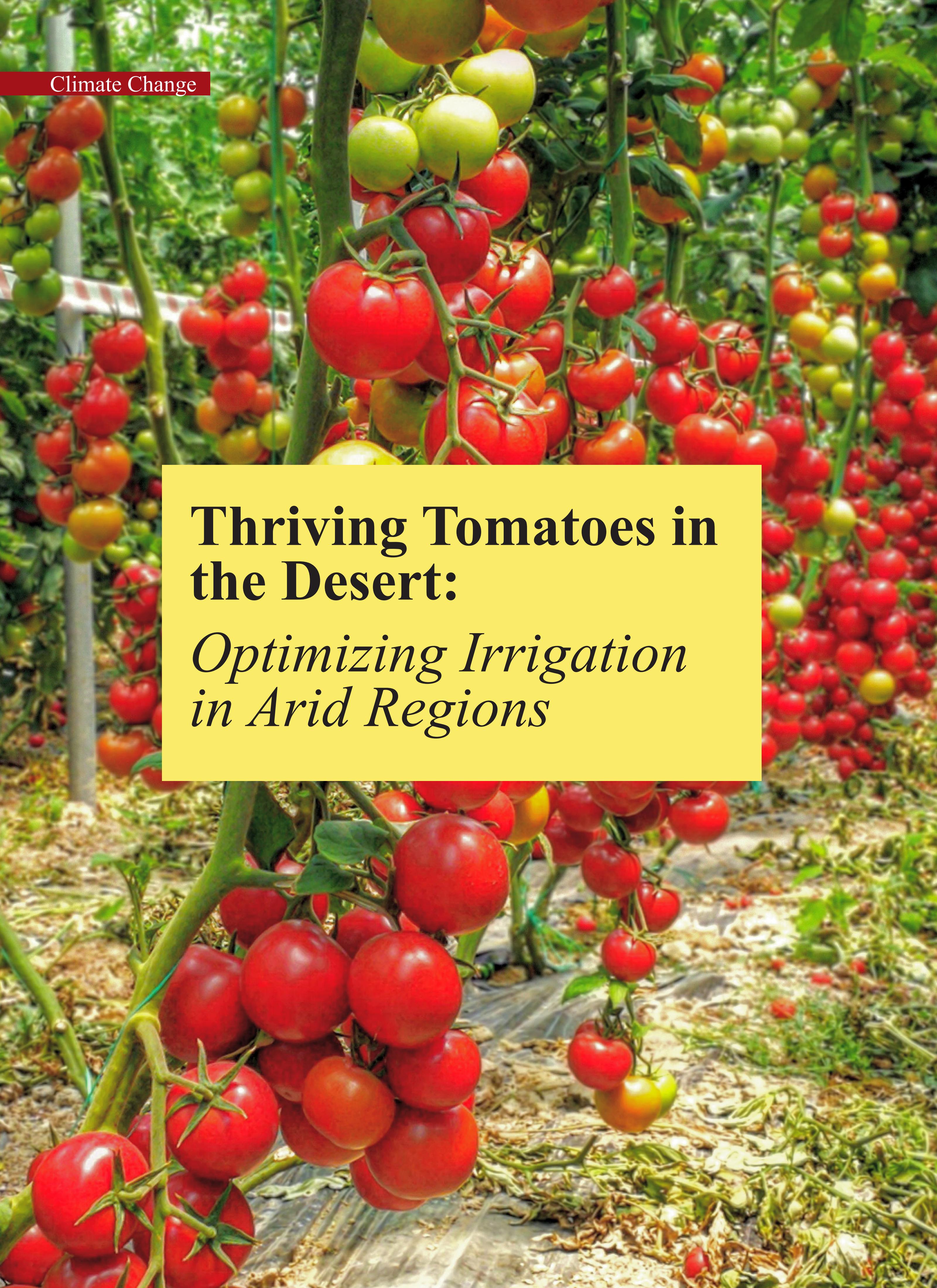
**For Multilateral and Financial Institutions**, create financing mechanisms that recognize the triple impact of food banks (environmental, social, and economic).

The evidence is clear: food banking works as both a climate and nutrition solution. But to reach its potential, we need formal recognition of food recovery as a strategic climate intervention, inclusion of specific food recovery policies in recommended regulatory frameworks, and concrete financing mechanisms that adequately value the multiple dimensions of food banks' impact.

Ana Catalina Suárez Peña is a seasoned senior executive with over 20 years of experience in administrative, legal, and management roles across public, private, and non-profit sectors. She holds advanced degrees in law, sustainable development, and senior management from Colombian universities. Currently serving as Strategy and Innovation Senior Director at The Global FoodBanking Network, she leads food loss and waste prevention strategies with a critical focus on environmental and climate initiatives, particularly methane reduction. Her expertise spans social, environmental, and economic project management, with a strong emphasis on addressing poverty and food security through collaborative, structured approaches.

*For more information on food banking as a climate, social and economic solution, contact [asuarez@foodbanking.org](mailto:asuarez@foodbanking.org) or visit [www.foodbanking.org](http://www.foodbanking.org).*

# Thriving Tomatoes in the Desert: *Optimizing Irrigation in Arid Regions*



Food security is a growing concern, especially in arid regions where water scarcity and climate change pose significant challenges. In the United Arab Emirates (UAE), a nation characterized by its arid climate, innovative approaches to agriculture are crucial. A recent study titled "Determination of irrigation requirement for tomato using FAO-CROPWAT model in the Arid Region" and published in the Journal of Aridland Agriculture sheds light on how technology can help overcome these challenges, focusing on the efficient cultivation of tomatoes, a globally popular and nutritious crop.

The research was conducted by Dr. Suzan Shahin, Environmentalist, Assistant Professor, College of Arts and Science, and Head of Innovation and Entrepreneurship Center at Umm Al Quwain University (UAQU). Also, a UAE Chapter Leader at Women in Renewable Energy (WiRE).

### The Challenge of Growing Tomatoes in the Desert

Tomatoes are a staple in diets worldwide, valued for their taste, versatility, and health benefits. However, they are also water-intensive, making their cultivation in arid regions particularly difficult. Climate change exacerbates this issue, with rising temperatures and unpredictable rainfall patterns further straining limited water resources.

### A Technological Solution: The FAO-CROPWAT Model

To address this challenge, Dr. Shahin turned to the Food and Agriculture Organization (FAO)'s CROPWAT model. This advanced tool simulates how crops respond to different irrigation strategies, taking into account climate, soil, and crop-specific data. By using CROPWAT, scientists can determine the precise amount of water needed for optimal tomato growth in a specific location.

### Ras Al Khaimah: A Case Study in Arid Agriculture

The study focused on Ras Al Khaimah (RAK), one of the seven emirates of the UAE. RAK was selected due to its relatively fertile soil compared to other regions in the UAE, making it a promising location for agricultural development. Researchers collected climate data from the Ras Al Khaimah International Airport spanning thirty years (1971-2000) and combined it with detailed information about tomato plants and local soil conditions. This data was then fed into the CROPWAT model to calculate the ideal irrigation schedule for tomatoes in RAK.

### Key Findings: Tailoring Irrigation to Tomato Growth

The study revealed that the irrigation needs of tomatoes in RAK vary significantly throughout the growing season. The highest water demand occurs during the early and mid-growth stages, with a peak requirement of 34 millimeters per ten-day period in October. Initially, frequent irrigation is necessary to establish the plants, but as they mature and their root systems develop, the frequency can be reduced.

### The Importance of Effective Rainfall

The research also highlighted the importance of considering rainfall patterns. While RAK receives limited rainfall, primarily during the winter months, even small amounts can contribute to the water needs of the plants. By accounting for effective rainfall, farmers can further optimize their irrigation practices and conserve precious water resources.

### Practical Implications for Farmers and Policymakers

The findings of this study have significant implications for farmers, farm owners, and policymakers in arid regions. By using tools like CROPWAT, they can:

- **Optimize water use:** Reduce unnecessary water loss and ensure that tomatoes receive the precise amount of water they need for optimal growth.
- **Improve crop yields:** By meeting the water demands of tomatoes at critical growth stages, farmers can increase their yields and improve the quality of their produce.
- **Promote sustainable agriculture:** Efficient irrigation practices contribute to the long-term sustainability of agriculture in water-scarce regions.

- **Enhance food security:** By enabling the successful cultivation of essential crops like tomatoes, these practices contribute to food security in arid environments.

### Looking Ahead: Expanding the Scope and Sharing Knowledge

The research recommends expanding this study to other emirates in the UAE to determine the optimal irrigation strategies for tomatoes in different regions. They also suggest investigating ways to minimize water requirements even further to promote sustainable tomato cultivation and food security across the country.

Furthermore, the study emphasizes the importance of sharing these findings with farmers, land owners, and decision-makers through awareness campaigns and workshops. By communicating the benefits of advanced irrigation modeling tools and promoting best practices, the UAE can ensure the widespread adoption of sustainable water management strategies.

### A Path Towards Sustainable Agriculture in Arid Lands

This research demonstrates the power of technology to overcome the challenges of agriculture in arid regions. By using advanced modeling tools like FAO-CROPWAT, farmers and policymakers can optimize irrigation practices, conserve water resources, and ensure the sustainable production of essential crops like tomatoes. As climate change continues to threaten food security in water-scarce environments, these innovative approaches will be crucial for building resilient and productive agricultural systems.

*Content Credits- Suzan Marwa*



# Insuring the Future: *The Untapped Power of Africa's Insurance Sector in Driving Climate Action*



Content Credits- Gifty Owusu

ESG & Climate Change Analyst / Researcher in Climate Justice, Sustainable Mining & Just Transition / Sustainability Consultant / Founder of The Future Climate Ghana

pacity, and innovation when it comes to climate action. Many insurers are still focused on conventional products and short-term returns, missing the emerging global demand for green insurance products and sustainable investment strategies. The sector has the tools—but not yet the mindset—to respond meaningfully to climate challenges.

What we need now is a shift. A shift in education, where insurance professionals are trained to understand climate risk and sustainable finance. A shift in policy, where regulators encourage green investment and support innovation in insurance products. A shift in collaboration, where insurers partner with governments, civil society, and technology providers to scale climate solutions.

Africa has the opportunity to lead. With its youthful population, abundant natural resources, and increasing digital connectivity, the continent is well positioned to pioneer climate-smart insurance models that protect lives, empower communities, and build long-term resilience. But this will require the collective will of the industry—and indeed, all sectors—to see climate not as a niche issue, but as a central pillar of economic stability and social well-being.

The truth is, climate action is not reserved for those with an environmental science degree. It is the responsibility of all of us, regardless of our backgrounds or industries. The insurance sector, with its unique lens on risk and its reach into every facet of society, must recognize its role and rise to meet the moment.

*We are all players in this fight. And unless every sector—insurance included—joins in with intention and urgency, the cost of inaction will be too great to bear.*

## References:

- African Climate Foundation. (2024). *Scaling insurance for climate resilience in Africa*. Retrieved from [africanclimatefoundation.org](http://africanclimatefoundation.org)
- African Development Bank. (2025). *Africa Climate Risk Insurance Facility for Adaptation (ACRIFA)*. Retrieved from [afdb.org](http://afdb.org)

# From the Roots Up:

## *How a Nigerian Clean Energy Pioneer is Rewriting Africa's Climate Story*

By Suraj Wahab, Founder and CEO of Toyola Energy

*In a world increasingly defined by climate anxiety, there is something profoundly hopeful about stories that start small and grow big. This is one such story. It begins under the shade of a mango tree in Ghana, where a Nigerian entrepreneur began assembling improved cookstoves by hand. He had no factory, no funding from local banks, and no roadmap—just lived experience, conviction, and an unwavering sense of purpose.*

### A Seed Planted in Smoke

Long before carbon finance or clean energy entrepreneurship entered his vocabulary, the founder of Toyola Energy was a child in a smoke-filled kitchen, gasping for air while his mother cooked with firewood. That exposure to indoor air pollution left him with chronic respiratory illness, but it also planted a seed: “Someday, I’ll find a better way for families like mine to cook.”

That seed began to sprout decades later when, after investing every kobo he had into his clean cookstove vision, he became so broke he couldn’t pay his son’s GHS 80 (\$5) school fee. Too proud to keep begging teachers, he withdrew the boy from school and began homeschooling him. Years later, he watched that same boy graduate from a major British university—tears streaming down his face.

### When Banks Said No, a Mango Tree Said Yes

The journey began in Ghana, under that mango tree, where the first stoves were built with locally sourced materials. The turning point came when E+Co, a US-based impact investor, took a bet on his vision. With that seed capital, he launched West Africa’s first registered carbon offset project and went on to build Toyola Energy, which now operates in seven West African countries and has offices in Europe and the Middle East.

### Stories that Prove Climate Action Is Human

Gina, a struggling market woman in Accra, once approached him with a plea: “Give me five cookstoves on a sale-or-return basis. I have no money, but I can sell them.” He agreed. Today, Gina is one of his top retailers—she built a house for her family from the proceeds.

In a remote village, a 104-year-old woman still remembers buying her Toyola stove nearly 20 years ago. On a recent visit, she greeted him warmly and asked, “Do you still sell those stoves?” When he replied yes, she whispered, “Never stop selling them. They change lives.” That moment, he says, “broke something open in me.”

One mother told Toyola’s team that she used the money saved on fuel to buy her stove outright. Another said her children no longer coughed through the night. These are not marketing lines; they are proof that clean cooking is one of the most powerful tools for climate justice and public health.

### From Local Innovation to Global Leadership

Today, Toyola Energy is Nigeria’s highest generator of Gold Standard-certified cookstove carbon credits. Its Community Clean Cooking Enterprises (CCCEs) train women and youth to manufacture stoves using 100% local raw materials. Active in Lagos, Kaduna, Ondo, Nasarawa, Oyo, and Osun states, each CCCE is a self-sustaining micro-factory and climate innovation hub.



## Toyola's impact has earned it global recognition, including:

- Ashden International Gold Award for Sustainability
- African Energy Awards
- Special Achievement Awards for Creating local markets.

Its founder has spoken at major global forums and met world leaders such as King Charles III, President Bill Clinton, and late former UN Secretary General ,Kofi Anan, sharing insights on how Africa can lead the climate transition through community innovation.

### Nature Integrated Offsets (NIOs): Next-Gen Climate Solutions

Toyola's latest evolution is the Nature Integrated Offsets (NIOs) program, reinvesting carbon revenues into:

- Bamboo cultivation and agroforestry
- Briquettes from agricultural waste

The goal is a fully circular clean cooking ecosystem powered by local labor, local fuel, and climate finance—a model that can scale across the continent.

### A Call to Governments, Investors, and Citizens

What Toyola Energy has achieved is not a miracle. It is what happens when courage meets community, when failure becomes fuel, and when climate action is rooted in lived experience.

If African governments establish supportive policy frameworks, if buyers appreciate the value of high-integrity, community-driven credits, and if young entrepreneurs are given opportunities, Africa has the potential to become the world's clean cooking capital.

And if you ever doubt the power of a simple stove to change the world, just remember the old woman who whispered,

*“Don’t stop.  
They change lives.”*



# Harnessing Carbon Markets for International Climate Finance

Carbon markets hold this huge potential for unlocking finance for both climate and Africa, but untapping it isn't easy. My story on this continent has just begun and is woven into the stories of others, already here, already protecting our planet. So, I invite you to listen to the stories of trailblazing friends on the ground and just share an introduction to the work they do and call to action for those looking to write their own climate stories.

## An awakening

I lived oblivious with regards to carbon markets for most of my life. I'm not proud of that but I want to be honest and highlight that even among the most educated, there is naivety and Discovering carbon markets is like taking the red pill and falling down the rabbit hole, you can't unlearn and unsee. It is a singular trajectory. I now work to provide a bridge between carbon projects in Africa and international finance, and it's immensely rewarding, but I largely live on the other side of the coin. Like many in the west, my climate action lives within the boundaries of capitalism and my ability to keep working in the space requires playing the game and finding the path to drive off revenues not philanthropy.

## The role of markets

As a believer in markets (that they enable the allocation of goods and services in the most resource efficient manner), when I stumbled upon the international trade of carbon



By: Melissa Lindsay, founder and CEO of carbon origination platform Emsurge and carbon brokerage, Emsurge.

credits at a wholesale level, I fell in love. The solution seemed so simple and eloquent. Have those who want to continue generating carbon emissions, buy credits from those who are willing to remove or reduce carbon emissions. This could scale and create huge flows of capital from the global north that has caused climate change, to the global south who are now suffering the brunt of climate change. Sound simple? Unfortunately, not. The deeper you dive into it, the more complex it becomes.

*It is not enough to just plant a tree or use a clean cooking stove that reduces wood consumption or protect your local forest from being clear cut. You need to prove it, and you can't do it personally. To qualify for climate finance, the activity can't occur in the absence of said finance. Meaning if common sense or economics alone encourages a positive behaviour, you can't be rewarded for it in the future. Moreover, the carbon credit generated needs to be from a project designed in accordance to an approved methodology (normally international), be validated and verified by a third-party, and finally be issued by a recognised carbon standard on an associated public registry. This generally means Africa needs to not only partner with the west to secure demand for carbon, but to create the qualifying supply.*



## What is a tonne of carbon?

Even after all this, a tonne is not a tonne. Some tonnes are 'better' than other tonnes. It's a bit like art, some perception of value is real (cost of materials, time taken, skill), the rest is personal taste. For your carbon credits to command the highest premium (\$100-600/tonne), they need to offer the buyer assurances of permanence (100 or even 1000 years plus carbon removal), despite having less than 25 years to solve the problem.

Alternatively, to attract buyers they can be charismatic – telling a story that resonates with people and solving for multiple other sustainable development goals. These credits can trade anywhere between (\$0.30-\$50/tonne). The result is a market that can value



community and planetary benefits, such as labour, redistribution of income, cleaner air, gender equality and biodiversity.

### Voluntary vs compliance

If you take the red pill, you will learn about voluntary versus compliance markets. Voluntary being where certificates for each verified tonne of carbon removed or reduced (carbon credits) are bought, traded and retired by companies voluntarily. These are sometimes referred to as 'carbon offsets', but an offset is simply a use case of a carbon credit. Compliance carbon markets are those with government construct and oversight. This is important because another key factor that can influence price is the fungibility of the credit. As a project developer, you ideally need to consider which nuanced carbon market(s) you want to target selling your credit into before you design your project. The methodology and carbon standard you pick will influence the route to market, economic viability and success of your project.

A compliance market can take the form of a cap-and-trade system or a carbon tax. In a cap-and-trade market, the government issues a restricted number of permits to pollute – carbon allowances, such as European Allowances (EUAs) that are traded in a regional Emissions Trading Scheme (EU ETS). Governments may choose to use a carbon tax to reduce carbon emissions. Both schemes, may elect to allow verified carbon credits that would otherwise be sold in the voluntary market. These selections of qualifying credits tend to be highly restrictive and unique to each scheme. I consider voluntary carbon credits that can be used to meet compliance obligations quasi-compliance. With so many compliance markets emerging, project developers in Africa need to research which are likely to command the highest prices over the lifetime of their project. At the moment, it is challenging to design for multiple compliance markets and chasing conformity, may drive up costs unnecessarily for voluntary buyers.

### Article 6, a global compliance market

To add to the complexity, a new global carbon compliance market is emerging and being supported by many African states, thanks to the Paris Agreement, a legally binding international treaty on climate change. Specifically, Article 6, presents a mechanism for countries to trade carbon and collaborate on achieving their climate goals (Nationally Determined Contributions). To comply with Article 6, and essentially export sovereign carbon, governments must put into law an Article 6 framework which explicitly permits the export of carbon credits from a domestic project for the use in claims by another country or entity.

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To some, Article 6 represents the holy grail of voluntary carbon markets, to others, it is an accounting system for governments that shouldn't trouble corporates. I personally believe it provides a path to achieving the scale we require for carbon markets to make a real dent on global emissions. Projects delivered with the support of governments, but that would not have happened without climate finance, raise global ambition. For every credit exported, a country must increase its own target, giving a buyer two tonnes of impact (provided governments do as they promise) for every one tonne.

### *The next chapter*

In my view, the most pragmatic approach to decarbonisation is to pair emissions from sectors like oil and gas with carbon credits. Carbon markets can spur innovation. The economic viability of renewables is a carbon success story. So even if you work in a heavy emitting industry, you can and should be embracing the carbon markets. Building demand is essential in supporting the flow of climate finance to Africa.

# Treasuring African Votes & Voices

## *Redefining Growth Through Air Quality Governance in a Rapidly Urbanizing African Countries*

We often hear of countries celebrating rapid urbanization where success is measured by how measured by the number of paved thoroughfares and skyscrapers, how technologies are deployed and the extent to which the Sahara Desert and forests are being claimed by asphalt and concrete.

However, for such urban development to be sustainable, success metrics need to be established so that nations compete fairly and access energy sources equitably, where developing countries can embrace a model of sustainable development rather than chronic dependence. The relentless march to urbanization is a defining characteristic of our time. But is this singular vision of urban success truly sustainable? And more importantly, does it pave ways to equitable prosperity?

It may be a fair and complex question to ask why developing countries must follow a sustainable trajectory to prosperity when developed countries did not emerge towards development in the early 20th century. Developed countries industrialized rapidly in the 19th and 20th centuries, using cheap fossil fuels, often with little regard for environmental consequences. They built their wealth and infrastructure without the constraints now being asked of developing nations. Today, we face climate change consequences due to rapid industrialization and exploitation of cheap fossil fuels, often with little regard for environmental impacts. Many countries built their wealth and infrastructure without the constraints now being asked of developing nations.

Although infrastructure and technological advancements are undeniably crucial for progress, measuring success solely on them risks overlooking unchecked urbanization's profound social, environmental, and economic implications. For true sustainability, as indicated by former US President Barak Obama during his climate speech in 2014, we need a paradigm shift in how we measure urban development, establishing metrics that foster fair competition, ensure equitable access to energy resources, and empower developing nations to embrace a model of sustainable growth rather than perpetual dependence [1].

The current emphasis on purely physical and technological metrics often fuels a race where nations with greater financial and resource capacity inevitably surge ahead. A competition of loaded dice and different starting points leaves developing countries struggling to keep pace, potentially locking them into unsustainable development pathways that prioritize short-term gains over long-term well-being. The environmental costs of this model are also becoming increasingly apparent, from escalating carbon emissions and resource depletion to habitat loss and the exacerbation of climate change impacts. Prioritize rapid progress over all other concerns to leapfrog in an attempt to catch up with their developing counterparts on their path to prosperity, resulting in catch up strategies that are frequently unsustainable and detrimental to the environment.

At the 8th Urbanization and Poverty Reduction Research Conference at the World Bank in 2024 in Washington, Mrs. Y. Aki-Sawyerr, the mayor of Freetown, Sierra Leone, encouraged participants to explore the meaning of "growth." She addressed the question of whether population size or economic growth is more crucial. She used Freetown to illustrate the government's role in managing growth effectively, emphasizing that urbanization stems from both rural-urban migration and the impact of climate change on subsistence farmers. With 70% of Freetown's population under 35, she noted that population growth must be paired with economic strategies to enhance living standards and reduce vulnerabilities. The lack of resilience has contributed to issues like deforestation



By: Dr. Iyad Al-Attar

and the emergence of informal settlements. Ultimately, the government's role is vital in ensuring that urbanization translates to economic productivity and sustainable growth. As urbanization continues, there is an increasing emphasis on public health and well-being. However, expanding urban areas beyond the capacity of a city's healthcare facilities and sanitation systems poses significant risks. It is essential to provide clean air and water while promoting environmental awareness. From the perspective of indoor air quality (IAQ), making a significant impact on public health and well-being requires considerable education and awareness.

Does Africa have the energy resources, HVAC infrastructure, and filtration systems necessary to make its built environment livable? Can the continent hope to enjoy the benefits of clean air in the face of challenges posed by rising fossil fuel combustion? Ultimately, providing shelter means ensuring safe, clean, and healthy living conditions, complete with access to fresh air and proper sanitation.

Trying to promote enhanced IAQ amid the widespread informal settlements and poorly constructed houses, especially in the absence of good ventilation systems, leads to trapping pollutants inside and subjecting inhabitants to great health risks. Continuing to assume that raising the bar of IAQ is tethered to energy-efficiency approvals neglects the simple truth that saving one life is worth the additional energy requirement. Furthermore, even when Africa enshrines IAQ policies, enforcement will still be challenging. Establishing guidelines is part of the success equation, but ensuring those guidelines are followed is another thing, especially in places where resources might be limited.

Africa must broaden its lens and definition of urban success to move towards a more sustainable and equitable future. This requires establishing a new set of metrics that go beyond the purely tangible and incorporate crucial elements when it comes to environmental stewardship such as:

**Air and Water Quality:** Monitoring pollution levels and ensuring access to clean and safe resources indoors and outdoors.

**Ecological Footprint:** Measuring the impact of urban consumption on natural resources and waste generation.

**Green Space Index:** Tracking the availability and quality of cities' parks, urban forests, and other green areas.

**Renewable Energy Adoption:** Assessing the percentage of energy derived from sustainable sources within urban areas.

**Climate Resilience:** Evaluating the preparedness of urban infrastructure and communi-



ties to withstand climate change impacts.

By adopting such a comprehensive set of metrics, African nations can engage in more meaningful, equitable, and fairer competition. Success would be determined through a holistic approach of protecting the public health and well-being of their citizens from cognitive and hedonic perspectives. Furthermore, establishing these metrics can facilitate a more equitable distribution of energy resources. As the world transitions towards cleaner energy sources, a shared understanding of sustainable urban development can guide international cooperation and investment, ensuring that developing countries are not left behind. Instead of being locked into fossil fuel dependence, they can be empowered to advance towards sustainable energy use and build resilient urban environments from the outset.

Embracing sustainability is about purpose and profit and not about halting progress; it is about redefining success and the ways we perceive it. It is about recognizing that true urban success lies not just in the physical transformation of landscapes but in the creation of livable, equitable, and environmentally responsible cities that serve as engines of sustainable development for all nations. By embracing a broader set of metrics, we can foster a global landscape where developing countries are not merely recipients of aid but active participants in building a future where urbanization benefits all - without compromising the well-being of future generations. The time has come to move beyond the asphalt network and cultivate cities thriving in harmony with people and the planet. Quite simply, we cannot celebrate urbanizing people from poverty to pollution and clustering them into buildings envelopes of poor air quality.

The establishment of robust air quality governance in Africa is no longer a matter of environmental stewardship alone, but a critical public health priority [2]. As the continent rapidly urbanizes and industrializes, pollution levels are rising, compounding the already significant burden of respiratory and cardiovascular diseases. In many African cities, air quality levels far exceed World Health Organization (WHO) limits, yet the monitoring infrastructure and regulatory frameworks remain limited or fragmented. Without urgent action, millions will continue to be exposed to harmful pollutants, leading to preventable illness, reduced productivity, and premature deaths. At the same time, Africa faces increasing vulnerability to climate-induced emergencies—heatwaves, droughts, and wildfires—that further degrade air quality and strain already overstretched healthcare systems underscoring the need for integrated policy responses. Therefore, a strategy to ensure the unification between cohesive resilience and air quality governance is needed. This includes not only the implementation of stricter emissions standards, better data collection, and enforcement mechanisms but also the integration of air quality into broader climate adaptation and health planning. By aligning environmental and health objectives, governments can create synergies that strengthen public systems, reduce inequalities, and build more sustainable and resilient societies.

Empowering local communities with information and tools to protect themselves, while promoting cleaner energy and transport alternatives, can catalyze transformative change. Ultimately, robust air quality governance is a linchpin for safeguarding Africa's development gains and ensuring a healthier future for its growing population.

### Leading by example

Leadership emerged from specific countries such as South Africa that established guidelines for managing domestic IAQ and enshrined laws through leveraging their constitution, the National Health Act. South Africa is also monitoring air quality in cities like Johannesburg and feeding that data into their national system to get a handle on the scope of the air quality issues. On the other hand, Ghana has focused on international

partnerships with the US EPA to work on clean cookstoves and air quality management plans in its capital, Accra, making it the first African country to commit to clean cooking. Other great examples include Kenya, which is taking a regional approach by implementing lower sulfur fuel standards in collaboration with Uganda, Tanzania, Burundi, and Rwanda [3]. Many African countries are integrating air pollution education into schools and community health programs to raise awareness and promote prevention. Another testament to being on the right track is the Eastern Africa Regional Framework Agreement on Air Pollution -2008, which covers more than just IAQ and calls for provisions for cleaner energy and better ventilation in buildings. Programs such as the Africa Clean Air Programme (ACAP) represent a great starting point for induced change in regional cooperation on air pollution and climate change, building on the "Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa." Today, many African cities are participating in the Clean Air Initiative (C40), which supports cities like Addis Ababa, Dakar, Durban, Johannesburg, and Lagos in strengthening air quality management [4,5,6].

### Challenges in raising the bar of IAQ in Africa

Despite progress in awareness and policy development, many African countries still lack comprehensive IAQ governance frameworks. Key challenges include limited effective policy implementation resources, often requiring scarce financial and technical resources. Informal settlements highlighted by poor ventilation complicate IAQ improvements. Finally, socio-economic factors such as poverty and the use of biomass fuels hinder IAQ improvements, which requires transitioning to cleaner cooking technologies, which is essential but challenging.

### The African voices and votes

The timing for a compelling argument for redefining urban success metrics to prioritize sustainability, equity, and environmental well-being is imminent. In the context of Africa, this broader perspective is crucial as the continent undergoes rapid urbanization. Simultaneously, the growing awareness and concerted efforts to address the critical issue of IAQ, driven by national initiatives, international collaborations, and regional frameworks, hold immense promise for Africa and its nations. While significant challenges remain, the increasing focus on policy development, technological adoption, and public awareness signals a positive trajectory toward improving air quality and fostering healthier, more sustainable environments across Africa. While acknowledging the significant hurdles, the future for Africa can be bright as encouraging initiatives and collaborations across the continent continue to emerge. The central message emphasizes the need for African nations to actively shape their sustainability story in developing a trajectory that would leverage their agency and prioritize policies that ensure clean air and healthy environments for all citizens. For Africa to embrace a model of sustainable development rather than chronic dependence, nations must treasure their voices and votes pre and post-election day.

### Reference:

- [1] <https://obamawhitehouse.archives.gov/blog/2014/09/23/president-obama-no-nation-immune-climate-change>
- [2] Asongu, S.A. and Odhiambo, N.M., 2021. Enhancing governance for environmental sustainability in sub-Saharan Africa. *Energy Exploration & Exploitation*, 39(1), pp.444-463.
- [3] <https://www.ccacoalition.org/news/setting-motion-cleaner-fuels-and-vehicles-africa>
- [4] Borge, R., Lange, S. and Kehew, R., 2023. Analysis of air quality issues and air quality management status in five major African cities. *Clean Air Journal*, 33(2), pp.1-22.
- [5] Wright, C., Alo, B., Garland, R., Touré, N.D.E., Chirinda, N., Kituyi, E., Khomsi, K., Tchuikoua, L.B., Ozor, N., Zakari, I.S. and Liebenberg-Enslin, H., 2022. *Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa-Summary for Decision Makers. Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa-Summary for Decision Makers*.
- [6] Lode, B., 2014. *Increasing Integration in Global Climate Governance-The Climate and Clean Air Coalition. Institute for Advanced Sustainability Studies Working Paper*, Available at: [https://www.iass-potsdam.de/sites/default/files/files/rz\\_working\\_pape\\_ccac\\_0.pdf](https://www.iass-potsdam.de/sites/default/files/files/rz_working_pape_ccac_0.pdf) [accessed 9/11/21].



# Driving Precision and Sustainability

*EnE Solutions on the Future of Flow Meter Technology in India*

Environmental monitoring is no longer a compliance formality—it's a strategic necessity. As regulations tighten and industries push toward sustainability, Engineering and Environmental Solutions (EnE) is redefining how Indian businesses monitor and manage water, air, and emissions.

## Precision Flow Meters: The Pulse of Industrial Sustainability

India's industrial landscape is evolving fast. Heightened environmental awareness, stricter compliance frameworks, and the push for sustainable growth are driving an urgent need for accurate, low-maintenance monitoring systems. At EnE, we view this as a crucial opportunity to deliver context-specific flow meter solutions engineered for India's diverse field conditions.

From textile factories to wastewater treatment plants, industries are adopting precision flow meters to meet Central and State Pollution Control Board (CPCB/SPCB) mandates.

Trends reshaping the sector include:

**Regulatory Integration:** Our IoT-enabled flow meters sync directly with CPCB's data servers via our proprietary Hawk Eye cloud platform—offering seamless, secure compliance without third-party dependencies.

**Smart Monitoring:** EnE clients benefit from remote diagnostics, real-time alerts, and predictive maintenance—all powered by digital intelligence.

**Groundwater Governance:** Coupled with ultra low-powered piezometers, our flow meters enable effective tracking of water extraction in line with CGWA norms.

**Cost-Efficient Engineering:** Designed for rugged conditions, our devices offer long-lasting performance with minimal power needs—ideal for remote or resource-scarce regions.

**Enhanced Customization:** EnE's flow meters are tailored for sector-specific challenges—from sludge-heavy effluent lines in pharma and textile industries to low-volume, high-accuracy needs in food and beverage processing.

**Data-Driven Decision Making:** Integration with SCADA and enterprise dashboards enables facilities to turn flow data into actionable insights—boosting operational efficiency and sustainability metrics.

As we prepare to launch our NABL-accredited calibration lab, EnE is investing in the infrastructure needed to elevate India's precision instrumentation ecosystem.

## A Vision Rooted in Purpose: The EnE Story

Founded in 2015, EnE Solutions emerged from a simple yet bold vision: bridge the gap between industrial growth and environmental responsibility. Born from the belief that sustainability and technology must co-exist, the company set out to design indigenous solutions to tackle India's complex environmental challenges.

What began with real-time monitoring systems has evolved into a comprehensive portfolio of intelligent, compliance-ready technologies. Today, EnE is a trusted partner for industries navigating the intersection of operational efficiency, regulatory compliance, and environmental stewardship.

**-From Startup to Sector Leader:** Within a decade, EnE has grown from a bootstrapped innovation lab to a national presence across sectors—serving industries from pulp and paper to power and petrochemicals.

**-Local Manufacturing, Global Quality:** EnE's made-in-India solutions meet global metering standards, reducing dependency on imports and enabling faster support cycles with better localization.



## What Sets Us Apart: Innovation in Action

At EnE, we innovate for impact. Our proprietary technologies are built for performance, adaptability, and longevity—especially in remote or underdeveloped regions.

*Some of our standout innovations include:*

**Ultra Low-Powered Piezometers:** With a 5-year battery life and zero maintenance, these devices are redefining groundwater monitoring in off-grid locations.

**Solar Rain Gauge & Piezometer Networks:** Deployed across 300+ UP villages, these IoT systems deliver real-time aquifer recharge data for sustainable water planning.

**Micro STPs with Membrane Tech:** These solar-powered units treat wastewater at industrial sites like Apple's Bangalore campus—minimizing infrastructure while maximizing efficiency.

**Smart AQMS Mesh with Air-Purifying Nodes:** Active across Lucknow Smart City, our mesh networks don't just monitor air—they purify it.

**Predictive Analytics Dashboards:** Our cloud platforms deliver ESG reporting, compliance alerts, and performance insights—turning raw data into strategic intelligence.

**AI-Driven Pattern Recognition:** EnE's latest platform upgrades include machine learning models that flag anomalies in flow and emissions patterns—improving preemptive maintenance and environmental risk management.

**Edge IoT Architecture:** Our devices can function independently during internet outages and sync automatically when networks restore—ensuring no data is lost.

## Digital Intelligence Meets Field Durability

Our flow meters and sensors are equipped with IoT modules, edge processing capabilities, and smart alert systems that guarantee no data loss—even in connectivity-challenged zones. Features like SCADA/AMR integration, SMS/email alerts, and tamper-proof logging give industries the tools they need for real-time, regulatory-grade monitoring.

Each unit is also designed with:

- Field-Replaceable Parts for minimal downtime
- High-Contrast Local Displays for quick metrics checks
- Remote Health Diagnostics for continuous performance tracking
- Fail-Safe Memory Buffers: Even in extreme environments, our devices store encrypted data locally for 90+ days—ideal for remote compliance inspections or dispute resolution.
- Zero-Liquid Contact Sensors: Non-intrusive meters reduce maintenance, contamination risks, and calibration issues—critical for sectors like pharma and dairy.

## Built for the Field, Backed by Support

EnE understands that hardware alone doesn't deliver results—support does. Our post-installation engagement is rooted in partnership, including:

- On-site and remote training for users at all levels
- Scheduled calibrations with traceable certificates
- AMC plans tailored to sector-specific needs
- 24/7 remote monitoring and technical assistance
- Self-service knowledge hubs with videos and guides
- Compliance Concierge Services: We assist clients in compiling CPCB, CGWA, and SPCB documentation—ensuring seamless inspection readiness and faster license renewals.
- Multi-Lingual Support: With pan-India deployments, we offer regional language training modules and dashboards—boosting usability across diverse teams.

We remain actively involved in each customer's journey—offering everything from pre-compliance readiness checks to regulatory advisory services.

## Future-Forward: Enabling Net-Zero and Beyond

As industries aim for net-zero targets, EnE is preparing clients to move from reactive compliance to proactive sustainability.

**Non-Contact Flow Meters:** Ideal for open drains and stormwater channels, these tamper-resistant sensors deliver accurate data with zero fluid contact.

**Leak & Resource Optimization:** Our smart metering network identifies inefficiencies across facilities—supporting conservation and cost savings.

**Power-Free Deployments:** With solar and battery-powered units, EnE technologies operate reliably in the most infrastructure-deficient environments.

**ESG Reporting & Carbon Footprint Dashboards:** Our enterprise platform enables centralized emissions tracking, audit reports, and sustainability scorecards to support green financing and ESG benchmarks.

**Scalability with API-First Design:** Our solutions integrate easily into enterprise systems and smart city frameworks—ensuring future-ready infrastructure that grows with your operations.

From monitoring to mitigation, EnE empowers industries to manage environmental impact with intelligence and integrity.

At EnE Solutions, we don't just build environmental monitoring systems—we build resilience, trust, and a cleaner future. As we scale up our capabilities and global presence, our commitment remains rooted in empowering India's industries with the tools they need to grow responsibly.

*Content Credits- EnE Solutions*

# Omnion Technologies

## *Innovating for Cleaner Air and Sustainable Futures*

*Air pollution remains one of the most pressing environmental challenges globally, with severe implications for public health, climate change, and economic stability. In Africa, rapid urbanization, industrialization, and deforestation have exacerbated air quality issues, making emissions monitoring and pollution control more critical than ever. Omniton Technologies, a pioneering force in environmental innovation, is committed to developing cutting-edge solutions to combat air pollution, enhance emissions monitoring, and drive sustainable climate action.*

### **The Growing Challenge of Air Pollution in Africa**

Across Africa, cities are experiencing deteriorating air quality due to vehicle emissions, industrial pollution, biomass burning, and dust storms. According to the World Health Organization (WHO), air pollution is a leading cause of respiratory diseases, affecting millions. Governments and environmental agencies are increasingly recognizing the need for robust monitoring and intervention strategies to mitigate this crisis.

### **Omnion Technologies' Approach to Air Quality and Emissions Monitoring**

Omnion Technologies has taken a proactive approach to addressing air pollution by developing advanced solutions that leverage real-time data and mitigate emissions effectively. Our work focuses on:

#### **Real-Time Air Quality Monitoring Systems**

- Deploying smart sensors in urban and industrial areas to collect real-time air quality data.
- Enabling public access to air quality indices for increased awareness and action.

#### **Emission Reduction Technologies**

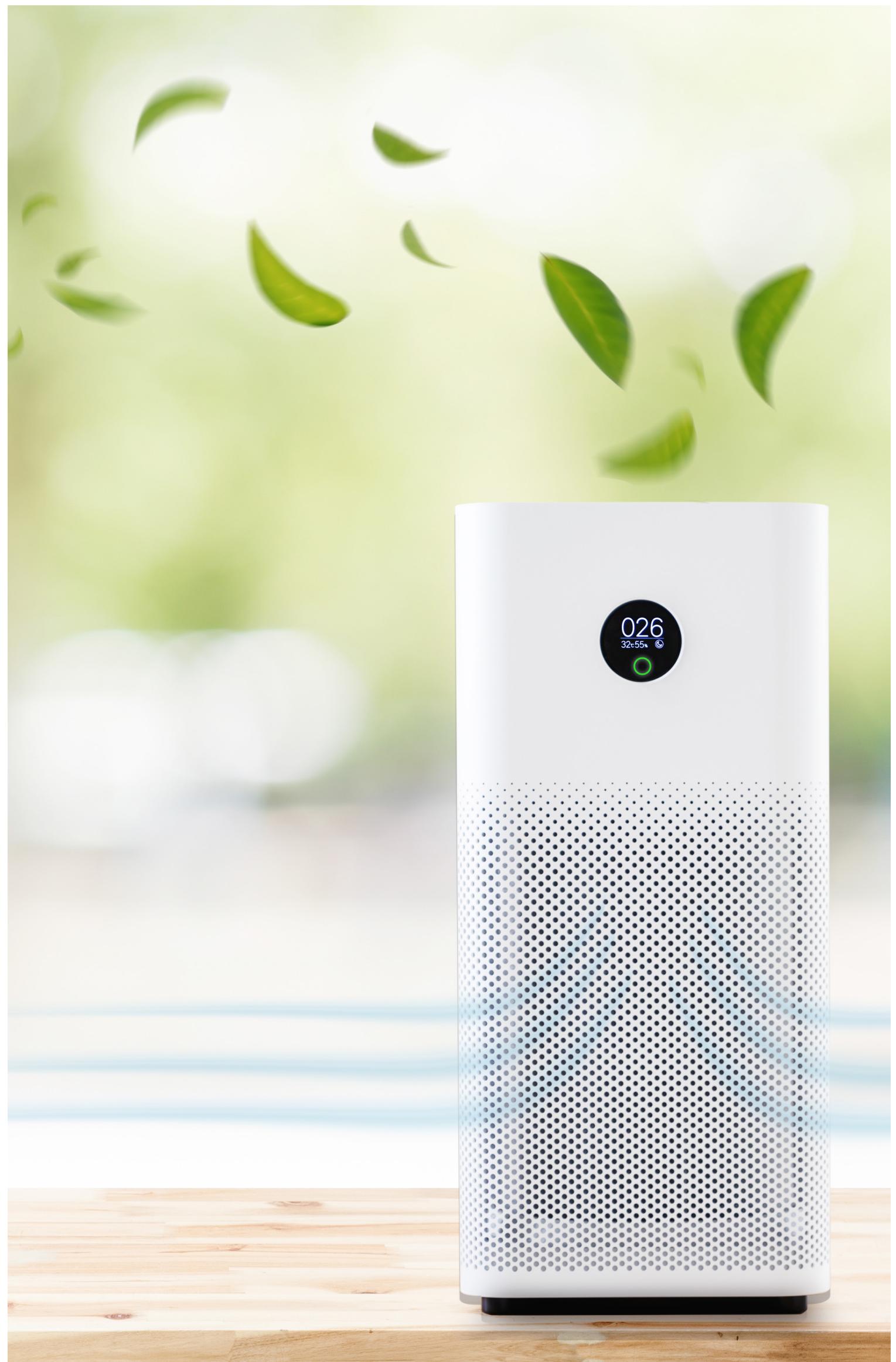
- Developing and deploying solutions for industrial air pollution control.
- Working with local governments to implement low-emission zones.
- Introducing sustainable alternatives to traditional fuel sources in rural and urban areas.

#### **Fog Dispersion & Artificial Rainfall Solutions**

- Addressing visibility concerns caused by industrial and vehicular emissions.
- Using cloud seeding and atmospheric intervention techniques to improve weather conditions in pollution-heavy regions.

#### **Community Engagement and Policy Advocacy**

- Partnering with local stakeholders to educate communities about air pollution and its impact.
- Supporting governments with policy recommendations for stricter emission controls and better environmental governance.





## Case Stud

### A Breakthrough in Industrial Emission Monitoring

In collaboration with research institutions like IIT Delhi, DPCC, and IMD Pune, Omniion Technologies implemented an air pollution control project in heavily industrialized areas. By deploying high-efficiency filtration and fog dispersion systems, we successfully reduced particulate matter by over 40% within six months. This initiative not only improved air quality but also set a benchmark for sustainable industrial practices.

### The Road Ahead: Expanding Efforts in Africa

Recognizing the urgent need for air pollution control in Africa, Omniion Technologies is looking to partner with African governments, environmental agencies, and private enterprises to deploy its air quality monitoring and emission reduction solutions.

Our focus is on:

- Establishing air quality monitoring networks in major African cities.
- Collaborating with policymakers to integrate clean technologies into national environmental strategies.
- Investing in research and innovation tailored to Africa's unique environmental challenges.

## A Call to Action for a Sustainable Future

The fight against air pollution is a collective responsibility. As Omniion Technologies continues to innovate and expand its impact, we invite governments, businesses, and communities across Africa to join us in building a cleaner, healthier, and more sustainable future. Through collaboration, technological advancement, and shared commitment, we can drive meaningful climate action and transform the air quality landscape across the continent.

# Small steps, big impact:

*How communities can lead the way on waste management*

Across Africa, cities, towns, and villages are growing fast. With this growth comes an urgent need to manage waste better – to protect health, reduce pollution, and create local jobs. Yet for many municipalities and communities, finding the right way to start can feel overwhelming, especially when resources are limited.

The good news is that meaningful progress does not always require big budgets or external consultants. By taking small, practical steps using local materials, skills, and leadership, communities can begin building simple, effective waste management systems. These systems can grow over time, improving lives and protecting the environment without becoming dependent on outside support.

### The waste challenge: urgent but solvable

According to the United Nations Environment Programme's Global Waste Management Outlook 2024, nearly half of all global municipal solid waste is still mismanaged – dumped, burned, or left uncollected. In Africa, the situation is critical: less than 11% of waste is properly managed, and open dumping and burning are still widespread. These practices release harmful pollutants into the air, soil, and water, posing serious risks to human health and contributing to climate change.

The Outlook highlights that waste management is no longer simply an environmental issue – it is fundamental to public health, economic resilience, and sustainable development. Yet, formal waste services often struggle to reach informal settlements, rural areas, and smaller towns. This leaves a major gap – but also an opportunity – for community-led solutions to step in.

### Starting small: practical actions communities can take

Building a waste management system from scratch does not need to be complicated. Many successful initiatives across Africa have shown that simple, low-cost actions can make a major difference when they are grounded in local realities. Some practical steps communities and municipalities can start with include:

**Household separation:** Encouraging residents to separate organic waste (such as food scraps) from non-organic waste (such as plastics and metals) at source makes recycling and composting easier and more effective.

**Composting organic waste:** Small-scale composting facilities can turn food and garden waste into valuable compost for farming, gardening, or landscaping, supporting local food security and reducing the need for chemical fertilisers.

**Black soldier fly farming:** Setting up small units to rear black soldier fly larvae can turn food waste into high-protein feed for chickens and fish, creating local livelihoods and reducing reliance on expensive imported feeds.

**Small-scale biogas systems:** Using simple biodigesters, communities can convert organic waste into biogas for cooking or lighting, reducing firewood use and providing a clean, renewable energy source.

**Plastic and metal recovery:** Setting up simple collection points for recyclables such as plastic bottles, aluminium cans, and scrap metal helps reduce litter and provides materials for local recycling businesses.

**Community awareness campaigns:** Building understanding about the health, environmental, and economic impacts of poor waste management is key to encouraging behaviour change and community ownership.

**Partnerships with local enterprises:** Working with local waste pickers, cooperatives, and small businesses can help professionalise waste services, create jobs, and strengthen the local economy.



These actions require coordination, persistence, and community engagement – but they do not require expensive technology or large external grants. Instead, they are built on local leadership and resourcefulness.

### Learning from Flipflop: a model for practical innovation

One inspiring example of community-led innovation is the Flipflop Project in Kenya. Flipflop made global headlines in 2019 when it launched the world's first traditional sailing dhow made entirely from recycled plastic waste. Built by local boat builders on the island of Lamu, using waste plastic collected from beaches and towns, Flipflop is both a practical project and a powerful symbol of what can be achieved when communities come together around a shared challenge.

But Flipflop's work goes much further than building a boat. To help other communities replicate and adapt their approach, they have created the *Flipflop Toolkit* – a free, practical guide to setting up community-led plastic recovery and recycling initiatives.

The Toolkit shares lessons learned from Flipflop's experience in Kenya and the wider East Africa region. It covers:

**Feedstock:** How to organise plastic collection, including working with households, businesses, and informal waste pickers.

**Operations:** How to sort, clean, and process collected plastics using low-cost, locally appropriate methods.

**Enterprise:** How to create useful products from recycled plastics, reach local markets, and manage business finances.

**Tracking impact:** How to measure the environmental, social, and economic benefits of a community-led recycling initiative.

**Research and development:** How to experiment, learn, and adapt processes based on local conditions.

**Teaching others:** How to share knowledge and skills with young people, vocational col-

relying on external consultants or unaffordable technologies.

Through our network, we aim to support those working in small towns, rural areas, peri-urban settlements, and coastal communities across Africa and beyond. Whether you are a municipal officer, a community organiser, a teacher, or a local entrepreneur, Global Waste Lab is here to help you access ideas, training, and peer support.

### A call to action

The Global Waste Management Outlook 2024 is clear: without urgent action, the health, economic, and environmental costs of poor waste management will continue to rise. Yet it also shows that solutions are within reach – especially when communities lead the way. Africa's waste challenge is immense, but so is its potential. By taking small, practical steps today, municipalities and communities can lay the foundations for healthier, more resilient futures.

Together, through small steps and shared knowledge, we can build waste systems that work for Africa's people and its future.



### About the Author

**Zoë Lenkiewicz** is a global waste management specialist and founder of Global Waste Lab, a platform supporting community-led waste solutions across the Global South. She was the lead author of UNEP's Global Waste Management Outlook 2024 and Towards Zero Waste: Waste Management as a Catalyst for Delivering the Sustainable Development Goals. Zoë has worked with governments, NGOs, and local leaders across Africa and Asia to promote simple, sustainable approaches to waste and resource management. You can connect with Zoë on LinkedIn to learn more.

leges, and other community groups.

**Partnerships:** How to engage with local and national governments, industry associations, and other partners to build supportive ecosystems for circular economy initiatives. The Flipflop Toolkit is designed to be practical, flexible, and rooted in African contexts. It acknowledges the financial and operational challenges many communities face but encourages a spirit of local innovation and gradual growth. [toolkit.theflipflop.com](http://toolkit.theflipflop.com)

### Introducing the Global Waste Lab

To support communities and municipalities looking to start or improve waste management initiatives, **Global Waste Lab** has been launched as a platform for learning, collaboration, and practical support.

Global Waste Lab brings together tools, resources, and real-world examples to help local leaders design waste solutions that work in their context. Our mission is to empower communities to take the first steps towards sustainable waste management – without



# Climate Resilience and Community-Led Conservation

What does it truly take to foster climate resilience in the world's most vulnerable regions? How are women on the frontlines leading the charge for a more sustainable future? My journeys through the remote deserts of Mongolia and the lush mountains of Sri Lanka have illuminated how local communities are reshaping conservation through grassroots initiatives and indigenous wisdom. Their stories offer powerful lessons—and an urgent call to action for us all to safeguard our planet.

Reflecting on the many expeditions I've had the privilege to organize across the globe, I am continually inspired by the extraordinary impact of community-led conservation, especially in regions most at risk. Time and again, it has been clear that true climate resilience can only be achieved when we place people—particularly women—at the heart of environmental stewardship.

## Empowering Women for Conservation

In 2019, our HER Planet Earth team embarked on a life-changing expedition to Northern Kenya, trekking alongside the Samburu people, a nomadic pastoralist community deeply connected to their land. It was evident that Samburu women, as primary gatherers of water, firewood, and food for their families, are among the first to feel the impacts of environmental decline. Yet, their intimate knowledge of the land, combined with their resilience, positions them as natural custodians of their environment. Their strength, determination, and leadership are vital to building lasting climate resilience.

One of the most poignant experiences from our time in Kenya was visiting the Reteti Elephant Sanctuary, the country's first community-owned elephant reserve. Here, Samburu women nurture orphaned elephants with care and compassion, fostering bonds that allow these animals not just to survive—but to thrive. This sanctuary stands as a powerful symbol of the transformative impact that empowering women can have on conservation.

## Discovering Strength in Sri Lanka and the Gobi Desert

In April 2023, our team undertook a rigorous expedition across Sri Lanka's Knuckles Mountain Range, a UNESCO World Heritage Site. As we trekked and cycled 150 kilometers through this breathtaking terrain, I felt an unbreakable connection to the Sri Lankan women whose lives are directly threatened by climate change. Recognized as one of the world's most climate-vulnerable nations, Sri Lanka's communities are facing increasing challenges from floods, droughts, and landslides. Working with organizations like UN Women Sri Lanka, we supported initiatives aimed at bolstering resilience among marginalized groups, including women with disabilities and migrant women—highlighting the importance of intersectional, tailored solutions.



A year later, I found myself amidst a completely different landscape—the vast, frozen expanse of Mongolia's Gobi Desert. Our winter expedition, though grueling, was a celebration of local leadership and resilience. Partnering with The Nature Conservancy, we raised vital funds to empower women leaders in Mongolia's Omnogovi province, who, through sustainable livestock practices and traditional crafts, are paving the way for community-driven conservation—even in the harshest climates.

## The Power of Indigenous Leadership

Leading expeditions in my home country, the Philippines, has deepened my understanding of the role indigenous knowledge plays in environmental protection. In 2018, while sailing on a traditional paraw boat through the islands of Palawan, I witnessed how em-

powering women through sustainable practices like organic farming and heritage crafts enables communities to adapt to and mitigate the impacts of climate change. These efforts not only strengthen environmental stewardship but also foster economic independence and resilience.

## Learning from the Wisdom of the Elders

Equally transformative was our 2015 journey with the Nenets reindeer herders of Siberia. Trekking with them on their annual migration, I saw firsthand how profound respect for nature, combined with strong communal ties, has enabled them to sur-

vive in one of the world's most extreme environments. Yet, even their ancient way of life now faces existential threats from a rapidly changing climate—emphasizing the urgent need to integrate indigenous knowledge into global conservation strategies.

## Empowering Change from the Ground Up

These experiences reaffirm a vital truth: community-led conservation is not merely about protecting ecosystems—it's about empowering people, especially women, to lead transformative change. Women, often among the hardest hit by climate change, are also its fiercest advocates and most effective changemakers.

By investing in local leadership and amplifying women's voices, we can build a world that is not just environmentally resilient but also socially just. Climate resilience begins with people—standing together, learning from one another, and forging a shared path toward a sustainable future.

This is the journey I remain committed to—and one that calls for all of us to join.

*Content Credits-Christine Amour-Levar*

# Turning Data into Action:

## *How the EU and Germany Support Climate Resilience in Africa*

Across Africa, the effects of climate change are being felt with increasing intensity—droughts, floods, unpredictable weather, and rising temperatures are threatening people's lives, livelihoods, and entire economies. In 2022 alone, more than 33 million people in the Horn of Africa were affected by the worst drought in four decades, leading to widespread food insecurity and displacement. In Nigeria, severe floods displaced over 1.4 million people, killing more than 600 and damaging nearly 300,000 homes and farmlands. Meanwhile, coastal erosion in countries like Senegal continues to swallow land and livelihoods, while desertification in the Sahel fuels competition over shrinking natural resources.

Although the continent contributes less than 4% of global greenhouse gas emissions, it bears a disproportionate share of the climate burden—economically, socially, and environmentally.

A key barrier to effective climate action remains the lack of reliable, high-quality data to inform policy, monitor progress, and enable inclusive responses. Without trustworthy information, it is difficult for governments to plan ahead, respond to emergencies, or measure progress on climate commitments. Many African countries lack functioning weather stations, up-to-date land use maps, or systems to track emissions and resilience efforts. According to the African Union, fewer than 25% of African countries have the data infrastructure needed to regularly report on their climate goals under the Paris Agreement. Simply put: *You can't fix what you can't measure.*

To address this, through the EU and German funded Data Governance in Africa Initiative, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is supporting the African Union and its member states in strengthening data systems for sustainable development—with climate action as a central focus. The goal: to empower decision-makers and communities alike with the information they need to build resilience. At its core, this effort promotes inclusive co-creation, local ownership, and long-term sustainability through practical, data-driven use cases that respond directly to Africa's pressing climate challenges.

### Using Technology to Close Data Gaps

One example of this approach is the Carbon Lens Initiative (CLI), launched in Senegal. CLI aims to fill critical gaps in carbon stock data—information needed to monitor forest loss, land degradation, and national climate targets. By using satellite imagery and artificial intelligence, the initiative provides affordable and accurate estimates of carbon storage in forests and soils.

This is essential for countries to assess their progress on Nationally Determined Contributions (NDCs) and to apply for international climate financing with credible, verifiable data. The CLI builds on methodologies successfully tested in countries like Indonesia and adapts them to African contexts. It also ensures country ownership of the data, helping governments set their own priorities based on evidence—not assumptions. By establishing a mechanism to generate trustworthy, country-owned climate data, CLI addresses one of the most fundamental obstacles to implementing and financing climate action: data scarcity.



### A Climate Data Platform for Governments

To improve how governments use and share climate-related data, GIZ also supports the development of the Climate Data Information Platform (CDIP). This digital tool helps ministries and agencies combine climate data from sectors like agriculture, ener-



gy, and water into a single, integrated platform. It addresses key structural challenges in data sharing and coordination by embedding monitoring and evaluation tools that ensure consistency and comparability. With its emphasis on inter-agency cooperation and data accessibility, CDIP enhances transparency and accountability, while strengthening a country's ability to meet its climate goals and attract funding based on documented performance.

## Putting Communities First: The Tana River Example

But data systems alone won't stop floods or droughts. True climate resilience begins with the people most affected. In Kenya's Tana River County, the Climate Action Project for Community Resilience exemplifies a community-led model for leveraging data in climate response. Scaling a 2022 pilot by Ushahidi and World Vision Kenya (with GSMA support), the project utilized a crowdsourcing platform to collect real-time data on the impacts of severe flooding that displaced over 43,000 people in recent years.

A key to the project's success was its inclusive approach. Through a participatory process involving local government and civil society, the project used digital tools to map flooding patterns, improve early warning systems, guide emergency response, and support long-term mitigation efforts such as constructing water-harvesting dams and restoring vegetation cover. Crucially, the project also worked with community representatives—youth,

women, persons with disabilities, and elders—to co-create survey tools and ensure inclusive participation. Sign language interpreters were present at sessions, and community members from across three sub-counties were consulted through discovery sessions and public forums.

These "discovery sessions" revealed deep local knowledge of climate trends, including increasing rainfall intensity and the frequency of droughts over the past five years. Communities identified priority needs such as combating malnutrition, increasing awareness about evacuation procedures, and implementing ecosystem restoration efforts. They also emphasized the importance of improving governance structures and enhancing communication channels—ranging from SMS alerts and radio to community meetings—for better disaster preparedness.

By putting community experiences at the center, the project didn't just collect useful data—it built trust. People felt heard. Local leaders, youth, women, and elders all took part in shaping the process. This made the work more effective—and more likely to last. The collaboration with the Tana River County Government, including the newly established Climate Sector Working Group (CSWG), reflects a promising institutional framework for scaling these efforts.

The Action is now exploring similar approaches with neighboring countries, aiming to develop a regional use case that includes AI-based tools for data analysis and real-time disaster response.



What ties these diverse efforts together is a unifying vision: harnessing data as a public good that can drive inclusive and effective climate action. Whether through satellite platforms or community storytelling, the goal is the same—giving everyone, from smallholder farmers to national leaders, the information they need to act.

This approach also strengthens Africa's standing in global climate governance by enabling countries to participate more actively and credibly in international climate negotiations and financing mechanisms. With better data, African countries can not only set more ambitious climate targets but also demonstrate progress, attract investment, and design interventions that reflect local priorities and realities.

GIZ's effort under the Team Europe Data Governance in Africa Initiative shows that climate solutions don't start with technology or policies alone—they start with people. With the right tools and the right partnerships, communities across Africa can turn vulnerability into resilience.

As one participant in Tana River put it:

**“We know what is happening to our land and our lives. What we need is to be heard—and to have the tools to act.”**

Through international cooperation, smart innovation, and inclusive design, that vision is already taking shape—and offers hope far beyond Tana River.

*Content Credits- Eva Scholtes*



## Environmental Pollution

# AFRICA'S AIR CRISIS

WHY DATA-DRIVEN MONITORING IS THE KEY TO BREATHING EASY

## *A Continent Gasping for Air*

**A**ir pollution kills over 1.1 million Africans annually. Most don't even know they're at risk.

Cities in Africa are growing rapidly, but many cities lack effective air quality management. As the infrastructure rises, the pollution level also increases. Air pollution is a major rising concern for urban areas. Africa is facing one of the highest rates of air pollution-related deaths globally, a silent crisis impacting millions every year. This growing health and environmental threat underscores the urgent need for robust air quality and emissions monitoring systems.

For a healthy and clean environment, the initial step is to keep an eye on the rising pollution levels. This not only helps in getting the data, but also helps in implementing required actions on time. To solve air quality issues, companies like Oizom are stepping up with innovative technologies to help mitigate the effects of pollution, empower policymakers with real-time data, and pave the way toward a cleaner, healthier future for Africa.

### The Unseen Toll

Africa is facing a serious air quality crisis. *According to the 2024 World Air Quality Report, several countries across the continent rank among the most polluted in the world. A country in central Africa, Chad, for instance, recorded an average PM2.5 level of 91.8 µg/m³, over 18 times higher than the safe limit set by the World Health Organization.*

This level of pollution isn't just a number, it's a health emergency. Every year, air pollution is linked to about 1 million premature deaths across Africa. The most vulnerable are often the most affected, children under five and the elderly. In Sub-Saharan Africa, it's now the third leading cause of death in young children, mainly due to respiratory illnesses caused by indoor smoke from biomass fuels used for cooking.

The toll on newborns is especially heartbreaking. *Each year, an estimated 236,000 babies die within their first month of life because of exposure to polluted air. Over 80% of those deaths are tied to household air pollution.* Air pollution has become almost as deadly for young children as malnutrition and lack of clean water and sanitation.

These numbers are more than just statistics, they're lives. And they point to something we can't ignore: the urgent need for clean air, continuous monitoring, and stronger action to protect the most vulnerable across the continent.

### The Data Gap That's Holding Cities Back

Africa is one of the most vulnerable regions to the impacts of climate change, facing extreme weather patterns, prolonged droughts, and rising sea levels. These environmental shifts make the air pollution effects intense, impact the economy, and make it harder for people to recover from climate-related challenges.

Even with all this going on, most African countries still don't have the right tools to monitor air quality. A lot of the existing equipment is old, not well-maintained, or only found in big cities. That means huge parts of the continent have no reliable data at all.

It got even harder recently when the U.S. stopped sharing air quality data from its embassies. For many African cities, that was one of the only steady sources of information. Now, without accurate data, it's tough for governments to make strong environmental policies. And for regular people, it's almost impossible to know when the air they're breathing is dangerous.

## Why Real-Time Monitoring Is Step One

Before cities can improve air, they need to measure it with precision and consistency.

*Robust air quality monitoring allows:*

- Early health warnings
- Smart traffic and infrastructure planning
- Data-driven regulatory enforcement
- Access to global climate funding mechanisms



### Oizom's Role in Africa's Clean Air Future

Investing in air quality monitoring is not just an environmental move but a strategic move toward resilience and long-term sustainability. Real-time environmental intelligence, like that provided by Oizom, is key to building climate-ready cities and safeguarding communities across Africa.

With Oizom, monitoring harmful air pollutants doesn't have to be complex or expensive. Our smart sensors and IoT-based technology make it easy to track real-time air quality data, even in tough environments.

We've built our devices to work anywhere, from busy streets in Lagos to quiet towns in Senegal. The data is live, local, and reliable. And it's all accessible through our easy-to-use platform.

This kind of information helps people make better decisions. Urban planners can design cleaner, healthier cities. Health officials can act early to reduce pollution-related illnesses. Environmental agencies also get the data they need to enforce clean air regulations.

Oizom's monitoring systems are scalable, accurate, and made for Africa's unique climate challenges. So whether you're tackling urban emissions or rural household air pollution, we've got you covered.

### What makes Oizom tech stand out?

**-Real-time Monitoring:** You don't have to wait for reports. You get live air quality updates in real time.

**-Multi-parameter Monitoring:** One device tracks multiple pollutants, plus weather conditions, so you get the full picture.

**-Remote Access via Envizom:** Envizom, an AI-enabled platform, lets users view data from anywhere, anytime, in an intuitive dashboard with advanced reporting and analytics capabilities. .

**-E-Breathing Technology:** The patented data sampling system improves accuracy by simulating how humans breathe, giving highest level of accuracy in extreme climatic conditions.

**-Weather Integration:** By integrating weather sensors like wind, temperature, and humidity, users get data on how pollution travels and where it may strike next.

Whether for urban planning, public health, or industrial compliance, Oizom's solutions are practical, scalable, and ready for Africa's unique challenges.

### From Field to Impact: Oizom in Action

Oizom is already making a difference on the ground in Africa. Our key projects involved working with leading companies to address air quality concerns in different parts of Africa.

We deployed our all-in-one environmental monitoring system, Polludrone, across several locations, from Oil and gas drilling sites to the biggest Cement plants on the continent, to some of the most crowded metropolitan cities in Africa, to empower university research initiatives with some renowned universities to monitor real-time air quality. The goal was clear: help the company manage environmental risks proactively, ensure workplace safety, and support transparent, responsible operations.

### Conclusion: The Road to a Breathable Africa Starts With Data

Africa stands at a critical crossroads. As it continues to develop, it must ensure that progress doesn't come at the cost of public health. Real-time air quality monitoring is not just a technological upgrade, it's a necessity. Oizom is proud to be part of this essential journey, empowering communities and decision-makers with the data they need to build a sustainable and clean environment in Africa.

Fixing air pollution needs collaboration at every level, from government agencies and private innovators like Oizom to international funders and NGOs. Join us for cleaner air in Africa, and deploy cutting-edge air quality monitoring solutions in your city, industry, or community. Together, we can clear the air and secure a healthier and more sustainable future.

*Content Credits- Jainam Mehta, CBO, OIZOM*

# Revolutionizing Air Quality Monitoring in Africa:

## *The GO AQS Initiative*

As Africa continues its rapid urbanization and industrial expansion, air quality has become a critical concern affecting millions of lives. Recognizing the need for real-time, accurate air quality data, the Global Open Air Quality Sensor (GO AQS) initiative is poised to revolutionize environmental monitoring across the continent. With its cutting-edge technology and collaborative approach, GO AQS is setting new benchmarks for air quality management, ensuring a healthier and more sustainable future for African communities.

### The Need for Reliable Air Quality Data

Air pollution is a silent but deadly threat. Across Africa, cities are grappling with increasing levels of pollutants from industrial emissions, vehicle exhaust, and biomass burning. Despite the evident risks, one of the biggest challenges in mitigating air pollution has been the lack of reliable data. Many regions lack extensive air monitoring networks, making it difficult for governments, researchers, and policymakers to address the issue effectively.

GO AQS bridges this gap by offering an advanced air quality monitoring system that provides real-time data with high accuracy. This initiative is particularly crucial for African cities, where air pollution has been linked to respiratory diseases, cardiovascular conditions, and premature deaths.

### The GO AQS Approach: A Game Changer

GO AQS stands out due to its innovative, cost-effective, and accessible technology. The system comprises compact, low-cost sensors that offer real-time monitoring of pollutants such as particulate matter (PM2.5 and PM10), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), and ozone (O<sub>3</sub>). Unlike traditional air quality stations that are expensive and complex to maintain, GO AQS devices are designed for easy deployment and scalability.

A key advantage of GO AQS is its open-access data platform. The initiative emphasizes transparency and collaboration, ensuring that air quality data is freely available to stakeholders—including governments, researchers, businesses, and the general public. This democratization of data empowers African communities to take informed actions, advocate for cleaner air policies, and implement targeted interventions.

Imagine a World Where People Breathe Equally the Same Air



pollution data, African policymakers can develop more effective environmental regulations. GO AQS enables local governments to pinpoint pollution hotspots, assess the impact of industrial activities, and implement emission control measures. Additionally, it provides crucial insights for urban planning, helping cities design greener, more sustainable environments.

Beyond policy, GO AQS is fostering a culture of environmental awareness. By integrating air quality data into mobile apps and digital platforms, the initiative educates citizens about pollution levels and encourages proactive measures to reduce exposure. Schools, health organizations, and advocacy groups can leverage this information to drive public health campaigns and community-driven solutions.

### Collaborative Efforts and Future Prospects

GO AQS is not just about technology; it is about fostering partnerships. The initiative actively collaborates with African governments, universities, NGOs, and the private sector to expand its network and enhance its impact. By integrating data analytics, artificial intelligence, and cloud computing, the project aims to refine its predictive capabilities, offering even more precise air quality forecasts.

Looking ahead, the GO AQS initiative has the potential to become a continental standard for air quality monitoring. By equipping African cities with robust environmental intelligence, it paves the way for a healthier, more resilient future.

### Rundown!

Africa stands at a pivotal moment in addressing air pollution, and GO AQS is at the forefront of this transformation. By making air quality data accessible, actionable, and reliable, the initiative is not only safeguarding public health but also empowering communities and policymakers to create a cleaner, greener Africa. As air pollution continues to pose a global challenge, Africa's proactive approach through GO AQS can serve as a model for other regions striving for environmental sustainability.

Content Credits- Sotirios Papathanasiou  
GO AQS Lead Author / Environmentalist / Air Quality - Air Pollution / IoT

### Transforming Policy and Public Awareness

With access to high-quality air

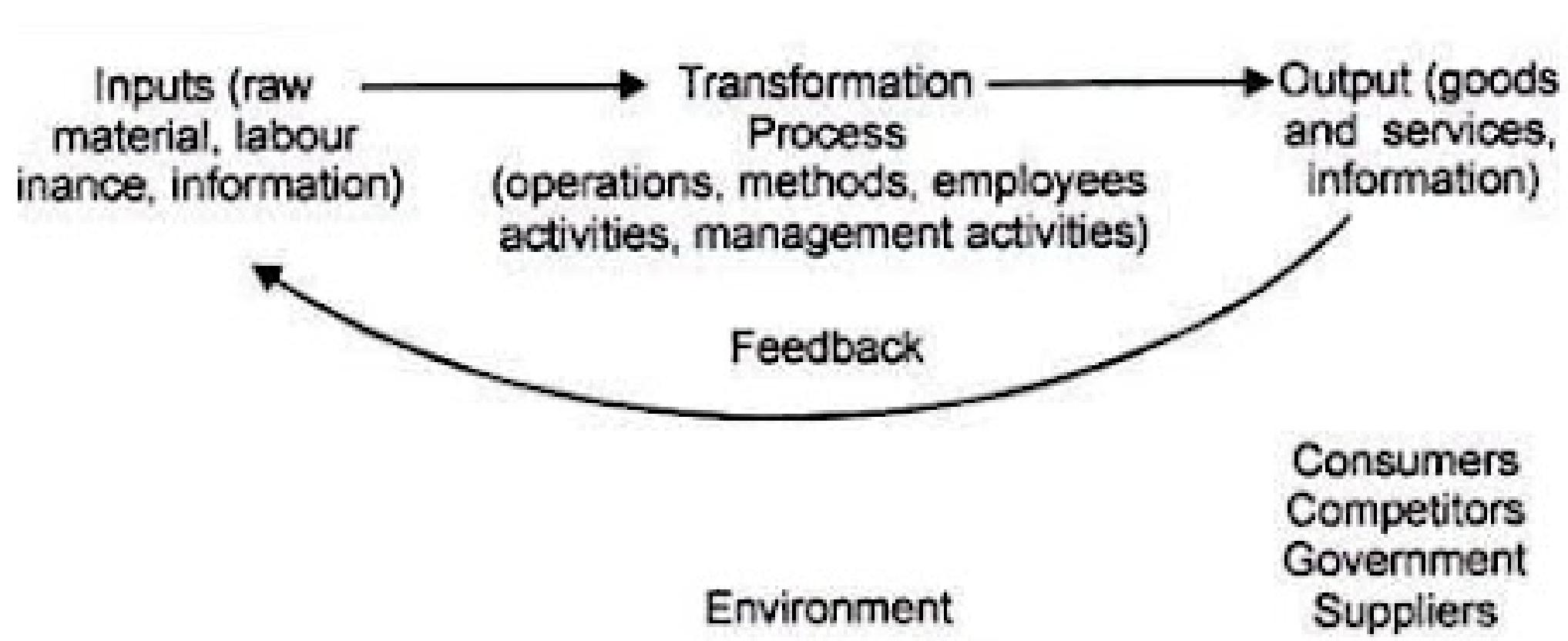




## Environmental Pollution

# Public Participation in Strategic Environmental Assessment in the Greater Accra Region of Ghana

The failure of policies and projects worldwide, remain often attributed to poor grassroots participation in decision-making. Strategic Environmental Assessment (SEA) is an effective tool for environmental governance, though its implementation in developing countries, including Ghana, has



not yielded the desired results. The paper uses systems theory to explore the relationship between local authorities and grassroots involvement in SEA processes. Data collected through interviews, focus group discussions, and observations reveals that while local authorities are knowledgeable

about SEA, grassroots participation is limited due to unclear public guidelines and resource shortages. The study recommends prioritizing clearer public participation guidelines and resources to enhance engagement in the SEA process.

## Introduction

Many environmental damages could be avoided with proper adherence to environmental procedures and enhanced community involvement in the development and implementation of policies, plans, and programs (PPPs). In the Greater Accra Metropolitan Area (GAMA), improper waste disposal and unplanned development, largely due to poor public involvement in decision-making, have caused severe environmental problems, including deadly floods (Daily Graphic, July 16th, 2002; Damoah and Akwei, 2017; Ghana Audit Service, 2018). This study aims to explore how Strategic Environmental Assessment (SEA) is applied by local governments in Greater Accra and identify conditions that enhance public participation in environmental governance.

## The Systems Theory

Systems theory allows one to view an institution as a social system composed of sub-systems, which communicate and interact with one another in a holistic manner (Mele, Pels & Polese, 2010). Conceptually, the Easton David Conceptual framework of Systems Theory indicates that actions are interrelated and systemically networked into a big social system that interacts as a comprehensive and inclusive system (Easton, 1955). People involved in the interaction become members of the system through their actions (Figure 1). They belong to the system not as human beings but as role players (Easton, 1957).

## Systems Theory in SEA Application

The interaction between people and society is a comprehensive system that influences SEA reports, shaping MMDAs' MTDPs. The system's structure—whether open or closed—affects cohesion and identity within a group. SEA, including its processes and stages, must be viewed as a complete system, encouraging dialogue among stakeholders. Public participation and institutional capacity are key to achieving good decisions and influencing collective action, with input-process-output analysis informing the study's conclusions on participation (Easton, 1957).

## Empirical Literature Review

Synthesis of literature reviewed concerning public participation in SEA indicated that 60% of the studies were conducted in developed countries, and 35% in developing countries. Studies in developing countries and Africa, including Ghana, covered public participation in SEA at the project level but not at the local governance level.

In Ghana, the National Development Planning Commission (NDPC) mandates MMDAs to develop and submit Medium-Term Development Plans (MTDPs) which are expected to integrate SEA as a very important component by encouraging the effective participation of the citizens, influenced by factors such as resources, representation, and fairness, among others (Brody, Godschalk & Burby, 2003; Stewart & Sinclair, 2007; OECD, 2009; Jami & Walsh, 2014). This notwithstanding, environmental challenges remain prevalent (Amankwah, 2013), presenting the debate of whether adequate knowledge and understanding about the process, procedure and benefits of SEA application for PPPs development at the MMDAs exist.

Jami and Walsh (2014) developed a conceptual framework for effective public participation in wind power projects (Figure 2). Upon analyzing the framework and noting its stance on improving the process of public participation, the researcher has adopted it for SEA.

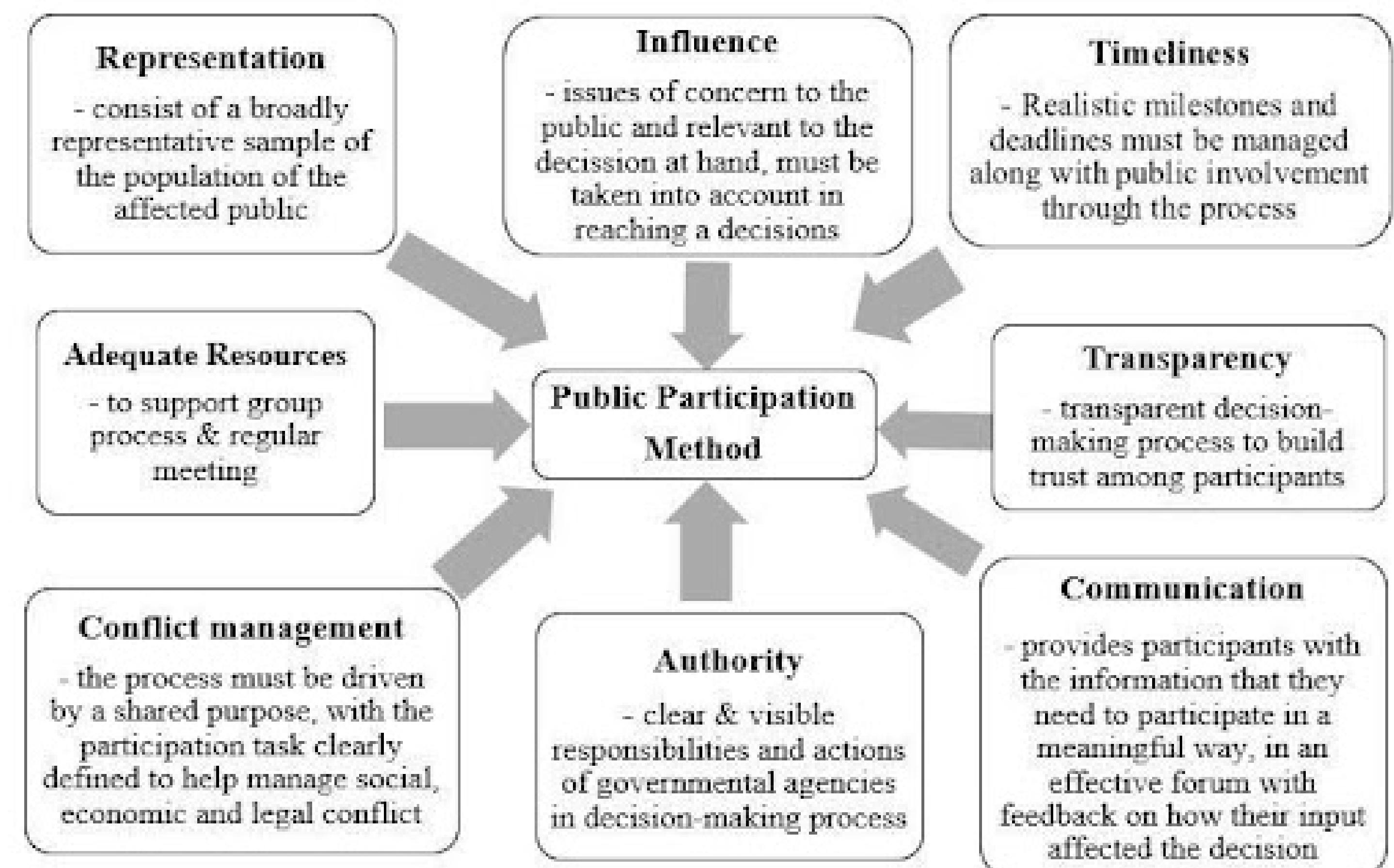
Figure 2: Conceptual Framework for Effective Public Participation

Source: Adopted from Jami and Walsh (2014).

## Methodology

An interpretive qualitative research and multiple case study approach was explored in the study to further understand the participants' world, interpret and give meanings to participants' lived experiences (Cohen et al., 2007; Chowdhury, 2014). There was the need to ascertain the level of understanding of SEA processes by officers of the MMDAs and its application.

This study used interviews, focus group discussions and observations for primary data collection. Secondary data was obtained via data triangulation, for validation. A multi-stage sampling technique was used purposively to select eighteen (18) respondents from six (6) MMDAs in the Greater Accra Region, and three (3) each from the EPA, UNDP,



and NDPC. In total, forty-eight (48) participants joined the FDGs, with eight (8) from each of the MMDAs.

## Findings

### *Application of SEA as an environmental decision-making tool by MMDAs in PPPs.*

#### **Knowledge and Understanding of SEA Legal Framework, Process and Guidelines**

Permanent staff of the various Assemblies indicated their awareness of the SEA. Assembly members on the other hand largely had very little or no knowledge of SEA. All the Assemblies indicated that the legal framework that enjoins them in adopting and implementing the SEA approach stems from the National Development Planning System Regulation, 2016, LI 2232, specifically Section 29, Clause 5, which calls for public participation in MMDAs development process. According to them SEA compliance as demanded by regulation were viewed by Assemblies as 'The creation of Medium-Term Development Plan (MTDP).'

#### **Stages of the SEA Processes / Practices Indicating Public Consultation**

Public participation was at varying levels for the MMDAs. For AMA public involvement is in setting the objectives at the scoping stage and defining the terms of reference for their PPP at the screening stage. Specifically finding alternatives to issues concerning the environmental impact of PPPs and evaluating the expected impact was stages the public were involved in at AMA. In the case of GEMA, the public was involved in only two stages of the process, namely, the screening and identification stages, where the setting of the objectives and the identification of stakeholders for the process respectively were considered. All the other remaining MMDAs have one stage as the required point for engaging the public and not the entire process. KKMA engages the public to determine the terms of reference for the process, which ends the extent to which the public is involved.

#### **Stakeholders Engaged During Public Consultation on PPPs**

The stakeholders involved in SEA consultations identified via the study include chiefs, queen mothers, assembly members, community members, youth groups, community-based organizations (CBOs), civil society organizations (CSOs), opinion leaders, and NGOs. These stakeholders were identified based on their influence within the community. This approach is crucial for determining which interest groups should be prioritized in future planning processes (Ahmed, Mercier & Verheem, 2005; Videira et al., 2006). The study emphasizes that SEA requires the active involvement of those who will benefit from the proposed development activities. Participants in focus group discussions identified chiefs, queens, and assembly members as essential representatives in decision-making. The discussion also highlighted the importance of open-mindedness and thorough background checks when identifying stakeholders, as this ensures a balanced and inclusive representation of diverse interests.

#### **Methods of Public Participation in the SEA Processes and Practices**

The methods used for public participation in SEA processes varied across MMDAs. Some MMDAs, such as AMA, GEDA, and GCMA, adopted methods like popular participation, open forums, and invitations, with popular participation being the preferred approach. Public participation was incorporated into the MTDPs, which included climate change, environmental plans, sanitation, and environmental cleanliness. MMDAs used various communication methods, including town hall meetings, workshops, PowerPoint presentations, and visual aids, often in local languages. However, no MMDA reported engaging the public in the assessment and monitoring stages of the SEA process.

## **Good Environmental Governance Through Public Participation**

The study finds that stakeholder engagement enhances the integration of environmental and development policies, helping to meet the aspirations of the communities. The SEA process was applied to several projects, including the MTDP (2018-2021), commercial, school, health, and market projects. However, the implementation of SEA was inconsistent, with MMDAs adopting only certain stages of the process (scoping, screening, evaluation, and reporting).

## **Barriers and Opportunities for Public Participation in SEA Processes**

Barriers to effective public participation were identified, including socio-economic and institutional challenges. Socio-economic barriers included factors like religious beliefs, job access, and leadership status. Institutional barriers involved the lack of a guiding framework for public participation in SEA and limited understanding of the SEA concept. Some MMDAs operated a top-down approach due to the absence of guidelines, and challenges such as poor communication, financial constraints, and logistical issues, like transportation costs, impeded public participation. In some instances, the bureaucratic structure of MMDAs discouraged participation, with concerns that the process was dominated by elites. Despite these barriers, most MMDAs acknowledged the increased costs associated with public participation.

## **Opportunities for Enhancing Public Participation in SEA Procedures**

Opportunities for enhancing public participation in SEA included improving transparency and accountability, ensuring better resource availability, and engaging technical working groups with representatives from interest groups. Increased awareness and pre-decision sensitization efforts were also seen as valuable for improving participation. The MMDAs and institutions like GEDA, AMA, GCMA, NDPC, UNDP, and EPA recognized the benefits of public involvement in SEA processes, including improved decision-making and resource management. However, overcoming the challenges and barriers to participation remains crucial for fully realizing the benefits of SEA in sustainable development.

## **Shaping Environmental Outcomes Through Public Participation**

SEA reports are created to support accountable decision-making, with processes documented and public input included in the MTDP. Public participation outcomes include increased transparency, improved stakeholder feedback, minimized project impacts, and enhanced environmental health. However, participants, particularly from KKMA, expressed frustration, noting their inputs often went unnoticed, with no feedback or reports indicating their contributions. Despite these challenges, the process aims to ensure effective public involvement and the integration of community perspectives, emphasizing that SEA should be community-owned, as it directly affects them.



## Recommendations

On the accounts of the findings, the following recommendations are made:

- i. Public involvement in SEA must be improved at MMDA level to enhance participation throughout the local authority governance structure.
- ii. Capacity building on SEA and its implementation processes for staff of MMDAs is necessary for appreciation of the essence of the process.
- iii. Sensitization of the public on SEA as well as improvement on public participation awareness drive by MMDAs is key in obtaining the interest of stakeholders to regularly participate in SEA activities and not reduce the process to an under-served activity.
- iv. Resource allocation for promoting public participation in the SEA process must be sufficiently provided and prioritized by the MMDAs.
- v. Guidelines for promoting public participation in PPPs at the MMDAs in the SEA process must be sufficiently provided and prioritized by the MMDAs
- vi. Further research into the SEA process and its application by researchers and institutions remains critical.

## Conclusion

The concept of SEA as a decision-making tool within the environmental governance process must have a guidance on how the participation is conducted and an in-built mechanism that allows for effective public participation. This study has established that the MMDAs in the Greater Accra Region have applied SEA as an environmental decision-making tool in policies, plans, and programs, notwithstanding their variability in approach. The majority of the MMDAs have indicated that their MTDPs integrates the SEA process.

Additionally, some of the ways the public was involved in SEA process were through town hall meetings, community engagement, focused group discussions, and interviews. Again, most of the Assemblies were concerned about the barriers to public participation in the SEA processes. Issues such as; inadequate resources, high cost of participation which has led to a limited number of participants, lack of proper communication, lack of commitment on the part of the public, and the absence of clear public participation or engagement guidelines were identified.

Also, the majority of the MMDAs concluded that public participation in the SEA process at the respective stages of engagement had promoted some level of environmental sustainability outcomes - communities have become members of the SEA preparation team, issues of climate change and gender are mainstreamed.

*Author: Dr. Peter Justice Dery (Esq.)*



# Empowering Communities, Restoring Nature:

## *A Conservation Story from Malawi*



By Hollis McLellan, Founder, Collaborative for Change, Inc.

In Malawi, just outside a small village in the Lilongwe District, a long-forgotten building is coming back to life. What once stood as four crumbling brick walls with no roof, no windows, and no floor and was hardly recognizable as a school, is being transformed into a place of hope, learning, and environmental stewardship.

At Collaborative for Change, Inc., our mission is simple yet profound: empower communities and restore nature. We believe that real conservation begins when people have the tools, the knowledge, and the ownership to care for their environment in ways that also improve their quality of life. Our work is grounded in environmental health, restoring ecosystems while simultaneously addressing hunger, education, gender equity, and sustainable livelihoods.

One of our most inspiring partnerships to date has been with Pike Ng'oma, Program Director of the Malawi-based organization We Clean We Green. When Pike first shared a photograph of the unfinished structure that was meant to be Nsonga Primary School, I didn't recognize it as a school at all. It looked like a ruin. And yet, it was meant to serve children in grades 1 through 6, who sat on dirt floors, exposed to the elements, with no

safe infrastructure.

Pike's deep-rooted commitment to his community and our planet moved us to act. Through his tireless efforts, materials were sourced locally and responsibly, brick by brick, a roof was added, windows are being installed, and a floor will soon be laid down. The school will be ready in time for the new academic year, and with it, the dreams of many children will finally have a foundation, literally and figuratively.

But our vision for Nsonga goes beyond rebuilding a school.

We are working with local leaders and educators to expand the curriculum to include a forest-building component. The village chiefs have generously designated a hectare of adjacent land for what will become Nsonga Forest Park, a living classroom where students will learn to gather, preserve, and propagate native seeds, care for saplings, and restore biodiversity. Our forestry consultant, Jill Wagner of Future Forests, is designing the curriculum, ensuring that what is planted is not only ecologically sound but also meaningful to the students who will grow with it. *It is also a climate smart activity which will provide shade for the children, reduce rainfall runoff, and reduce dust while supporting regional biodiversity.* Therefore, this forest will be more than a conservation site, it will be a place of pride and joy for the children, a tangible expression of their role in healing our planet.

In addition, the school grounds will host an agroforestry project, providing fruit, vegetables, and nutrient-dense plants that can be used in the school lunch program and distributed to families in need. In a country like Malawi, where hunger is a daily reality, planting food alongside trees is not just sustainable, it is essential. *This is another benefit of the project that includes food resiliency.*

Yet this project is not just about trees, crops, or bricks. It's about protecting the most vulnerable - especially girls and women.

By completing the school and extending it from grades 1–6 to grades 1–8, we are making a direct impact on girls' safety and access to education. In the past, when girls had to travel long distances along busy roads to reach the nearest secondary school, many were subjected to violence, rape, harassment, or road accidents. With the new upper grades now located within the village, these risks are drastically reduced. It's a quiet but powerful intervention in the fight against gender-based violence and educational inequality.

Another less visible but equally critical challenge we're addressing is menstrual hygiene. Far too often, girls are forced to leave school for the day or stop attending altogether once they begin menstruating. The shame, lack of privacy, and absence of proper facilities take a toll on their education and self-esteem.

To change that, we are constructing a dedicated women's changing room, complete with the first compostable toilet in the area. This space will offer privacy, dignity, and a sense of normalcy for young girls during their menstrual cycles. In addition, we are building a compostable toilet for female teachers, whose current pit latrine is unusable. These are small, practical steps, but they send a clear message: girls and women matter. Their needs matter. Their education matters.

What makes this project special is not just its impact, but how it came to life. From the beginning, it has been community-led. We did not arrive with blueprints and assumptions, we listened. We built on the vision of local leaders and especially on the skill and passion of Mr. Ng'oma. We adapted to what the community needed, not what we thought it needed. That spirit of collaboration and humility is what allows our projects to take root and grow.

In our view, climate action and sustainability in Africa must be locally driven. Solutions that work are those that honor Indigenous knowledge, create economic opportunity, and

align with ecological realities on the ground. Nsonga is a model of that philosophy in action: blending education, conservation, food security, and gender equity into one living, breathing project.

The school is not just a structure; it is a statement. A sign that this community is investing in its future, and that future includes healthy forests, educated girls and boys, and full stomachs.

We hope that Nsonga will be one of many. As we scale our work across East Africa and across the African continent, we are committed to building partnerships that reflect the same values: equity, sustainability, and community empowerment in order to *protect the planet and transform lives*.



# Prof. Nana Ama Browne Klutse:

## *Pioneering Climate Science in Africa*

*Africa's scientific community has produced many luminaries, but few shine as brightly as Prof. Nana Ama Browne Klutse. A distinguished climate scientist, educator, and advocate, she has not only advanced climate research in Africa but also positioned herself as a global authority in climate policy and environmental sustainability. Her remarkable career is a testament to the power of scientific inquiry, leadership, and unwavering dedication to the continent's future.*



### A Journey Rooted in Excellence

Prof. Klutse's passion for science was ignited at a young age. She attended Mfantsiman Girls' Senior High School, where she demonstrated an early aptitude for physics. Her academic pursuits led her to the University of Cape Coast, Ghana, where she earned her undergraduate and master's degrees in physics. Determined to deepen her expertise, she pursued a Ph.D. in Climatology at the University of Cape Town, South Africa, where her research focused on climate modeling for West Africa.

With an insatiable drive to bridge the gap between scientific knowledge and practical application, Prof. Klutse returned to Ghana and dedicated herself to academia. She is currently a professor and Head of the Department of Physics at the University of Ghana, Legon. Through her leadership, the department has become a hub of research excellence, fostering collaborations that aim to address Africa's unique climate challenges.

### Leading Africa's Climate Science Agenda

Prof. Klutse's expertise in climate modeling has made her a leading voice in climate science, particularly in Africa. Her work has significantly contributed to understanding climate variability, extreme weather patterns, and long-term environmental shifts affecting the continent. With more than 45 peer-reviewed publications, her research has informed national and regional climate policies, providing data-driven insights to governments, institutions, and international organizations.

Her impact extends far beyond academia. In July 2023, she was elected as Vice-Chair of Working Group I of the Intergovernmental Panel on Climate Change (IPCC), a prestigious role that places her at the center of global climate assessments. As part of the IPCC, she collaborates with scientists worldwide to evaluate and synthesize the latest climate science, ensuring that policymakers receive accurate and actionable information.

### Driving Policy and Environmental Advocacy

Beyond research, Prof. Klutse has been a vocal advocate for integrating scientific evidence into policymaking. Recognizing the disproportionate impact of climate change on Africa, she has consistently called for more investment in climate adaptation and resilience-building measures tailored to the continent's needs. She has engaged with policymakers, environmental agencies, and global leaders to push for equitable climate action, ensuring that Africa is not left behind in the global climate conversation.

As the Chief Executive Officer of Ghana's Environmental Protection Agency (EPA), she has played a pivotal role in translating climate science into actionable policies. Under her leadership, the agency has intensified efforts to combat deforestation, promote sustainable agricultural practices, and enhance public awareness of environmental conservation.

### Mentorship and Capacity Building for Future Scientists

Prof. Klutse understands that Africa's scientific progress hinges on the next generation of researchers and climate scientists. She has dedicated significant time and effort to mentoring young scientists, particularly women in STEM, inspiring them to pursue careers in climate research and environmental policy. Through her involvement with institutions such as the African Institute of Mathematical Sciences (AIMS), she has helped shape programs designed to equip young African researchers with the necessary skills to tackle climate-related challenges.

Her commitment to education also extends to public engagement. She frequently participates in climate forums, conferences, and media discussions, simplifying complex climate issues for broader audiences. Her ability to communicate science effectively has made her an influential figure in raising awareness about climate change and its implications for Africa's socio-economic development.

## *A Legacy of Impact and Inspiration*

Prof. Nana Ama Browne Klutse's contributions to climate science and policy are not just commendable—they are transformative. Her work has solidified Africa's role in global climate discussions, ensuring that the continent's voice is heard in crucial negotiations. As she continues to lead groundbreaking research and advocate for sustainable environmental policies, her influence will shape Africa's climate resilience strategies for years to come.

In a world grappling with the pressing realities of climate change, Prof. Klutse stands as a formidable force, proving that African scientists can lead the charge in shaping a more sustainable and equitable future. Through her brilliance, leadership, and dedication, she has not only elevated Africa's scientific community but also set a precedent for the generations that will follow in her footsteps.



# Bright Tide Unveils AgriBlue.

## AI at GITEX Africa:

*Bridging AI and Agriculture for a  
Regenerative Future*



**Bright Tide**, the UK-based sustainability consultancy known for bringing together business, technology, and environmental leadership, has officially launched its latest global initiative: **AgriBlue.AI**. The programme was unveiled during **GITEX Africa**, the continent's largest and most influential tech event, held in April 2025 in the vibrant city of Marrakesh, Morocco.

This milestone marks another bold step forward for Bright Tide following the successful launch of its **Sustain.AI** Accelerator at GITEX Global in Dubai in October 2024. With a mission to support high-impact ventures solving some of the planet's most pressing challenges, Bright Tide continues to position itself as a catalyst for climate innovation across both land and sea.

### A New Chapter: AgriBlue. AI

AgriBlue. AI is an ambitious accelerator programme designed to catalyse breakthrough innovation at the intersection of **artificial intelligence, agriculture, and aquaculture**. Applications are open globally from **16 April to 15 July 2025**, inviting entrepreneurs, startups, and researchers working on AI-powered solutions for sustainable food systems to apply.

The programme's goal is to **revolutionise food production** by bridging the gap between regenerative farmers and cutting-edge AI innovators. From soil health monitoring and precision irrigation to aquaculture data analytics and climate-smart crop planning, AgriBlue.AI seeks to scale solutions that can meet the world's growing food demands without compromising biodiversity or planetary health.

*"We're at a critical moment in the global food system," said Harry Wright, CEO and Founder of Bright Tide. "With the pressures of climate change, soil degradation, and water scarcity mounting, it's essential that we find smarter, more sustainable ways to feed the world. AgriBlue.AI is about connecting visionary AI pioneers with farmers and ocean stewards to build scalable, real-world solutions."*

### Support Beyond Capital

Unlike many other accelerators, Bright Tide's ethos goes beyond simple investment matchmaking. Through AgriBlue.AI, participants gain tailored legal support, strategic investor-readiness guidance, and assistance in storytelling, branding, and communications. The programme is designed to nurture ventures holistically—supporting not just their product development, but their long-term market fit and impact potential.

This integrated approach reflects Bright Tide's belief that meaningful innovation in the climate space needs more than funding; it needs mentorship, cross-sector collaboration, and platforms to amplify voices that are too often overlooked.

### A Global Launch in Africa

The official launch of AgriBlue.AI took place on Day 3 of GITEX Africa on the Impact Stage, with Harry Wright taking to the spotlight to announce the programme's opening call for applications. The announcement was followed by a powerful fireside chat between **Sangeeta Laudus**, Senior Advisor to Bright Tide, and Ian Redmond OBE, the world-renowned conservationist known for his early work with mountain gorillas in central Africa and his collaborations with figures like **Sir David Attenborough and Sigourney Weaver**.

The session underscored the interconnectedness of **climate, biodiversity, and sustainable food systems**, and the urgency of leveraging emerging technologies like AI to solve these challenges in tandem.

With **Morocco's Generation Green 2020–2030 strategy** serving as a national roadmap for inclusive and sustainable agriculture, and its pivotal geographic and diplomatic role in connecting the global north and south, GITEX Africa was a natural choice for launching AgriBlue.AI. It provided a powerful platform to spotlight the potential of African innovation and agritech in shaping the future of global food security.



### Building on Past Successes

AgriBlue.AI builds on Bright Tide's experience running successful sustainability accelerators and partnerships with ventures across Africa and beyond. In previous programmes, Bright Tide has worked with a variety of standout African startups including:

• **Tese (Zimbabwe):** Founded by Kuzi Charamba, Tese enables financial institutions to scale support for small and medium-sized enterprises, fostering inclusive access to capital in emerging economies.

• **Healthy Seaweed Company (Tanzania):** Empowering women to become seaweed farmers, the venture produces and exports high-quality, wildcrafted seaweed to global markets while advancing gender equity and coastal community resilience.

These ventures exemplify the kind of scalable, locally grounded solutions that AgriBlue. AI hopes to elevate through its next cohort.

### What AgriBlue.AI Offers

Successful applicants to AgriBlue.AI will join a bespoke 12-week accelerator designed to:

- **Connect ventures with leading investors**, corporates, and ecosystem partners in the agri-food and ocean innovation space;
- Offer **mentorship from global experts** in AI, regenerative agriculture, and aquaculture;
- Provide **hands-on support with fundraising**, legal structuring, marketing, and growth strategy;
- Showcase selected ventures at high-profile **pitching events and demo days**, including a final event at a prestigious international venue.

The programme is open to ventures at various stages—from seed to Series A—working

on solutions such as:

- AI-powered soil and crop monitoring
- Predictive analytics for climate resilience
- Aquaculture optimisation tools
- Biodiversity-friendly farming tech
- Supply chain transparency and traceability

### Looking Ahead

As global interest in regenerative food systems, climate adaptation, and biodiversity markets continues to grow, Bright Tide's launch of AgriBlue.AI is both timely and ambitious. It represents a critical investment in the technologies and talent that will shape a more sustainable, equitable, and food-secure future.

By uniting innovators across continents and ecosystems, AgriBlue.AI is more than an accelerator—it's a global movement to reimagine the way we grow, harvest, and consume our food.

### How to Get Involved

Applications for the **AgriBlue. AI Accelerator** are now open until 15 July 2025. Interested ventures can apply via Bright Tide's website and are encouraged to reach out for more information or partnership opportunities.

As Harry Wright concluded in Marrakesh:

*"We believe in a future where innovation is regenerative by design—where AI isn't just a tool for efficiency, but a bridge to a thriving planet. AgriBlue.AI is our commitment to that future."*

# Rethinking Systems:

*A Call for Courage, Creativity, and Collective Action*

How can private sector actors better recognize and account for the hidden value within human, social, and natural capital? This question strikes at the heart of what is often missing in today's economic models—and addressing it is critical if we are to incentivize lasting, meaningful change.

It forces us to reflect on systems: how change truly happens, and what it takes for that change to become the norm. As Donella Meadows famously put it, "*Leverage points are places where a small shift in one thing can produce big changes in everything.*" But before we can shift the system, we must first learn to truly see it

## Understanding the Systems We Live In

Systems are all around us—whether it's a couple, a family, a city, a nation, or the global economy. They are dynamic, interconnected, and constantly evolving. Today, however, our economic system is beginning to creak under the weight of centuries of relentless growth, fueled by the unchecked borrowing of natural resources from other geographies and future generations.

The urgent question becomes: *how do we transition toward a new economic paradigm—one that values nature, people, and prosperity equally?*

### Letting the System See Itself

To change a system, it must first be able to reflect on itself. Recognizing the full impact of our economic choices, beyond mere financial returns, is deeply political, multidimensional, and demands both courage and creativity. It's no longer enough to believe that markets alone will solve climate change, biodiversity loss, or persistent inequality. Addressing these challenges requires us to think, organize, and act differently—across entire systems.

Yet, often, we remain trapped within our own silos, struggling to connect with others who are pushing boundaries or innovating at the edges. We also lack a cohesive narrative within the private sector to talk about systemic change in a way that resonates and compels action.

But the truth remains: it is within our collective power to update the economic system. Focusing solely on financial capital is no longer sufficient. Change is not only possible—it is becoming inevitable. And importantly, we can shape how that change unfolds.

### A Critical Moment for Collective Wisdom

What lies ahead is a profound call for courageous leadership, radical creativity, and collective wisdom. Over the next decade, political, economic, social, and environmental systems will face immense pressure—and systems, by nature, resist change before they embrace it.

There is a pressing need for a bold strategy—a roadmap for 2025 to 2035—that redefines success, moving beyond GDP figures and profit margins to account for what truly matters: sustainable livelihoods, vibrant ecosystems, and thriving communities.

Changing a system's paradigm may seem daunting, but, as Meadows reminds us, it often happens not through force or cost, but through a simple shift in perception. "In a single individual it can happen in a millisecond—all it takes is a click in the mind, a falling of scales from the eyes, a new way of seeing."

### Time for a New Vision

*Let us be brave enough to allow our systems to see themselves—to recognize their strengths, their faults, and their immense potential for transformation. Because sometimes, all it takes is a moment of clarity to set an entirely new future in motion.*



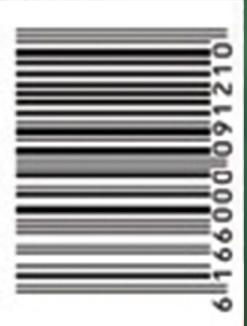
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