AFRICA iN FACT

GGA
Good Governance Africa

ISSUE 67 | OCT–DEC 2023
WWW.GGA.ORG

FOOD & WATER SECURITY

INTRA-AFRICA TRADE
AGRICULTURE'S BUILDING BLOCKS

AFRICA'S COASTS
ADAPT OR DROWN

FOOD SOVEREIGNTY
POWER TO THE PEOPLE

DOWN THE DRAIN
WASTEWATER IS UNDERUSED

Be the catalyst.
Be the change.

Imagine a future where all our youth have unlimited access to opportunities. A future without barriers.

That future is possible, and it is calling on us to stand up today and do our part to make it a reality.

At Anglo American, we believe that the future belongs to each and every one of us, and that we are each accountable to shape a better future. One where the rule of law, economic growth and opportunity pave the way for people to thrive. A future that we can be proud of.

Together with our partners and all our stakeholders, we aim to help build a stronger, healthier, and more sustainable South Africa. Enhancing the lives of people through a re-imagined mining industry, catalysing socio-economic opportunities that ignite a sense of hope and optimism for the future.

Our collective efforts are channeled into areas that will have a lasting positive impact, including education, health, and enterprise development.

Mzansi, we are the catalysts for a better tomorrow, and the time to shape that future is now.

Together, we are shaping a better future.

Scan the QR code for more information about Our Impact.

AngloAmerican

AFRICA iN FACT

The quarterly journal of Good Governance Africa
October - December 2023
Issue 67

Published by Good Governance Africa
The Mall Offices, 11 Cradock Avenue,
Rosebank, Johannesburg, 2196

Africa in Fact engages with writers and readers across the continent.
As part of that, we invite comments to our Letters section.
Contributions can be sent to info@gga.org
or posted to: The Editor, *Africa in Fact*, Good Governance Africa,
P.O. Box 2621, Saxonwold, 2132

All emails should be clearly marked “Letter to the Editor” in the subject line.

To advertise in *Africa in Fact*, email info@gga.org

CONTENTS

EDITORIAL

9 Food For Thought
Bold choices are required to improve both food and water security across Africa.

12 Beyond borders
Leveraging AFCFTA to advance food sovereignty.
by Adio Dinika

18 Innovation is key
Africa faces unprecedented food insecurity.
by Raphael Obonyo

24 A sober reality
Hunger is rising all across Africa's regions.
by Mischka Moosa

28 Food and water security
There's an intricate relationship between water and food security.
by Christine Dube

34 Written in the data
Improving food and water security requires better statistical systems.
by Nnaemeka Ohamadike

38 The future is blue
The fishing sector and aquaculture feeds more than 200 million Africans.
by Ronak Gopaldas

44 At what cost food security?
The hidden hand of Africa's agri-investment bonanza.
by Malcolm Ray

52 Going to waste
The fight for better wastewater treatment across Africa is an uphill one.
by Joe Walsh

58 New fields and forests
Reclaiming Africa's deserts.
by Michael Schmidt

64 Mini livestock is having a day
Commercialised creepy crawly farming is the new food frontier.
by Michael Schmidt

68 Time is of the essence
Marginalised indigenous crops have a role to play in alleviating food insecurity.
by Anna Trapido

74 The last mile
Reimagining urban food systems.
by Tshepo Mokholo

80 Rising tides, waning fortunes
Africa's fishing sector faces serious challenges.
by Monique Bennett

86 Nigeria's food and water woes
A confluence of conflict, extreme weather, and economic challenges.
by Anthony Ademiluyi

90 Thrown away
In Kenya vast amounts of food decay while too many of the poorest die of hunger.
by Issa Sikiti da Silva

94 The devil's in the detail
Mismanaged subsidies hit Malawi's struggling subsistence farmers hard.
by Josephine Chinele

98 Benin's water warriors
Public-private partnerships are working to improve food and water security.
by Mamah Djiman Hairith

102 Togo's journey to self-sufficiency
Ambitious 'Planned Agricultural Zones' are boosting harvests and improving livelihoods.
by Blamé Ekoue

BOOK REVIEW

106 Water challenges in rural and sub-Saharan Africa
Solutions for holistic water management.
Reviewed by Sarah Nyengerai

REGULARS

04 Contributors
85 Cartoon

MAP

110 Africa in numbers

Education: The heartbeat of the digital economy

At a time when South Africa's youth are facing startling levels of unemployment and poverty, the Telkom Foundation believes the best way to effect change in society is through appropriate education which addresses the country's skills shortage.

Over the past few years, the Telkom Foundation has upped its game regarding the way it assists schools, learners and teachers – striving to make progressive ways of learning accessible and affordable, as well as equipping learners with future-fit skills.

While the Telkom Foundation has adopted a holistic approach with multiple initiatives, these are interconnected components to ensure comprehensive support. The learner support programmes focus on Science, Technology, English, and Mathematics (STEM), Digital Skills, Career Management and Psychosocial Support. The intention is to make learners "future fit" by investing in skills of the future while also empowering them to succeed in their studies today. The girl child has been a focal point in our programmes by ensuring that the majority of learners in our programmes are girls. This ensures that whilst we contribute to STEM and ICT skills, we also contribute to increasing the number females in ICT and STEM.

"At the heart of it all, we are doing this so that we can produce learners who are resilient, learners who have grit, learners who are constantly aware of the world of work that is rapidly changing, learners who have a very strong desire to perform in Maths and Science," says Sarah Mthintso, Head of Telkom Foundation.

To enable the learners to be future fit and resilient, the Foundation needed to work on a comprehensive ICT solution that not only provides connectivity, but also hardware and content geared to support academic and digital skills goals. The plan was also to address issues of digital inclusivity for learners, teachers and school leaders.

"Once deployed, the Foundation worked with teachers and learners on how to use computers and other ICT solutions. The second was to focus on skills that we believe are important in advancing an understanding and knowledge of digital skills," reveals Mthintso.

"Skills like problem-solving, critical thinking, and innovation were introduced as part of the digital skills programme. We did not only want to expose them to the technical skills, but we also wanted to make them aware of the societal challenges that exist and how technology could assist in solving some of those problems."

The Telkom Foundation, through its digital skills programme, is already implementing what many believe to be the Classroom of the Future. It is miles ahead of many others in readying learners for the digital economy.

"We pride ourselves in having introduced our young people not only to coding and robotics, but also to emerging technologies such as Fintech, the Internet of Things (IoT), and Artificial Intelligence (AI). We think it is important to understand today, what the world of tomorrow will look like," concludes Mthintso.

Telkom

CONTRIBUTORS

TONY ADEMILUYI

is a Lagos-based freelance journalist and writer. His works have appeared in leading Nigerian newspapers including *Punch, Nation, Guardian, Vanguard, This Day, Daily Independent, Sahara Reporters*, and *Daily Post* among many others. His works have also been published in reputable African magazines like The *Africa Report* and *Africa Today*.

MONIQUE BENNETT

holds a Master's degree in International Relations from the University of the Witwatersrand. The researcher is currently pursuing her Doctorate in Political Science at Stellenbosch University funded by the Peace Research Institute of Oslo. She enjoys a mixed-methods approach to research across topics such as governance, environmental issues, human security and peacebuilding within the African context.

JOSEPHINE CHINELE

is a multi-award-winning international journalist. She has worked as a news, features and investigative journalist for newspapers, radio and television platforms in Malawi, Tanzania and South Africa. Josephine has also been awarded several prestigious journalism fellowships in the area of HIV and AIDS, health and human rights among others. She is also a biomedical HIV prevention advocate.

ADIO DINIKA

is a writer, researcher and affiliated PhD fellow at the Bremen International Graduate School of Social Science (BIGSSS). His areas of interest are digitalisation and the future of work. He has published opinion pieces on digitalisation and socioeconomic development in several print and online publications, and his first unpublished novel, *They like us dead*, was longlisted for the 2021 James Currey Prize for African Literature.

CHRISTINE DUBE

is head of Good Governance Africa's Governance Insights and Analytics programme. She completed her Bachelor of Social Sciences degree in Industrial, Organisational and Labour Studies in 2011, her Honours in Commerce in 2012, and her Master of Commerce at the University of KwaZulu-Natal in 2013. Her experience includes risk analysis, finance, administration as well as marketing and sales.

BLAMÉ EKOUE

is the Togo correspondent for the BBC and for Paris-based media house ANA. He has also reported for Associated Press and Radio France International. He holds a BA in Communications from the Leader Institute in Lomé. Formerly deputy editor of the *West Africa Revue*, he has been a contributor to the Lomé-based *Business and Finance* magazine since 2015.

GGA
Good Governance Africa

ISSUE 67

THE QUARTERLY JOURNAL OF GOOD GOVERNANCE AFRICA

OCTOBER/DECMBER 2023

Good Governance Africa is a registered non-profit organisation with offices in Johannesburg (South Africa), Lagos (Nigeria), Accra (Ghana), Dakar (Senegal), Addis Ababa (Ethiopia) and Harare (Zimbabwe).
We aim to improve governance performance across the continent; to inform and persuade the policy community that transparency and accountability are the basic building blocks of successful development; to strengthen the rule of law; and to build an active citizenry that institutionalises constraints on executive power.
Our publications serve to further these goals. Opinions expressed are those of the individual authors and not necessarily of Good Governance Africa.

Africa in Fact engages with writers and readers across the continent. As part of that, we invite comment to our Letters section.

Contributions can be sent to info@gga.org

or posted to:
The Editor,
Africa in Fact,
Good Governance Africa,
P.O. Box 2621,
Saxonwold,
2132

All emails should be clearly marked "Letter to the Editor" in the subject line.

To advertise in Africa in Fact, email info@gga.org

www.gga.org

CONTRIBUTORS

RONAK GOPALDAS
is a director at Signal Risk, an exclusively African risk advisory firm. He was previously the head of country risk at Rand Merchant Bank (RMB), where he managed a team who provided the firm with in-depth analysis of economic, political, security and operational dynamics across sub-Saharan Africa. He holds a BCom degree in philosophy, politics and economics (PPE) and a BCom (Hons) from the University of Cape Town (UCT). He also has an MSc in finance (economic policy) from the School of Oriental and African Studies (SOAS) in London.

MAMAH DJIMAN HAIRITH
is an investigative reporter from Benin with more than 10 years of field experience in Africa's media industry. She has worked across various platforms, including radio and newspapers like *Le Paradoxe* and *Togo Finance et Business* in Benin and Togo. She holds a degree in linguistics and communication and is passionate about telling stories around science and technology.

TSHEPO MOKHOLO
is an urban practitioner, designer, writer, and researcher based in South Africa. He has worked on design and research projects across the continent, including Kenya and Rwanda. He holds an honours degree in architecture from the University of Pretoria and is currently a Master's student in Southern Urbanism at the African Centre for Cities, where his research is exploring alternative development models, using an analysis of township food systems as an entry point.

MISCHKA MOOSA
is a data journalist at Good Governance Africa. She holds a Bachelor of Social Science with majors in Gender Studies and Political Science that she obtained from the University of Cape Town. Her focus of interest is on decolonial approaches to justice, development and transformation in Africa.

SARAH NYENGERAI
is an academic and freelance writer based in Zimbabwe with a strong passion for social, cultural, economic and political issues that affect women. She believes literary works form the foundation for the dialogue required to sustain momentums of change and aims to bring attention to such matters. A member of NAFSA (Association for International Educators) and Forum for African Women Educationists (FAWE), Sarah is actively involved in the advancement of education for women.

RAPHAEL OBONYO
is a public policy analyst. He has served as a consultant with the United Nations. The alumnus of Duke University is widely published in Africa and beyond. He's a Ford Foundation and TEDx fellow and has won various awards.

NNAEMEKA OHAMADIKE
is an experienced teacher with a background in politics and international relations, and programming skills in R and Python. Passionate about using computational methods in data science in solving real-world problems. Much of his research focuses on quantitative social analysis, human development, governance, and migration.

MALCOLM RAY
is a research consultant and author of two scholarly books, titled *Free Fall: Why South African Universities are in a Race against Time* and *The Tyranny of Growth: Why Capitalism has Triumphed in the West and Failed in Africa.* Malcolm's subject speciality is economic history, dealing directly with themes of power hierarchies, race and gender discrimination, and class inequality. Currently, he focuses on the shifting dynamics of urban livelihoods, economic growth and power relations.

CONTRIBUTORS

MICHAEL SCHMIDT

is a veteran investigative journalist, best-selling non-fiction author, and human rights activist with more than three decades of experience, having worked in 47 countries on six continents. He is official rapporteur of the international Safe Havens arts rights justice summit, and convenor of the Creative African Defensive Network (CADENET).

ISSA SIKITI DA SILVA

Kinshasa-born Issi Sikita da Silva is an award-winning freelance journalist. Winner of the SADC Media 2010 Awards in the print category, he has travelled extensively across Africa and lived in South Africa for 18 years, where he worked in the media industry for 10 years. He is currently based in West Africa.

ANNA TRAPIDO

is an anthropologist and a chef. She trained as an anthropologist at King's College, Cambridge, completing her PhD in the department of community health at Wits University, Johannesburg. She qualified as a chef at the Prue Leith Chef's Academy in Pretoria, and uses both disciplines in her work.

JOE WALSH

is a freelance journalist based in Johannesburg. He writes about the environment, energy and the green economy as well as politics and society for British publications, including *Environmental Finance*, the *New Statesman* and *The New European*.

SUBSCRIPTION ENQUIRIES
Call: +27 (0)11 268 0479
subscriptions@gga.org

For editorial queries contact the editor, Susan Russell, at susan@gga.org

For advertising and other commercial opportunities contact amanda@gga.org

We can also be reached at
Tel: +27 11 268 0479
info@gga.org

EXECUTIVE DIRECTOR
Chris Maroleng

DIRECTOR OF PUBLICATIONS
Lloyd Coutts

EDITOR
Susan Russell

SUB-EDITOR
Helen Grange

CREATIVE DIRECTOR
Brandon Janse van Rensburg

GRAPHIC DESIGNER
Mallory Munien

DATA JOURNALIST
Mischka Moosa

VIDEO PRODUCTION
Deon Kloppers
Nhlakanipho Masemula

CHIEF TECHNOLOGY OFFICER
Tshepang Molefe

ADVERTISING SALES
Amanda Chetty

CONTRIBUTORS TO THIS ISSUE
Anthony Adelimuyi, Monique Bennett, Josephine Chinele, Adio Dinika, Christine Dube, Blamé Ekoue, Ronak Gopaldas, Mamah Djiman Hairlth, Tshepo Mokholo, Mischka Moosa, Sarah Nyengerai, Raphael Obonyo, Nnaemeka Ohamadike, Malcolm Ray, Michael Schmidt, Issa Sikiti da Silva, Anna Trapido, Joe Walsh

Good Governance Africa

PUBLISHED BY
Good Governance Africa
The Mall Offices,
11 Cradock Avenue
Rosebank
Johannesburg
2196

WORLD-CLASS EDUCATION

- Postgraduate
- Degrees
- Advanced Diploma
- Diplomas
- Higher Certificates
- Occupational & Short Learning Programmes

APPLY NOW

BCC BOSTON City Campus
Education. For Life.

boston.ac.za

Accredited by the **British Accreditation Council. Accreditation Council for Business Schools & Programs, United States of America.***

Serious about Education. Serious about You.

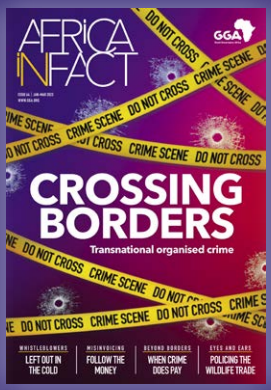
PAYMENT PLANS. TEXTBOOKS INCLUDED.

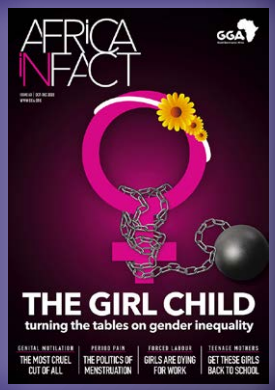
NATIONAL CALL CENTRE **0861 BOSTON** | 47 Support Centres Nationwide

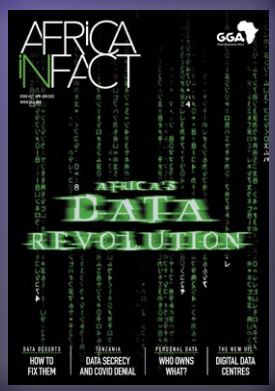
MISSED AN **ISSUE?**

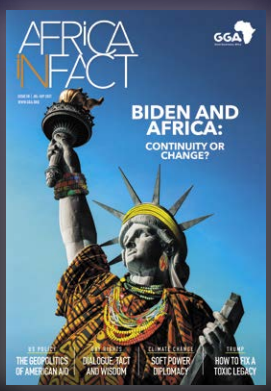
GET YOUR COPIES AND LET'S BUILD A BETTER FUTURE, TOGETHER.

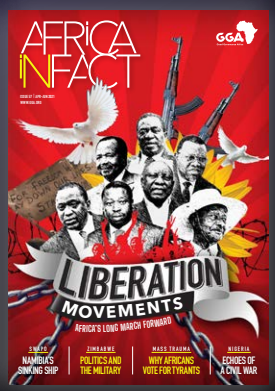
Email Amanda for back issues: amanda@gga.org











OR PURCHASE YOUR DIGITAL ISSUES FROM OUR ONLINE STORE:

AFRICAINFACT.COM

Food for thought

Two decades into the 21st century, it is difficult to accept that on a planet where so many people suffer the health and other consequences of too much of everything, millions of Africans still struggle to access two of the most basic human needs: sufficient food and clean water.

The figures are stark. As Raphael Obonyo writes in this issue, Africa is facing unprecedented food insecurity, with more than 134 million people in 29 out of 54 countries facing acute shortages, according to the US Department of State Humanitarian Information Unit.

The Food and Agriculture Organization (FAO) says that about 257 million Africans are undernourished, making Africa the region with the highest prevalence of hunger globally. The statistics relating to access to clean water are also shameful; the World Health Organization (WHO) reports that nearly 40% of the African population lacks basic access to safe drinking water, leading to waterborne diseases and preventable deaths.

As this issue of *Africa in Fact* clearly illustrates, addressing food and water security in Africa is not only a moral imperative but also an urgent priority for policymakers.

The African Continental Free Trade Agreement (AfCFTA) is one instrument that governments could harness to improve both food and water security. Adio-Adet Dinika's article explores how this would work, pointing out that AfCFTA offers immense potential to reduce Africa's dependence on volatile global markets and costly agricultural imports. Given that Africa spends more than $35 billion annually importing staple cereals, oils, and other basic foods to meet demand, AfCFTA promises to be an important tool in developing more resilient, self-sufficient, and diversified food production and water systems.

At the same time, it is impossible to ignore the nexus between food and water insecurity and the effects of climate change, which are already damaging African livelihoods, especially for the poorest. Irregular rainfall patterns, prolonged droughts, and extreme weather events have become increasingly common, disrupting agricultural practices and water sources. But climate change is just one phenomenon that threatens the food security of millions of people who populate Africa's coastlines.

As researcher Monique Bennett writes, "Africa's fishing sector, which in 2011 contributed an estimated $24 billion annually to the region's economy, faces serious long-term threats, not only from climate change but overfishing and poor management of the aquaculture system as well. Across sub-Saharan Africa, approximately 100 million citizens depend on fisheries as a primary or alternative livelihood activity, and rising populations and per capita income growth are expected to increase the demand for fish by 30% across the continent."

Land degradation, often due to unsustainable farming practices and deforestation, is also a pervasive problem on the continent, leading to reduced agricultural productivity and water quality. Contributors Blame Ekoue and Mamah Djiman Hairith both write about innovative government programmes in West Africa (Benin and Togo) to improve crop yields for smallholder farmers and provide rural communities with potable water.

Scaled up, these programmes will improve the lives of millions.

Speaking of millions, Good Governance Africa's data journalist Mischka Moosa's article takes a hard look at the statistics, according to this year's State of Food Security and Nutrition in the World report (SOFI). "Underlying Africa's sluggish progress towards food security has been a combination of market disruptions and increased political volatility, especially in the Sahel and East African regions," she notes. "The lingering economic effects of the pandemic and ongoing global market inflations, alongside Russia's invasion of Ukraine, has resulted in many countries placing restrictions on food exports to secure domestic supply. But this has still meant ongoing reduced access to key commodities for many countries on the continent." In her article, the low cost of what constitutes the most "energy-sufficient" daily diet (globally $0.83 cents per day) that nevertheless remains beyond the means of millions of Africans makes for sober reading.

In her article, Anna Trapido points out that spatial models predicting the impact of climate change on agriculture in sub-Saharan Africa up until 2070 indicate that in regions where major staples of maize, rice, cassava, and yams are presently grown, 10% of these will alter so radically that none of these crops will be able to survive.

Of these, only yams are indigenous to Africa, which was not always the case. Making the case for the reintroduction and commercialisation of long-neglected indigenous food crops, Trapido says that historically, African agriculture had a wide range of indigenous and/or traditional cereals, leafy greens, pulses, roots, tubers, fruits, seeds and nuts that were once the basis for many and varied nutritious foods.

Regular contributor Michael Schmidt, meanwhile, partly drawing on his own on-the-ground experiences in Darfur, looks at how reforesting initiatives and the presence of under-exploited water resources are contributing to the regreening of swathes of the Sahel. "Great progress has been made towards re-greening the semi-arid 3.05 million km² Sahel belt to the south of the Sahara," he writes. And beneath otherwise parched Darfur itself, he says, lies a huge, almost untapped, freshwater resource that underwrites the reliability of its remaining wells. This is the "world's biggest groundwater aquifer, with a total volume estimated at 150,000km³, covering two-thirds of Egypt, a third each of Sudan and Libya, and a substantial part of Chad".

Collectively, the articles in this issue of *Africa in Fact* make the case that addressing Africa's food and water security requires a multifaceted approach that combines immediate relief with long-term resilience-building strategies. These include sustainable farming practices such as crop diversification, agroforestry, and efficient water use. The continent also desperately needs investment in water infrastructure, including dams, reservoirs, and irrigation systems, which can help store and distribute water more effectively, mitigating the effects of droughts. Education and capacity building that empower local communities with knowledge about water management, nutrition, and sustainable farming practices are also important in building resilience. Addressing poverty and income inequality is essential for ensuring that vulnerable populations can access food and clean water. Finally, efforts to resolve conflicts and promote peace are vital in regions such as the Sahel, which are plagued by violence, because peaceful environments are more conducive to food production and water access.

It is with these challenges top of mind that Africa's policymakers must recognise that without bold choices and investment in sustainable food and water security, economic development and social stability will remain elusive.

Susan Russell – Editor

AFRICA NEEDS TO BE HEARD

Hear what is being said and have your say with our **FREE** monthly Insights.

SIGN-UP IN SECONDS!

WhatsApp: Scan the QR code or navigate to: tinyurl.com/wa-opt-in

Email: Fill in your details at: tinyurl.com/email-opt-in

Online: Read or download your copy at:

africainfact.com

GGA
Good Governance Africa

BEYOND BORDERS

By Adio-Adet Dinika

Russian President Vladimir Putin's recent promise of free grain to six African countries and headlines highlighting the continent's reliance on grain imports from war-torn Ukraine demonstrate Africa's urgent need to strengthen agricultural capacity and food security.

Persistent food insecurity and agricultural underdevelopment undermine health, stability, and economic progress across many African countries. According to Oxfam, 20% of Africans are undernourished, and nearly half of the population lacks access to clean drinking water. At the same time, Africa spends more than $35 billion annually importing staple cereals, oils, and other basic foods to meet demand. With climate change exacerbating droughts, floods, and locust invasions, the continent urgently needs more resilient, self-sufficient, and diversified food production and water systems.

Amid these escalating challenges, the recently enacted African Continental Free Trade Agreement (AfCFTA) offers a significant opportunity to systematically strengthen regional agricultural trade, infrastructure, supply chains, and production capacity. The purpose of this article is to explore how the AfCFTA could be leveraged to advance food sovereignty and resilience across Africa. By progressively dismantling barriers to intra-African trade and facilitating greater regional integration, the AfCFTA provides a mechanism to enhance climate-smart agriculture, empower smallholder farmers, and reduce reliance on volatile global markets.

Realising the AfCFTA's potential, however, will require proactive efforts on multiple fronts by policymakers, private sector actors, and regional bodies. The article will analyse models such as the EU's Common Agricultural Policy, highlight crucial

investments and policies, identify risks, and offer recommendations to help guide effective AfCFTA implementation for robust, sustainable food systems across Africa.

The AfCFTA offers immense potential to reduce Africa's dependence on volatile global markets and costly agricultural imports, according to a recent report by the African Union (AU). By facilitating intra-regional trade, food-deficit countries could source staples more efficiently from nearby surplus areas rather than import them at inflated prices. A UN Economic Commission for Africa study estimates that intra-African agricultural trade could expand by 20-30%, generating an extra $2-4 billion in annual GDP gains. However, fully harnessing this potential will necessitate major investments in transborder infrastructure and supply chains, along with supportive policies to integrate smallholders into cross-border value chains.

A core tenet of food sovereignty is reducing import reliance through enhanced domestic production and regional self-sufficiency. Africa currently produces less than 60% of its food consumption, with yields lagging far behind global averages, according to UN Food and Agricultural Organisation (FAO) data. Transforming this equation requires a coordinated effort to upgrade regional infrastructure. Constructing and rehabilitating roads, rail, electricity, storage facilities, and irrigation can

ABOVE: A screen shows Russian President Vladimir Putin virtually delivering remarks as delegates look on while attending a meeting during the 2023 BRICS Summit at the Sandton Convention Centre in Johannesburg on August 24, 2023.

Photo: Marco Longari / POOL / AFP


Photo: Asmaa Shazly / AFP


Photo: Eduardo Soteras / AFP

connect smallholders across borders to expanded markets, enabling countries to unlock Africa's immense agricultural potential.

The late Kenyan scientist and leading authority on sustainable development, Dr Calestous Juma, spoke extensively about the critical role of technology and innovation in transforming African agriculture to achieve food security on the continent. In his book *The New Harvest: Agricultural Innovation in Africa*, he argued that "Africa needs a strategy that harnesses science, technology, and entrepreneurship to raise agricultural productivity and incomes". Juma highlighted the need to accelerate the diffusion and adoption of technologies like drought-resistant seeds, precision farming tools, and digital advisory services for smallholder farmers across Africa.

In a 2015 interview, Juma stated that "the application of science and technology to raising agriculture productivity, increasing food production, and reducing food losses and waste is critical for the future of the continent. Africa needs a new green revolution built on innovations tailored to its ecological conditions." Through his various writings, Juma consistently emphasised that transforming Africa's food systems required greater technological innovation and diffusion across borders. The AfCFTA can catalyse this diffusion of innovations, enabling the transformation he envisioned.

The European Union's Common Agricultural Policy (CAP) stands as perhaps the most prominent model of using regional economic integration and targeted investments to systematically enhance food security. Initiated in 1962, the CAP aimed to raise agricultural productivity, ensure stable farmer incomes, stabilise markets, and guarantee food supplies across the bloc. The CAP currently accounts for more than 35% of the EU's budget.

According to Alan Matthews, Professor of European Agricultural Policy at Trinity College, Dublin, the CAP modernised production, substantially raised productivity, and transformed Europe from a food-deficient continent to a major food exporter through subsidies, infrastructure upgrades, training, standardisation, and shared research. Rural development programmes

connected smallholders to emerging value chains, helping them survive. According to the think tank Farm Europe, the EU's food self-sufficiency has grown from 73% to more than 115% since 1960. The CAP reflects how strategic regional-level policies, coordination, and investment can systematically enhance food security.

Smallholder farmers (SHFs) produce up to 70% of Africa's food but struggle with many constraints that limit productivity and market access. These bottlenecks include a lack of access to improved inputs like quality seeds, fertilisers, irrigation, and farming machinery. SHFs also have limited access to credit and insurance to make investments to improve productivity. Also, training limitations result in sub-optimal planting and harvesting practices, and the inability to implement climate-smart techniques, which is an area needing urgent attention as much of the implementation of climate agreements falls on them.

Policies under the AfCFTA should systematically identify and alleviate these bottlenecks through:

- Import duty waivers on productivity-enhancing inputs, tools and equipment well-suited for small acreages. This could incentivise widespread adoption.
- Investing in rural broadband expansion and mobile tech tools to provide SHFs with precision agriculture advice, mobile payment platforms, and e-commerce access. This would help integrate SHFs into wider digital value chains.
- Establishing regional smallholder agricultural transformation funds that provide affordable credit and partially subsidise farm inputs. This would enable investments in irrigation, inputs, tools, etc.
- Creating regional commodity exchanges and border facilities and protocols to allow the sharing of market data, connect buyers and sellers, and enable SHFs to trade outputs across borders.

TOP LEFT: A Sudanese farmer tends to his crops in Shendi, located on the banks of the Nile.
LEFT: A man seeds his family's land in the village of Wereb Michael, Ethiopia.
ABOVE: Women sit beside basketfuls of tomatoes harvested from Food and Agriculture Organisation (FAO)-supported farms at Jere community, in Borno state, north-east Nigeria.


Photo: Eduardo Soteras / AFP


Photo: Pius Utomi Ekpei / AFP

ABOVE: A farmer plows the land in a village in Ethiopia.
LEFT: A farmer tries to channel irrigation water to crops in FAO-supported farms at Jere community, 11 km away from Maiduguri metropolitan in Borno, north-east Nigeria.
TOP RIGHT: Somali farmers weed their onion and vegetable field at an irrigation scheme near Dollow in central Somalia.
RIGHT: A Zimbabwean woman works on a field 34 km outside Harare.
FAR RIGHT: Members of the Turkana community walk next to an irrigation canal to provide water to their sorghum crops in an arid area in Nanyee, Kenya.

Realising the benefits of greater agricultural integration under the AfCFTA, while mitigating risks, will require implementing prudent safeguards. Providing technical assistance and gradually harmonising regulations around inputs like seeds, fertilisers and equipment is vital to ensure small-scale farmers access high-quality and certified products without facing exploitation from unfair regulations. Combating opaque bureaucratic policies, corruption and rent-seeking will also be key as regional farm trade expands. Governments must show commitment to transparency, streamlining regulations and anti-corruption initiatives.

Bolstering water security is also imperative, as nearly half of Africa's population lacks reliable access to clean drinking water. Upgrading shared water infrastructure like dams, irrigation canals, and pipes; facilitating cross-border coordination on water management; and investing in technologies like rainwater harvesting, desalination, and wastewater recycling could significantly improve availability and access. Policies that promote more judicious water usage in agriculture and communities are equally important. The AfCFTA provides a mechanism for harmonising regulations and sharing investments to enhance water security and food production across Africa.

With prudent safeguards like these, African leaders can achieve the AfCFTA's potential while protecting farmers' livelihoods and national interests. Good governance, savvy regulation, and continuous monitoring will be imperative for managing risks on the journey towards greater continental integration.

Photo: Tony Karumba / AFP

Photo: Alexander Joe / AFP

Photo: Luis Tato / AFP

As the analysis has shown, strategically leveraging the AfCFTA to strengthen regional infrastructure, integrate smallholder farmers into cross-border value chains, accelerate technology adoption, and facilitate trade could significantly bolster production capacity and food security. Successful implementation aligned with the AU's Agenda 2063 and the Malabo Declaration could profoundly transform the continent's agricultural sector.

Ultimately, African leaders face a critical choice. Will they proactively leverage the AfCFTA's potential to build robust, sustainable food systems? Or will they let this historic chance slip by? To quote Frantz Fannon, "Each generation must, out of relative obscurity, discover its mission, fulfil it, or betray it". The future food security and prosperity of millions of Africans hangs in the balance, and what greater generational mandate exists than this? With strategic vision and steadfast commitment, the AfCFTA can be harnessed to advance continental food sovereignty, uplift rural communities, and build climate resilience for generations to come. GG

Photo: Stefanie Glinski / AFP

INNOVATION IS KEY

By Raphael Obonyo

Africa is facing unprecedented food insecurity, with more than 134 million people in 29 out of 54 countries on the continent facing acute shortages, according to the US Department of State Humanitarian Information Unit.

Countries facing acute food insecurity in Africa include Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d'Ivoire, Democratic Republic of Congo, Eswatini, Ethiopia, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Senegal, Somalia, South Sudan, Sudan, Tanzania, Zambia, and Zimbabwe.

Current rising levels of food insecurity are attributed to several factors, including extreme weather, human displacement, conflict, and economic shocks. Strategic and urgent measures are needed to enhance the resilience of Africa's food systems and bolster the ability to deliver on food security.

Recently, Norad, a Norwegian agency for development cooperation, sent out a call for proposals on combating food insecurity in sub-Saharan Africa, listing some interventions they believed to be key in overcoming food insecurity including climate resilient agriculture, biodiversity, and support to small-scale food producers. Other proposed interventions include reducing food loss and waste and developing effective local value chains and access to markets for small-scale farmers.

Speaking at the Mo Ibrahim Governance Weekend held in Kenya in April, Ibrahim Mayaki, African Union Special Envoy for Food Systems, emphasised the need for more investment in food systems to reduce food insecurity. "Food insecurity is not a question of production, but of poverty. The main aim should be to tackle poverty," said Mayaki.

Indeed, investment in agriculture is crucial in addressing food insecurity

Photo: Tony Karumba / AFP

ABOVE: Anne Mburu looks over her flexibag biogas 'digester' which she installed on her farm in Kiambu county, Kenya, that she plans to use to generate electricity for her broiler chicken brooding project.

and features prominently in the African Union 2003 Maputo Declaration on Agriculture and Food Security, which required countries to allocate at least 10% of national budgetary resources to agriculture and rural development. However, Mayaki lamented that only 10 to 12 countries on the continent had managed to reach that target.

The third Biennial Review Report, published by the AU in February 2022, on the progress in implementing the comprehensive Africa Agriculture Development Programme (CAADP) through the Malabo Declaration, revealed that only one country, Rwanda, was on track to achieve the goals of the seven Malabo Declaration commitments: re-committing to the principles and values of the CAADP process; enhancing investment finance in agriculture; ending hunger in Africa by 2025; reducing poverty by half by 2025 through inclusive agricultural growth and transformation; boosting intra-African trade in agricultural commodities and services; enhancing resilience of livelihoods and production systems to climate variability and other related risks; and strengthening mutual accountability for actions and results.

Photo: Tony Karumba / AFP

ABOVE: William Kiarie feeds goldfish at his Green Algae Highland fish farm, in central Kenya.

But in addition to investments to prevent food crises, countries, regional institutions, and individuals are addressing food insecurity and boosting the resilience of food systems in diverse ways.

For example, in West Africa, the World Bank has rolled out a $570 million multi-phased programme to increase agricultural productivity through climate-smart agriculture, to promote intra-regional value chains and trade, and to build regional capacity to manage agricultural risk. The project was deemed necessary to address the urgent

LEFT: Lukas Wekesa (L), a plant doctor, speaks during a training course for farmers, at a maize farm attacked by fall armyworms in Vihiga, some 278 km west of Nairobi.

need for food assistance due to a combination of drought, poverty, high cereal prices, environmental degradation, displacement, poor trade integration and conflict.

In Kenya, meanwhile, the government has prioritised sustainable farming practices in its policies and budget to boost food and nutrition security and build resilience against climate change shocks.

Kenya's Principal Secretary, Ministry of Agriculture and Livestock Development Kello Harsama, in a recent statement, said climate-smart agriculture was key to food security.

"Various state agencies, in collaboration with partners from county governments, local and international firms, and research institutions, are building the capacity of both smallholder and large-scale farmers to practise sustainable agriculture towards improving crop yields, stimulating the economy, and helping mitigate climate change," he said.

"Agriculture is hugely vulnerable to climate change, particularly in Kenya, where farmers bear the brunt of irregular, insufficient and unpredictable rainfall patterns," he added. "Climate Smart Agriculture (CSA) is the solution to erratic weather patterns, as it involves actions that sustainably increase productivity, enhance adaptation, reduce greenhouse emissions to a possible zero, and enhance the achievement of national food security and development goals."

With a quarter of sub-Saharan Africa's economy driven by agriculture, and more than 60% of the population made up of smallholder farms, technological innovation must be key to producing enough food to meet the needs of a burgeoning population.

Brian Bosire, a qualified engineer, is the founder and CEO of UjuziKilimo in Kenya, an enterprise he founded four years ago to empower smallholder farmers to use technology in making decisions on their farms, access financial support, and obtain the knowledge they need to improve the productivity of their farms.

In particular, UjuziKilimo processes millions of data points each day to create a complete soil and agronomic data pool that is both field-specific and highly accurate, ensuring farmers move away from relying on guesswork to make decisions on which

ABOVE: An unmanned aerial vehicle spreads fertiliser over a tea farm at Kipkebe Tea Estate in Musereita, Kenya.
RIGHT: Kenyan traders wait in their truck for clients at the Marikiti market in Nairobi.
FAR RIGHT: Workers on a vegetable farm harvest a crop in Kagio, 90 km northeast of Nairobi.

crop will do well. For UjuziKilimo, whose stated mission is to "enable data-driven decisions for the world's smallholder farmers by collecting and making sense of agricultural data" it's about seeing smallholder farmers get a return on their products. The data that is collected from the soil is what Bosire uses to ensure these farmers have assistance such as insurance and financing.

In South Africa, Karidas Tshintsholo has co-founded Khula, a company that has created an app that helps small-scale farmers connect with markets and to transport and sell their produce, and with the aim of creating support systems across Africa.

It is also worth noting that agriculture is the largest water user in Africa and that inadequate water resources impede better agricultural development and food security. The World Resource Institute estimates that one in three African citizens are impacted by water scarcity, and 400 million people in sub-Saharan Africa lack access to basic drinking water.

According to the recent Global Water Security Assessment report, 13 African countries are critically water insecure. These include Chad, Comoros, Djibouti, Eritrea, Ethiopia, Liberia, Libya, Madagascar, Niger, Sierra Leone, Somalia, South Sudan, and Sudan.

Africa's pervasive water scarcity problem means the sector urgently needs more investment, although, according to the African Development Bank, countries on the continent invest an average of 0.5% of gross domestic product in the water sector.

Still, countries are making efforts to address the water problem. Eswatini, for example, is forging partnerships, and supporting innovation, policies and initiatives that promote sustainable water management practices. Recently, three rural


Photo: Simon Maina / AFP


Photo: Tony Karumba / AFP

communities in Eswatini benefited from $220,000 in water infrastructure built under an IBSA (India, Brazil and South Africa) – funded water, sanitation and hygiene (WASH) project. Implementation of the project was made possible through the combined efforts of IBSA countries, WaterAid, the National Development Management Agency (NDMA) and the United Nations Development Programme (UNDP).

Similarly, Kenya plans to raise $7 billion through a public-private partnership (PPS) programme, the Kenya National Water and Sanitation Investment and Financing Plan (NAWASIP), to enhance water security for irrigation, domestic and industrial use, as well as hydropower generation that will see the construction of 100 dams across the country.

This programme is not without controversy, however, as critics have claimed this amounts to the privatisation of Kenya's water resources, a position that Water and Sanitation Cabinet Secretary Alice Wahome denies.

"Water resources belong to the people of Kenya," she said, when she appeared before Kenya's Parliamentary Committee on Blue Economy, Water and Irrigation, to explain why the state was opting for public-private funded water projects. "What we are doing is allowing private investors with financial, technical and operational expertise to invest in the sector in a substantial way that ensures we meet the country's water needs and ensures that investors are able to recoup their investments."

Water access impacts food security, and more must be done to improve this. Water is a key driver of economic and social development – water-related challenges undermine progress in all major areas of concern, from health to hunger, gender equality to jobs, education to industry, and disasters to peace. That is why African countries must commit and take action to achieve Sustainable Development Goal (SDG) 6 as part of the 2030 Agenda, that promises that everyone will have access to safely managed water and sanitation by 2030. GG

A SOBER REALITY

By Mischka Moosa

According to UNICEF's State of Food Security and Nutrition in the World (SOFI) report this year, global hunger remained relatively unchanged between 2021 and 2022. It said that while progress was made in most sub-regions of Asia and Latin America, food insecurity levels are still well above both pre-pandemic levels and the SDG target of zero hunger by 2030. Critically, while most regions experienced either progress or stagnation, hunger continues to rise in all sub-regions of Africa.

In 2022, the global share of those affected by hunger in Africa was second only to Asia. Approximately 55% (402 million) of people affected by hunger in the world lived in Asia, while more than 38% (282 million) lived in Africa. In terms of variation across the continent, Algeria and South Africa report the lowest levels of food insecurity, with roughly 19% of their populations considered food insecure. Elsewhere, over 50% of populations in more than 30 countries on the continent are considered food insecure, with Sierra Leone (86.7%) and the Republic of Congo (88.7%) having the highest levels within the region.

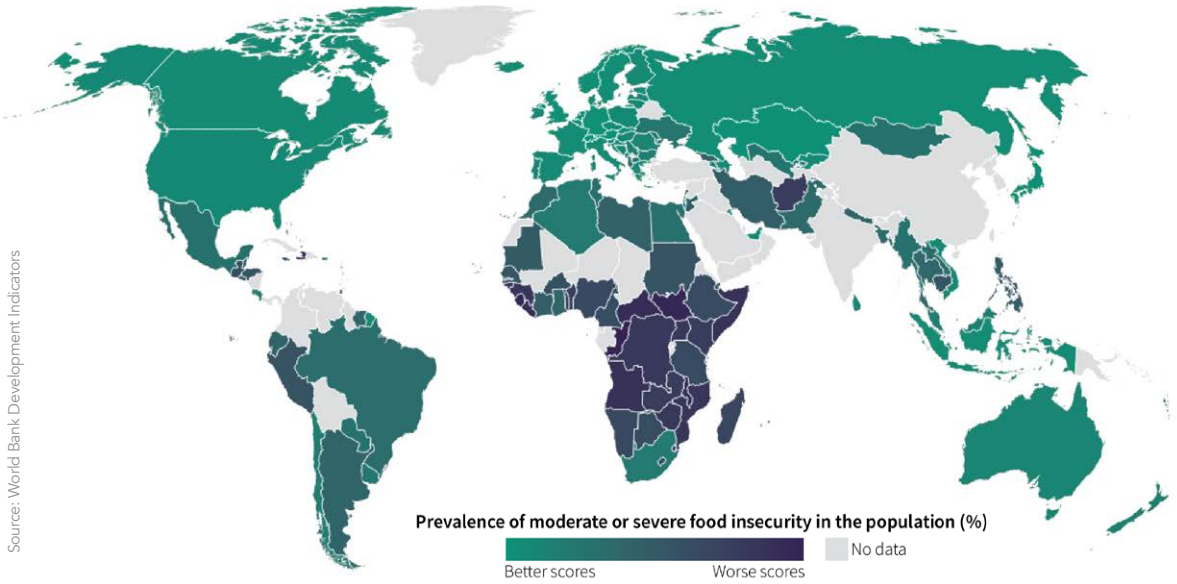
Also relevant is that food insecurity in Africa is not confined to rural or conflicted situations; the report highlights that in urban and peri-urban areas, the levels of moderate to severe food insecurity are on par with, and at times slightly exceed, those observed in rural regions. This heightens another concern, the "triple burden of malnutrition", where many populations have a combination of stunting, increasing rates of obesity in urban areas, and a widespread problem with micronutrient deficiencies.

Underlying Africa's sluggish progress towards food security has been a combination of market disruptions and increased political volatility, especially in the Sahel and East African regions. The lingering economic effects of the pandemic and ongoing global market inflation, along with Russia's invasion of Ukraine, have resulted in many countries placing restrictions on food exports to secure domestic supply. But this has still meant reduced access to key commodities for many countries on the continent.

These fluctuations have augmented the already elevated costs of food and fertilisers

ABOVE: A woman cooks kassava leaves in a pot that she will share with 22 displaced people in Bimbi, a district in Paoua, Central African Republic.

Photo: Barbara Debout / AFP



Source: World Bank Development Indicators

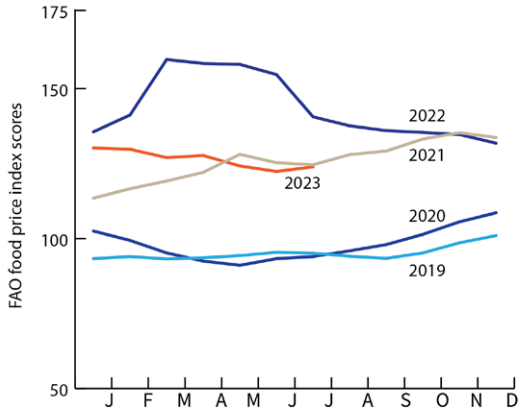
Figure 1: Global food insecurity.

– a predicament prevalent even prior to the pandemic – and caused many staple food prices to drastically increase. According to the Brookings Institute, food prices in Africa increased on average by almost 25% between 2020 and 2022. In 2023 alone, more than 10 new food export restrictions were announced over only eight months, the latest being by Russia (a ban on the export of rice and rice groats) and India (a ban on the export of non-basmati white rice).

Within the continent, extreme climate variability and increased political instability across the Sahel and East Africa have severely compounded fractures in food and aid delivery systems. This is particularly true for the Horn of Africa, where the cumulative impact of these factors has been acutely felt. The region is currently facing its fifth consecutive season of drought—the longest drought in 40 years. Critically, the ongoing conflict in Sudan since April this year has displaced more than 2.2 million people and caused an acute humanitarian crisis, particularly in Darfur, where both the army and the paramilitary Rapid Support Forces (RSF) have been accused of restricting access to critically needed humanitarian aid.

In tandem with these pressing issues, the broader challenge of food security encompasses economic dimensions, as underscored by recent data from the World Bank's Food Prices for Nutrition database. According to this data, around 3.1 billion people, or 42% of the global population, could not afford a healthy diet in 2021. Of that, just under a billion (950 million) people, or a 30% share, live in sub-Saharan Africa.

The most basic diet to prevent hunger (the energy-sufficient diet) provides just enough energy for daily survival. The cost of this diet at a national level is calculated using the cheapest available



Source: FAO Food Price Index, 2023

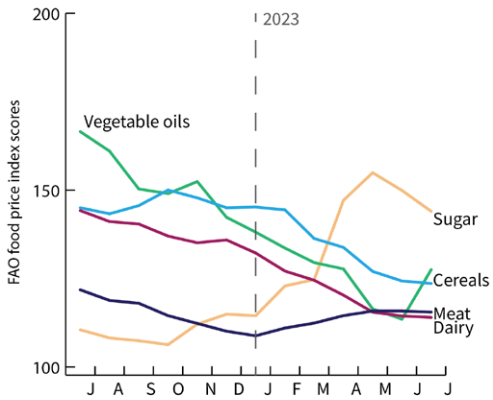
Figure 2: FAO food price index performance 2019-2023.

starchy food, enough to sustain an adult woman requiring 2,330 calories a day. Globally, this type of diet costs $0.83 per day.

Considering the cost of living, an energy-sufficient diet is priced similarly in both the United States ($0.90) and Tanzania ($0.99). However, in Tanzania, despite the fact that the cost of an energy-sufficient diet is only slightly higher than the global cost, more than 44% of the population cannot afford this diet. In contrast, about 1% of the US population cannot afford the equivalent diet.

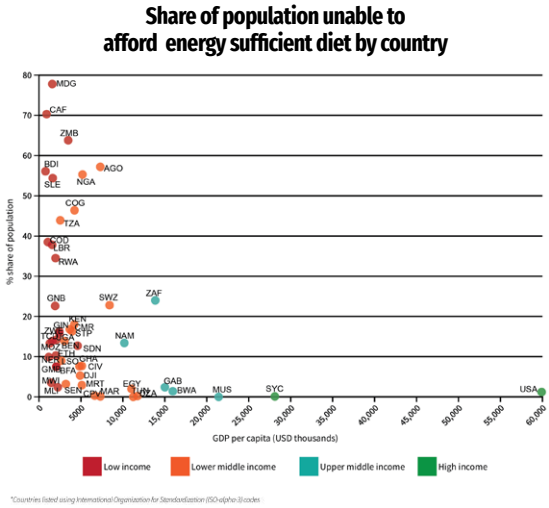
When looking at those who can afford a diet that meets the goal of preventing diet-related diseases and enables a healthy and active life, the affordability of a healthy diet looks even more bleak. Healthy diets are more expensive, but they embrace recommended dietary guidelines, achieve dietary balance, respect cultural preferences, safeguard long-term health, and mitigate all forms of malnutrition. In Tanzania, a healthy diet costs ($2.60) but is only affordable to a shocking 10% of the population, with the other 90% unable to access it. This is often the case for low- and lower-middle income countries.

On the continent, the cheapest energy-sufficient diets are found in Malawi ($0.29) and Mozambique ($0.38), where 3,5% and 13.3% of their populations,



Source: FAO Food Price Index, 2023

Figure 3: FAO food price index scores for individual foods 2022-2023.



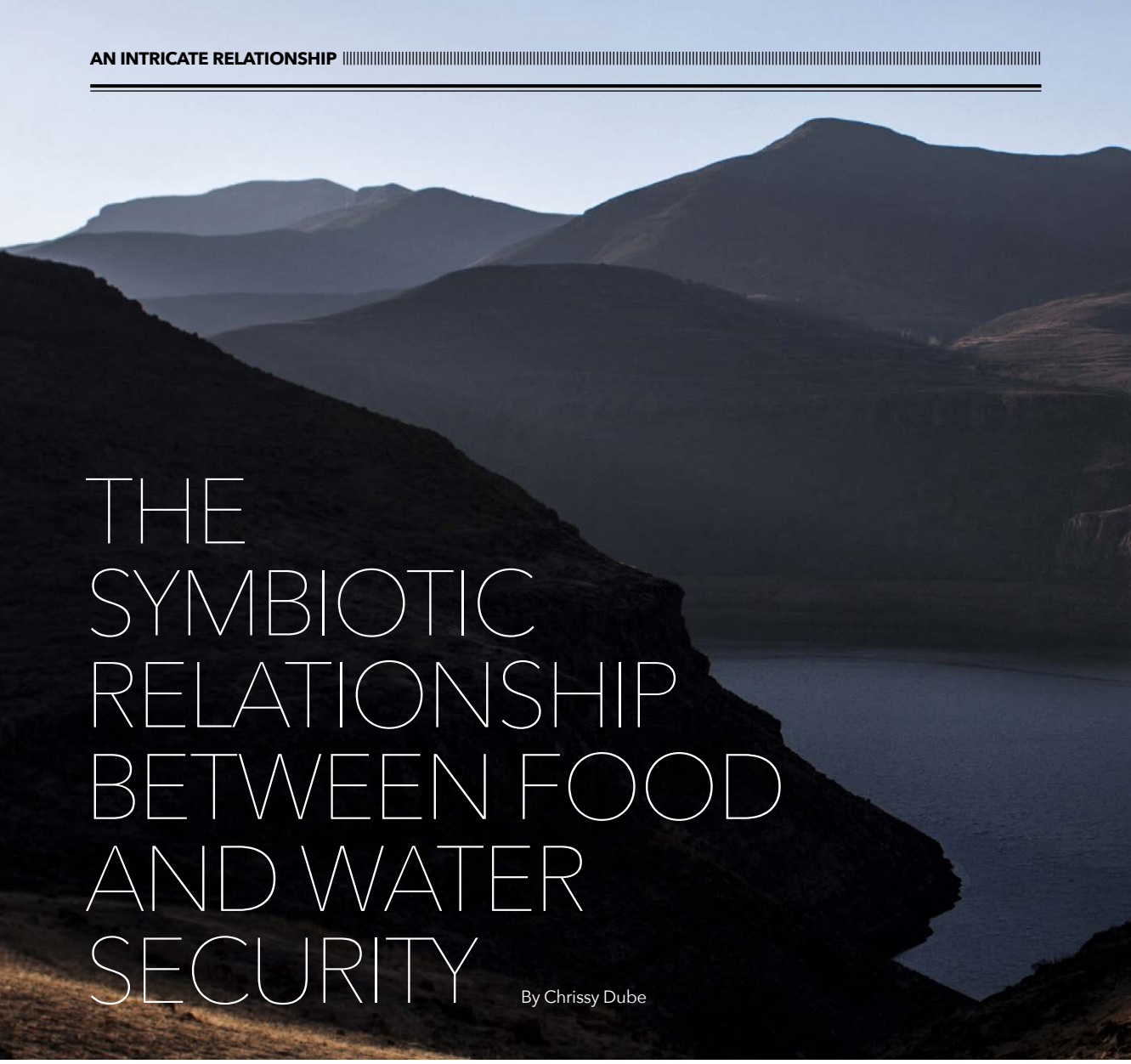
Source: World Bank Atlas of Sustainable Development goals (2023)

Figure 4: Share of population unable to afford energy sufficient diet by country.

respectively, could not afford this diet. The most expensive energy-sufficient diets are found in Nigeria ($1.38) and Angola ($1.40), with 55% and 57%, respectively – more than half the population unable to afford this diet.

In terms of healthy diets, the cheapest are found in Senegal ($2.19) and Tanzania ($0.99), with 53% and 88.7% of populations unable to access this diet, respectively. The most expensive healthy diets are found in South Africa ($4.1) and Angola ($4.33), with 24% and 57.2% of the population unable to access this diet, respectively.

In summary, the 2023 State of Food Security and Nutrition in the World report and Food Prices for Nutrition data present a sobering reality of hunger on the continent. Africa's escalating food insecurity stands as a stark reminder of the challenges that persist despite regional advancements and that demand a transformation of the region's food systems. The complex interplay of economic volatility, political instability, and climate vulnerability on the continent underscores the urgency for resolute and collaborative actions towards sustainable and resilient food systems that can ensure equitable access to hunger and nutrition security for all. GG



THE SYMBIOTIC RELATIONSHIP BETWEEN FOOD AND WATER SECURITY

By Chrissy Dube

Food and water security are closely intertwined, with the latter undeniably a precursor to the former, and this connection is particularly significant in Africa. The continent faces numerous challenges related to water availability, quality, and equitable distribution, which directly impact its ability to ensure a stable and sufficient food supply for its growing population. This article explores the intricate relationship between Africa's water and food security by examining specific case studies, ongoing projects, the importance of data, mitigation strategies during droughts, and the continent's progress towards sustainable development goals.

Some key reasons why Africa's food and water security are interdependent include:

- **Agriculture relies on water:** Agriculture is a crucial sector in African economies, employing a significant portion of the population and providing food for the continent. However, agriculture heavily depends on water for irrigation, livestock, and crop production. In many parts of Africa, rain-fed agriculture is the norm, making it vulnerable to variations in rainfall patterns. Ensuring a consistent and sufficient water supply is essential for food production.
- **Climate variability:** Africa is susceptible to

ABOVE AND BELOW: Lesotho's Katse Dam, which forms part of the Lesotho Highlands Water Project, with underground tunnels designed to carry the country's most precious resource to South Africa's thirsty industrial heartland.

Photo: John Wessels / AFP

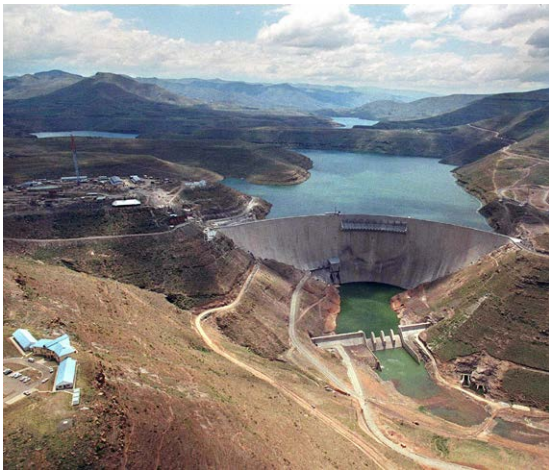


Photo: Walter Dhladhla / AFP

climate change and variability, leading to unpredictable rainfall patterns, prolonged droughts, and erratic weather conditions. These climate challenges can have a devastating impact on crop yields and food production. Adequate water resources and effective water management strategies are essential for adapting to and mitigating the effects of climate change.

- **Water for livestock:** Livestock farming is another vital component of African agriculture. Animals require water for drinking and maintaining their health. Insufficient access to clean and reliable water sources can lead to reduced livestock

productivity and, in turn, affect the availability of meat, dairy, and other animal products.

- **Food processing and distribution:** Beyond agricultural production, the food supply chain, which includes processing, storage, and transportation, also relies heavily on water. Without a secure and sufficient water supply, it becomes challenging to process, store, and transport food products, resulting in losses and reduced availability.
- **Malnutrition and health:** Water is not only essential for food production but also for ensuring proper nutrition and health. Access to clean and safe drinking water is critical to preventing waterborne diseases and ensuring that people can consume nutritious diets. Food security is not just about having enough food; it's also about having access to safe and nutritious food.
- **Conflict over resources:** In some regions of Africa, competition for limited water resources leads to conflicts, displacements, and insecurity. These conflicts can disrupt agricultural activities and food production, exacerbating food insecurity.

Prioritising water security is essential to addressing Africa's food security challenges. This includes investment in water infrastructure, sustainable water management practices, and climate-resilient agriculture. Additionally, promoting policies and initiatives that ensure equitable access to water resources for all segments of the population is crucial for achieving both food and water security. The cases that follow further reinforce the need to prioritise water security with the goal of ensuring food security.

The Katse Dam, situated in the Kingdom of Lesotho, provides a valuable case study of the interplay between water security and agriculture. Completed in the late 1990s as part of the Lesotho Highlands Water Project, the dam was primarily constructed to supply water to South Africa's industrial heartland of Gauteng. However, its impact on local agriculture has been profound.

The dam's reservoir has facilitated irrigation projects in the surrounding areas, transforming arid lands into productive agricultural zones. Farmers in the region now have reliable access to water for crop cultivation, reducing their dependency on rain-fed agriculture. As a result, the Katse Dam exemplifies how strategic water management and infrastructure development can enhance food security by enabling agricultural diversification and increasing crop yields.

Photos: John Wessels / AFP

Angola has embarked on an ambitious water infrastructure project that has raised concerns regarding its impact on regional water security and food production. The project aims to extract water from the Kavango River, which flows through Namibia and Botswana, before joining the Okavango Delta.

While Angola's objective is to bolster agricultural production in its arid southern regions, downstream countries like Namibia and Botswana fear that water extraction will reduce the flow of the river, affecting ecosystems and agricultural activities. This highlights the importance of transboundary cooperation and the need for careful consideration of the potential repercussions of water-related projects on food security in neighbouring nations.

Droughts in Africa have devastating consequences for both

TOP LEFT: Mohlakoana Molise, 65, sorts through his last yield for the year in front of the Katse dam.
TOP RIGHT: People gather around one of the last water pumps in working order in their area in July 2016.
BOTTOM LEFT: Basotho women and men queue at a World Food Program (WFP) food distribution station.
BOTTOM RIGHT: A Basotho women makes the long walk back home with jugs full of water.


Photo: Monirul Bhuiyan / AFP

human populations and wildlife. Botswana, known for its rich biodiversity, recently experienced a severe drought that adversely affected not only local communities but also its iconic rhino populations.

During droughts, access to water sources becomes increasingly challenging for both people and wildlife. Reduced water availability results in competition for resources, often leading to conflicts between humans and wildlife. In Botswana, the drought forced rhinos to venture into areas populated by humans, increasing the likelihood of human-wildlife conflicts. This illustrates how water scarcity can disrupt ecosystems and indirectly impact food security, as conflicts over resources can hinder agricultural activities.

Accurate and up-to-date data on natural resources, including water sources, are essential for informed decision-making, allocation of budgets, and development planning. In many African countries, insufficient data on water resources leads to inefficient resources allocation, mismanagement, and even exacerbate food insecurity.

Collecting and analysing data on water availability, usage, quality, and distribution can help governments and organisations prioritise investments in water infrastructure, implement sustainable management practices, and allocate funds more effectively. Moreover, the availability of reliable data enables governments to respond proactively to changing climatic conditions and emerging challenges, such as droughts and water-related disasters.

Drought is a recurring challenge in many African regions, and its impact on food security can be devastating. To address this issue, it is crucial to plan and implement mitigation strategies that enhance resilience in times of drought. These strategies encompass a range of measures, including:

- Encouraging crop diversification and promoting drought-resistant crop varieties can help mitigate the impact of water scarcity on food production.
- Investing in modern and efficient irrigation systems to make agriculture less reliant on rainfall and more resilient to drought conditions.
- Implementing water harvesting techniques, such as rainwater harvesting and small-scale dam construction, that can store water during periods of abundance for use during droughts.
- Involving local communities in water management and conservation efforts can

ABOVE: Cattle and hippos wallow in the mud due to drought in one of the channels in the Okavango Delta near Nxaraga on the outskirts of Maun, Botswana, in September 2019.

foster a sense of ownership and responsibility for water resources.

- Developing and disseminating early warning systems for drought can help communities prepare for and respond to impending water shortages.

Africa's progress towards water security is closely aligned with the global sustainable development agenda (Agenda 2030) and the continent's own development blueprint, Agenda 2063. Both agendas recognise the central role of water security in achieving broader development goals, including food security, poverty reduction, and economic growth.

Agenda 2030, with its 17 Sustainable Development Goals (SDGs), provides a global framework for addressing water security and its impact on food security. SDG 6 aims to ensure the availability and sustainable management of water and sanitation for all. While Africa faces significant challenges in achieving this goal, notable progress has been made. Several countries, including Rwanda, Ethiopia and Senegal, have made efforts to expand access to clean drinking water and improve sanitation infrastructure, which is fundamental to food security by ensuring safe and hygienic food production and preparation.

However, there is still much work to be done. Many communities in remote and underserved areas of Africa still lack access to safe drinking water and adequate sanitation. Achieving SDG 6 is crucial, not only for water security but also for enhancing food security by reducing waterborne diseases and improving overall health.

Meanwhile, Agenda 2063, developed by the African Union, emphasises the need for member countries to take ownership of their development and prioritise water security as a foundation for achieving prosperity and self-reliance. This long-term vision recognises that water is not only essential for survival but also for fostering economic development and regional integration.

In conclusion, addressing water security challenges in Africa requires concerted efforts at local, national, and regional levels. By recognising the intricate relationship between water and food security and prioritising sustainable water management, African countries can pave the way towards a future where all their citizens have access to safe and sufficient food and water resources.

It's written IN THE DATA

By Nnaemeka Ohamadike

The African food and water security landscape faces a significant challenge. Despite its vast agricultural potential and abundant water resources, the continent continuously faces issues of hunger and water scarcity. This is clear from the mean value of 0.26 on the food and water security index, with many countries falling below this mark (Figure 1). The index operates on a scale from 0 to 1, where higher scores denote better security. To tackle these issues, it is vital to leverage, among other things, data-driven approaches that can enhance agricultural planning, resource allocation, risk management, and overall governance.

In recent years there has been a surge in the use of data for evidence-based decision making and predictive analysis. Unfortunately, as the Food and Agricultural Organization (FAO) notes, agricultural statistical systems and data are in a sorry state in many African countries. As illustrated in Figure 2, enhancing food and water security governance and outcomes in Africa hinges on substantial improvements in the statistical systems of African nations.

To investigate the relationship between statistical systems and food and water security governance in Africa, the food and water security index incorporated multiple indicators from the World Bank. Given data constraints, the food security indicators focused on food availability. Each indicator was weighted according to its

ABOVE: Mohammad Omar tends to vegetables in a greenhouse farm on the outskirts of Mogadishu, Somalia, last year. The greenhouse farming business is new and has created jobs in Mogadishu.

Photo: Hassan Ali Elmi / AFP

significance and contribution to Africa's food and water security based on literature in this field. The weighted indicators included:

Food security indicators

- Cereal yield (kg per hectare) (25%)
- Arable land (% of land area) (25%)

Water security indicators

- Renewable internal freshwater resources per capita (cubic metres) (20%)
- People using at least basic drinking water services (% of the population) (15%)
- People using at least basic sanitation services (% of total population) (15%)

Statistical capacity, on the other hand, is, as the World Bank puts it, a nation's ability to collect, analyse, and disseminate high-quality data for evidence-based decision making. This, and other data sets used for the analysis, were obtained from the World Bank.

A significant correlation emerged from examining the bivariate relationship between the food and water security index and the statistical capacity score of African countries over the past decade. The scatterplot revealed that African countries that had strong statistical capacity or systems over the past decade exhibited better food and water security governance and outcomes, with a correlation of 60%. Conversely, African countries with poor statistical systems had lower food and water security outcomes over the past decade.

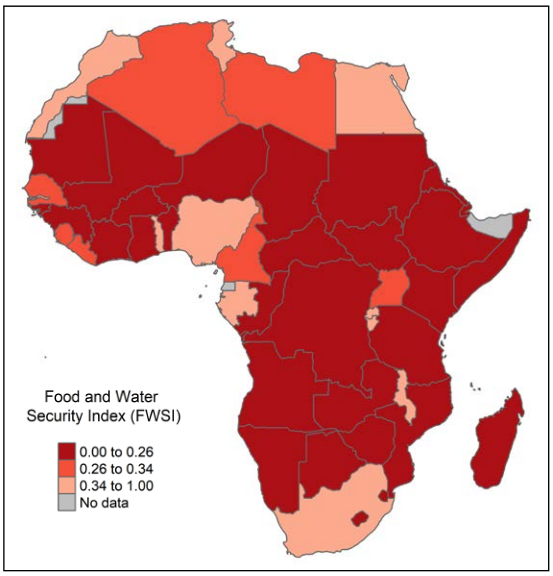
These results remained consistent after controlling for variables such as GDP per capita, population size, and an index of governance quality encompassing government effectiveness and control of corruption in multivariate regression analysis.

By way of analogy, consider the practices of experienced farmers who strategically rotate crops to maintain soil fertility. Just as these farmers use data on crop growth and soil conditions to inform their planting decisions, data-driven approaches rely on information to optimise agricultural planning, resource allocation, and risk management. In both cases, the goal is to maximise efficiency and productivity while minimising risks.

The implications of these findings are substantial. Africa possesses abundant agricultural and water resources and potential, making it possible to eliminate food and water insecurity. However, realising this potential necessitates improving and harnessing data-driven approaches, among other things.

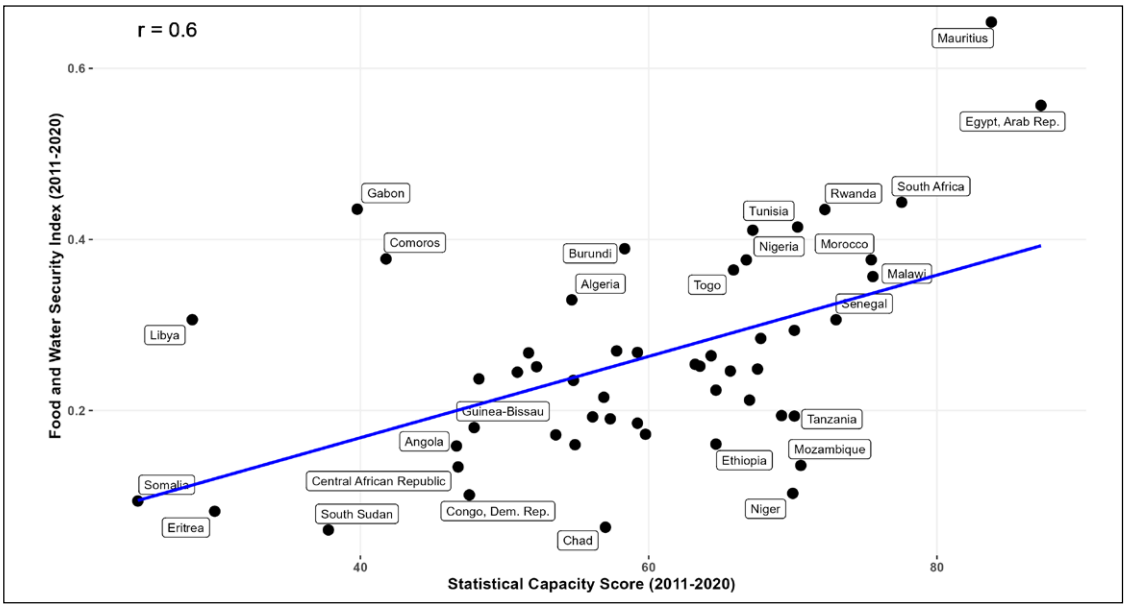
One of the key benefits of this approach is its ability to enhance agricultural planning. With accurate and up-to-date data, policymakers can make informed decisions regarding crop selection, planting schedules, and resource allocation. This can lead to increased agricultural productivity and a reduction in food shortages.

Moreover, data-driven approaches aid in resource allocation. By identifying areas with the highest levels of water stress or food insecurity, governments can allocate resources more efficiently



Source: WDI (2022)

Figure 1: Food and water security scores of African countries (2011-2020)



Source: World Bank's WDI (2022)

Figure 2: The relationship between statistical capacity and FWSI in Africa

to target those in need. This targeted approach ensures that resources are used where they are most needed, reducing waste and inefficiency.

Risk management is another area where data-driven governance shines. By collecting and analysing historical data, governments can predict and tackle potential food and water security crises. This approach allows for timely interventions, such as drought-resistant crop cultivation or water conservation measures, to be implemented, reducing the impact of disasters.

Overall governance is also enhanced through data-driven approaches. Accurate data empowers policymakers to monitor progress, track the effectiveness of interventions, and adjust strategies as needed.

Egypt and South Africa are examples of African countries with strong statistical systems that have exhibited better food and water security governance and outcomes in the past decade.

Egypt, facing extreme water scarcity, relies heavily on external freshwater sources, primarily the Nile River, for most of its water needs. To address this challenge, Egypt uses digital technologies, including moisture sensors, for real-time water monitoring, such as tracking water pressure and quality, which in turn reduces water waste. As the African Union Development Agency notes, these digital sensors, which can be placed in the soil, measure moisture levels and transmit data to policymakers and farmers via smartphones, aiding timely and efficient decision-making.

In South Africa, Statistics South Africa, which is the country's statistics agency, regularly collects, processes, analyses, and reports data on food and nutrition security to inform decisions on government initiatives in this area. This process involves providing information on the extent of households' experiences of hunger and access to food and providing insight into the location and profile of households that are food and nutrition insecure.

In the words of the late actor Peter Ustinov, echoed by Nigerian academic Emefiele Ezeani, the point of living, and of being an optimist, is to be foolish enough to believe that the best is yet to come, even when little or nothing is changed. Despite the challenges that persist, African countries have the potential to overcome food and water insecurity through data-driven approaches. These approaches are key to unlocking the continent's agricultural potential and improving the well-being of its citizens. GG

The future is BLUE

By Ronak Gopaldas

According to the World Bank, the blue economy is the "sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of the ocean". The blue economy has great potential to contribute to higher and faster GDP growth across Africa. The continent's seafood, aquaculture, and fisheries industry employs 12.3 million people, at least a third of whom are women.

The sector provides food security and nutrition for more than 200 million Africans. It is also a vital source of foreign currency and tax revenue, and its contribution to African GDP is almost 2%. Moreover, Africa's 38 coastal and island states access more than 30,000 km of coastline along the Atlantic and Indian oceans, two of the planet's most extensive waters.

Yet despite its vast potential, Africa's transition to a blue economy is still in its infancy. Development of this potential faces several barriers: weak coordination at the highest levels, poor

Photo: Stephane De Sakutin / AFP

infrastructure development, a lack of funding, and the turmoil generated by the COVID-19 pandemic and the Ukraine war.

Despite these challenges, the African Union estimates that the blue economy currently generates nearly $300 billion for the continent, creating 49 million jobs in the process. These and other crucial benefits – most notably food security, livelihoods, and biodiversity – are entirely dependent on the ocean's health.

There are several compelling reasons why the blue economy is now generating excitement that it may be the next big continental bet.

The first is geopolitics. As noted by Anil Sooklal of South Africa's Department of International Relations and Cooperation (DIRCO), the Indian Ocean and its littoral states are increasingly at the epicentre of the evolving global geopolitical architecture. The Indian Ocean provides a vast maritime space and sea lanes that connect the great economies of the West and East. It is home to one-third of the world's population, 25% of its land mass and 40% of the world's oil and gas reserves. As a result, the region is set to become a leading source of new global growth over the next 20 years. Its strategic access, energy resources and national security importance are driving commercial and security investments by major powers.

India and China, in particular, have attempted to assert themselves in the region. Quartz's iconic headline 'Xi sells Seychelles by India's seashore' succinctly summed up these evolving power dynamics and competition between the two Asian powers. Now, as Beijing, New Delhi and a host of other great powers continue to navigate these seas, both literally and metaphorically, there will be some tough choices for African policymakers to consider. While growing strategic competition involving both external powers may be subject to risks and exploitation, it will also create leverage and significant development and investment opportunities.

This push is further supported by regional initiatives. The thrust of Africa's blue economy drive comes from Agenda 2063, the African Union's (AU) 50-year social and economic development framework that seeks to grow Africa into a global economic powerhouse. Moreover, 90% of Africa's trade is transported by sea and as the continent begins to ramp up trade under the African Continental Free Trade Area (AfCFTA), there is an urgent need to improve trade channels and leverage

the economic endowments of its ocean resources.

The next driver is climate change, which is having a significant impact on the region's economic transformation as countries attempt to move from vulnerability to resilience. This is especially pronounced for the continent's Small Island Developing States (SIDS) nations, which are most exposed to the acute risks caused by climate change. Now, as the world accelerates decarbonisation efforts, the blue economy (like the green economy) represents low-hanging fruit for Africa. However, as observed by Kenyan developmental economist Anzetse Were, much of the focus (and funding) thus far has been on climate mitigation whereas there are significant climate adaptation opportunities which have not yet been fully seized. She specifically highlights the emerging opportunities arising in untapped areas such as fisheries and aquaculture, water security and tourism as being ripe for investment.

To be sure, the opportunity set is vast. Meeting global food demand requires the development of sustainable food supply chains anchored on coastal communities and sustainable production. Marine resources are vital to ensuring food security, and Africa is set to play a critical role in this regard. As Christopher Costello noted in a paper written for the 'High-Level Panel for a Sustainable Ocean Economy' in 2019, "ocean health and ocean wealth go hand-in-hand. If we make rapid and far-reaching changes in the way we manage ocean-based industries while nurturing the health of its ecosystems, we can bolster our long-term food security and the livelihoods of millions of people."

But it won't be plain sailing. The continent faces multiple maritime security threats around its oceans and seas with the Gulf of Guinea in West Africa, the Gulf of Aden and down to the Mozambique Channel, and the Mediterranean and Red seas all deemed vulnerable areas. As analysed by the Institute of Security Studies, continued instability and insecurity at sea undermine states' ability to secure trade routes, protect and harness the benefits of their blue economies, and ensure inclusive economic growth.

That said, maritime security is a key enabler of the blue economy – through safeguarding navigation

Photos: Sia Kambou / AFP

routes, providing important oceanographic data to marine industries and protecting rights over valuable marine resources and activities within claimed zones of maritime jurisdiction. Moreover, maritime security itself is a source of economic development and growth. An expanded blue economy creates greater demand for maritime security capabilities, which in turn triggers increased investment and growth in these capabilities.

The combination of global, regional, and environmental factors is shifting both the types and modes of funding, catalysing investment into the sector.

Given these trends, which countries are best placed to capitalise on this new wave of momentum? In an African context, the three leading lights are the Seychelles, Mauritius, and South Africa, which all have a unique set of comparative advantages.

Seychelles is a leader in capital market debt issuance for the blue economy. As early as 2008, Seychelles re-engineered its finance strategy and retooled its diplomatic service to leverage on oceans under the banner of the blue economy, seeing it as an anchor for economic development and a flag for the Indian Ocean archipelago's foreign policy. Leveraging its strategic positioning, the Seychelles has courted interest from across the Middle East, Asia, and Africa as well as multilateral and regional bodies across the world – including the Alliance of Small Island States (AOSIS), the Indian Ocean Commission (IOC), the Indian Ocean Rim Association (IORA), the AU and the United Nations.

In Mauritius, territorial waters are more than a thousand times larger than the landmass of the island making it critical from a GDP contribution and governance point of view. The blue economy represents more than 10.5% of Mauritius's national GDP, with total direct employment estimated at more than 20,000, excluding coastal tourism. Tapping into the economic potential of the ocean has required thoughtful policy, planning, and management as policymakers have attempted to double the sector's contribution to GDP by 2025. For Mauritius, fishing and aquaculture are essential components of coastal tourism, attracting many visitors seeking marine leisure activities. Renewable marine energy is another

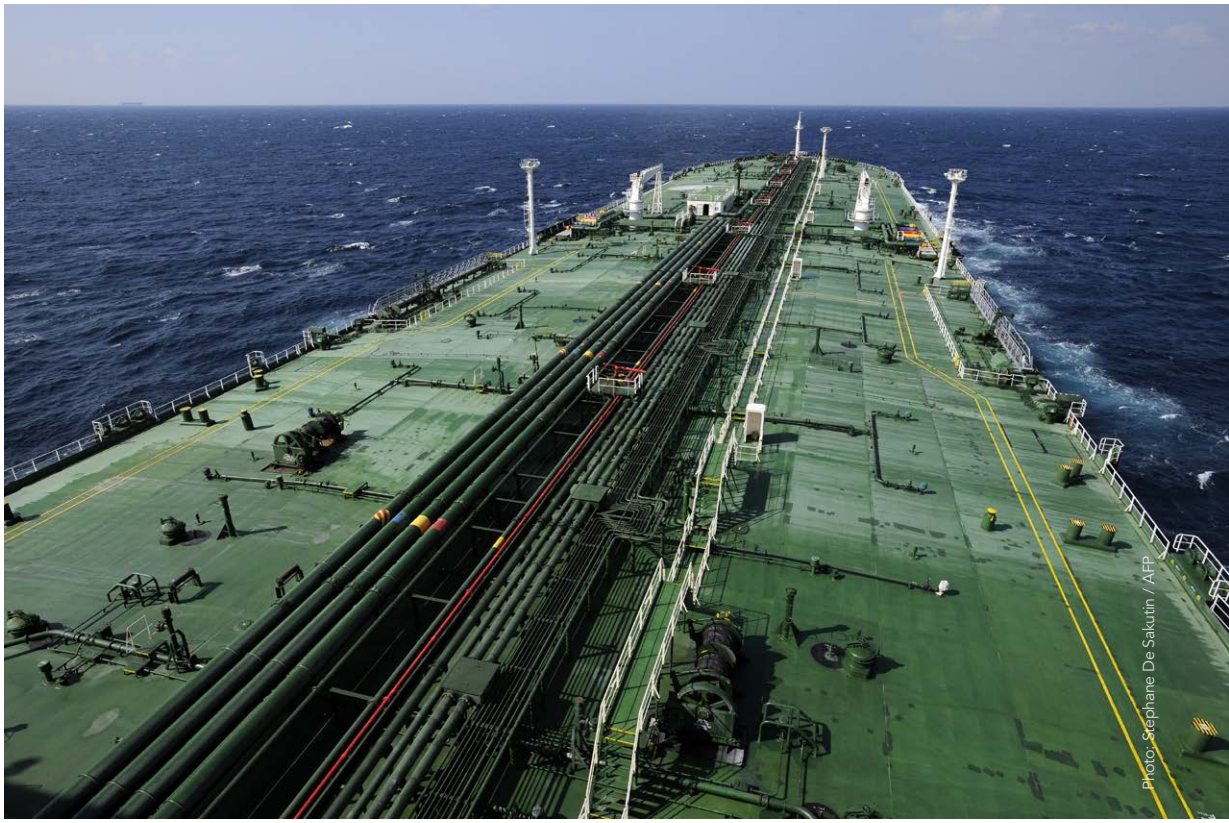


Photo: Stephane De Sakutin / AFP

significant opportunity, with the development of sustainable energy sources from waves and oceanic currents. Shipbuilding, marine biotechnology, oceanographic research, maritime transport and marine resource conservation and management are other areas of investment and innovation supported by the blue economy.

The South African government's plan to grow a sustainable blue economy is called Operation Phakisa. The initiative is targeting four key areas of blue-economic growth: marine transport and manufacturing; aquaculture; offshore oil and gas; and, ultimately, marine protection. The government estimates the oceans bordering South Africa on three sides, giving it a coastline almost 4,000 km long, have the potential to add R177 billion to GDP and create more than one million jobs by 2033. The government's easing of private-sector participation hurdles for renewable energy projects should see more stable fixed investment inflows to fund infrastructure.

Meanwhile, countries such as Ghana, Kenya and Nigeria are still in the early stages of developing their blue economy agendas but have ambitious strategies for growth. Nigeria plans to build Africa's largest floating dockyards and operate its ports 24 hours a day. But the reality of the situation of these countries demands overcoming severe challenges. Piracy off the African west coast is an ongoing concern, while Ghana has seen a dramatic decline in fish stocks due to an inability to police its waters effectively.

Arguably the most important challenge to overcome, however, is that of financing. Current fiscal constraints will limit government investment in crucial infrastructure such as electricity, ports, and patrol vessels. To offset the lack of public sector resources, African governments should focus attractive investment incentives on critical sectors. This tactic would encourage the private sector to help build the institutions and infrastructure necessary to implement their blue economies.

The good news is that momentum is building.

Photos: Sia Kambou / AFP

Photo: Daniel Hayduk / AFP

Several blue financing instruments have emerged over the past couple of years that have driven much-needed investment into the sector, as observed by Maram Ahmed, in a recent piece for CNBC. For example, Seychelles issued the world's first sovereign blue bond in 2018, using debt for nature swaps – a blue financing mechanism. The issuance of blue bonds is fairly new, but it is a valuable instrument for raising capital from investors to finance marine and ocean-based projects that have positive environmental, economic and climate benefits. Indeed, blue bonds have the potential to be as impactful as green bonds, of which $1 trillion have been issued since inception in 2007.

The blue economy offers a sea of untapped potential, presenting African nations with the means to diversify their economies, create sustainable jobs and alleviate poverty. As the continent now scales up its resilience to climatic shocks, such adaptation measures will create dynamic opportunities for the private sector to play alongside the public sector, offering an array of new trade and investment opportunities. Success, like in most sectors on the continent, will hinge on policy consistency and coordination, sound regulatory mechanisms and improved political will, as well as adequate private sector inclusion. But as policy momentum and investor interest grows across the continent, there is optimism that the rush for "blue gold" could be a game changer for the continent. GG

Hidden hand of Africa's agri-investment bonanza

By Malcolm Ray

First, it was subsidised farming in the US and Europe and food dumping that pushed up prices and reduced food security. Now it's a global food supply shortage that has tipped the scales in Africa and sparked an investment bonanza. The big question is: at what cost to food security?

In early summer, the sun is a flaming ball through the windscreen, while outside, silhouettes of people carrying fruit and vegetables file by. Here, dense green forests and grasslands carpet the hills and valleys. It is the middle of June 2006, and I am driving to see the farm manager of an agricultural processing plant on the rural outskirts of Uganda's capital, Kampala. About 10 km outside the city, the main road takes you past Lake Victoria, into forested hills, before plunging into a scattering of decayed rural homesteads and impoverished villages strung around perennial rivers and tributaries that have carved out the valleys over centuries.

Beneath a thin belt of mist, women shuffle across the saddle of a hill into the valley to draw water from a tributary where cattle defecate. The women have no choice; their homesteads have no running water, no sanitation, no electricity, and no work. Every day, villagers walk up to 30 km to Kampala to sell fruit and vegetables grown on the open grasslands of the valleys. Some erect makeshift stalls along the thoroughfare; some fish from Lake Victoria, hoping for a decent catch of the area's staple dish, tilapia.

After 10 km, the ungraded mud track reaches the crest of the hill. A few kilometres further, the sky turns bright yellow, and the landscape opens into a vast plateau of lush farmland. The focal point of your view is a hulking prefabricated processing plant laid out like a vast grandstand with its back

ABOVE: An aerial view of convoy of trucks travelling on National Highway 27 towards Uganda are blocked due to poor road conditions in September 2020.

Photo: Alexis Huguet / AFP

Photo: Emmanuel Leroux-Nega / AFP

turned to the valleys. Nearby, a cluster of brick tenements houses expatriate plant managers and technicians. The business is wholly owned and operated by the Indian pharmaceutical multinational Cipla. The area, the plant manager told me, is fertile ground for harvesting Artemisia, the active ingredient used in the manufacture of a Cipla patent to treat malaria.

"Anything will grow here. But nothing will grow without investment, and our presence here is an investment opportunity for us and Uganda," he said, seemingly oblivious to the social neglect of this "showcase of investment opportunity". Cipla is a model of globalisation muscled into Uganda: exploiting the area's natural resources using expatriate labour, exporting the raw product abroad where it is manufactured into the anti-malaria drug at Cipla laboratories, then exporting the drug back to Africa, where malaria is a common affliction among mainly poor rural communities like the ones outside Kampala.

The Ugandan government understood the importance of foreign investment. During the 1980s, partly in response to structural adjustment measures of the International Monetary Fund (IMF), Uganda, along with other African countries, was "industrialised". That is to say, it was a designated source of cheap raw materials as the government sought western capital and aid to underwrite its parlous economy.

Its former colonial authority, Britain, was the most enthusiastic backer. Capital poured in and, with the backing of the IMF, the colonial jargon of "cheap" commodities and "surplus" labour was dropped; the country was now a "showcase of investment opportunity".

Yet, for all the capital inflows, the economy incurred annual net losses in the contribution of investment to Gross Domestic Product (GDP). While it lasted, President Yoweri Museveni, like many of his peers in the African Union (AU), made investments in agriculture and mining a trademark of his popular appeal. Uganda was open for business, he was fond of telling his interlocutors at multilateral gatherings, just not to locals.

I wanted to understand the thinking behind the

LEFT: Habitations near Bwindi Impenetrable National Park, in Uganda, one of the most densely populated rural areas in the world and home to an estimated 400 mountain gorillas.
RIGHT: Mary Cheposepoy, a cattle keeper, in Komoret, northern Uganda, believes the locust swarms that have slowly been arriving are a blessing as they associate the presence of locusts with rain.

Photo: Sumy Sadurni / AFP

theatrical façade of "investment" in agriculture that had become a miracle cure for hunger and poverty in most African governments' policy avowals since the 1990s. What had gone wrong?

"You plant a stick in the ground, and something grows. But we don't harvest the fruits," Charles Mbire, a Kampala businessman, told me when I offered up the Cipla manager's remark. This was only partly true. The real story was that investment in Uganda's rich agricultural assets was not without substantial foreign representation. When I visited Kampala in 2006, British, Indian, and Chinese firms were muscling into the economy's agriculture sector. Those locals fortunate enough to be employed were paid just enough to keep their families alive. Along the main thoroughfare to Kampala there was something symbolic about the daily journey of rural villagers. The paradox – the desolation of impoverished communities and the lucrative farmlands and hulking processing plants – said much about the model of agricultural investment.

The truth is that Uganda, like other African countries with strong agricultural potential, was failing because the model of subsidised farming and food processing in the West had been succeeding. Consider a continent with some 800 million hectares of arable land lying largely fallow because governments in the US and Europe could use their market dominance to subsidise their farmers or simply dump massive quantities of processed food to keep the consequences of technological efficiencies – surplus product – in check. That may have literally been easy to swallow two decades ago if you were a consumer reading these words from the aisle of a bustling supermarket in the plush Upper West Side of New York City or Paris where food prices had been heavily subsidised. It may have been even easier to imagine if your farm in the American mid-West continued to receive buckets of cash from the government to shield the agricultural industry from cheaper exports. Of the 58 developed countries surveyed by the World Bank in 2009, 48 had imposed price controls, consumer subsidies, restrictions on imported food, or lower tariffs.

Then, two years after my visit to Kampala, the prolonged period of abundance and low prices

ABOVE: A woman who supports the Sudan People's Liberation Movement-in-Opposition (SPLM-IO), stands at her maze field on the South Sudanese side of the border with Uganda, in September 2018.

Photo: Sumy Sadurni / AFP

in advanced economies took their toll, laying the groundwork for an inflationary spiral that is still silently ticking over into a full-blown global food crisis. Data from the World Bank and the United Nations Conference on Trade and Development's World Investment Report 2022 suggests that food supply is, in fact, entirely out of kilter with demand, and subsidies in Europe and the US are adding unsustainable upward pressure on prices. If that were not enough, soaring oil prices and biofuels are conspiring to make sure that this particular financial unravelling will play out over a prolonged period. The difference these days is that investors are on the prowl for high-yield harvests to exit the damage wrought by the massive speculative binge that plunged the world economy into red ink in 2008. Their sights are on fertile, untapped land in equatorial Africa, where, according to the UN's World Investment Report 2015, investment still trails the rest of the world.

Over the past few years, investment firms like Emergent Asset Management, Britain's Chayton Capital, the US's Global Environment Fund, as well as homegrown players like South Africa's Development Bank for Southern Africa, Sanlam Private Equity and SP-aktif, both of which have raised $400 million for the Agri-Vie Fund, Ghana's Databank Financial Services, Kenya's Amani Capital in a joint venture with the Norwegian Investment Fund for Developing Countries (Norfund), and Uganda's Gatsby Charitable Foundation, set up by the Rockefeller Foundation, have been eyeing agro-industrial companies and lobbying African governments to back joint ventures and buyout-related investments in the continent's $280 billion per annum agriculture sector. "It's a simple matter of funds scouring the earth for the best value deals. And today they're funding them in Africa's agribusiness," the World Economic Forum's (WEF's) chief economist John Page told a WEF gathering in 2017.

That potential is not an advertising script for the evening news. The agriculture sector in Africa accounts for 60% of the world's unused arable land at a relatively low average level of soil degradation and relatively good weather conditions, of which only 3% is irrigated, compared to 20% globally. Less than 10% of land in Africa is cultivated, and 80% of farms are less than two hectares in size. Farm yields

LEFT: Children harvesting jackfruit from a tree in their garden outside their family home in Butaleja district in Eastern Uganda, in January this year.

are around 1.2 tonnes per hectare, compared to an average of five tonnes globally.

At a time when land and hunger in Africa have become synonymous, establishing food security, particularly household food security, is widely acknowledged as an important milestone in advancing the living standards of the poor. Yet the deals so far have been controversial; in recent years, African politicians have routinely railed against "vulture capitalists". Even the business-friendly World Bank recently warned investment funds that they needed to behave responsibly.

But will they? Notwithstanding the recent investment stampede, the number of malnourished people globally has increased from under 100 million before the 2008 global financial crisis to approximately one billion before the onset of the COVID-19 pandemic in 2020, with 80% living in Africa. This demonstrates that investment in farming and food production does not necessarily imply an equitable and proportionate distribution among African countries and people at the household level. In fact, by 2015–16, sub-Saharan Africa had been losing market share in global agriculture exports. According to the 2017 World Competitiveness Report, the top exporters of agricultural commodities were the Ivory Coast, Ghana, Nigeria, Kenya, Ethiopia and South Africa, all of which lost market share despite increasing their exports in absolute terms.

That's partly because of low agricultural productivity, which in turn has made agriculture on the continent economically impoverishing and technically unsustainable. But there's a larger, macro-level reason: the absence of scalable and diverse markets capable of extracting benefits from international trade.

Since the AU adopted the Africa Continental Free Trade Agreement (AfCFTA) as a blueprint for integrated trade and growth, little has been done to implement the economic reforms the AfCFTA Secretariat has recommended. In the face of competing economies in the West and the costly burden of structural rigidities and scalable markets, the AfCFTA plan is to deregulate labour markets, slash red tape, and boost competition on the continent. But only a poorly handled overhaul has been attempted.

It is not that those pioneering the AfCFTA agenda haven't tried. The problem, as the academic Ian Taylor has written, is that the idea of putting 800 million hectares of arable land to productive use may be undermined by trade barriers that make agriculture and food production a tough act in African countries. To put that in perspective, by some estimates, about 97% of African businesses are small and medium-sized enterprises (SMEs) that provide at least 50% of employment and account for 70% or more of GDP growth. Yet the biggest hassle factors in agriculture, identified by the AfCFTA, have been high transaction costs, driven by weak physical infrastructure, widespread information asymmetries, low levels of marketed surplus, and high export taxes.

There are significant macro-regional implications as well, like the reality that the economic architecture for scalable agricultural and food processing markets is sclerotic. Indications are that the seven Regional Economic Communities (RECs) and the African Economic Community, formed in 1991 following the Abuja Treaty, are hardly solid foundations for inter-continental trade and sustainable investment in the sector.

What, then, is the way forward? With rising food prices on the back of global supply shortages, the ongoing investment stampede in the agriculture sector is a potential Vitamin B shot for the continent. The solution, economist Iraj Abedian has argued, is in the identification of regional comparative advantages that could harmonise trade between individual countries and businesses in the agriculture value chain, and ultimately help reconfigure and integrate the present geo-political boundaries of the AU's seven RECs.

"The problem with the present setup," Abedian says, "is that regional boundaries are mapped onto inherited colonial boundaries rather than a value chain that makes economic sense. Put economic

Photo: Badru Katumba / AFP

Photo: Camille Lepage / AFP

LEFT: Vendors sell vegetables at a market in Soroti, Karamoja region, Uganda, in May 2022.
ABOVE: A South Sudanese market trader sits in his shop where he sells imported bananas from Uganda.

participants in the value chain – from farming in countries with arable land to food processing in countries with strong manufacturing capacity – and in the rough and tumble of business, they will fall together within economic boundaries by virtue of sectoral advantages."

Indeed, the case for remapping the economic contours of farming and food production under the AfCFTA rests on economic pragmatism. Abedian urges us to consider fertile agricultural opportunities in, say, Uganda, as one of those advantages: "If technological and research inputs into seed banks and food processing capacity are supplied by, say, South Africa to countries with natural agricultural endowments like Uganda, the results could be an uptick in farming and food production with benefits for food security on the African continent and massive export opportunities."

In such a scenario, a scalable market would arise from an integrated agricultural value chain. The AfCFTA agenda, in a global context of rising food scarcity and soaring prices, is an opportunity to institutionalise a process that burst onto the scene in 2008. But can the AfCFTA initiative meet the challenge? What seems clear enough is there is, for the first time, a sense of forward momentum – from moribund bilateral trade relations with the West and the portentous declarations and institutional lethargy of the AU, to the real building blocks of agriculture: intra-African trade. GG

GOING TO WASTE

By Joe Walsh

Photo: John Wessels / AFP

Water scarcity is only set to grow as an issue in Africa as its population increases from 1.4 billion currently to an estimated 1.7 billion by 2030, while as many as 2.5 billion people could live on the continent by 2050. Demand for water will also increase as it is needed not just for drinking but also for sanitation, farming, energy, and manufacturing as the continent increasingly industrialises.

The United Nations Environmental Programme (UNEP) estimates that globally, the right wastewater

treatment processes could supply more than 10 times the water provided by current desalination efforts and offset over 10% of global fertiliser use.

Sub-Saharan Africa remains the region of the world with the lowest reuse of wastewater, with data collection from many countries difficult to attain. "There's a lack of data – a lack of valuable data. How do we improve monitoring, evaluating, and data processing, and (also) share and strengthen our capacity?" asks Avantika Singh, UNEP programme associate for wastewater management, in reference to the scale of the problems the continent faces in treating it.

As Africa's populations grow, its countries further industrialise, and its inhabitants increasingly urbanise, more dangerous wastewater is produced. In countries where water is already scarce (it is the second-driest continent on the planet behind only Australia, which has 2% of Africa's population), this can be a severe problem. But properly managing, treating, and reusing wastewater can not only avoid polluted water being pumped into the continent's environment, waterways, and freshwater supplies, which results in deaths, but could also provide fresh water for reuse and extract nutrients to displace fertiliser.

Yet, wastewater treatment is not given priority across the continent. "Wastewater is not, in general, a very sexy topic," Singh tells *Africa in Fact*. "It doesn't garner as much attention and action as it deserves. A

ABOVE: A man looks on as acid waste is pumped directly into the sea along a stretch of beach around 70 km north of Dakar, outside the village of Mboro Kandio in November 2021.

Photos: Sia Kambou / AFP

ABOVE: A gutter filled with wastewater and used oil near the Ebrie lagoon, in Abidjan, Côte d'Ivoire.
RIGHT: Wastewater runoff and dumped plastic on the shores of the Ebrie lagoon in July 2022.

mindset change needs to come about; it can't just be seen as waste and out of sight, out of mind."

That lack of attention has been highlighted by UNEP itself, which released a report in August this year, 'Wastewater: turning problem to solution', that recognised changes in wastewater treatment are not happening at the speed or scale required given the growing challenges of climate change, biodiversity loss and rampant pollution.

The World Bank reports that GDP per capita in sub-Saharan Africa increased from $591 at the start of the century to $1,690 last year, and increases in individual wealth have knock-on effects on water security. To take just one example, beer, a water-intensive product, takes 60 to 180 litres of water to produce just one litre, according to brewer SAB Miller, and is increasingly consumed across Africa. Industry body International Wine and Spirit Research (ISWR) finds sub-Saharan Africa to be the fastest-growing beer market in the world at 5% per annum. It is easy to see the strain being put on the continent's limited water supplies.

Last year, in Singapore, a craft brewery released a beer in collaboration with the National Water Agency made of 100% recycled water as one step to address the industry's increasing impact on water security. It remains to be seen how effective initiatives like this one will prove to be and whether they can be expanded to places like Africa.

Yet, there have been pockets of progress and bright spots across Africa that enable Singh to remain optimistic for the continued development of improved wastewater treatment. In water-scarce Namibia, a drought led Windhoek, the capital, to increase its water reuse from 20% of total usage to 37%, while aquifer water replaced surface water.

In rural Burkina Faso, UNEP found water and sanitation services were improving; more pit latrine construction had reduced open defecation, for example. The report did note, however, that the country was missing an opportunity to use the

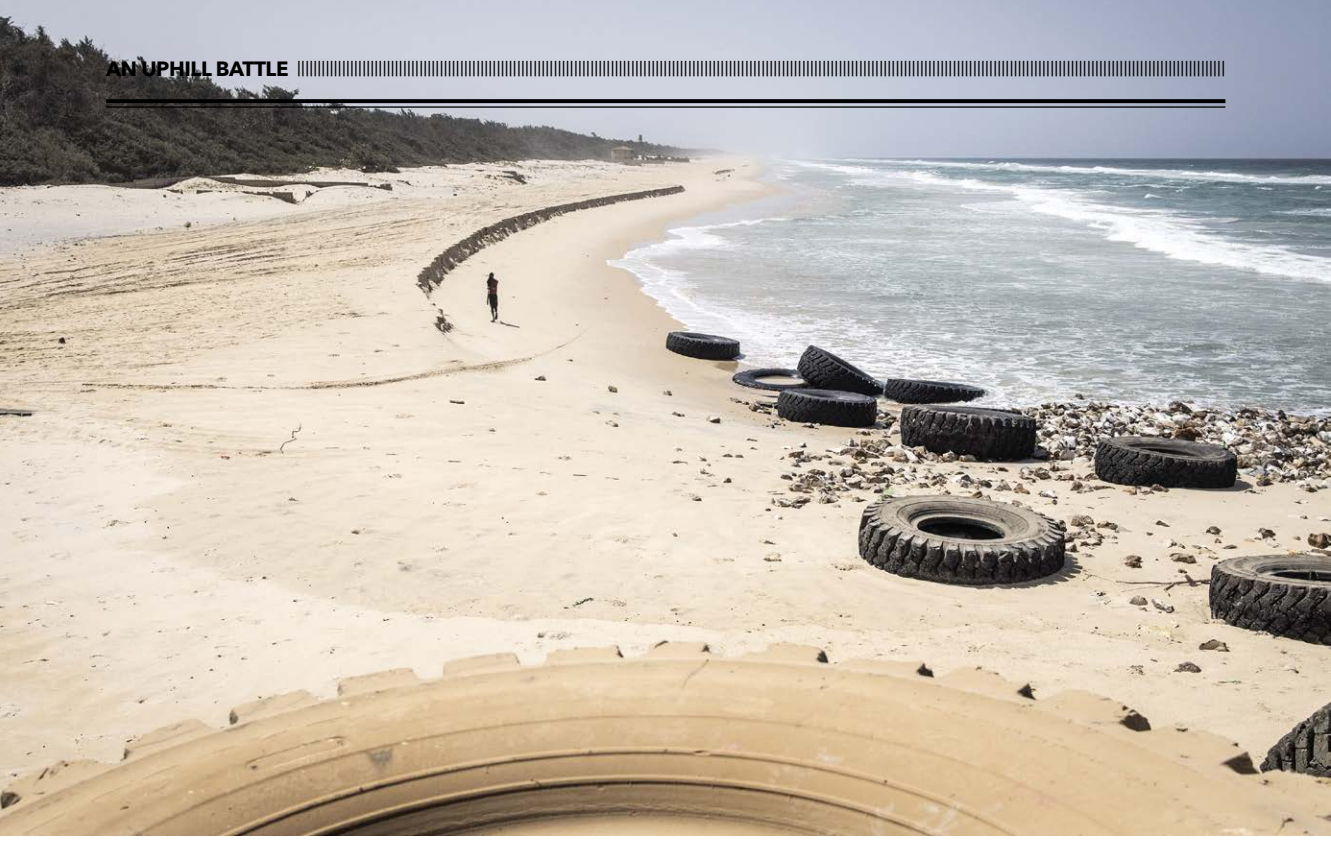
nutrients in human excreta as fertiliser in rural areas where subsistence farming dominates and commercial fertiliser is expensive.

Overall, though, the outlook is bleak. As Singh notes, countries lack the will to come together and address their wastewater management problems. "We need to increase co-ordination between people and organisations," she told *Africa in Fact*. "So many people are working [across the continent] on the same issue but on their own projects; we need to bring them together to learn from each other."

A sign of the troubles in the continent's wastewater treatment systems can be seen in South Africa, sub-Saharan Africa's leading country for wastewater treatment, which has unfortunately taken backward steps.

Last year, the country's first report into wastewater treatment in nine years was released, demonstrating how little attention is paid to this subject. The Green Drop Report 2022 revealed that 39% of the country's 955 wastewater treatment systems were in a critical state, an increase from 29% in 2013, while the cumulative risk ratio for treatment plants increased to 70.1%, a high-risk classification, from 65.4%, a medium-risk classification.

"Wastewater treatment in general is really getting to a dire state in this country," says Dr Kirsty Carden, the acting director of the Future Water Institute, a research initiative at the University of Cape Town (UCT) focused on sustainable and resilient water futures. "We now have a situation where there's large volumes, large quantities of



often almost untreated wastewater finding its way into the environment," she told *Africa in Fact*.

The deteriorating situation is having a very real impact on South Africa's citizens. Earlier this year, in the township of Hammanskraal, Pretoria, an outbreak of cholera killed at least 17 people, and was also found in the Vaal River, one of the main sources of water for Johannesburg and Pretoria. Although the outbreak can't be attributed solely to failing wastewater treatment, it is certainly a contributing factor.

"Obviously, low levels of wastewater treatment contribute to that because if treatment systems are failing, that means discharges are going into the environment; waterways are often very polluted. So if people are collecting water from places other than taps, there's a chance that it might be contaminated. And then you get these public health outbreaks," Carden said.

As with the rest of the continent, a major factor in this lack of treatment is inadequate funding, organisation and attention, as other topics dominate the attention of both the government and the media. In South Africa, that is primarily the ongoing electricity crisis, although, as Carden points out, these issues are not unrelated.

"The electricity crisis is contributing to this one too, with load shedding resulting in pump station overflows and sewer leaks and all the rest," she said. "So, I mean, these things are all intertwined, and if we could sort out the electricity crisis, that would be one way of getting towards better wastewater treatment. But at the same time, I don't think there's enough attention paid to issues of environmental health in this country."

Photos: John Wessels/AFP

ABOVE: A stretch of beach near Dakar, Senegal, where trucks belonging to Chemical Industries of Senegal have allegedly been dumping millions of litres of acid waste for the past 30 years. Locals claim they have fallen ill as a result and fish die.

The fight for better wastewater treatment across Africa is an uphill one, especially when you consider that the world's 6th largest economy, the United Kingdom, has in recent years seen its wastewater treatment disintegrate to such an extent that earlier this year 57 athletes competing in the World Triathlon Championship got ill swimming in its seas. It is primarily the result of disintegrating wastewater treatment systems, which saw the amount of untreated sewage dumped into its waterways increase by 2,553% between 2016 and 2021 and has left just 14% of the country's rivers in a "good" ecological state.

As for Africa, "honestly and sadly, not much progress has been made over the past 13 years [since UNEP's previous report]. It pains me to say, but we have a long way to go," lamented Singh. GG

New fields AND FORESTS

By Michael Schmidt

ABOVE: This aerial view shows rice and vegetables fields in the Libyan desert near Sabah.

At the entrance to the dusty town of el-Fashir in North Darfur, there is a sun-faded sign that reads "Desert Combat Department". But despite the tribal conflict there, this is not an army unit but a municipal outfit with the Sisyphean task of holding back the immensity of the Sahara desert.

I was there as a foreign correspondent covering the war and attempting to understand the complexity of it all. One night, I was invited to a large dinner hosted by the governors of the three Darfurian provinces. During an interview, the governor of South Darfur told me about his youth growing up in the provincial capital of Nyala, where, as recently as 1992, the desert dunes stood a good 120 km to the west.

By the time of the interview in 2007, the dunes had invaded to a mere 5 km outside the city's limits. That constituted an implacable eastward march of the Sahara desert of nearly 10 km a year.

So, desertification and environmental degradation, exacerbated by the decimation of Darfur's trees by wood sellers, resulted in the compression of tribes already competing for scarce resources into ever smaller areas of viable pasturage.

Equitable access to waterholes and grazing land had, by ancient tradition, been controlled and balanced by delicate agreements between tribal chieftains. But socialist modernisation in the 1970s under the military regime of Colonel Gafaar Mohammed Nimeri deliberately eroded the authority of the chiefs.

The combination of vital wells swallowed up by desert sands and weakened tribal agreements had fuelled inter-tribal competition to the point where

Photos: Patrick Hertzog / AFP

BELOW: Aliou Faye from the Research and Development Institut IRD shows a dune stabilised by the planting of filao trees, near Tivaouane, Senegal in November 2004.

it resulted in regular massacres and atrocities, which deployments of United Nations and African Union forces were unable to prevent.

This sadly familiar contemporary thirstland scenario in which desertification drives conflict is a far cry, in fact by some 2,400 years, from the time when there had actually been a fish-filled Lake Darfur (sometimes called Lake Ptolemy) with a surface area of some 11,230 km² and a volume of 547 km³ at its maximum. Then, the Sahara, instead of being a 1,600 km-wide arid barrier, was mostly a lushly wooded, animal-rich grassland environment dotted with monsoon-fed freshwater inland seas and networked with rivers.

Photos: Seylou Diallo / AFP

The natural fecundity at the height of the "North African Humid Period" as it is known, created human settlements that left some of what appear to be among the earliest depictions of people swimming – in Egyptian palaeolithic rock art from 10,000 years ago – and sowed the seeds for the cultures of what would later become the Nubian and Egyptian pyramid-building empires.

Climatologists believe the green Sahara phenomenon actually repeats in long cycles, and there is evidence of at least 230 previous occurrences cycling back to the first appearance of the Sahara seven to eight million years ago.

But while advancing that clock towards fecundity is a clear impossibility, there are significant modern regreening initiatives underway that might at least provide plentiful water to key developments in the 9.2-million km² Sahara, and transform huge swathes of the semi-arid Sahel fringes of the desert into silvicultural land – and much of the grassland savannah further south into arable farmland.

Beneath otherwise parched Darfur itself lies a huge, almost untapped, freshwater resource that underwrites the reliability of its remaining wells: the world's biggest groundwater aquifer, with a total volume estimated at 150,000 km³, covering two-thirds of Egypt, a third each of Sudan and Libya, and a substantial part of Chad.

The world's largest irrigation scheme already makes use of the aquifer, in which "fossil" water left over from the last great Ice Age as far back as 38,000 years ago is trapped in sandstone beneath the desert – in Libya's Great Man-made River Project, involving some 1,300 wells in seven main well-fields deep in the Sahara.

The Nubian Sandstone Aquifer System (NSAS) was discovered in 1953 while drilling for oil. Construction on the project – the "world's largest engineering venture", according to the global specialist *Water Technology* journal – began in 1984, and the first water was delivered to the Libyan capital Tripoli in 1996. Despite disruptions caused by the ongoing Libyan civil war, the $25 billion system continues to supply some 2.4 million to 6.5 million cubic metres of water a year to Libya's cities and farms (when completed, 155,000 ha should be irrigated).

But the aquifer's subterranean complexity means it is hard to tell what such mass extraction means for multiple users of this finite resource, so in 2013, the four arid NSAS countries (Libya, Egypt,

ABOVE: Ibrahima carries firewood in the northern Senegalese village of Thiokhmar, where residents managed to stop the desert from advancing 13 metres per year by planting three hectares of trees.

Photo: Seyllou Diallo / AFP

Chad and Sudan), with the technical assistance of the UN's scientific body UNESCO and other multilateral bodies, signed an agreement on the equitable use of the aquifer.

As the announcement on the agreement stated, with "growing populations and decreasing water availability from other sources in the region, the aquifer is under mounting pressure. Removing water without a clear understanding of transboundary and other implications threatens water quality and has the potential to harm biodiversity and accelerate land degradation."

Meanwhile, great progress has been made towards re-greening the semi-arid Sahel belt to the south of the Sahara. If the late Libyan leader Muammar Gaddafi was the visionary for the aquifer project, Burkinabé farmer Yacouba Sawadogo is his peer regarding the reforestation of the Sahel.

In 1972, the Sahel entered a 12-year period of severe drought, exacerbated by overgrazing, overpopulation, and poor land management, that eventually led to hundreds of thousands dying of famine as the groundwater table dropped by a metre, and formerly farmed slopes became heavily eroded and unfarmable.

Sawadogo and his neighbour Mathieu Ouédraogo came up with a method of placing rows of stones, three stones wide, along the contours of the slopes to retain rain runoff, giving it a better chance to soak into the soil, as well as for nutrient-rich silt to accumulate and for crops to take root along the rows.

This *cordons pirreaux* practice was bolstered by an adaptation of traditional water-trap *zaï* or *tassa* holes. Dug into the soil about a metre apart between the stone lines, the holes were made larger than usual and filled with manure and compost, which not only provides crops with nutrients but also attracts termites who tunnel and thus break up hard, drought-compacted soil. *Zaï/tassa* holes increase the productivity of maize, sorghum, and millet crops by up to 500%, according to the International Food Research Institute.

Combined with agroforestry – the practice of interspersing crops with trees and shrubs (also farmed for wood, nuts, and fruit) to improve soil resilience and fertility, reduce water evaporation and runoff, widen biodiversity, provide year-round harvesting of different crops, enhance carbon sequestration, and increase crop yields – Sawadogo's

pilot project quickly established a remarkable 40-hectare forested farm near his home village.

His methods caught on across the Sahel, and former *TIME* magazine Africa correspondent Alex Perry wrote that by 2004, 300,000 hectares had been re-greened in Burkina Faso, five million in Niger, one million in Ethiopia, and 450,000 in Mali: "More than five million people were farming themselves out of starvation."

The idea was spread further by the 2010 documentary on Sawadogo, *The Man who Stopped the Desert*, and in 2019 by a YouTube instructional video available in French, Arabic, English, Spanish, and Malagasy.

A 2004 study of the practice in Niger noted its excellent environmental and farming results, but cautioned that it was labour-intensive and could provoke conflict as newly arable land impinged on pastoralists' grazing rights. Yet a 2011 study said that the rise in annual crop yields increased farmland values by about €2,000/ha (then $1,800/ha).

The new fields and forests not only buttress food security, but have arguably also increased rainfall in the replanted regions, raised the water table, spread the number of trees by up to 50%, decreased temperature, and improved African community autonomy from foreign aid and central governments.

Still further south of the Sahel, the wooded grasslands of the savannah embrace 13.5 million km², or 400 million hectares, representing 60% of the world's uncultivated arable land. In 2017, the African Development Bank (AfDB) initiated a project to sustainably transform some 16 million hectares, or about 4% of it, into farmland for maize, soybeans, and livestock, turning Africa into a net exporter of those products.

The continent currently imports about $35 billion a year on what it should be producing: 22 million metric tons of maize, two million metric tons of soybean, one million metric tons of broiler meat, and 10 million metric tons of milk product. Scale is part of the problem: large commercial agriculture is rare, with 80% of Africa's farms (some 33 million) comprising less than two hectares apiece.

The model for the AfDB's Technologies for African Agricultural Transformation for the Savannahs (TAAT-S) initiative is Brazil, where the tropical Cerrado grasslands were turned into a $54 billion food industry within two decades through, as the bank stated, "skilful development of production technologies for new crop and livestock varieties; innovative soil and crop management programmes adapted to the tropics; wide-scale dissemination of new agricultural technologies; low-interest loans, and ambitious rural development programmes."

The project has since been launched in more than 30 countries, and by 2020 it was beginning to record several success stories. Yet the Brazilian model is deeply problematic, as *The Guardian* warned the same year, saying 283,000 km² of indigenous Cerrado bush had been cut down since 2001, causing rising temperatures, droughts, wildfires, lower rainfall, pesticide pollution, and erratic river behaviour, not to mention displacing indigenous people and endangering animal species.

"Africa faces a dilemma," admitted the authors of last year's Africa Agriculture Status Report: "If it is not able to raise yields sufficiently, it will need to convert much of its remaining forests and natural grasslands into farmland – with associated high costs to the continent's environment, biodiversity, and the ecosystem services that they provide – and/or become much more dependent on the global market for its food supplies."

The improvement of productivity and economies of scale on existing farmland was preferable, the report enjoined, while Sawadogo's methods have been commended for relieving pressure to plough the savannah. But exceptional care needs to be taken with future policy decisions on how Africa's thirst is to be slaked. GG

Mini livestock is having a day

By Michael Schmidt

It was more of a challenge chewing the hard carapace of the palm-sized Madagascar hissing cockroach than swallowing it. That, strangely enough, elicited a pleasant chocolaty taste – not that anyone I have told about this experience even faintly believes me.

Yet pre-Columbian insect tucker as eaten by ancient Aztecs and Mayans – cockroaches, spiders, scorpions, worms, grasshoppers, and so forth – is pretty standard fare that one can find in food markets, even in a giant modern metropolis like Mexico City.

Ant-eggs are an Aztec delicacy and taste like pomegranate, but my personal favourite is a taco filled with slices of fresh avocado topped with dried grasshoppers and sprinkled with the real hot zing delivered by a salsa made from tics.

Again, there are no takers among anyone I describe this to. But insect foods, in recent decades the exclusive preserve of traditional cultures or tourists on a dare, are busy making a serious comeback, not only as a viable alternate protein source to beef, pork, chicken, and fish, but as haute cuisine too.

Actually, little of this is new: fully a quarter of the world's eight-billion people, mostly in Africa, Asia, and Latin America, already supplement their diets with more than 1,900 species of insects – beetles constituting almost a third – and their cousins such as spiders, solifugids, and scorpions. Most of these are wild-gathered; it's the industrial farming idea that is novel.

Yet this potential to address food insecurity was only recognised at an international level by the UN's Food and Agricultural Organisation (FAO) 20 years

ABOVE: Madagascar hissing cockroaches (*Gromphadorhina portentosa*).

Photo: flickr.com/photos/calliope

Photos: Pacome Pierrot / AFP

ago when it initiated research into the uses of what it terms "mini-livestock". This was against a backdrop where populations were, and are, rising, threatening "scarcities of agricultural land, water, forest, fishery and biodiversity resources, as well as nutrients and non-renewable energy are foreseen."

The advantages of edible insects include that they "contain high quality protein, vitamins and amino acids for humans. Insects have a high food conversion rate, for example, while crickets need six times less feed than cattle, four times less than sheep, and twice less than pigs and broiler chickens to produce the same amount of protein. Besides, they emit less greenhouse gases and ammonia than conventional livestock. Insects can also be grown on organic waste."

In a perfect circle, larvae can eat such waste and in turn be harvested for animal feed, the animals producing more biowaste for insect consumption. Insects require far less land, water, and other scarce resources to cultivate – and farming them is cheaply accessible to marginalised communities including rural women, landless people, and the urban poor.

For malnourished children, they promise a higher dose of fatty acids than provided by fish, and are also rich in fibre and micro-nutrients such as copper, iron, magnesium, manganese, phosphorous, selenium and zinc. They are also less likely, in a post-Covid world, to transmit species-jumping zoonotic diseases.

There are challenges in industrialising production, as discovered by a University of Copenhagen exploratory "GREEiNSECT" project, partnering with the Jomo Kenyatta University of Agriculture and Technology and others in Kenya that started in 2014. These challenges revolve largely around how to sustain the productiveness and weight gain of mass-rearing harvests. Other threats include the depopulation of useful insect

Photo: Rodger Bosch / AFP

FAR LEFT AND ABOVE: Street vendors sell insects on a market in Bangui, Central African Republic. **LEFT:** Mopane worms, imported from Zimbabwe, are a traditional snack in South Africa. These dried insects are high in protiens, fats, and a variety of minerals, making them very healthy to eat.

populations (despite their critical plant-pollination function, bees are widely consumed globally), as well as the introduction of invader species by bug farmers. Food health and other policy and regulatory authorities are scuttling to catch up.

But in 2018, the projects' partners in Kenya discovered "a new, previously undescribed edible cricket with great promise for mass production for human consumption and inclusion as an alternative protein ingredient in animal feeds."

Things have now moved to the point that Montreal in Canada last year hosted the fourth Insects to Feed the World international summit, with 58 countries represented. There, Dr George Sekonyana, backed by South Africa's National Research Foundation, presented a paper on the sustainability of the informal cross-border trade in edible mopane worms, arguing that traditional ecological farming processes were bedevilled by regulatory inflexibility.

The sadly defunct pan-African innovation journal *Ogojiii* carried several insect recipes in a 2016 article, including sushi given crunch by fried mealworms; by then, even snooty French foodies like the 1895-founded Le Cordon Bleu cooking school were sampling creepy-crawly cuisine. Looking forward, the transmutation of the continent's biblical horror locust-plagues into a bio-friendly African industry that nourishes millions of lives is the next food frontier. GG

ABOVE: A woman holds sorghum in her hands while preparing "burukutu", a locally brewed alcoholic beverage, in Makurdi, Nigeria in December 2019.

Time is of the essence

By Anna Trapido

Many African countries, particularly those in West, central, and East Africa, are being negatively impacted by anthropogenic (human induced) climate change. The continent is climatically diverse, both within and between countries, but as the frequency and/or severity of extreme weather events increases, the temperatures rise and rainfall patterns shift, agricultural stress is escalating almost everywhere. These issues are made more difficult by the continent's and the world's violent conflicts, rapid population growth, urbanisation, post-pandemic economic vulnerability, and high food import dependency (more than 30% for cereals, according to United Nations data).

The Food and Agriculture Organisation (FAO) definition of food security calls for all people, at all times to have "sufficient, safe and nutritious food that meets their dietary needs and food preferences."

The failure to meet this standard is widespread; 2022 FAO statistics estimated that 20 million Africans were facing hunger. In the Horn of Africa, UNICEF 2023 data reports seven million children under five are malnourished and in urgent need of nutrition support. There is a critical need to provide not only more food but also nutritionally better, culturally appropriate food while simultaneously supporting climate crisis adaptation and mitigation strategies.

Time is of the essence. Spatial models predicting the impact of climate change on agriculture in sub-Saharan Africa out to 2070 indicate that in the locations where the region's major staples of maize, rice, cassava, and yams are presently grown, 10% of these areas will alter so radically that none of these crops will be able to survive. Of these, only yams are indigenous to Africa.

It was not ever thus. Historically, African agriculture had a wide range of indigenous and/or traditional (i.e., native to a region or introduced so long ago that they have evolved unique, regionally specific traits) cereals, leafy greens, pulses, roots, tubers, fruits, seeds and nuts that were once the basis for many and varied nutritious foods.

While Africans have traded and incorporated non-native ingredients into their culinary cultures since time immemorial, a combination of the post-15th century Columbian Exchange (between the Americas and Eurasia), colonisation and cash cropping resulted in a widespread transfer of food plants that displaced many traditional species. Such is the extent of the displacement that they are now commonly referred to as neglected and underutilised crop species (NUCS).

Neglected and underutilised but not extinct. Many continue to exist at the periphery of commercial agriculture, predominantly grown

Photo: Kola Sulaimon / AFP

ABOVE: A sudanese farmer stands in his field of sorghum at the Gezira Scheme in Sudan.

at small-scale and sold at informal markets. Income derived from such sales not only makes a significant contribution to livelihoods but also play a part in cultural heritage and spirituality across the continent.

As the climate becomes ever more inhospitable, the adapted strengths of NUCS are becoming increasingly apparent. Africa is geologically old and (even prior to climate change) was characterised by degraded soils and irregular rainfall. While no plant can withstand drought indefinitely, many of the NUCS are waterwise, tolerating regionally specific pests and poor soils. Returning to the spatial model described above, whereas 10% of regions will no longer be able to sustain exotics, native crops will still be able to survive in 95% of all current farmlands.

The nutritional content is also advantageous. Several studies have shown indigenous fruits to be higher in Vitamins A and C, while the leafy greens are often richer in iron, folate, and zinc. African ancient grains and pulses contain significant proteins and micronutrients. Furthermore, the genetic diversity of NUCS provides a pool of traits for plant breeding programmes that will become increasingly valuable as the climate changes. Biodiversity is also vital for the performance of ecosystem services to improve water quality, maintain soil health and pollinate crops that agriculture depends upon.

That these NUCS are nutritionally advantageous, biologically diverse, adapted to the environment and of socio-spiritual value to many people is indisputable but if they are to play a significant part in alleviating food insecurity for rapidly increasing, urbanising populations, production must be significantly scaled up.

Table 1 shows sorghum, millet and fonio make up 20% of staples grown on the continent, but when imports are included this share falls to 13%,

STAPLE	PRODUCTION	IMPORTS
Maize	98 399 383	17 554 747
Rice	37 188 989	30 950 668
Wheat	29 219 448	44 919 732
Sorghum	26 280 475	709 049
Millet	12 105 492	68 605
Fonio	664 429	59

Source: FAOSTAT

Table 1: Production and imports of selected staples for 2021 (tons).

Photo: Jose Cendon / AFP

Photo: Monirul Bhuiyan / AFP

ABOVE: A farmer wears a face mask while covering the sorghum in his field to protect it from from the birds on the outskirts of Gaborone, Botswana.

indicating that their contribution is limited. For NUCS to reach their potential, there are a number of obstacles that need to be cleared.

Farmers need access to good seeds if they are to be persuaded to diversify production away from non-native staples. Crop scientists spent more than a century creating high yield maize, rice and wheat varieties. Nothing like the same effort has gone into improving indigenous/traditional plants and many countries have no formal seed supply systems, meaning farmers use seed from one planting season to the next without improvement.

But this situation is beginning to change. At the African Centre for Crop Improvement in Pietermaritzburg, in the province of KwaZulu-Natal, South African seed scientists are working to improve strains of teff, sorghum and cassava and other NUCS. Participatory research with smallholder farmers, drawing on indigenous knowledge is also underway in Kenya, Tanzania, Benin and Mali to evaluate new varieties, optimise methods to diversify cropping systems and streamline distribution. Policy pertaining to the protection, respect and reward of indigenous knowledge, including agricultural techniques and seed saving, are being drawn up in line with the African Union's Continental Strategy for Geographic Indications (GIs) 2018-2023.

Farmers contemplating a switch also need assurances that there will be buyers to take and process their crops. These buyers must be able to sell on through distribution channels that can take the produce to the consumer. Every link in the chain has to be sufficiently profitable to support those involved. Only then can a farmer justify allocating scarce resources to previously NUCS.

There are indications that NUCS can be profitable and even exportable. New York-based, Senegalese born chef Pierre Thiam has been central to the promotion of fonio (a West African ancient grain, millet variety) outside of West Africa. His company, Yolele Foods, sells fair trade fonio in Europe and the United States to mitigate against the risk of the superfood curse that has seen previous indigenous ingredients (quinoa, for example) become western food fashions to the detriment of the communities from whence they come. Thiam currently works with 1,400 women-run fonio


Photo: Eduardo Soteras / AFP

growing and processing cooperatives in rural Senegal and is set to expand operations into north and central Mali in early 2024.

"Fonio has the potential to transform the economic landscape of rural West Africa, that's what drives us at Yolele," Thiam told *Africa in Fact*. "We think that the combination of a fair-trade export market and a beneficial, commercial-scale supply chain will provide life-changing results for smallholder farmers and promoting biodiverse, regenerative, and resilient food systems."

International customers are increasingly asking for African ingredients, but at home consumer resistance runs high. More than a century of explicit and subliminal messaging around the sophistication of foreign crops has created negative perceptions equating indigenous ingredients with poverty food. The isiZulu insult: "*uyadla imbuia ngothi*", which can be translated as "you are so poor you are eating amaranth again", is one of many such slurs uttered all across Africa.

Challenging and changing negative perceptions is essential if NUCS are to take their rightful place within African food systems. But there are some signs of social change. The New African Cuisine movement is part of a chef-led process of claiming space for traditional tastes and rebranding the continent's original ingredients as part a contemporary, regionally relevant culinary genre. At the Ìtàn Test Kitchen, in Lagos, Nigeria, Chef Michael Elégbèdé told *Africa in Fact*: "I incorporate a personal touch and locally sourced indigenous ingredients with both ancient and modern culinary methods; our restaurant is a fine-dining establishment that will bring Nigerian cuisine [the recognition] it has never seen before." While Elégbèdé's restaurant is über-expensive, fine dining fare, media exposure means that its ability to change hearts and minds is much wider than the small pool of those who can afford to eat his work. The chef also coordinates the Abori Network, an online marketplace for Nigerian heritage food suppliers.


Photo: Issouf Sanogo / AFP

ABOVE: Harvesting millet near Tahoua, Niger.

One of the ways such crops can be mainstreamed on an increasingly urbanised continent is to make these ancient ingredients user-friendly and quick to cook for time-poor, fuel-poor urban lives. At the University of Johannesburg's Food Evolution Research Laboratory food scientists are working to develop premixes and other instant products.

Government policy framework, regulations, extension services, market support and finance

BELOW: Farmers harvest and thresh sorghum by beating the panicles with sticks in a field near the village of Ayasu Gebriel, near Alamata, in Ethiopia.

Photo: Eduardo Soteras / AFP

have an important role to play in taking academic theory into mainstream farming practice. There are still government policy obstacles to the wider uptake of NUCS – in South Africa, maize is exempt from value added tax (VAT), making it much more affordable than sorghum (the much more nutritious, environmentally sustainable indigenous alternative), which is taxed.

Campaigns emanating from multilateral agencies are also potentially powerful. The FAO declared 2023 as the International Year of Millets (IYM) in a global effort to promote these environmentally sustainable ancient grains. India motivated the IYM declaration and strongly promoted it domestically and internationally. Indian politicians, economists, agronomists and media have actively engaged with, and capitalised on, the campaigns encouraging cultivation and consumption of millet to improve resilience of the farming sector and improve diets.

Tax deductions for Indian companies incorporating millets into their food products have also been introduced. Across Africa, the response has been slower and smaller but the IYM has raised the profile of millets to cope with drought conditions and given a much-needed fillip to government, farmers, food companies and research efforts to exploit their potential.

The International Crops Research Institute for the Semi-Arid Tropics, for example, has partnered with projects in West, central, East and southern Africa to improve dryland crop resilience using millets. Caution is not necessarily a bad thing. When the UN designated 2013 the international year of quinoa, prices of the South American ancient grain rose to such an extent that while farmers benefited, some of those who had consumed it for millennia could no longer afford to eat it. In Bolivia, for example, the quinoa price tripled and the rate of consumption in that country declined by 34%, according to Marc F. Bellemare and co-authors in an article, 'The Welfare Impacts of Rising Quinoa Prices in Peru', published in *World Development* in 2018.

NUCS have the potential to complement and improve the resilience of existing food systems. Tapping that potential will require focused policies and practices to encourage expanded production, create better market access and consumer appeal. Progress has been made but there is long way to go if the continent's edible ancestry is to take its rightful place at the forefront of Africa's delicious, nutritious daily diet. GG

THE LAST MILE

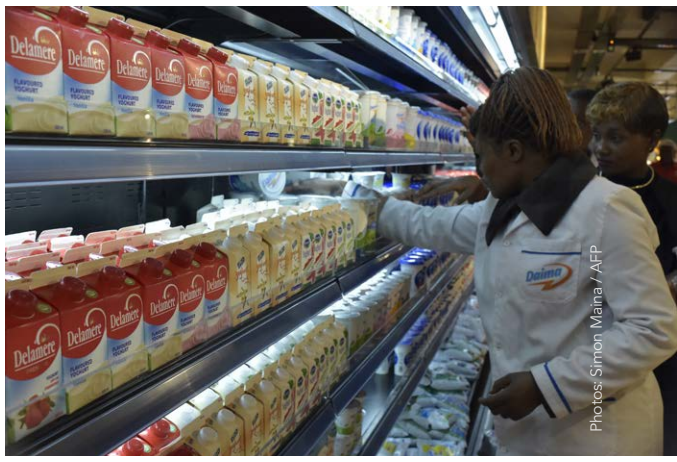
By Tshepo Mokholo

It is now commonly accepted that the world is moving towards an urban future, and with African (and Asian) cities set to account for 86% of the world's urban population growth, we are faced with the challenge of how best to plan and develop for this reality.

Urbanisation brings with it multi-dimensional shifts, and those shifts come with their own problems. One such problem is how we intend to feed this burgeoning urban population, considering that today, nearly 60% of Africans are either moderately or severely food insecure. You cannot begin to discuss food security without discussing urban food systems in Africa, as they hold lessons and the potential for a new way of thinking about food in our cities.

ABOVE: Residents observing food distribution in the Kwa Mai Mai area of the Johannesburg CBD, in Johannesburg, in May 2020.

Photo: Marco Longari / AFP



Photos: Simon Maina / AFP

Food systems are complex and difficult to untangle at times. They operate at multiple scales, in multiple geographies, and rely on multiple networks, systems, and infrastructures to function. Food security in Africa presents what could be described as a wicked problem. Increased investment in technology and agricultural processes in the past 60 years has done very little to reduce food insecurity on the continent.

Tackling this wicked problem requires a systematic approach, one where we can identify possible leverage points in the system, an approach championed by renowned systems thinker Donella Meadows. Within this approach, a deep understanding of the system and the thresholds for change that exist at any point is required.

Food security as a system can be understood through its six pillars: access, availability, utilisation, stability, agency, and sustainability. All of these pillars present possible leverage points and are the topics of many articles on food security, but I would like to zoom in on "access" as a pillar and possible leverage point, and its spatial manifestation in our urban environments that are morphing our access and relationship to food, and the dangers they present.

To borrow from logistic business speak, food access often represents the "last mile" of a food system, the contact point with the consumer, and one that is spatialised either through access points such as grocery stores or food deliveries. This last mile is widely accepted as the most difficult part of any logistics business and a potential failure point, and the same can be said of food access points. They require close attention if we are to seriously address our food security challenges.

As one of the more developed economies on the continent, South Africa offers us insights into how there has been a shift in food access that has been

underpinned by our flawed development models. The spatial restructuring of consumption within South Africa's urban centres has widespread implications.

South Africa's food access landscape has shifted dramatically in the past three decades. In 1992, approximately 90% of all food in South Africa was purchased from small-scale neighbourhood stores, informal vendors, local fruit and vegetable shops, and spazas, and only 10% was purchased through large supermarket chains. By 2017, the landscape had been completely altered, with supermarkets now accounting for as much as 75% of all groceries sold in the country, a number that makes it the highest in the world. During this time, South Africa has built and continues to build an extraordinary number of supermarkets, anchored within the shopping mall typology that punctuates not only the suburbs of the country but increasingly its townships and rural areas.

The result of this proliferation is the decline of the diverse access points that underpinned food access in communities, such as neighbourhood stores and vendors, who formed key economic mainstays of community life. This shift in landscape has had significant implications for food security because it has undermined an important part of communities that allows them to access food closer to home, on a scale necessary, and using credit systems built on trust developed over time.

The social and cultural underpinnings of these food access points play a vital role in how many people, especially in more economically vulnerable spaces, are able to access food. The concentration of supermarkets as dominant points of food access has inadvertently generated a food system that undermines food security.

Small-scale stores are more closely aligned with the economic realities of communities than supermarkets. While supermarkets offer food at overall lower price points per unit, their unit sizes are often too large for the economically vulnerable to afford. The operating times of supermarkets are also often not aligned with the times most communities return from work. The spatially concentrated nature of shopping malls also means there has been an increase in distance between consumers' homes and the supermarkets.

This expansion and concentration of supermarkets are the result of two contributing factors. The first is the financialisation and growth of consumerism in the South African economy, which started in the early 1990s. What this did was create demand in the economy for low-risk, high-yield investments, and property, which has long been seen as the holder and creator of wealth, became an opportune outlet of which developers were more than ready to take advantage. There was also a demand boost due to the increase in credit

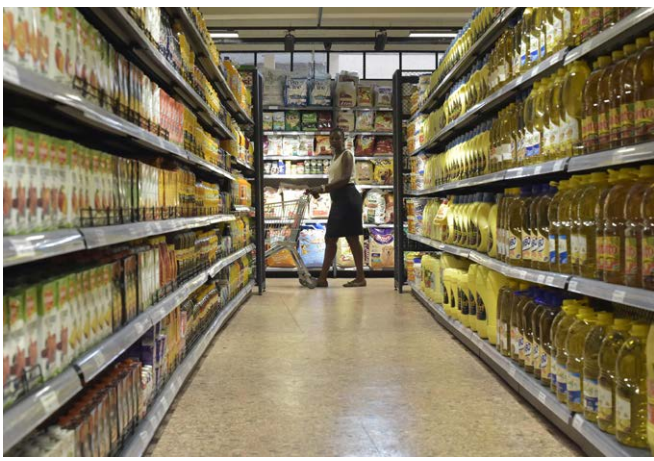


Photo: Luca Sola / AFP

made available to consumers. With the flow of capital and the growth of the middle class, shopping malls and supermarkets became the symbols of modernisation and development in the country.

The relationship between development and shopping malls still has a strong hold on our public psyche, so much so that the model is being replicated across the continent. The growth of shopping malls in Kenya and Ghana, often anchored by South African retail giants such as Shoprite or Mass Mart's Game stores, is an example.

The framing above serves to highlight the interlinked dependency of urban food systems and urban governance, particularly urban planning. One could argue that local governments have no power to decide on food supply, but it becomes clear that through their inaction, either through policy or planning, they have a tangible impact on food systems. Recognition of this gap in urban governance presents a potential leverage point through which we can imagine food systems that are more rooted in African practices and ways of life and that are able to respond to the specific needs of consumers.

To start reimagining a food system for African cities that is rooted in localised social and cultural practices, it is important to recognise current spatial forms of food access not only as a stop-gap and unmodern typology, but as what they tell us about the logic of community. They can provide a good basis from which we can develop Afrocentric models of modernity and urban governance with respect to food.

I want to draw on two examples from different parts of the continent. The first is the spaza shop, a typology that punctuates South African townships and exists in similar forms in cities across the continent. Spaza shops offer a community-based and flexible food access point that responds to the needs of its immediate community, whether through the products they stock, the unit sizes


Photo: Pius Utomi Ekpei / AFP

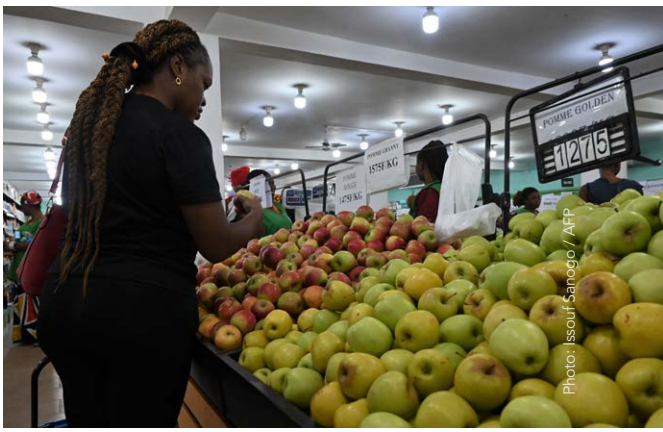


Photo: Issouf Sanogo / AFP

Photo: Luca Sola / AFP

Photo: Desmond Kwande / AFP

they sell, or the informal credit system they offer to trusted members of the community. Their resurgence of late signifies a clear demand for these more localised access points, and their contribution should not have to exist outside of formal urban planning systems.

On the eastern coast of the continent, *Kibandas* (Which are small, usually informal outdoor restaurants) not only punctuate the poorer parts of Nairobi but are a common sight in the wealthier neighbourhoods of Westlands, Lavington, and Kileleshwa as well. These informal roadside restaurants are popular even among professionals who work in these areas. It is not uncommon to see workers in suits sitting at one of the wooden huts, enjoying a plate of *ugali*, *sukuma wiki*, and some goat meat during lunch.

These neighbourhoods are populated by some of the most popular shopping malls in the city, yet the presence and popularity of *Kibandas* remain strong and are growing. Despite this, they are not a part of urban planning and future visions of the city; they are instead seen only as a subaltern practice rather than having the potential to play an important role in Nairobi's urban food system planning.

It is clear that food systems have to be part of future urban planning and urban governance, especially relating to food access. There is a significant gap in policy, practice and research in this space, but it holds great potential to shift the mental models of development that currently hold sway and avoid a path dependency that might be detrimental to food security on the continent.

We have to re-imagine new forms of development and modernisation that centre on localised practice rather than undermining them. This reimagination then needs to inform our urban planning processes, which themselves need to be re-imagined to be more fit for purpose in challenging contexts across the African continent. GG

RISING TIDES, WANING FORTUNES

By Monique Bennett

Finding a balance between preserving fishing resources and providing adaptation strategies to fishery-dependent households is complex and difficult. Most of the strategies employed by government institutions focus on ecological adaptation and the sustainability of resources, which can often undermine the capacity of fishery-dependent communities to adapt to climate change and the impacts of overexploitation. Fishing remains a critical source of livelihood for millions of coastal residents across East and West Africa; without it, millions face severe food insecurity.

The coastal regions of sub-Saharan Africa (SSA) are well-endowed with great cultural, ecological, and climatic diversity. Africa's western and eastern coastlines stretch across a combined 10,100 km and encompass some of the most diverse fish resources in the world.

However, Africa's fishing sector, which in 2011 contributed an estimated $24 billion annually to the region's economy, faces serious long-term threats, not only from climate change but from overfishing, and poor management of the aquaculture system as well. Across SSA, some 100 million citizens depend on fisheries as a primary or alternative livelihood activity, and rising populations and per capita income growth are expected to increase the demand for fish by 30% across the continent. However, despite the sector's great potential, it underperforms in production and supply. Although data for the entire SSA region remains limited, some substantive research has been done to deepen our understanding of the region's vulnerability to climate change impacts on marine fisheries.

Within the past decade, food insecurity has risen in SSA countries; recent statistics indicate an

ABOVE: A young boy reaches into the water along the Casamance River in Ziguinchor, Senegal, in May this year.

Photo: Muhamadou Bittaye / AFP

estimated 704 million people experience moderate to severe food insecurity. Around 30% of the SSA population depends on fish and fish products as their primary source of animal protein.

The latest Intergovernmental Panel on Climate Change (IPCC) report, released in March this year, indicates that "widespread and rapid changes" have occurred in the earth's geosphere and hydrosphere (i.e., oceans, rivers, and lakes). Fishing communities have been identified as among the most vulnerable to climate change due to their high dependence on climate-sensitive resources. Not only that, but together, fisheries and humans form a complex social-ecological system that is under threat from both human exploitation and climate change. Climate change causes ocean acidification, increasing sea surface temperatures, lower PH levels, sea-level rise, and more intense cyclone systems, amplifying other stressors like pollution, overfishing, and illegal fishing.

Photo: Tony Karumba / AFP

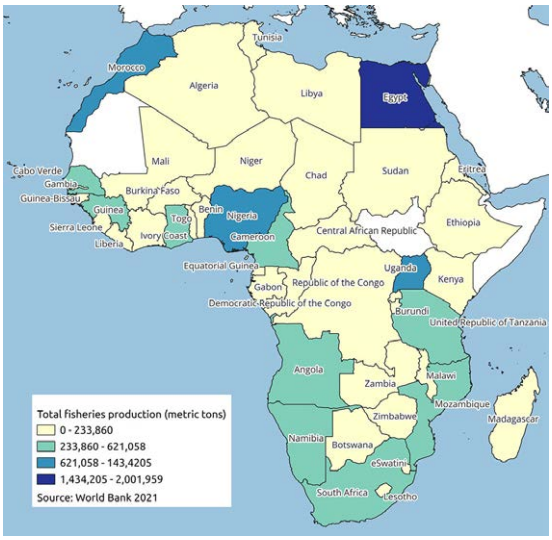
Aquatic species and organisms exhibit diverse responses to shifts in climate conditions. These changes can prompt shifts in a species' distribution, dynamics, physiology, and seasonal biological patterns. For instance, elevated temperatures can significantly influence fish reproduction, development, and metabolic functions. In southern Africa, sea surface temperatures are rising at an accelerated rate of 0.8 °C per decade, surpassing the global average. Projections indicate that coastal areas in both the western and eastern parts of Africa could experience a temperature surge of up to 3°C by 2100. Furthermore, the foreseeable future is likely to witness a heightened frequency and intensity of extreme weather events, such as intense rainfall and prolonged droughts. The effects of climate change on fisheries can be broadly classified into biological, physical, and socioeconomic impacts.

The effect of climate change on the biology of certain fish and aquatic species is a key concern among scientists. Plankton, the foundation of the aquatic food web, is sensitive to changes like temperature and rainfall. Studies have examined whether plankton's abundance is at risk in freshwater and marine ecosystems and found that, for example, in East Africa's Lakes Kivu and Malawi, there is a diminishing population due to warmer water. Fish reproduction is also closely linked to specific temperature ranges due to its impact on cueing egg production, larval distribution, and survival. Effects differ among species, but studies indicate that temperature changes have caused some fish species to migrate to new areas with more favourable conditions.

Rising sea levels, a prominent consequence of melting ice and diminishing snow coverage, stand as one of climate change's most widely recognised outcomes, with its impact on coastal fisheries and vulnerable island nations taking centre stage. While understanding sea-level change across

Photo: Mohamed Abdiwahab / AFP

LEFT: A fisherman prepares his catch to sell on the UNESCO-listed Indian Ocean Island of Lamu, Kenya.
ABOVE: Somali vendors offload a catch from fishing boats in Puntland northeastern Somalia.
RIGHT: Africa's total fisheries production (metric tons).



Source: World Bank 2021

the coastal regions of sub-Saharan Africa (SSA) remains a challenge, recent strides have been made in investigating its ramifications along the shores of Accra, Ghana. This research aims to discern the effects on fish distribution, coastal habitats, and essential infrastructure. The findings underscore the sobering reality that, over the long term, 100,000 individuals could face displacement, while the Desu wetlands – a critical natural fish landing site for small-scale fisheries – are in peril of inundation. The repercussions extend further; vital habitats like mangroves, seagrass beds, and coral reefs – crucial sanctuaries for breeding, nurturing, and feeding – are at serious risk across the coastlines of SSA.

The capacity of many coastal communities and their governments to cope with these impacts is limited, but there are strategies that scientists and policymakers have proposed to help them.

A solid grasp of the ecological roles, socioeconomic dynamics, and institutional settings within a specific fishery or aquaculture system should form the foundational elements essential for enhancing resilience and formulating the most suitable adaptive strategies. These strategies vary depending on the location and available resources. Diversifying livelihoods, changing fishing gear, targeting new species, and relying on social networks are among the strategies fishery communities can employ.

Fishers in Lake Wamala, Uganda, for example, changed their fishing gear, increased fishing time, targeted new species, and diversified to non-fishery livelihoods. In Kenya, changing fishing gear has

ABOVE: Senegalese fishermen save a sea turtle from their fishing nets in Joal, Senegal, on June 16, 2020, where people are being made aware of the importance to save endangered species, which regulate the ecosystem and help maintain fish abundance.

Photo: Seyllou / AFP

allowed fishers to catch new species and increase their catch per unit effort. In West Africa, small-scale fishers have increased their efforts and expanded their fishing grounds. In West Africa, there has also been migration to new fishing grounds within Exclusive Economic Zones (EEZs). This strategy has helped fishers who have experienced declines in traditional catches due to climate change to target previously unexploited fish species. However, some of these strategies are beneficial in the short term but can risk overexploitation and increasingly unsustainable fishing practices in the long term. For example, in Lake Wamala, fishers changed their fishing gear by reducing the mesh size, which is likely to result in heavy exploitation of non-target species and younger juvenile fish.

The capacity of communities to adapt to climate change depends on institutional regulations and interactions. Institutions play a crucial role in fisheries management and conservation for sustainable development. However, institutional approaches often prioritise ecological adaptation over the adaptation capacities of fishery-dependent households and communities. This can have socioeconomic impacts, such as the exclusion of fishers from marine resources. Fishing boundaries can also hinder the ability of small-scale fishers to adapt to climate change. In Senegal, livelihood diversification has helped yield dual benefits for food security and poverty reduction. This has included training and assisting women's collectives in establishing new oyster farms. Further afield, a project in the South Pacific island nation of Vanuatu is aiding coastal communities in cultivating ecotourism. Certain initiatives encompass business development and planning training, facilitating a shift to livelihoods that decrease dependency on potentially fragile ecosystems, such as mangrove or coral reef habitats.

Adaptation ought to be seen as a continuous and evolving journey, integrating adaptability and input loops to glean insights from previous encounters and prevent emerging threats. For now, further investigation is necessary to evaluate the efficacy of adaptation methods for fisheries and aquaculture across the coastlines of SSA. GG

CARTOON

by Victor Ndula

Nigeria's confluence of food and water problems

By Anthony Ademiluyi

A confluence of circumstances is causing concerning levels of food insecurity in Nigeria, which, according to a Relief Web report published in August, has led to 10.6 million people in the populous country needing humanitarian aid and 4.2 million in the north-east facing acute hunger.

The report, quoting Save the Children, said a relentless wave of attacks by armed groups against farmers was hindering critical food supplies and threatening to push the country deeper into a devastating hunger crisis this year.

Attacks by armed groups and other non-state actors are just one of a rising number of similar incidents against farmers across parts of the country, leading to displacement, market disruptions, and loss of livelihoods. Armed groups killed more than 128 farmers and kidnapped 37 others across Nigeria between January and June this year, according to the Nigerian Security Tracker. In June alone, 19 farmers were killed by non-state armed groups in Nigeria's northern Borno State.

In the highly troubled north-east, farmers risk their lives when they go out to work on their land, while in other parts of the country, most notably the north-central Benue and Plateau States, there are regular violent struggles between farmers and pastoralists.

Food insecurity in Nigeria has also been exacerbated by the abrupt removal of the decades-long petrol subsidy. Despite being a major oil exporter, Nigeria has relied on processed fuel imports, which have been heavily subsidised since the 1970s, making the country vulnerable

ABOVE: A farmer walks on a marshy shore of a river polluted by oil spills at B-Dere, Ogoniland in Rivers State in August 2021.

Photo: Pius Utomi Ekpei / AFP

to exchange rate fluctuations, importation and handling charges, haulage costs, and insurance. The subsidy had also been plagued by corruption and mismanagement.

Over the years, the cost of funding the subsidy had become unsustainable, causing ballooning government debt that left insufficient funds for infrastructure, health, education, and other developmental initiatives. Incoming President Bola Ahmed Tinubu abolished the subsidy in May this year.

In the short term, the removal of the subsidy has hit Nigerians hard as the costs of food, fuel and services have rocketed, although the president has appealed to Nigerians to be patient and accept the short-term pain for long-term sustainability.

"In a little over two months, we have saved over a trillion naira that would have been squandered on the unproductive fuel subsidy, which only benefited smugglers and fraudsters," Tinubu said at the end of July, promising that he would intervene if necessary.

Unfortunately, extreme weather conditions have also added to the crisis. Last year, Nigeria experienced the worst flooding in a decade, which UNICEF said damaged more than 676,000 hectares of farmland, increasing "the risk of food insecurity for families across the country".

Wale Oyekoya, a former Lagos State Chamber of Commerce and Industry chairman and an agriculturist, told *Africa in Fact* that food insecurity could only be tackled if security issues were properly addressed, especially in the northern part of the country where the majority of food production takes place. "The security challenges should not be left

to the federal government to solve; state governors should get involved too."

Oyekoya praised President Tinubu for releasing grain and fertiliser to battling farmers. "Tinubu's courageous move to declare a state of emergency on food security and the decision to release fertilisers and grains to farmers is timely, but whether there is grain in the storage facilities is another issue."

To mitigate food insecurity Oyekoya supports the re-introduction of marketing boards in Nigeria. "Marketing boards will regulate the prices of commodities and will indirectly increase food security in the country," he said, adding that state governments should also introduce drastic and firm measures to reduce conflict between farmers and nomadic herdsmen. "State governments should curb the menace of herdsmen by promoting ranching as it's been done in developed nations," he said.

Gregory Omiyi, a retired chief technologist who formerly worked for the National Agency for Food, Drug, Administration, and Control, the agency that regulates the food, drug, and water sectors in Nigeria, told *Africa in Fact* that food insecurity was down to other factors, as well. "It also involves ensuring food safety through proper processing, storage, and transportation, which involves preventing physical, chemical, and biological hazards".

Omiyi was ambivalent about President Tinubu's grain and fertiliser intervention, saying, "The distribution of grains and fertiliser is just a short-term solution. It may not yield the desired result if a monitoring and evaluation system is not incorporated into the process."

He did, however back the reintroduction of marketing boards. "Yes, it will help if well-structured and managed properly," he said.

ABOVE: ANigerien army forces patrol in pickup trucks near Malam Fatori in April 2015, after the town in north-eastern Nigeria was retaken from Boko Haram by troops from Chad and Niger.

Photo: Philippe Desmazes / AFP

ERNANCE POOR

WATER EVERYWHERE BUT NONE TO DRINK

Photo: Yasuyoshi Chiba / AFP

Despite being a country rich in water resources, only 19% of Nigeria's population has access to safe drinking water.

Researchers Nelson Odume and Andrew Slaughter, in an article published by The Conversation in 2017 titled, 'How Nigeria is wasting its rich water resources', described Nigeria's situation as "economic water scarcity – the inability to properly manage, use and protect water resources for socioeconomic development and environmental sustainability."

They pointed out that although 67% of Nigerians had a basic water supply, access was uneven; while 82% of people living in Nigeria's cities had a basic supply, only 54% in rural areas did.

Pollution, including inept household waste management and toxic chemicals, are among the major causes of water scarcity in Nigeria.

Solid waste in the form of paper, plastic, metal, food and other materials and industrial waste from factories – which use freshwater to carry waste from the plant into rivers, contaminating them with pollutants such as asbestos, lead, mercury and petrochemicals – all contribute to this scenario.

Beatrice Ola Enya, a hydrogeologist with Geoflex Technologies, specialists in borehole drilling, geophysical surveys and water-related installations, said the toxic concentration of metals could be reduced. "Reducing the toxic concentration of metals in Nigerian water to the barest minimum is a long-term process that requires a multifaceted approach," she told *Africa in Fact*. "In Nigeria, the heavy metals come from mainly point-source pollution with anthropogenic sources like wastewater irrigation, automobile emissions, paints, industries, sewage, and waste disposal, among others.

Hydrologist Ademola Ogungbe told *Africa in Fact* that the toxic concentration of metals in Nigerian water could be reduced by instituting a water quality database. "The first step will be to map out the areas of contamination and collect water samples to distinguish the polluted areas, followed by comprehensive surface and underground water monitoring for areas with a high concentration of heavy or toxic metals."

Nigerian regulatory water agencies must also better engage with communities, he said, to tackle water security problems, by involving relevant stakeholders such as community heads and youth leaders in project plans, and agreeing on possible outcomes that benefit the people overall.

Enya agreed with Ongungbe on the need for a comprehensive water quality database: "The Global Freshwater Quality Database GEMStat provides scientifically sound data and information on the state of global inland-water quality. This helps to monitor and manage water resources," she said.

Nigeria's overall quality of water could be improved, especially in the rural areas, she added, by improving infrastructure and funding for clean water systems as well as developing policies in partnership with communities. GG

THROWN AWAY

By Issa Sikiti da Silva

Two elderly homeless men unwrap a package of a significant quantity of cooked rice locally known as *Pilau* and tuck in. The scavengers found the freshly thrown-away food in a trash bag left unattended in a suburb of the Kenyan capital, Nairobi.

One of the scavengers, Luis, told *Africa in Fact* that he and his friend were poor and homeless and had not eaten good food for weeks. "It is our lucky day," Luis said. "God answered our prayer. We were nearby when we saw a lady disposing of the package. We waited until she'd finished and pounced on it."

Overwhelmed by the quantity of "unwanted" food increasingly found in trash cans and bin bags across Kenya, community leader and environmentalist Amos Kariuki has urged the government to launch media campaigns to raise awareness about the issue. "To throw away such huge quantities of food in this country of ours, where thousands of people are dying of hunger due to drought, higher taxes, and extreme poverty amid the Russian invasion of Ukraine, is immoral and pure evil," he told *Africa in Fact*.

His concerns are echoed in the United Nations Environment Programme and Waste and Resources Action Programme (WRAP) 2021 Food Waste Index report, which reveals that every Kenyan throws away an average of 99 kg of food every year.

In addition to household waste, Practical Action, an international development organisation, estimates that up to 40% of Kenya's food is lost

ABOVE: People collect rotten meat at a dumping site near Dandora informal settlement in Nairobi, Kenya, in July 2021.

Photo: Patrick Meinhardt / AFP

after it has left the farm and before it's bought by consumers, contributing to the country's food insecurity. Reasons include delays in getting the food to market and a lack of adequate transportation and storage facilities.

As Practical Action notes, unsold fruit and vegetables from Nairobi are often dumped. Left to decompose, they pollute the streets and are an additional burden on the city's already stretched waste collection systems.

Drought-prone Kenya, Africa's eighth-largest economy ($115.99 of Gross Domestic Product in 2022), is also experiencing severe episodes of disruption to its weather patterns due to global warming.

The number of Kenyans facing acute food insecurity and requiring humanitarian assistance increased from 3.5 million to 4.4 million by July 2022, according to figures from the National Drought Management Authority (NDMA) published in June this year. According to the International Rescue Committee, some 970,000 children aged between six and 59 months and 142,000 pregnant or lactating mothers in Kenya were suffering from acute malnutrition over the course of 2023 and needed treatment, adding that more than 2.4 million livestock that pastoralist families relied on for nourishment and livelihood had died.

In the face of these statistics and of skyrocketing food prices, Kenya this year has experienced several deadly anti-government demonstrations to protest the rising cost of living. In July, for example, a series of protests in Nairobi and other major cities against tax hikes and the end of subsidies, that led to price increases for basic commodities such as food and fuel, turned deadly after the police response left at least two protestors dead and hundreds more injured. For more fortunate families, however, it was business as usual, filling up trash cans with unwanted food.

"Waste is a huge and growing priority for African cities as it can represent up to 35% of Global South cities' overall emissions, primarily from methane generated at dumpsites and landfills," Hastings Chikoko, the regional director for Africa at C40 Cities, told *Africa in Fact*. "Therefore, targeting food waste and reducing the resulting methane emissions is critical for cities to take meaningful climate action.

"When organic waste decays in landfills, it produces methane, an extremely potent greenhouse gas. Waste accounts for 31% of total emissions in Nairobi, and as much as 60% of the city's waste is organic. The city is taking action by developing treatment capacity for organic waste across city markets to produce near-term climate benefits. This could lead to higher waste collection efficiencies for the city's waste sector and a cleaner city for citizens.

"Just last year, in October 2022, seven African cities from a total of 13 global south cities signed the C40 Pathway Towards Zero Waste, a city-level strategy to improve waste management practices and reduce methane emissions," he added.

The signatories included Accra (Ghana), Amman (Jordan), Buenos Aires (Argentina), Curitiba and Rio de Janeiro (Brazil), Dar es Salaam (Tanzania), Dhaka South (Bangladesh), Durban, Tshwane, and Ekurhuleni (South Africa), Freetown (Liberia), Nairobi (Kenya), and Quito (Ecuador).

However, Chikoko cautioned that Africa, facing some of the worst effects of the climate emergency, was facing a food and nutrition insecurity crisis that could not be solved by only addressing food waste, even if it was an important piece of the puzzle.

"Food system resilience is key to addressing the crisis, and this will require building robust, sovereign, sustainable food economies with strong urban-rural linkages that can support diversified indigenous diets. Cities are playing an important role in making sure that all residents have access to healthy, nutritious, and sustainable food," he explained.

"While we cannot fully control all the external

Photo: Ousmane Makaveli / AFP

forces affecting food and water systems, such as geopolitical events, cities can take proactive action to secure their futures. By intertwining awareness, preparedness and transformative measures, African cities can chart a resilient and sustainable path forward in these uncertain times."

Apart from recommending the redistribution of surplus food to those in need to reduce waste, Chikoko also recommended a "food rescue" approach, which, he said, was suited to fresh produce markets and grocery stores, with some potential for food rescue in the restaurant and institutional food service sectors through prepared meals. Other food waste reduction strategies, including purchase planning and food storage, were suited to household food waste reduction, he added.

As the debate about food security rages in Africa, the Brookings Institution has pointed out that food sovereignty in Africa is not just about production and trade but also about resilience and ensuring that the continent's food production is not held hostage by natural and market shocks.

"The use of technology, fertiliser, and improved farm management practices could revolutionise Africa's food sector," the think tank noted in its Foresight Africa 2023 report. "In addition, African countries must take steps to reverse their dependence on food aid and food imports. Free or cheap food imports have made local food production in Africa less competitive and, in turn, shifted consumer preferences away from local brands to foreign ones."

ABOVE: A woman sorts food waste outside a makeshift shelter at the Mali's Faladie internally displaced people camp in Bamako in November 2022.

Chikoko pointed out that local government had a vital role in building resilience and successfully implementing mitigation policies and projects. "Municipal governments are major asset owners and procurers of goods and services," he said. "They own land, buildings, and vehicle fleets, construct new buildings and infrastructure, and are often among the biggest purchasers of food and energy in a city, for instance.

"Decisions about municipal assets and procurement can catalyse change in key sectors across the city and beyond, as well as bring down the city's own emissions and exposure to climate risk," Chikoko said. GG

THE DEVIL IS IN THE DETAIL

By Josephine Chinele

BELOW: Malawi's farmers' subsidy programme needs an overhaul to improve food security and reach its full potential.

Despite becoming a beneficiary of Malawi's subsided fertiliser scheme three years ago, Clement Kalonga of Nsanje district in southern Malawi has never been food secure.

He is just one of Malawi's subsistence farmers who has found the process of buying subsidised farm inputs chaotic and exhausting. "It's been one issue after the other," he wearily tells *Africa in Fact*. "Some years, I've had a problem with buying because the designated fertiliser stores were always full of people... In others, like last year, the fertiliser was not available on time, and when it came, the shop owners prioritised selling to vendors rather than those of us on government subsidies."

Malawi's subsistence farmers have long been the backbone of the nation's agricultural sector, providing food security for countless families across the country. However, despite government efforts to support these farmers through subsidies, many like Kalonga continue to face challenges that prevent them from reaping the full benefits of these programmes.

The initiative he is referring to is the Affordable Input Programme (AIP), which was introduced in 2020 to provide farmers with access to subsidised fertilisers and seeds. While the programme has the potential to significantly improve farmers' livelihoods, it has been plagued by various issues, including delays in coupon distribution, irregular fertiliser availability, and bureaucratic complexities.

Last year, Kalonga and farmers like him fell foul of delays in the distribution of AIP coupons. These coupons, which provide access to subsidised fertilisers and seeds, often arrive too late in the planting season to be applied. The traditional maize farming season in Malawi typically begins in November and ends in March/April, coinciding with the rainy season. Farmers need timely access to coupons to purchase fertilisers and enhance their crop yields.

Added to this was the non-availability of fertiliser at designated traders who have an agreement with the government to sell subsidised

Photo: flickr.com/photos/crimnal/net

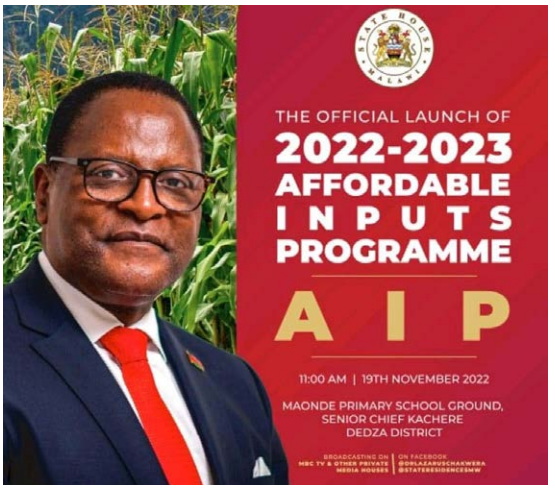
fertilisers in exchange for the coupons. Traders instead prioritised customers who bought fertiliser for cash upfront for the equivalent of $68 per 50 kg bag rather than those customers with coupons, which enabled them to buy the fertiliser for the subsidised price of $14.

Mathias Chilumba, the chairperson for the Area Development Committee (ADC) in Traditional Authority Malemia in Nsanje, says many people under his jurisdiction are still food insecure despite receiving the AIP coupons.

He corroborates Kalonga's experience in that people in his community also borrowed money from loan sharks to pay for fertiliser in advance (from government extension workers who went around the villages to collect money from AIP beneficiaries), hoping they would be able to repay their debt with a good harvest. However, these farmers were now in trouble, he said, because they had not harvested enough to get out of debt.

"It seems the AIP woes will never end," Chilumba told *Africa in Fact*. "It's not helping us rural people as it's claimed to do. The government needs to do its homework with this programme so farmers have everything in place before the first rains. Otherwise, it's no benefit to us."

Overall, the 2022/23 AIP programme faced



numerous issues with procurement, distribution, sales, and access to inputs, leading to inefficiencies in supply chain management and delivery.

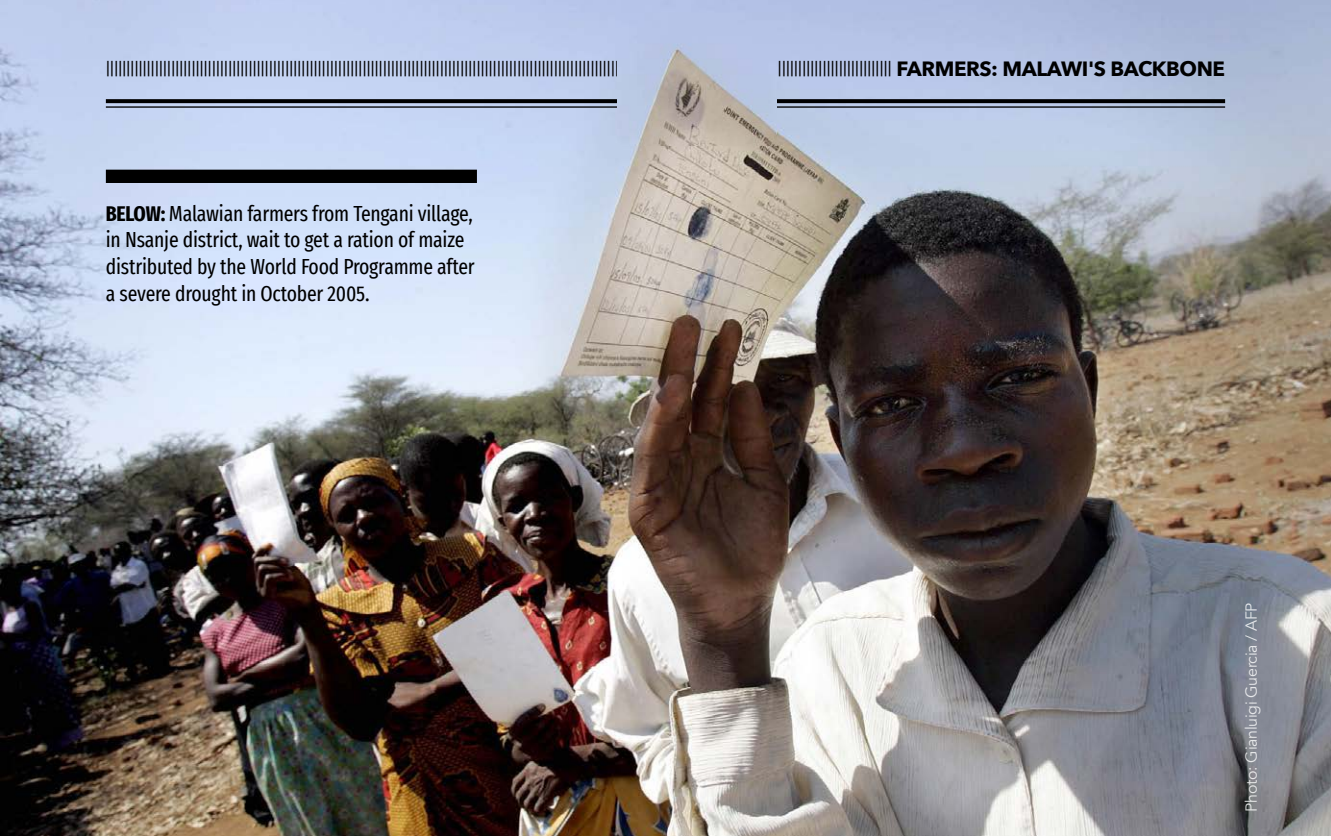
Both the Anti-Corruption Bureau (ACB) and Office of the Ombudsman, (a public body established under the Malawi Constitution to investigate all cases where it is alleged that a person has suffered injustice) have agreed that the 2022/23 programme had many challenges.

This was despite the introduction of a mobile vending system introduced over that period to reduce the distance beneficiaries had to travel to access inputs and eliminate the waiting period for them. An ACB report noted that the mobile vending system was not properly executed in some areas because there were no proper arrangements to announce when the vehicle would arrive.

Questions have also been raised about the efficacy of the programme given that many AIP beneficiaries still need additional help from the government's relief food aid during lean times, with some critics suggesting that overall food security would be better served by allocating subsidies to the farmers who produced the highest yields, while those who were not producing more due to AIP assistance should rather seek help from other programmes.

Suggestions of how the scheme can be made more efficient also included the following:

1. Coupons should be distributed well in advance of the planting season, ideally starting in September. This would give farmers ample time to prepare for the planting season and to buy fertilisers and seeds when they were most needed;
2. The government must strengthen its partnership with designated traders, with agreements between them strictly enforced and penalties imposed on traders who prioritise cash buyers over coupon holders. Adequate supply chain management should also be established to improve the distribution of the fertiliser;



BELOW: Malawian farmers from Tengani village, in Nsanje district, wait to get a ration of maize distributed by the World Food Programme after a severe drought in October 2005.

Photo: Gianluigi Guercia / AFP

3. The government must ensure better transparency and accountability over the AIP, actively involving stakeholders in the AIP planning and decision-making process;
4. The government must revise the criteria for participating in the AIP to ensure the programme assists farmers who genuinely need help.

William Chadza, the executive director of Mwapata Institute, an independent agricultural think tank, agrees the programme needs to be better targeted, telling *Africa in Fact*: "There is a need to revisit [how the] AIP targets recipients so that it translates into productive farming. Non-productive farmers should go to other social protection programmes. This would help in avoiding the duplication of beneficiaries." Chadza noted, however, that the AIP has not been successful due to politics. "Politicians feel if this is done in a proper manner, they might lose votes," he said.

The Malawi Vulnerability Assessment Committee (MVAC) report released in August this year indicated that an estimated 4.4 million Malawians were likely to face hunger in the 2023/24 consumption period. This number represents 22% of the country's population of 19.6 million.

Earlier this year Ministry of Agriculture Principal Secretary Dixie Kampani told the media that the 2023 AIP programme activities would begin in October with implementation plans at an advanced stage. At the time of writing, in mid-September, the ministry announced that the AIP programme would target between 1.3 million – 1.5 million households over 2023/4, a sizeable reduction from last year. The number of beneficiaries would be determined by the final price for the subsidised inputs.

While the AIP has the potential to significantly benefit Malawi's subsistence farmers, its current challenges hinder its effectiveness. By addressing issues related to coupon distribution, fertiliser availability, advance payments, and programme governance, the government can ensure that AIP contributes to improved food security and poverty reduction in the country. It is essential that these challenges are recognised and addressed to provide better support to the backbone of Malawi's agricultural sector: its subsistence farmers. GG

Benin's WATER WARRIORS

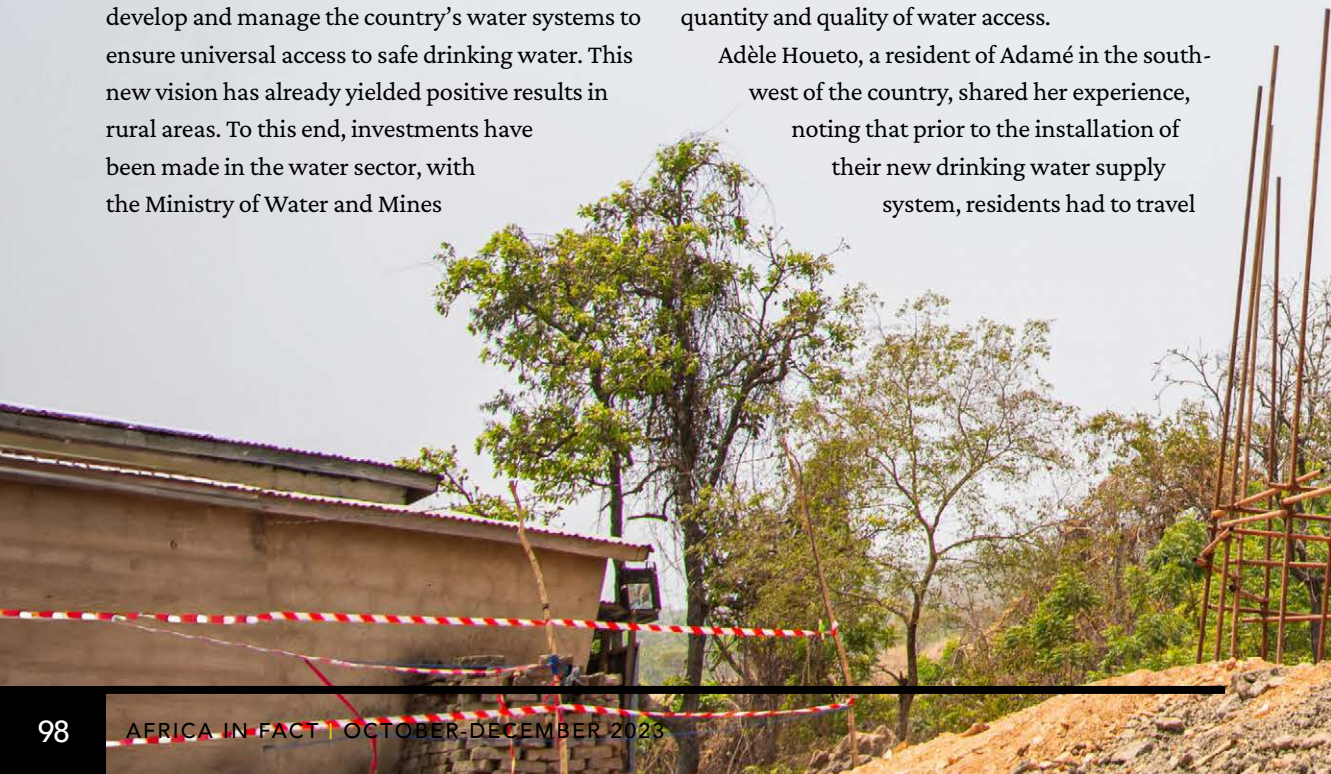
By Mamah Djiman Hairith

Since 2016, the authorities in Benin have undertaken various initiatives to provide the population with access to clean drinking water. These efforts are primarily focused on enhancing the effectiveness of the National Water Company of Benin (SONEB), the main public organisation responsible for this resource.

In 2017, Benin established the National Drinking Water Supply Agency in Rural Areas (ANAEP-MR) with the goal of achieving the targets set by Sustainable Development Goal (SDG) 6, which aims to ensure access to water and sanitation for all by 2030. The primary objective of this agency is to develop and manage the country's water systems to ensure universal access to safe drinking water. This new vision has already yielded positive results in rural areas. To this end, investments have been made in the water sector, with the Ministry of Water and Mines budget increasing from $123 million in 2022 to $141 million in 2023.

According to a recent estimate published in a half-year ANAEP-MR report (covering July-December 2022), the country has increased access to water in rural areas to 76.6%, up from 42% in 2017. This improvement means that communities in northern Benin no longer need to travel as far as 10km to access clean water. While there is a slight discrepancy between this report and the World Bank's estimation of 73% for access to water services in rural areas during the same period, it's evident that Benin has made substantial progress in improving both the quantity and quality of water access.

Adèle Houeto, a resident of Adamé in the south-west of the country, shared her experience, noting that prior to the installation of their new drinking water supply system, residents had to travel



ABOVE: Construction of a water tower for the community of Tchaourou, Benin.

Photo: anaepnt.wordpress.marabi.com

long distances to obtain potable water. "The only source of water was from wells, and the quality was questionable," she told *Africa in Fact*. "We also sometimes witnessed disputes because everyone wanted to be the first to access it."

To meet the challenge of universal access to water, the World Bank, through the International Development Association (IDA), has provided $250 million in financing to fund access to drinking water for Benin's rural communities. This funding is part of the Programme for Universal Access to Drinking Water in Rural Areas (PforR), also known as Aqua-Vie. Specifically, the programme, which started in 2021 and will run until 2026, plans to implement 80 new multi-village water supply systems in rural communities, benefiting an estimated three million people.

To ensure these programmes succeed in providing universal access to drinking water, the government is implementing comprehensive sectoral reform, which includes a new governance framework and a novel approach to managing the facilities at a cost estimated at several hundred million dollars. Under these reforms, the national programme for universal access in rural areas no longer focuses solely on installing boreholes, pumping stations, and water towers; it also prioritises a quality of service that meets people's expectations.

Sylvain Migan, Director General of ANAEP-MR, said Benin already employed modern technologies to provide access to drinking water. "We have village water supplies, self-sufficient water stations, and boreholes equipped with human-powered pumps," he said. "The government's goal is to eliminate the sight of our mothers and sisters carrying basins of water on their heads."

But Migan reiterated to *Africa in Fact* that the new approach went beyond mere infrastructure expansion. "It's not just about extending drinking water supply facilities across the entire territory," he said. "It's also about ensuring community-based management."

To achieve this, the authorities responsible for the water sector have, since 2022, adopted a leasing system for drinking water facility supply. Through this concept, communities are entrusted with the management of these facilities via private operators.

As Migan noted, "It's not usual for an African

country to systematically professionalise the management of public drinking water services throughout the entire territory, but this is what we are doing."

He explained that the water authorities were in the process of leasing all drinking water access structures in rural areas. So far, they have identified three areas where operators would take over the management of these. "In other words, the state will transfer all the systems to private operators who will deliver quality service at rates regulated by the state," he said.

This innovative approach aims to provide drinking water to the entire population by 2024-2025, offering reduced-cost drinking water to approximately 6.5 million people across the country. Companies specialising in water management have already been selected to implement this new contractual approach.

Jean-Marie Nicoué, a drinking water installation manager, said the water management companies would provide drinking water for a modest fee. "Operators handle maintenance with the income generated from selling drinking water," he said. "They, in turn, will pay royalties to the state to amortise the investments made."

The intention is not to discontinue the operation of some 12,000 boreholes currently equipped with human-powered pumps. Instead, there is a plan to maintain them through a framework for the upkeep and maintenance of simple structures, managed by municipalities and their delegates. This will complement the autonomous water stations and village water supply systems managed by private operators. The aim is for communities to gradually transition from lower-quality services provided by hand pumps to higher-quality services that allow household connections at subsidised prices.

Migan said the goal was to enable villagers to have pumps in their households, similar to urban areas, with connection costs estimated at around $33.

But while significant progress has been achieved in various regions of the country, challenges do persist, particularly in the north of the country due to factors such as the lack of electricity, which is required for water distribution. There are also geographical challenges to be overcome, but the political will to do so is already there. GG

Togo's planned agricultural zones pave the way

By Blamé Ekoue

Togo, a nation where agriculture accounts for more than 40% of GDP and employs over 65% of its workforce, is pursuing an ambitious vision of greater agricultural productivity and food self-sufficiency through what it calls Planned Agricultural Development Zones (ZAAP).

In a move aimed at boosting harvests and improving living standards, particularly in rural and peri-urban areas, Togo is on course to establish 400 of these zones by 2025, which are designed to focus on specific strategic crops, including rice, sesame, cashew, corn, soy, and sorghum.

As of 2021–2022, Togo had already set up 130 zones nationwide, covering an area of 12,608 hectares, although according to performance assessments the government carried out last year, only a handful of these were fully operational.

Despite this, a recent government report said these agricultural developments were proving their worth. Farmers within these zones were achieving higher yields, the report said, with an average difference of 36% compared to those outside the zones. Notably, the gains were substantial for crops like sorghum (33.5%), maize (77.5%), rice (18.25%),

Photo: Pius Utomi Ekpei / AFP

and soy (30%). Additionally, the zones had boosted farmers' profits, showing an average increase of 65% in promising sectors, including soybeans, corn, rice, and sorghum.

Yao Lombo, the director of the Togolese Institute for Agronomic Research (ITRA), told *Africa in Fact* that the essence of these zones lay in providing farmers with essential resources. "Farmers need good seeds, fertilisers, tractors, and expertise to enhance their agricultural production. Through this initiative, farmers within the same zone are united, receiving comprehensive support from the state for cultivating specific food products," he explained.

The pivotal role of mechanisation and intelligent agriculture cannot be understated. By clustering farmers together within these zones, Togo has successfully improved agricultural yields. This shift is attributed to the widespread deployment of tractors, consistent support from the Institute for Advice and Technical Support (ICAT), and cost reduction through consolidated orders of inputs and group sales of crops.

These initiatives have not only led to improved agricultural yields but also enabled farmers to attain food self-sufficiency, elevate their living standards, and to invest in income-generating activities such as cattle breeding – 77.5% of farmers within the ZAAP have reported improvements in self-sufficiency. Agricultural

activity in these zones has generated an average income of $658 per growing season compared to $480 outside the zones, a 36% increase in yields and income.

Amouzou Kokou, the chief of the canton of Essé Godjin in the prefecture of Yoto and a beneficiary of the planned agricultural development zones, is pleased with the programme. "It is a great joy for me that the government has taken it upon itself to develop an area of 100 hectares for us, it's a brilliant idea," he said. "In our canton, there is a cooperative that has been set up with a coordinator who will supervise everything. I grew okra on a small area due to lack of means to exploit a larger area, but this year we did several hectares and next year we will develop more, with peppers, lettuce, rice and tomatoes."

In May this year, Togo also partnered with the Moroccan group OCP (*Office Cherifien des Phosphates)* to bolster its long-term agricultural policy. This collaboration aims to facilitate agricultural mechanisation services and local fertiliser production in Togo, building on their prior agreement in 2020 to develop soil fertility maps.

That agreement, the FERTITOGO project, under the leadership of the Togolese Institute of Agronomic Research, produced a fertility map covering almost the entire country. The fertility map was carried out in 38 out of 39 prefectures in the country and made it possible to introduce rational

fertilisation techniques, based on precise knowledge of the soils and their fertiliser needs (mineral and organic fertilisers). This provided the nutrients necessary for crops while preserving the balance of ecosystems.

"Togo is the only country in the sub-region to have a fertility map covering almost the entire extent of its territory," Lombo told *Africa in Fact*: "This new agricultural approach has enabled the country to record cereal surpluses for several years following the gradual establishment of the planned development zones across the country. The online map system not only assesses the land, but it also gives recommendations on crops and fertilisers based on the region's average fertility and crop requirements."

Photo: Steeve Jordan/AFP

LEFT: Farmers in Togo's planned agricultural zones have had better access to fertiliser and other inputs resulting in increased yields and access to market.

The success of this initiative is evidenced by the substantial increase in cereal surplus, from 70,000 tonnes in 2019-2020 to 179,000 tonnes in 2021-2022. Challenges remain, however, including the need for improved water management, a concern the government is actively addressing through a concurrent water management sub-programme.

Daoudou Salifou, an executive at the Ministry of Agriculture, said this programme was aimed at promoting smart agriculture and irrigation in all the country's planned agricultural zones.

"Water management remains one of the challenges in these developed agricultural areas, a challenge for all the zones," he told *Africa in Fact*. "However, the government is working to find a lasting solution to this."

While the country has made significant strides in improving yields and livelihoods, achieving complete food self-sufficiency remains an aspiration. To help bridge this gap, Togo is also ambitiously creating agropoles – growth centres that aim to stimulate economic growth, generate employment, and enhance the link between agriculture and industry. The establishment of the first agropole (agricultural hub) in the northern region of Kara is a testament to this vision, uniting various stakeholders involved in agricultural production, processing, and marketing.

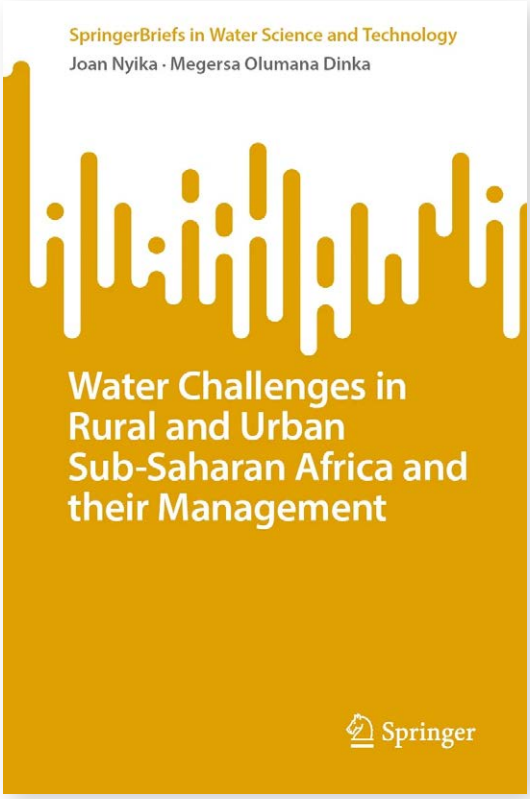
Located about 423 km from the Togolese capital, Lomé, and financed to the tune of $58 million, Kara brings together various actors involved in the production, processing, and marketing of agricultural products, among them 1,120 producers, including 274 women, operating in several planned agricultural development zones covering an area of 11,100 hectares. Going forward, the government plans to have 10 of these agropoles set up by 2030. The acting CEO of the national agency for the promotion and development of agropoles, Essowe Batana, said the agropoles represent a paradigm shift in the development of the Togolese economy.

Over the period 2023-2024, the country will intensify efforts in land development, agricultural mechanisation, water management, rural road construction, and the improvement of access roads. Innovative participatory approaches involving local authorities will secure land for development, and fertiliser orders will be optimised according to ecological zones. All in all, Togo's agricultural transformation is gaining momentum, promising a brighter future marked by enhanced food security and economic growth. GG

Reviewed by Sarah Nyengerai

Water Challenges in Rural and Urban Sub-Saharan Africa and their Management

By Joan Nyika and Megersa Olumana Dinka, published by Springer Nature (2023)



Water management remains one of the most pressing issues of the 21st century and is projected to be a key limiting factor in global socioeconomic and environmental development.

Globally, water resources are under threat due to rising pollution, urbanisation, and climate change. According to a UNESCO/United Nations (UN) Water Report 2020 (featured in the book), more than 685 million people from more than 570 cities worldwide will access freshwater at declining levels (by >10%) by 2050 as a result of environmental factors such as climate change.

Similarly, a report by the World Health Organization (WHO) and UNICEF (2020) (also highlighted in the book) indicates that due to neglect and an apparent disparity of access to basic services in rural and urban areas, more than 350 million people in sub-Saharan Africa (SSA) have no access to clean drinking water, the majority of whom reside in rural areas.

Evidently, the global goal to sustainably provide clean water and sanitation to all populations (Sustainable Development Goal 6 [SDG 6]) is under threat, with concerns raised regarding regions with unsafe, unreliable, and short-term water accessibility, most of which are in SSA.

It is against this background that the authors of the book, Joan Nyika and Megersa Dinka, explore issues regarding poor water access and management in urban and rural sub-Saharan Africa and propose solutions to avoid the looming crisis.

The analysis of the state of water access in urban SSA revealed the following: The demand and supply gap for water is growing due to urbanisation and unprecedented growth in population levels. Furthermore, the situation is exacerbated by poor governance, sub-optimal institutions, the non-enforcement of policies on water management, and poor planning for sanitation and hygiene needs. For instance, countries such as Senegal, Uganda, and the Democratic Republic of Congo neglect the sanitation and hygiene aspects of water management, which has led to the non-holistic development of their water sectors.

Also, due to limited financing, regulatory authorities in SSA do not prioritise the storage and distribution infrastructure improvements required to meet the growth in demand. For instance, in Addis Ababa, Ethiopia, the use of 50-year-old water distribution and transmission lines hinders effective water supply from service reservoirs and water treatment systems.

Additionally, overcrowded slums and unplanned settlements create technical challenges for expanding water supply systems and sewer lines. This is complicated by the difficulty of installing taps and piping in low-quality housing, often built from plasterboard, tin, plant material, and mud. This is the case in Kibera, a slum in Nairobi, Kenya, and Khayelitsha in Cape Town. The disparity in water access is similarly apparent in countries where illegal settlers are not included in national policies associated with water, sanitation, and hygiene – in Zimbabwe, for example.

The health hazards are obvious in these circumstances. Lack of sanitation in unplanned settlements leads to open defecation, which contaminates freshwater sources. This is evident in slums in Lagos, Nigeria, where more than half the population has no access to water, sanitation, or hygiene services. These residents are forced to rely on water sources such as unprotected wells and water vendors.

There are additional challenges to service delivery in SSA's remote and sparsely populated rural areas. Rural populations have limited access to water, caused by infrastructural neglect, malfunction, and over-abstraction at water points. Neglected by governments, independent utility providers also find it is not cost-effective to supply water to low-income rural communities that cannot afford to pay for the service. The authors give the examples of South Africa and Burundi in 2020, wherein in the latter, 3.8% of rural residents had access to water, while in the former, the gap in water access between wealthy urban dwellers and rural poor was 63.7%.

Rural dwellers travel long distances for water. Women and girls, who bear the greater responsibility of collecting water, are the most affected by the safety, health, and economic hazards of travelling long distances in search of uncontaminated sources. Although this trend is prevalent in most SSA countries, the book highlights the experiences of communities in Ghana, Kenya, Liberia, Mozambique, Sierra Leone, South Africa, Uganda, and Zambia.

Extreme weather patterns, combined with the use of agrochemicals and deforestation, also compromise water quality and access. Floods and runoffs induced by changes in weather patterns move chemical and microbial contaminants to water sources, causing pollution, as is the case in rural Limpopo province in South Africa and Kitui in Kenya.

Water scarcity also affects human security. Human life is further threatened by factors such as water conflicts. The most water-deprived and

arid regions have witnessed water conflicts, which typically escalate to water wars as communities/clans/countries claim ownership of scarce resources. For example, transboundary water conflicts have occurred between farmers and herders who share borders between Kenya and Ethiopia, and Mali and Burkina Faso. Consequently, the parties involved in water wars not only complicate access to safe water but jeopardise human security due to property losses and death. Nyika and Dinka also believe that the frequency of water conflicts in SSA will increase due to climate change effects that will make water more difficult to access.

To address the issues outlined, several SSA countries have adopted the practice of integrated water resources management (IWRM) as per UN WATER guidelines. IWRM is a cross-sectorial policy approach designed to replace traditionally fragmented sectorial approaches to water resource management. The main pillars of IWRM are an enabling environment, institutions and participation, management instruments, and financing.

Examples of IWRM efforts include those in Kenya, where IWRM implementation led to the establishment of the Water Act of 2016, which ensures rural populations participate in water management decision-making through user associations (WRUA). Similar policies and associations have been replicated in Tanzania and Uganda.

In West Africa, IWRM has facilitated the implementation of a regional water policy that promotes the development of infrastructure to improve access to and management of water for the Economic Community of West African States (ECOWAS).

IWRM in the Southern Africa Development Community (SADC) has led to the development of a protocol on shared water systems (PSWS) to prevent water conflicts.

Notwithstanding the efforts made in IWRM, Nyika and Dinka reiterate that good governance in water management is still lacking in SSA countries, suggesting that in addition to governments, stakeholders such as private institutions, civil society, and community-based organisations must incorporate good governance in their collective participation for holistic water management.

Water wars not only complicate access to safe water but jeopardise human security due to property losses and death.

Nyika and Dinka present an exceptionally detailed analysis of SSA's water access crisis and its poor resource management by featuring meritorious research from various experts and institutions. Their reflective approach to assessing water management also leaves readers with a clear understanding of the proposed solutions and the projected timelines.

Considering that three of the world's 10 largest freshwater lakes in volume and ratio (Lakes Malawi, Tanganyika, and Victoria) are in SSA, Nyika and Dinka rightfully assert that such facts and others highlighted throughout the book make it difficult to comprehend just how dire water access is in the region. In this respect, the book contains plenty of information and proposes solutions to help policymakers within various institutions, such as governments, improve water management for SSA's sustainable development. GG

Good Governance Africa strives to improve citizens' lives by strengthening governance performance across the continent.

We believe transparency, accountability, social responsibility, and environmental sustainability are the basic building blocks of successful development; to strengthen the rule of law; and instill an active citizenry that institutionalises constraints on executive power.

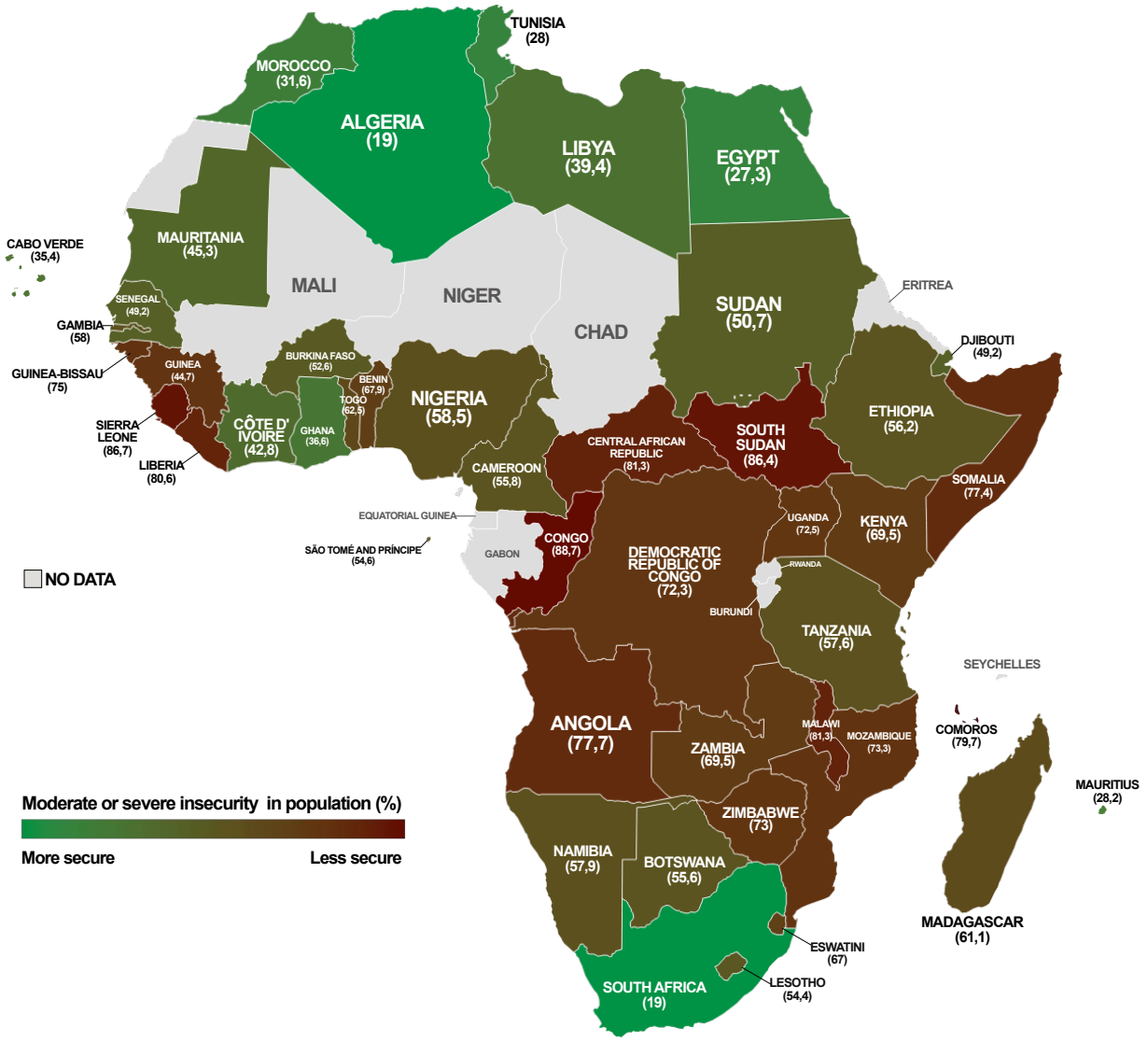
We conduct sound demand-driven, evidence-based, **research consultancy services** geared toward building efficient, productive and practicable policies to solve Africa's challenges in environmental degradation, climate change, under-development, and mass youth unemployment, which combined, threaten to undermine Africa's human security and ecological integrity.

Why do we do it? Because improved governance results in better economic, social, and environmental performance, and a greater wellbeing for all citizens.

gga.org

GGA
Good Governance Africa

AFRICA BY THE NUMBERS



Food security in Africa

PREVALENCE OF MODERATE OR SEVERE FOOD INSECURITY IN THE POPULATION (%)

Algeria	19	Djibouti	49,2	Libya	39,4	Seychelles	No data
Angola	77,7	Egypt	27,3	Madagascar	61,1	Sierra Leone	86,7
Benin	67,9	Equatorial Guinea	No data	Malawi	81,3	Somalia	77,4
Botswana	55,6	Eritrea	No data	Mali	No data	South Africa	19
Burkina Faso	52,6	Eswatini	67	Mauritania	45,3	South Sudan	86,4
Burundi	No data	Ethiopia	56,2	Mauritius	28,2	Sudan	50,7
Cabo Verde	35,4	Gabon	No data	Morocco	31,6	Togo	62,5
Cameroon	55,8	Gambia	58	Mozambique	73,7	Tunisia	28
Central African Republic	81,3	Ghana	36,6	Namibia	57,9	Uganda	72,5
Chad	No data	Guinea	73,3	Niger	No data	Tanzania	57,6
Comoros	79,7	Guinea-Bissau	75	Nigeria	58,5	Zambia	69,5
Congo Republic	88,7	Kenya	69,5	Rwanda	No data	Zimbabwe	73
Côte d'Ivoire	42,8	Lesotho	54,4	São Tomé and Príncipe	54,6		
DR Congo	72,3	Liberia	80,6	Senegal	49,2		

Source: World Bank, 2020