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Down To Earth

AFRICA

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

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TALKING ABOUT A REVOLUTION

HOW TO MAKE AFRICA FOOD SELF-SUFFICIENT, AGAIN

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THE AFRICA FILE



Africa is the only continent that imports more food than it produces, despite having the potential to feed the whole world. And the cost of food import is so high that it cannot invest in health and other welfare activities. With ground reports from 10 African countries, ***Down To Earth's*** editorial team speaks to experts and policymakers on how Africa can achieve food security

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Botswana

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Malawi
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Zimbabwe
ANDREW MAMBONDIYANI

Zambia
CHRISTINE CHISHA



Prepared by DTE/CSE Data Centre
Maps and Infographics: Raj Kumar Singh

A continental crisis, and a few green shoots

African countries are fighting an addiction: import of food items, which happens at the cost of domestic farmers. Despite the unprecedented import volumes, the continent faces famine and extreme food insecurity. Countries have started taking definitive steps to become self-sufficient in food, but the transition could be counter-productive if it is not backed by investments in agricultural infrastructure and measures to improve soil quality



HEN CHARLES Tawazadza, a farmer in eastern Zimbabwe's Middle Sabi area, tried to borrow money from the bank to finance his farming business, the bank rejected his application. He has land but doesn't have title deeds to use as collateral for the loan. Tawazadza is one of the thousands of beneficiaries of President Robert Mugabe's controversial land reform programme launched in 2000.

The programme brought Zimbabwe's once vibrant agricultural sector to its knees.

The government seized farms from up to 4,000 commercial white farmers but most of it was distributed to members of the ruling party. Mugabe argued that the programme was necessary to address the colonial imbalances that saw minority white farmers controlling the country's prime agricultural lands. But this terribly disrupted the agriculture economy. Before this reform, farmers of the Middle Sabi area met the country's wheat requirements; but not anymore. In just two decades, the country has become a net importer of basic crops, such as maize, which is imported from as far as Brazil and Mexico. Chronic drought and unpredictable weather due to climate change compounded the problem. Zimbabwe is no longer southern Africa's breadbasket.

Since financial resources are limited, most farms have been lying fallow. These include big farms, which once earned millions of dollars by exporting crops like sweet corn and baby corn, a variety of beans and horticultural products like Kondozi in Manicaland province. This has pushed the country into the import trap.

Eddie Cross, the country's leading economist and agriculture expert says the country's agricultural output is down by about 70 per cent and Zimbabwe is importing over 80 per cent of all its foods, which are now priced at import parity. Zimbabwe's food import bill ballooned to more than US \$1.5 billion at the height of the El Niño-induced drought in 2016, according to the country's Vice President Emmerson Mnangagwa.

Cross says if all food imports could be produced locally, the benefits would be huge. "Replacing the import means creating 0.35 million jobs locally and saving some US \$2.5 billion per annum in foreign exchange." Take the case of the lucrative poultry business. Enock Mbendani of the Manicaland Poultry Producers Association, a group of poultry producers in Manicaland province, says there are enough locally produced poultry products for domestic consumption; but they are more costly than the imported ones.

Due to the rising food import bill, there have been some efforts to make farming tenable again. But they have failed due to corruption and abuse of government facilities. For instance, in 2007, through the Reserve Bank of Zimbabwe, the government introduced the Farm Mechanisation Scheme, but it failed because most farm mechanisation resources were given to the political elite.

And late last year, the government came up with another programme, the Targeted Command Agriculture, aimed to ensure food self-sufficiency. Under the three-year-scheme, targeted farmers are given agricultural inputs by the government, with each participating farmer committing 5 tonnes of maize per hectare towards repayment of



In just two decades, Zimbabwe has become a net importer of maize, a staple crop. The country imports over 80 per cent of all its foods

Across most key crops, the rate of consumption has outstripped production in Nigeria. The deficit has been met by imports, a trend visible since 1975

loans. Though originally the Targeted Command Agriculture, spearheaded by Vice President Mnangagwa, targeted maize production, it has also been extended to livestock production, wheat farming and fishery. "Command Agriculture is a policy intervention by the government informed by the imperative to substitute grain imports through increased agricultural production and productivity, thereby revitalising various agro-processing value chains and helping the country to re-industrialise," Mnangagwa said during a public lecture at Midlands State University in Zimbabwe's city of Gweru early this year.

NIGERIA: new efforts, new results

AGRICULTURE REVOLUTION is the new buzzword in Nigeria, Africa's largest economy. For a country that came to treat oil as its main economic crop, it is an unusual turnaround.

Though agriculture remains the largest sector of the economy and employs two-thirds of the labour force, production hurdles have stifled the performance. Between 2011 and 2015, agro-processed exports declined by 41 per cent. Over the past 20 years, it is estimated that Nigeria has lost US \$10 billion in annual export opportunity from groundnut, palm oil, cocoa and cotton due to a decline in their production.

Across most key crops, the rate of consumption has outstripped production in Nigeria. The deficit has been met largely by imports, making the country a net importer, a trend evident since 1975. Currently, Nigeria imports about US \$3-5 billion worth of food annually, especially wheat, rice, fish and fresh fruits. Wastage remains high in production areas, reducing supply of feedstock to processing factories, requiring them to keep importing supplies. The effect has limited job growth across the agricultural chain. Import dependence has also made Nigeria vulnerable to global agro-price fluctuations.

Emmanuel Oladipo, an environmentalist and Nigeria's consultant to Global Environment Facility's Food Security Programme, says, "When the oil money started coming, we became affluent and discarded the local brand of rice." This left marginal farmers in limbo. Local production could not match the price of cheaper imported rice. Oladipo says the current situation is encouraging for farmers because they are regaining importance. In the 1990s, people could get money from the oil,

and there was no policy to guide farmers, which led to massive desertion, he says.

After an initial effort by the past administrations that turned out to be a false start, fresh policy changes have been introduced in Nigeria. For instance in 2012, the government introduced the Agricultural Transformation Agenda (ATA) to improve farmers' income, food security and to generate employment. ATA is said to have increased agriculture output by 11 per cent, to 202.9 million tonnes, between 2011 and 2014. It also reduced the 2014 food import bill by US \$1.29 billion.

More recently, the government launched the Agriculture Promotion Policy aimed at overcoming food shortages and improving the output quality. In addition, the Economic Recovery and Growth Plan (ERGP) prioritises food security and aims to achieve self-sufficiency in tomato paste, rice and wheat, by 2017, 2018, and 2019/2020 respectively. ERGP projects that the value of agricultural production would increase by 31 per cent in 2020.

But still the agriculture sector faces many challenges, notably an outdated land tenure system that constrains access to land (on average, a farming household has 1.8 ha) and a very low penetration of irrigation facilities (less than 1 per cent of cropped land is under irrigation). Other factors include limited adoption of technology, high cost of farm inputs, poor access to credit, inefficient fertiliser procurement and distribution, inadequate storage facilities and poor access to markets. These have kept agricultural productivity low (average of 1.2 tonnes of cereals/ha). According to Bala Dogo, coordinator of Kaduna-based Care and Action Research, a non-profit, there was a misplaced priority. "It was an issue of planning 'for', and not 'with' the people," Dago says.

KENYA: overreliance on rain, maize

THE LAST harvest in October 2016 was one of the worst for Justus Mutai, a 54-year-old Kenyan farmer from Kericho county in the country's Rift Valley region. From his 4 hectares under maize, he only managed 100 bags of the staple food, a far cry from the 300 bags he would usually harvest in a good season. Poor rains and sub-standard government-supplied subsidised fertiliser were partly to blame for this. "The crop hardly improved as it should have after the use of fertiliser, and the situation was made worse by inadequate rains," says a dejected Mutai.

UNDERSTANDING ENVIRONMENTAL LAWS FOR BETTER COMPLIANCE

TRAINING PROGRAMME September 18-22, 2017

Centre for Science and Environment (CSE) New Delhi, is conducting a five days training programme on 'Understanding Environmental Laws for better Compliance' to be held between September 18-22, 2017.

India has a comprehensive system of regulations to protect its natural environment and the health of its people. From the enactment of Water Act in 1974, a number of laws and regulations have been put into force in this regard. However, the intended purposes of these laws are far from being fulfilled due to various reasons. One of the issues which stems out is a holistic understanding of the different laws and how they should be looked into in a concerted manner for better environmental management.

The primary objective of the programme is to develop a better understanding and knowledge of the laws and their interrelationship.

Laws related to environmental preservation, pollution abatement, forest clearance, coastal zone regulation, and international treaties will be discussed during the programme.

On completion of the training, the participants will have:

1. Better understanding of environmental governance structure of the country, major institution, and their implementation statistics
2. Increased understanding of the obligations of industry and individuals under various environmental laws and regulations and how to meet these obligations
3. Participation of concerned internal and external stakeholders in the compliance process
4. Understanding the impacts of violations and non-compliance
5. Role of National Green Tribunal (NGT), environmental courts and public interest litigation (PIL)
6. Understanding of international treaties and agreements Government of India subscribes to and the impact of non-compliance with such agreements on business
7. A clear understanding that environmental compliance is not a financial burden but a clear business opportunity

Training methodology: Lectures, case studies, class exercises, discussions, and role play.

COURSE FEES

Rs 18,000 (Accommodation can be arranged nearby the training centre; it would incur extra charges)

COURSE DURATION

September 18-22, 2017

TIMING

9.30 am to 4.30 pm

COURSE VENUE

Centre for Science and Environment, 41
Tughlakabad Institutional Area, New Delhi - 110062

LAST DATE FOR APPLYING

September 15th, 2017

OPEN FOR ALL

Industry professionals; Environment Regulators and Experts; Environment Auditors; Environment Consultants; Environment Engineers and Academicians

FOR REGISTRATIONS mail at: s_rahul@cseindia.org



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Kenya received poor rains in 2016 and witnessed a severe food crisis. It had to rely on food imports almost throughout 2017

Most of Kenya received poor rains in 2016, leading to one of the worst food crises in the country since the 1990s, with the country having to rely on food imports almost throughout 2017. The Kenya National Bureau of Statistics (KNSB) says that the country spent a whopping US\$1.146 billion on food imports, or 8 per cent of the total import bill in 2016. The figure is predicted to rise in 2017 due to the drought. 2017 being one of the worst years in terms of Kenya's food security, KNSB statistics indicate that by April the country had spent about US\$0.33 billion on buying food, mainly cereals—maize, wheat and rice. The figure could triple in the remaining quarters of the year.

According to Agriculture, Livestock and Fisheries Minister Willy Bett, the government is doing all it can to ensure the country is food self-sufficient, by, among others, significantly increasing land under irrigation. "We agree that these past two years have been very bad as far as food production is concerned, with weather being the biggest culprit, says Bett, and adds that the country is trying to reduce its dependence on rains.

At the height of the shortage this year, a 2 kg packet of maize flour cost US \$2, an amount that nearly caused food riots in the country. By August the Food and Agriculture Organization put the number of people in urgent need of food aid at 3 million in Kenya, and 16 million people in the Horn of Africa countries of Kenya, Uganda, Tanzania, Somalia and Ethiopia.

"Over-reliance on rain-fed maize production is one key cause of suboptimal production, which occurs during years of drought. This is because arable land accounts for less than 20 per cent of the land mass in Kenya, and over time, it has been declining due to increasing population and other competing alternative land uses," says Dennis Otieno, research fellow at Tegemeo Institute of Agricultural Policy and Development, Egerton University in Nakuru city. According to Otieno, Kenya has been unable to meet its domestic maize demand since 1994, with the average annual maize production standing at about 40 million bags while consumption is over 50 million bags. The country needs to cut post-harvest losses, which stand at 30-40 per cent of all yields across Africa, increase agriculture budget, raise numbers of extension officers, and modernise agriculture by investing in technologies.

According to Anne Mbaabu, head of Markets and Harvests, Alliance of Green Revolution in Africa, an organisation that seeks to improve

agriculture across Africa, Kenya needs more investment in agriculture, including private sector investment, protection of farmers through crop and livestock insurance, investment in irrigation, storage and roads infrastructure, and a boost in its ability to respond to epidemics. More important is the political will to implement farmer-friendly policies and good prices to motivate farmers to produce more.

ZAMBIA: missing infrastructure

IN MARCH, Zambia created a flutter when it banned the import of certain fruits and vegetables. The decision was made to promote the agriculture sector. For a country that is not known for its domestic agriculture, the decision shows how desperate the situation is. In fact, the scenario is the same across the continent, with one country after another becoming dependent on imported food.

It's important to take into account the political context that led to the ban. Historically, Zambia focused on mineral exports as the dominant economy sector. It helped Zambia earn enough to pay for food import. But during his third term, President Levy Mwanawasa was forced to diversify the economy when global copper markets tanked in the late last century and the economy collapsed.

Just like other African countries, Zambia's imports of agricultural produce affect the local market. The list of banned items includes tomato, onion, carrot, mango, potato, pineapple, lemon and watermelon, and local farmers have greeted the decision with the hope that their produce will now have a market. But there is also a rider: farmers need right infrastructure to package, process and deliver the produces.

Frank Kayula, president of the National Union for Small Scale Farmers in Zambia, agrees that lack of infrastructure is a serious drawback, especially for small-scale farmers who produce the country's 80 per cent food. Poor infrastructure in agriculture at sowing, harvesting or selling stages resulted in agricultural countries like Zambia not being able to meet the domestic demand, which led to net import of food, Kayula says.

For companies dealing with food produce, the absence of a robust supply chain is the biggest hurdle to benefit from the ban. Food Lovers Market, a South African fruit and vegetable supermarket that has outlets in Zambia, has cited inconsistent supply and bad quality of produce from local



2017 was one of the worst years in terms of Kenya's food security. By April, the country had spent about US \$0.33 billion on buying food, mainly cereals. The amount could triple in the remaining quarters of the year

From a 42.7 per cent share in GDP at independence in 1966, agriculture fell to 1.9 per cent in 2008 in Botswana

farmers as one of the reasons for its disapproval of the ban. Calestous Juma, a professor at Harvard University, questions the ban as an instrument of achieving food sovereignty. According to Juma, in many cases, imbalances in agricultural trade exist because the country has not invested enough on storage facilities and capacity building.

Julius Shawa, permanent secretary in the Ministry of Agriculture and Livestock, says the ban follows concerns raised by local farmers. “Just recently, we received complaints from farmers that some tomatoes from neighbouring Tanzania were being imported cheaply, hence under-cutting our farmers. Our concern as a ministry is to encourage the sourcing and supply of these products from within the country; so we have imposed an administrative restriction for now,” Shawa says. He says the country has the capacity to satisfy local demand. “We are telling our farmers, here is the market. We want to make our farmers rich,” he says.

BOTSWANA: climate-proofing agriculture

WITH A population of 2 million and one of the highest per capita GDP in Africa (\$18,825), Botswana shouldn't have been worried by the rising food import bill. But it has reached such proportions that it can cause a collapse of the country's economy, say experts.

Botswana lies in the Sub-Saharan Africa (SSA) region, where the gap between cereal consumption and production is the largest in the continent. Further, it is projected that the demand will triple between 2010 and 2050. This is much greater than in other continents including Asia. Indeed, SSA, including Botswana, is the region with the greatest risk to food security because by 2050 its population will increase 2.5 times. The region already depends on import. To meet the future demand, it would have to import even more.

What's worse, the agriculture sector has seen a steady decline over past four-five decades. From a 42.7 per cent share in GDP at independence in 1966, agriculture fell to 1.9 per cent in 2008. Add to this the threat of climate change. Jimmy Opelo, permanent secretary in the Ministry of Environment, Natural Resource Conservation and Tourism, says, “What we need to ask ourselves is: are we ready for climate change and how can we adapt to it so as to reduce its effect in our country.” The country no longer receives normal rainfall and this has changed its agriculture cycles, he adds.

So, the government's focus has been to not only make agriculture viable again but also to make it climate change-resilient. In an interview to *Down To Earth*, permanent secretary in the Ministry of Agricultural Development and Food Security Boipelo Khumomatlhare, says, “Botswana is serious about more localised food production. So, we have included food security in the mandate of the ministry of agriculture.”

Its impacts are visible. Some 1,000 km from the capital city, Gaborone, the village of Shakawe hosts some incredible stories of making the country self-sufficient and also to fight climate change. The non-profit, Trust for Okavango Cultural and Development Initiatives (TOCADI), is implementing a programme to facilitate and mobilise community-based organisation to practise subsistence farming since 2003. The initiative has resulted in slow agro-industrial and supply chain development that is needed to drive the growth of associated sub-sectors such as food processing, transport and manufacturing. This is the most important investment to make domestic food production viable in the face of rising import. Conversations with local communities indicate a turnaround in local food production.

However limited this initiative might be, it has resonance in the country's agriculture sector. About 70 per cent of rural households derive their livelihoods from agriculture, through subsistence farming. The government has also introduced a young farmer's fund to encourage the youth to venture into farming. The loan may be used for infrastructure development needed for the project.

UGANDA: a systemic overhaul

WHEN 65-year-old Emmanuel Sempila of Rwentondo village in Kakoba division of Uganda's Mbarara district joined coffee farming 42 years ago, he never envisaged how much his life would change four decades later.

In these 40 years, coffee farming has enabled him to send his six children to get university education, build a house and live a middle-class life as per Ugandan standards. He is now his village's “nucleus coffee model farmer”. In that capacity, introduced under the government's agriculture zoning approach, Sempila provides some basic services to his fellow village residents, such as distributing coffee seedlings supplied by the government. With this approach—just one of an

I AM DownToEarth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT, ENVIRONMENT AND HEALTH

ARUN SHARMA | Banker



BECAUSE, THE MAGAZINE HAS ALERTED ME TO THE ENVIRONMENTAL REASONS
FOR NON-PERFORMING ASSETS AND HOW TO ENSURE FINANCIAL INCLUSION

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** Number of districts Down To Earth is read in.

**As per the
Malawi
Vulnerability
Assessment
Committee,
6.7 million
Malawians are
"food insecure"
this year**

array of initiatives that it has set up—the Ugandan government hopes to boost coffee production from the current 4 million bags to 20 million by 2025.

But as Uganda strategises to increase coffee, cotton, tea and tobacco exports, its food imports have steadily increased. This is taking a toll on the market for local produce. Take for instance vegetable oils. Uganda imported crude palm oil worth US \$149.4 billion in 2015 according to the Uganda Bureau of Statistics. "It means the market for indigenous oils gets drastically reduced. So while a farmer labours to produce oil crops, he won't get a good price because the demand is greatly reduced," reasons Sydney Ongwali, Regional Supervisor, Uganda Oil Seed Producers and Processors Association. Another example is maize. Although Uganda is one of East Africa's leading maize producers, it has continued to import it from its neighbours. "When maize from Tanzania and Rwanda comes in, the cost of a kilogram of Ugandan maize reduces from US \$0.08 to US \$0.04," says Asaph Mugizi, former chairperson for Mbarara District Farmers Association.

But some traders of food crops in Uganda do not see this as a problem. Ali Mukiibi, the chairperson of an association in Mbarara's Ruti Banana market, says imported foods help to stabilise the market. "Lack of imported rice, maize, and wheat in the market causes the demand of our bananas to hike. This hikes prices too."

But whereas Ali looks at increased food imports as an advantage, Wilson Twamuhabwa, an economic advisor to Uganda's minister for finance and economic planning, disagrees. "At times, food comes into Uganda at a lower price, which kills the farmers' incentives to produce more," he notes.

Uganda is currently in the throes of drought. According to a government survey done between December 2016 and January 2017, Uganda's crop production suffers from limited access to irrigation, low rates of adoption of modern farm practices, lack of insurance schemes, and inadequate meteorological and agricultural advisory services.

Uganda's current food insecurity, contends Twamuhabwa, has taught a big lesson to the government. "We will revamp agriculture." This, he says, will be done by providing extension services, quality seeds and water for irrigation to farmers, availing long-term financing and conserving the environment. For example, according to Wilson, this financial year, the government has provided US \$22 million for irrigation. It has also set aside, US \$8.3 million to fund agriculture extension services.

**MALAWI: irrigation,
crop diversity are key**

IT IS mid-morning on a dusty road leading to the Nsangwe market in southern Malawi's Chikwawa district, and Alexander Fombe is resting under the shade of an acacia tree, a 10-kg bag of maize by his side. Fombe travelled 6 km from his house to the depot of the state-run Agricultural Development and Marketing Corporation to buy subsidised maize. The journey is not his primary concern; feeding his five children and the next harvest are.

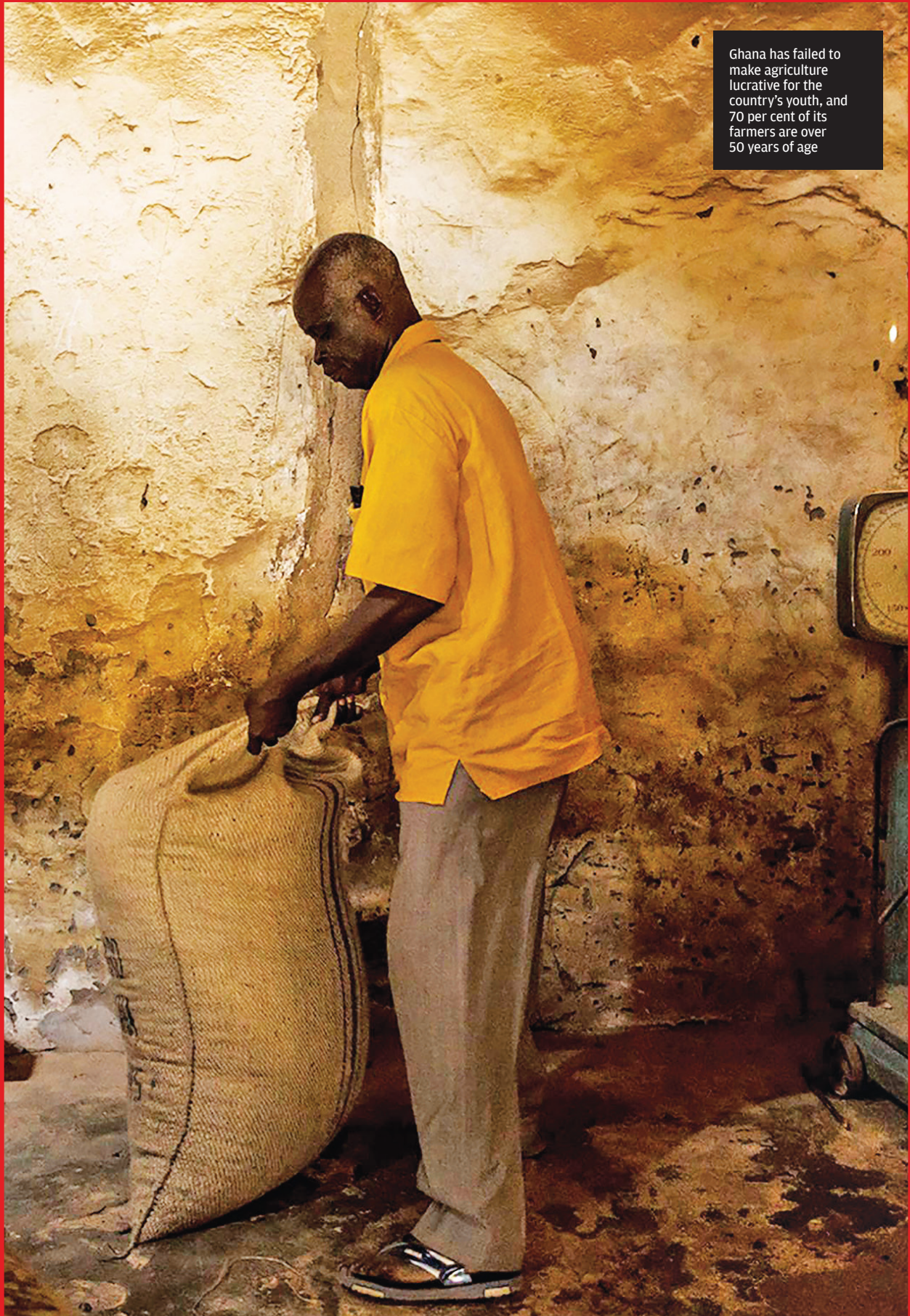
As a result of last season's failed crop in Chikwawa and other districts in Malawi, Fombe is among thousands who will face hunger in 2017. As per the Malawi Vulnerability Assessment Committee's evaluation, this year an estimated 6.7 million Malawians are "food insecure".

"Domestic production is low and erratic. It leaves us depending on imports," says Prince Kapondamgaga, CEO of the Farmers Union of Malawi. "On the other hand, increasing food imports means we are rendering, whatever little is produced locally, useless. This is because Malawians consider imported food to be better than local produce. The country also projects maize as the strategic food item to fight food insecurity. We need to change this mindset," he adds.

Experts cite various reasons for hunger being a perennial problem in Malawi. Economic analyst Henry Kachaje blames policy failure. "There must be a key political champion at the head-of-state level to steer and champion a vision on agricultural revolution," he says. John Kapito, executive director of the Consumers Association of Malawi, a Blantyre-based consumer rights watchdog, agrees that attaining its national food requirement has been a major challenge for the government. The last time Malawi had a grain surplus of 0.5 million tonnes was in 2005. Agriculture expert Tamani Nkhono notes that a combination of inadequate infrastructure, geographical realities, an ineffectual political system and changing weather patterns have created food scarcity in Malawi.

So what can Malawi do? "We need to extend cropping opportunities and facilitate crop diversification for both total and supplemental irrigation, create an enabling environment for irrigated agriculture and optimise government investment in irrigation development," says Nkhono. Malawi's principal secretary in the Ministry of Agriculture, Irrigation and Water Development Erica Maganga

Ghana has failed to make agriculture lucrative for the country's youth, and 70 per cent of its farmers are over 50 years of age



Tanzania imports food worth US \$42 million annually, about half of it just on cooking oils

says new policies and leadership are key for a solution to hunger. She also emphasises the need to adopt irrigation farming as the solution to food challenges arising from climate change. "With support from the World Bank and other donors, the Malawi government is developing a new national agricultural policy to refocus smallholder subsistence farming to commercial approaches. It promotes commercialisation to help sustain growth in the agriculture sector," she says.

Government plans are underway to intensify solar power irrigation in all irrigable areas. The country's first-ever Irrigation and Investment Master plan seeks to irrigate over 100,000 hectares in the next 20 years.

TANZANIA: a story of neglect

TANZANIA IS a large country covering 947, 000 sq km from the Great Lakes to the Indian Ocean and has a population of 45 million people. Over 75 per cent of Tanzanians depend on agriculture for their livelihoods.

Most of Tanzania has a single wet season which occurs between December and April. The country's various regions produce different crops: maize in the southern highlands; coffee and horticultural products in the northern highlands; sorghum, tobacco and cotton in the relatively drier centre and northwest and cassava and cashew (for export) in the southwest.

However, despite the major role played by agriculture in the economy, Tanzania imports food worth US \$42 million annually, about half of it just on cooking oil. Other major import items include wheat, sugar, dairy and poultry products. Experts say that Tanzania has the potential to cultivate all the food items it imports. Audax Rukonge, Executive Director of Dar es Salaam-based Agriculture Non-State Actors Forum says, "Tanzania spends a lot of money importing cooking oil whereas they can easily cultivate surplus quantities of sunflower, cotton, African oil palm, sesame and various types of nuts that can produce enough oil for consumption and export." He adds, "If the country invests heavily in agriculture, it would not be importing food, but would rather be exporting it and earning precious foreign exchange." Lenny Kasoga, a veteran economist and a farmer as well, seconds this. "Tanzania is still poor because it has been neglecting agriculture. If it wants to move to being

a middle income economy as is being vowed by current President John Magufuli, it should stick to agriculture, not to industry."

The government's neglect of the agriculture sector is quite evident. Tanzania has over 44 million hectares of arable land, but only a quarter is put to effective production. Agriculture contributes 25 per cent of the country's GDP. But Tanzania spends only 0.85 per cent of its national budget on agriculture. Recently, the government pumped in US \$9.3 billion into the Tanzania Agriculture Development Bank. But experts say the amount is simply inadequate as it is meant not just for farmers but for the whole agricultural chain. Another instance of neglect is irrigation: only 5 per cent Tanzania's cultivated land is irrigated. This is because surprisingly little attention has been paid to irrigation in the country. Minister for Agriculture, Livestock and fisheries, Charles Tizeba has now promised to expand irrigation to 1 million hectares by 2020.

Rugemeleza Nshala, Managing Director of Dar es Salaam-based environment protection organisation, Lawyers' Environmental Action Team, says Tanzania needs to take immediate measures to accelerate the processing of agricultural raw materials. Tanzanian governments (of the mainland and Zanzibar) must play a greater role in industrial promotion, particularly in small-scale industries of which those related to animal feed deserve special attention. Nshala says Tanzania's efforts in achieving agricultural growth are hindered by corrupt agricultural bureaucracy. That is the biggest problem that needs to be fixed, he says.

GHANA: Start-ups, IT to rescue farm sector

THE PRIMARY issue in Ghanaian agriculture is farmers' age. Most Ghanaian farmers are semi-literate smallholders above 50. Over the past few years, many Ghanaian youth have failed to venture into agriculture, largely due to the sector's unattractiveness. It is modernising at a slow pace, with farmers still using regimented tools and approach to farming.

"About 70 per cent of our farmers are above 50 years. It means the youth are not getting into agriculture. It is they who can introduce innovations," says Francis Danso Adjei, content manager at Ghanaian agriculture startup, Esoko.

The government of Ghana is seeking to address the problem of youth in agriculture with its flagship

policy called Planting for Food and Jobs Campaign. It was launched by the country's president, Nana Addo Dankwa Akufo-Addo, in April 2017. It would be implemented in 216 districts, with an aim to target 0.2 million farmers and create over 0.7 million jobs. However, the new policy cannot be implemented single-handedly by the government. There has to be involvement of the private sector. That is where agriculture startups come in. They are growing rapidly in Ghana. Currently, there are about six in the country. With most of them being led by the youth and having a lot of youth in their operations, it presents an opportunity to get the youth involved in agriculture.

But to remain relevant, the startups will have to be innovative. Esoko started in 2005 as an experiment to see how the emergence of mobile technology could improve the lives of rural communities. Today, it provides smallholders inputs and finance through its virtual marketplace, while driving business for dealers and financial service providers. Adjei says, "We are giving farmers weather forecasts. You need to innovate, to add on to whatever you have. Otherwise, it will be impossible to survive."

Image-Ad, a company formed in 2009, has a platform called Mfarms Agribusiness Solution—a mobile and web-based system for managing and communicating within the agricultural value chain. "Mfarms was previously sending price information to farmers through messages on mobiles. After research, we realised that most farmers are illiterate. We then came out with a solution to give farmers information in their local dialect," says marketing manager Michael Anderson.

"Information technology is built on infrastructure, which requires servers to run without interruptions. It means that electricity issues need to be addressed. Mobile network operators would have to be efficient... We should not have periods where calls drop or fail to connect," says Adjei.

ETHIOPIA: balancing ecology and agriculture

ETHIOPIA'S GROWTH story has caught the imagination of Africa and the world. But the truth about one of the globe's top five emerging economies lies beyond the headlines. It is about the thin thread of food security that could snap any day, given droughts and famines that happen with cyclic regularity in the Horn of Africa. It is also about the diversion of water and land and the loss of

biodiversity, all for the sake of development.

Ludwig Siege, an expert on sustainability and protected areas in Ethiopia, drives home the point on the crisis. "No amount of riches can replace the biodiversity of Ethiopia, most of which has lost out to urbanisation and unsustainable growth. When 85 per cent of arable land is owned by small landowners, big corporations simply buy them out to put factories, breweries and livestock farms on prime crop lands," he says.

The economy is being upended by industrial production and cash crops. One is coffee, which accounts for 40 per cent of Ethiopia's exports, with an estimated 15 million people involved in its production. Another crop is sugarcane. Ethiopia could soon have 40,000 hectares under sugarcane and produce up to 1,500 tonnes of sugar per day. For this, vast swathes of tribal farm and grazing lands have recently been leased out to sugar factories and water diverted from scarce wetlands when more cereals and pulses ought to be grown to feed the malnourished. The effluents from sugar factories are a big concern as well.

There has been a drastic loss to Ethiopia's unique biodiversity, often because of agricultural reasons. Take, for instance, the Senkelle Hartebeest Sanctuary, a 58 sq km protected area providing refuge to the critically endangered antelope, the Swayne's hartebeest. The sanctuary is hemmed in by dairy farmers and pastoralists graze their livestock, collect fuel wood and hunt for game in the protected area. The fringe of the Bole National Park, home to the world's rarest canid, the Ethiopian wolf, has been heavily settled upon and witnessed slash-and-burn cultivation of barley and pearl millet. Not surprising, only 300 wolves survive in the middle of all the human activity.

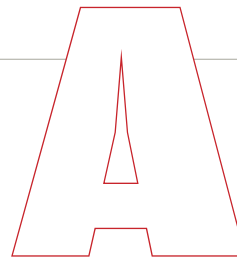
There are people in Ethiopia who are trying to reverse the tide. Tarekegn Habte, a college student who belongs to the Hamar tribe of the Omo river valley, talks about an eco-friendly indigenous practice that his people practise. "To counter the loss of pasture, we recoup grasslands by fencing in vast stretches of land called *darr*. Inside the *darr*, wild grasses will eventually grow again. The *darr* is a good example of controlled grazing practised to this day," he says.

Ethiopia's predicament is also true for the rest of Africa. The continent needs to promote farming to curb food imports, but this cannot be at the cost of environment. Climate change-triggered weather events and rising population of Africa will only make the food shortage more acute. ■

A grain revolution for Africa

In just a few decades, Africa has become a net food importer. But it has to feed more and more people in the future. Estimates suggest the continent may end up spending more on importing food than on any other development needs

Farm yields in Africa are at about 23 per cent of global levels and agricultural productivity is growing at about half the rate of population growth



AFRICA NEVER ceases to surprise the world with its existential contradictions. We know about its “resource curse”, the generic term that bundles all these contradictions. But, as the previous article points out, the contradictions in the agriculture sector are stark.

The continent has 65 per cent of the world’s arable lands that are yet to be cultivated. If cultivated, it could feed over 9 billion people, more than the world’s population. Yet, it has one-third of the world’s underfed population. By 2030, its agri-business potential would be US \$1 trillion, but this will be only because of being the world’s only continent to be a net food importer.

While Africa has other pressing developmental challenges such as malnourishment, growing



health burden and the threat of climate change, the continent spends the most on importing food, which otherwise could have been spent in such programmes. Moreover, the continent will have the world's largest population in a few years; it already records the fastest population growth. For a continent where agriculture still employs the most, it is no more an existential contradiction, but a real threat to a decent existence.

For more than three decades the continent has been a net importer of agricultural products. But what is stifling is the change in the nature of food imports. The continent has been importing basic foodstuffs such as dairy products, edible oils and cereals, implying that food imports have become increasingly important to ensure food security. In the continent's most densely populated region—the Sub-Saharan Africa (ssa)—40 to 60 per cent of smallholder farmers are absolute buyers of staple foods. They spend more on food than they earn from selling agricultural produce.

Growing imbalance

But it was not always like this. In 1980, despite Frankenstein famines that killed thousands and near non-existent resource in many countries to spend on human goods, Africa reported a near balanced agricultural trade. The continent imported and exported the same worth of agricultural produce—the food import bill was US \$14 billion. But that was also the last time the continent witnessed a healthy trade scenario. At present, Africa spends US \$35 billion a year on imports of agricultural produce, while exports are negligible (see 'Africa survives on imports' p54). The share of intra-African trade is less than 5 per cent. By 2050, the African population is expected to be about 2 billion. To feed this population, and going by the current import trend, the food import bill would be US \$110 billion in 2025.

Various regions of the continent are emerging as the world's biggest food importers. West Africa, for instance, imports 20 per cent of the world's total rice. Or take Nigeria. While domestic production of rice has stagnated at 28 kg per capita since 1990, consumption has nearly tripled in this period. It now spends more than US \$2 billion annually on rice imports. While export growth has not been as high as expected, the value of agricultural imports has increased five times since 1998.

"But Africa cannot eat potential," says Akinwumi Adesina, the president of the African Development Bank and Nigeria's former agriculture and rural development minister. "What Africa does with agriculture is going to determine the future of food in the world," he says.

Contradictions within

Africa remains a predominantly agrarian economy. The average contribution of agriculture to the national economy of an African country has been about 30 per cent since the 1980s. The poorest countries of the continent are importing the least, even though they are net food importers. This has ramifications for the continent's poor.

For example, a comparatively richer country like Nigeria with oil wealth reported the highest per capita food import of US \$185 annually between 2000 and 2005 on an average. On the other hand, a poor country in ssa had a per capita annual import of US \$17 annually. But the difference between these two scenarios is that in Nigeria's case, the government had the resource to pay for the import through revenue from exporting oil, but in countries in ssa, governments don't have the



Surviving on IMPORTS

Close to 70 per cent of countries in Africa are net food importers

- Total agricultural imports in 2012 (billion US \$) \ increase from 1980
- Total agricultural exports in 2012 (billion US \$) \ increase from 1980
- Total cereals imports in 2012 (billion US \$) \ increase from 1980
- Total cereals exports in 2012 (billion US \$) \ increase from 1980

AFRICA

Import dependency ratio (2012) **1,707*** Increase from 1980 **100%**

83,376\460%
Total imports \ increase from 1980
(in billion US \$)

42,666\214%
Total exports
(value)

AGRICULTURAL

27,485\450%
Total imports
(value in billion \$)

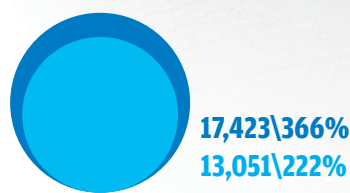
1,685\119%
Total exports
(value)

CEREALS

* Import dependency ratio shows the extent of dependency on imports in relation to an area's domestic consumption. It is calculated by $\text{imports} \times 100 / (\text{production} + \text{imports} - \text{exports})$

West Africa

Import dependency ratio (2012) **436** Increase from 1980 **91%**



AGRICULTURAL

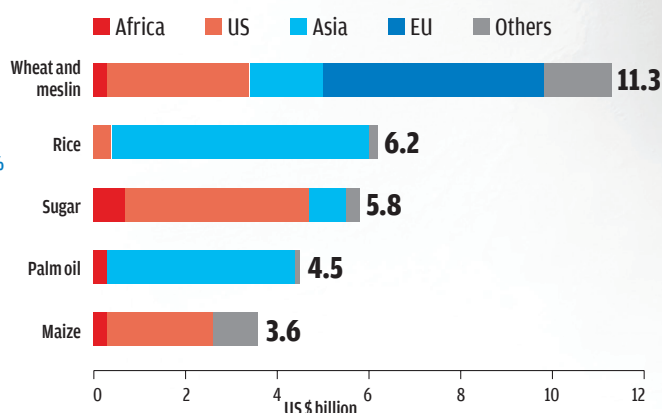
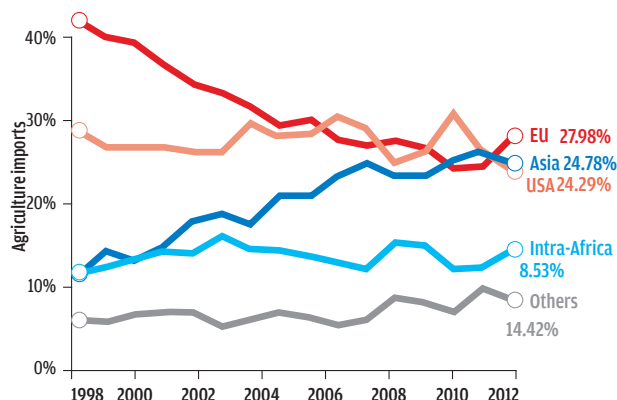


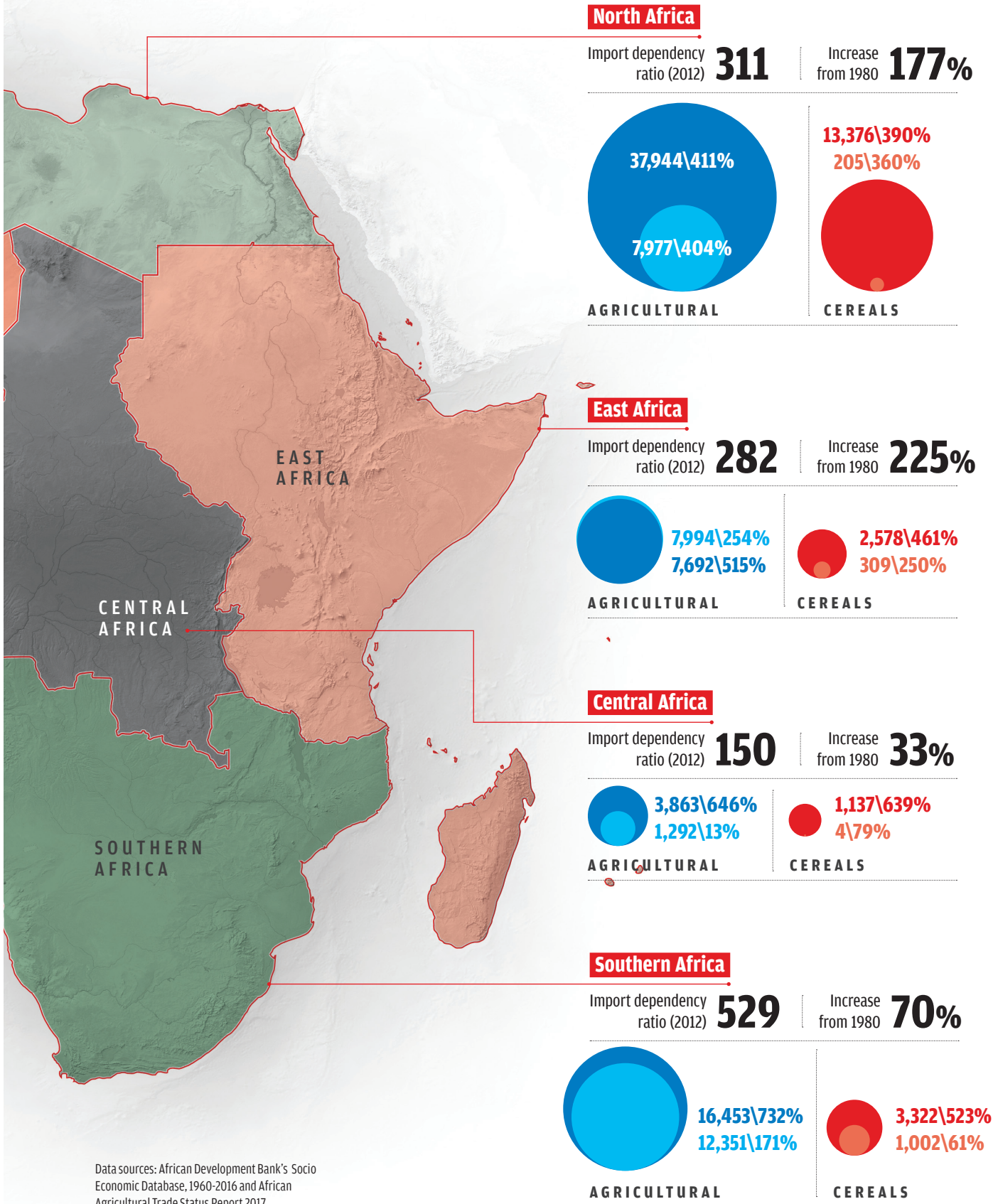
CEREALS

Africa's import story | cereals account for the bulk of Africa's agriculture imports

EU, Asia and the US account for 77% of Africa's agriculture imports

Top 5 agricultural commodities imported in 2013





capacity to pay for the import bill. So parts of the continent with the poorest population have been witnessing uncertain food availability.

The pessimists believe that the continent, particularly countries in SSA, will find it more difficult to attain food self-sufficiency. So, the import will continue in greater volumes, further draining the state exchequers. It will be a vicious circle for the rural population who will suffer the most due to the continent's inability to produce more food. And, the result: the much-feared slide on the path to dependency, unemployment, rural exodus and desertification, leading to famine. As we know conflicts just need these type of triggers.

Reports from the 10 countries carried in the previous article indicate a revival of policy interest in agriculture. But what is worrying is that the crisis needs immediate action. This is because food imports and the general decline of the domestic agriculture are having disastrous impacts.

Africa is predominantly a rural continent.

economic conditions. This demand will add to the already increasing food demand from rural areas. In fact, a significant percentage of imported food is consumed by the urban population. But as UN data point out, there were three African farmers for every urban dweller in 1990, but in 2020, one full-time African farmer will be expected to feed two urban dwellers. Projections by the Organisation for Economic Co-operation and Development and the Food and Agriculture Organization (OECD-FAO) on Africa's consumption and production of high value commodities over the period 2011 to 2023 indicate that an increasing share of the region's growing demand for high value food products associated with rising consumer incomes will be met by imports.

Agriculture has another crucial role to play in this continent. The continent needs to revive agriculture to provide livelihood to the booming young population. According to the FAO, agriculture still accounts for 58 per cent of Africa's eco-

More than 60 per cent of the continent's population is under the age of 25. Some 220 million youth will join the labour workforce by 2035, most of them from rural areas, who will need livelihood options

Unlike other continents, Africa will have 60 per cent more rural population in 2050 than now. The rural population of Africa is already more than 500 million, 80 per cent of them living in poverty. Rural population depends on agriculture for survival. Even though Africa is witnessing fast economic growth, there seems to be no proportionate impact on poverty reduction. Countries like Ethiopia and Zambia, for instance, outpace India and China in economic growth. It is clear now that without growth in the agriculture sector, pure economic growth doesn't have the capacity to turnaround the situation for the people. Agricultural growth is way behind services and industrial sector in term of growth. During 2000-09, per capita agricultural income reported less than 1 per cent of annual growth. Besides, more people mean more quantity of food for consumption. But without a productive local agriculture, the prohibitive import bill would surely lead to a serious scarcity of food.

There is another aspect to this crisis. Africa's urban population is also increasing and the urban Africans are vociferous consumers due to better

economically active population. In countries such as Burkina Faso, Guinea, Mozambique, Niger and Rwanda, agriculture provides employment to over 80 per cent of the population. More than 60 per cent of the continent's population is under the age of 25. Some 220 million young people will join the workforce between now and 2035 in SSA. According to projections by UN's Economic Commission for Africa, wage jobs can absorb up to 25 per cent of them. This leaves farming and related self-employment to absorb the employment needs for at least 70 per cent of young Africans entering the labour force (more than half of whom live in rural areas) till at least 2030, says the estimate.

Extent of degradation

Africa's agriculture is a victim of both environmental degradation and a lack of political will (see 'Low on farm growth' p58). Like rural India, the continent too is witnessing land fragmentation due to population rise and rising dependence on farming due to lack of other economic opportunities. Though there are visible signs that

small farmers are responding to this situation by increasing cropping intensity, but this is also limited to a few high-yielding varieties, leaving no time to take up activities like crop rotation to increase soil fertility.

It is estimated that 65 per cent of the arable land in SSA is already degraded. This costs farmers about US \$68 million annually due to loss in income. According to the Montpellier Panel, a group of African and European experts from the fields of agriculture, trade, ecology and global development which was chaired by Gordon Conway of Imperial College, London, the economic loss due to soil degradation impacts 180 million people, mostly smallholder farmers who are now depending on imported food.

Africa is already battling the impacts of climate change. According to a report by the Montpellier Panel, mean temperatures in Africa will rise faster than the global average, and agricultural losses will amount to 2 to 7 per cent of GDP by 2100. “By 2050, hunger and child malnutrition could increase by as much as 20 per cent as a result of climate change, reversing the gains achieved through the Millennium Development Goal (MDG) process whilst jeopardising the success of the Sustainable Development Goals (SDGs),” says the panel’s report.

Low investment in agriculture is a key bottleneck. Development and distribution of improved seeds, fertilisers, insecticides, improved extension service delivery and market infrastructure require capital investments. Walter Sandow Alhassan, director, Biotechnology and Stewardship for Sustainable Agriculture in Africa (BSSA), says a Green Revolution like that in Asia offers a dramatic increase in food production through the introduction of high-yielding seeds, insecticides, fertilisers, farmer credit and irrigation facilities. Farm yields are still low, at about 23 per cent of global levels. Agricultural productivity in Africa is growing at about half the rate of population growth. This is largely due to the continued low modern input supply—seeds, fertilisers, insecticides, continued reliance on rain-fed agriculture—and less exposure to new management practices.

States in action

In 2003, a definitive step was taken to start a Green Revolution in Africa with the adaptation of the Maputo Declaration. The declaration calls for a minimum investment of 10 per cent of the annual budget into agriculture and rural development, and a target of 6 per cent agricultural

growth. The Comprehensive Africa Agriculture Development Programme (CAADP) is Africa’s framework to transform the agricultural sector under the declaration. A number of initiatives put into place by development partners have helped considerably. These include the constitution of the African Agricultural Technology Foundation (AATF) in 2003, Alliance of Green Revolution in Africa (AGRA) in 2006 and the Drought Tolerant Maize for Africa (DTMA) programme in 2012. These initiatives did revive interest in agriculture.

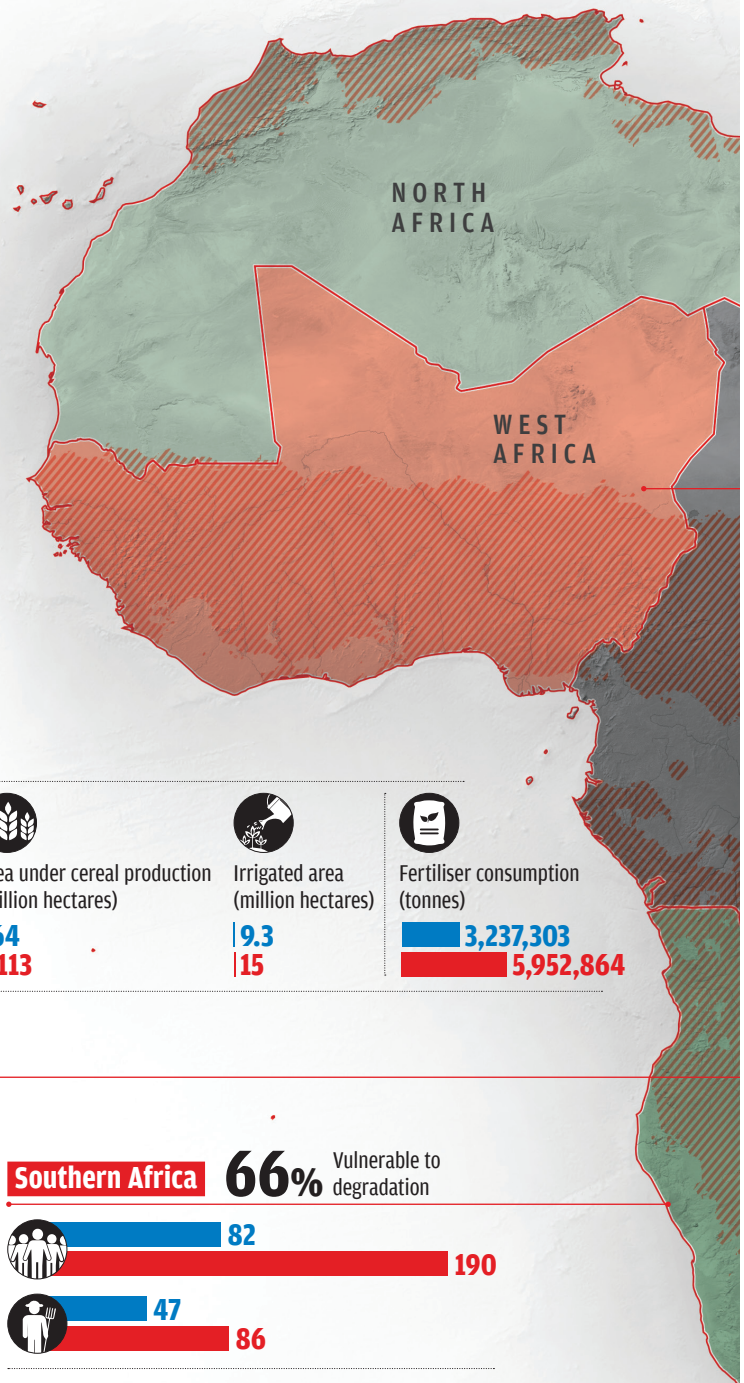
But after 14 years, only a handful of countries—Ghana, Ethiopia and Burkina Faso—have made the 6 per cent agricultural growth target made under the Maputo Declaration. “In most African countries, progress has not been remarkable as evidenced by the huge portions of national budgets spent on food imports,” adds Alhassan.

Together, NEPAD and CAADP represent a departure from externally-driven development strategies and programmes characterised by shifting priorities and the absence of the necessary consistency and continuity to produce solid results. CAADP is not a “one-size-fits-all” plan, but a strategic framework that provides a set of shared principles, targets and operational milestones to guide programme planning and implementation by country governments, regional economic communities (RECs), and other stakeholder groups.

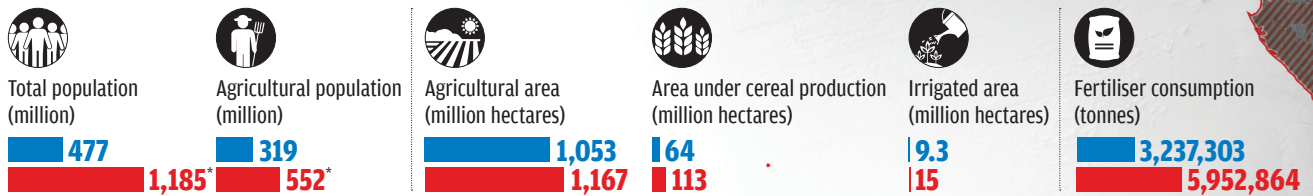
Barring a few exceptions, African countries and RECs have embraced the agenda. Major innovations of CAADP include the practice of evidence-based policy and programme planning and implementation linked to mutual accountability through peer review, benchmarking and mutual learning. The 2014, the Malabo Declaration significantly expanded CAADP’s agenda in terms of thematic coverage and mutual accountability requirements. In the declaration, African Union (AU) Heads of State incorporated issues dealing with reducing child undernutrition, post-harvest losses and vulnerabilities of livelihoods, and reaffirmed their commitment to mutual accountability by calling for a continental agricultural biennial review to assess progress on commitments. The first biennial review is scheduled for the AU Summit in January 2018. With the CAADP implementation agenda now in its second decade, work is underway to incorporate commitments of the Malabo Declaration into CAADP planning, implementation and review, dialogue and the mutual accountability processes. ■

Low on farm GROWTH

Africa's farm sector has been unable to feed its ever-growing population due to rapid land degradation and limited irrigation

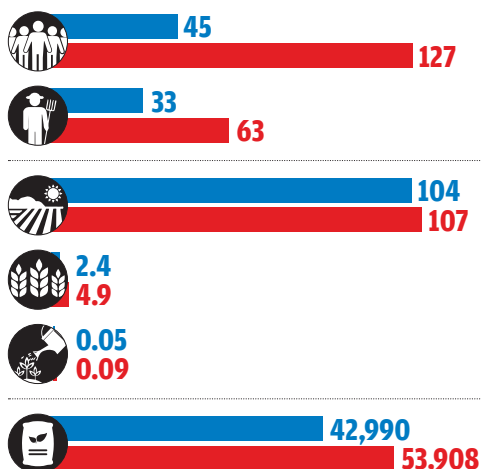


AFRICA 46% Vulnerable to degradation

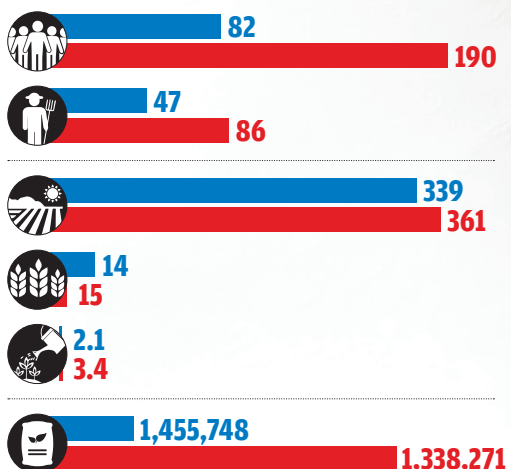


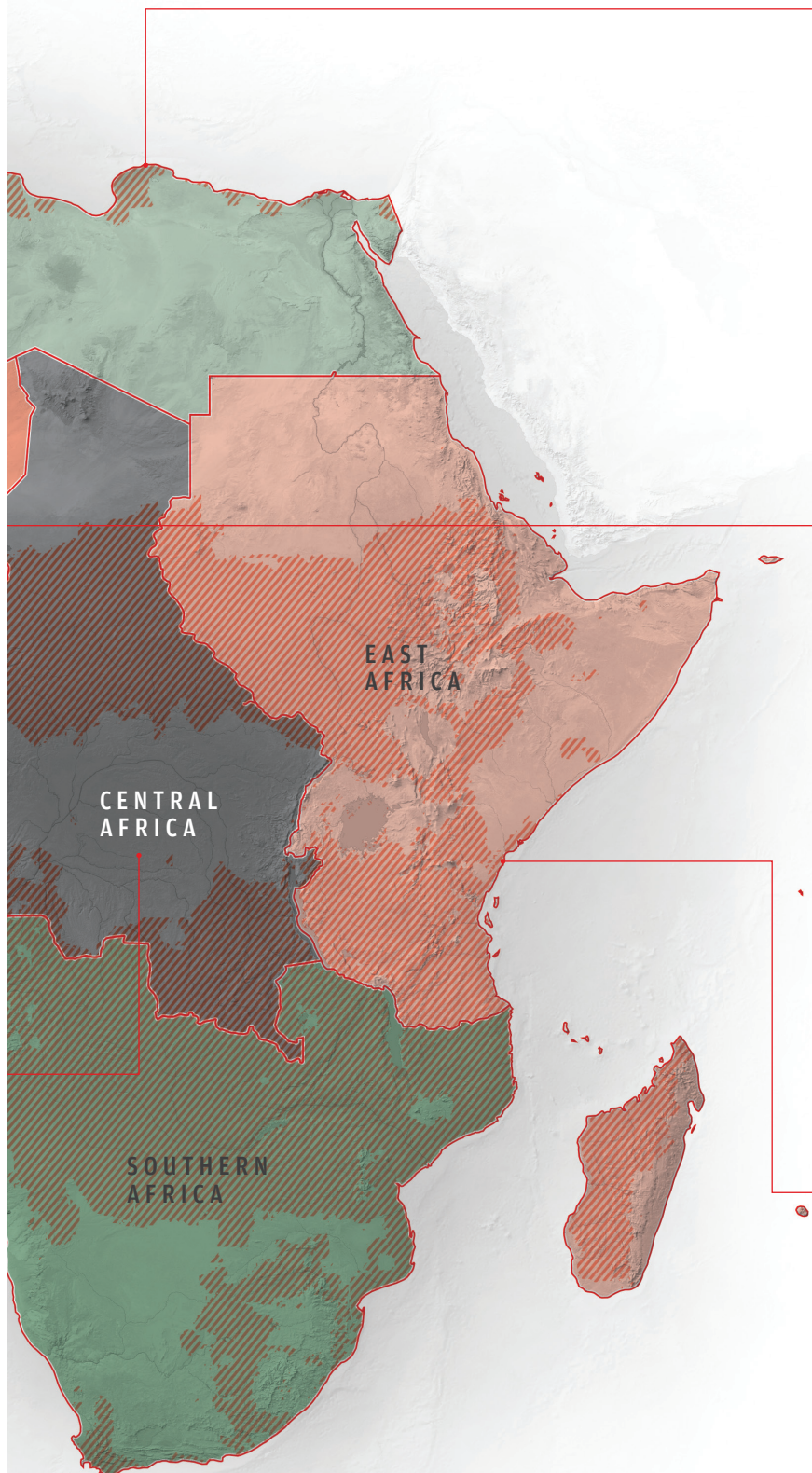
* In 2015

Central Africa 49% Vulnerable to degradation



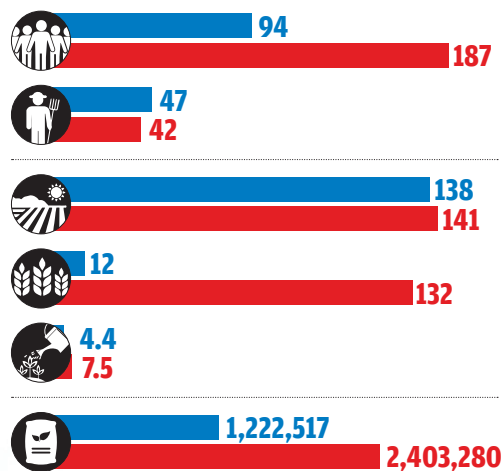
Southern Africa 66% Vulnerable to degradation



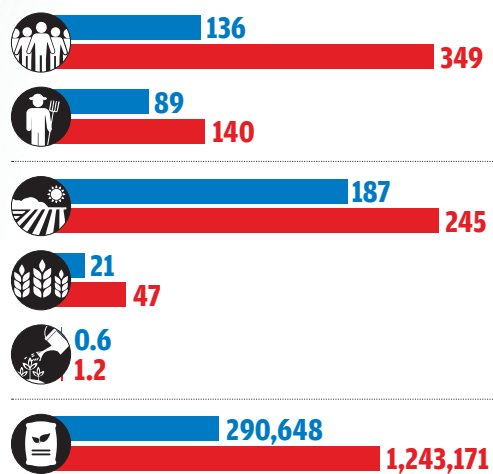


Data source: African Development Bank's Socio Economic Database, 1960-2016 and paper on Land Resource Stresses and Desertification in Africa published by the US' Natural Resources Conservation Service Soils

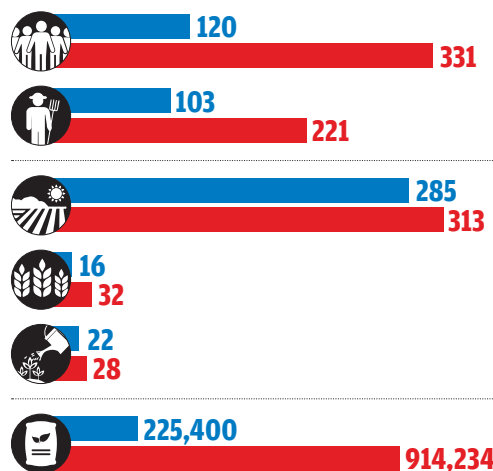
North Africa 20% Vulnerable to degradation



West Africa 76% Vulnerable to degradation



East Africa 46% Vulnerable to degradation



Climate disruption

Global warming has compromised Africa's ability to feed its population. It's time African nations adapt to the changing scenario

SOMETHING STRANGE is happening across East Africa. The region, which receives rainfall twice a year, is reeling from the worst drought in a century. Kenya, Somalia, Ethiopia, Tanzania and Uganda, which boast of rich agricultural lands, have received below-average rainfall for the third year in a row. This has caused food prices to skyrocket to record levels, doubling the price of staple cereals in some areas, and exacerbating the acute food insecurity prevailing over most parts of the continent. "Over the past six months, severe drought conditions have contributed to the displacement of more than 700,000 people within Somalia, 300,000 in Ethiopia and over 41,000 in Kenya," says Jemal Seid, Director, Climate and Geospatial Research, at the Ethiopian Institute of Agricultural Research.

In some places camel carcasses are being stacked up as even the world's most robust animal has not been able to survive this persistent drought. High number of people at the risk of starvation prompted South Sudan, a largely water-surplus region, to declare famine in February—the first such declaration anywhere in the world since 2011. In March, the World Health Organization warned that Somalia is at the risk of third famine in 25 years. According to the UN, 12 million people in the region are now dependent on humanitarian aid.

The persistent dry conditions are partly linked to the Indian Ocean dipole, which is similar to El Niño weather phenomenon in the Pacific and pushes away the moist air that brings rain to East Africa. But scientific studies show that the severity of the problem is due to changing climate. "The impacts of current and recent droughts in East Africa are likely to have been aggravated by climate change," notes the 2017 report by Oxfam, an international confederation of charitable organisa-

tions focused on the alleviation of global poverty.

The latest Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC), released in 2014, had warned of such an eventuality in Africa. Over the past century, temperatures across the continent have soared by 0.5°C or more, with minimum temperatures rising faster than the maximum temperatures. Higher temperatures result in greater evaporation, causing soil moisture depletion, reinforcing drier conditions and intensifying the impacts of failed rains, noted the IPCC report. According to the 2016 report by Berlin-based policy institute Climate Analytics, summer monsoon rain, which brings maximum precipitation to East Africa, has decreased in recent years due to rapid warming of the Indian Ocean. These changing climatic conditions pose the third whammy for a continent, already struggling with the need to feed more and more people and rising food import bill.

"Climate change has compromised Africa's ability to feed herself," says Oscar Magenya, chief research scientist at the Kenya Agricultural and Livestock Research Organization, Nairobi. "Climate change affects many physical and biological systems, disrupting growing seasons, fluctuating plant and animal ranges and resulting in the emergence of virulent pests and diseases," Magenya explains. In Sahel, for instance, most farmers depend on rain-fed crops. But these days rains do not last long enough to grow a full crop. This shrinking rainy season is affecting food security and exacerbating malnutrition in the region. In an April report to IPCC, experts have said that in some countries, yields from rain-fed crops could be reduced by up to 50 per cent by 2020.

Recurrent droughts is fuelling desertification. Sahel region, which alternately experiences wet and dry seasons, has been suffering from drought on a



REUTERS

regular basis since the early 1980s. As a result, says Peter Tarfa, acting director of the climate change department under Nigeria's environment ministry, semi-arid Sahel is not only fast turning into a desert but also encroaching on northern Nigeria, affecting farming and pastoral activities in the region.

While there is no study to link climate change with dwindling water resources, the fact is the Congo, the world's second-largest river, is experiencing a 50 per cent drop in its water levels. Lake Chad has shrunk by nearly 90 per cent since 1963. A prolonged drought could affect large parts of the shoreline of Lake Victoria—the world's largest tropical lake and the source of the Nile—which depends on rainfall for 80 per cent of the water. This would destroy fish breeding grounds and traditional agriculture, putting millions of lives at risk. In West Africa, as rising sea levels redraw the shoreline and ocean acidification damages coral reefs, fishing and agriculture that form the foundation of livelihoods suffer a blow. The coast accounts for 56 per cent of the region's GDP.

WHY AT THE RECEIVING END

What countries across Africa are experiencing is nothing unusual in this age of Anthropocene. Then why does the continent bear the insurmountable

loss and damage? Munich-based reinsurance company Munich Re offers an explanation. While climate change is a global problem, its impacts are unevenly distributed, with poor and developing countries bearing the maximum brunt. The impact of natural disasters is much greater on developing countries—currently 13 per cent of their GDP—than on rich nations, where it is 2 per cent, according to Munich Re. There is also a disparity among different parts of the developing world. While Asia is highly exposed to natural disasters, Africa is most vulnerable to its impacts. According to the Natural Hazards Vulnerability Index by risk analysis and research company Verisk Maplecroft, nine of 10 countries found most vulnerable on the index are in Sub-Saharan Africa.

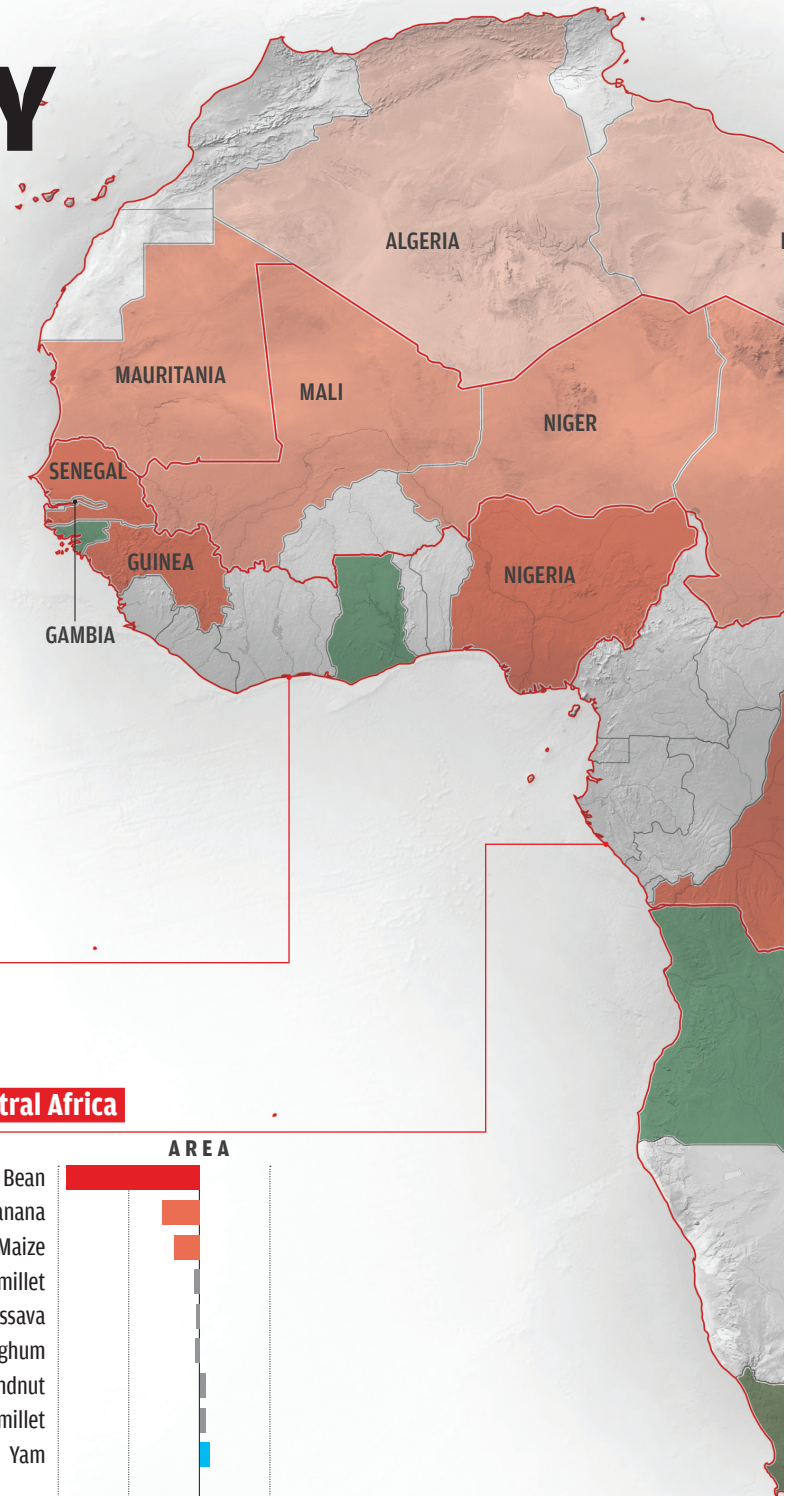
Analysis by *Down To Earth* shows that climate change impacts are more pronounced in Africa because of a few reasons. One, agriculture is largely rain-fed and underdeveloped; two, 90 per cent of the farms are small yet contribute to 80 per cent of the total food production; and three, a majority of the farmers have few financial resources, limited access to infrastructure and extremely limited access to weather and technological information.

According to the UN Food and Agricultural Organization (FAO), in developing countries the

Displaced people gather at an artificial water pan near Habaas town of Awdal region in Somaliland in April 2016. As East Africa reels from the worst drought in a century, scientific studies show the impact of drought is more severe because of climate change

Growing food INSECURITY

Africa's agriculture is predominantly rain-fed and based on small landholdings. This makes it highly vulnerable to climate change. With changing rainfall patterns and degrading land, productivity of beans, maize, banana and millet could suffer a huge setback across the continent

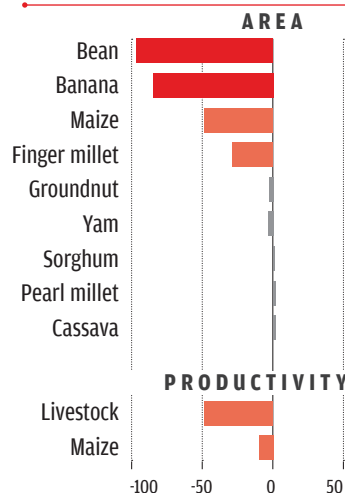


10 African countries most affected in 2015
High and very high vulnerable countries in Africa, according to Climate Change Vulnerability Index 2017
Medium risk High risk Extremely high

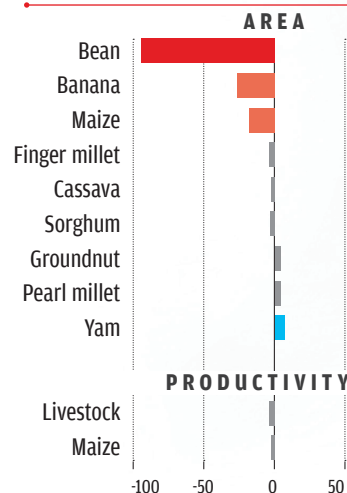
Median change in suitable area of productivity (%)

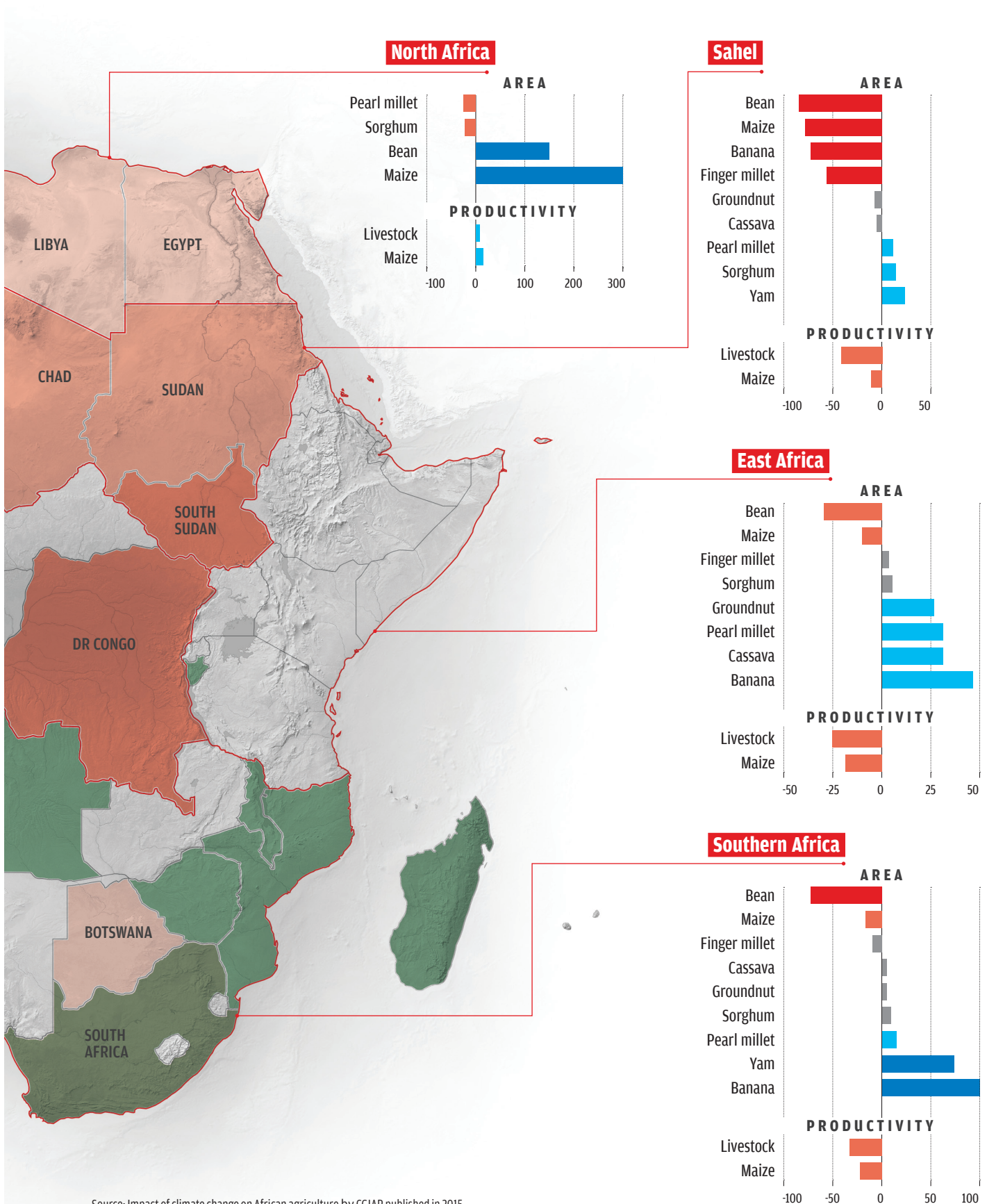


West Africa



Central Africa





Source: Impact of climate change on African agriculture by CGIAR published in 2015

agriculture sector, including crops, livestock, fisheries and forestry, absorbs 22 per cent of the economic impact caused by natural disasters. But in Africa, the sector only adds to the impact. Africa's crop and livestock losses caused by natural disasters in 2003-13 were US \$26 billion. Kulthoum Omari, Coordinator, Adaptation of African Agriculture (AAA), a 27-nation coalition, cites the enormity of the problem: "About 80 per cent of people in Africa depend on agriculture for their livelihood and sustenance. Therefore, boosting agricultural activities will have a positive impact on local and national economies in Africa. However, this is being hampered by the impacts of climate change."

The latest IPCC report also states that climate change is worsening the already deplorable state of agricultural systems in Africa. The white paper on the initiative for the Adaptation of African Agriculture (AAA) to climate change, presented at the Marrakech UN Climate Change Conference in 2016, says the continent has 500 million hectares

of agriculture, such attempts are limited to certain pockets. For instance, farmers in Bankass district of Mali are infusing vigour to the degraded soil by growing trees as well as staple food like millets on the same farm. In Northern Ghana, several non-profits are sensitising women farmers about the effects of pesticides on food crops as well as soil.

There is an urgent need to replicate such initiatives across the continent as extreme weather will significantly disrupt the agricultural calendar and affect crop yields and livestock production.

TIME TO STEP UP ACTION

Going by the latest IPCC report, changes in average temperature would be greater over northern and southern Africa and relatively smaller over central Africa. This means, Sahara and southern parts of Africa would get warmer in coming years. Extreme precipitation changes, such as droughts and heavy rainfall, that eastern African has been experiencing more frequently in last 30-60 years, is likely to

Two-thirds of African countries have little or no capacity to manage weather-related risks. It has fewer weather stations when compared to Asia and is the world's lowest consumer of agricultural inputs

of severely degraded land—this accounts for 27 per cent of the world's total degraded soils. The paper cites water erosion, chemical degradation and soil compaction as the prime reasons for land degradation. Further, about 66 per cent of African lands are located in arid or semi-arid areas, and suffer from water shortages. Due to uneven distribution of water resources, around 25 per cent of the population faces water scarcity, especially in North Africa and the Sudano-Sahelian region, and only 2 per cent of arable land is irrigated in Africa against 42 per cent in Asia, highlights the white paper.

Worse, Africa is least prepared to tackle weather-related risks. Two-thirds of its countries have little or no capacity to manage these risks. According to the AAA white paper, there are only 781 synoptic weather stations (that collect meteorological information every six hours) in Africa as compared to 1,696 synoptic weather stations in Asia. Besides, Africa is the world's lowest consumer of improved agricultural inputs, such as seeds resistant to heat, drought or diseases. Though some farmers are adopting climate resilient agricu-

batter the region in future.

By 2080, arid and semi-arid areas could expand by 60-80 million hectares. Viable arable land is predicted to decline, with 9-20 per cent becoming less suitable for agriculture. Suitable land for corn (maize) and beans—staple crops in the continent—could reduce by 20-40 per cent. Conversely, sorghum, cassava, yam and pearl millet could show little loss, or even gains, in the area suitable for production. Western Africa appears to be a highly vulnerable region, where suitable land for maize, sorghum, finger millet, groundnut and bananas are likely to reduce by 10 per cent.

This will impact crop productivity. A study by international research firm CGIAR predicts that because of climate change, maize yield could reduce by 22 per cent, groundnut by 18 per cent, sorghum and millet by 17 per cent and cassava by 8 per cent. Banana production could also decline in western Africa and in the lowlands of eastern Africa. In arid Egypt, production of paddy would decline by 11 per cent and that of soybean by 28 per cent by 2050.

While rising sea levels will affect fisheries

productivity by 50-60 per cent, substantial reductions in forage availability in some regions would alter productivity of livestock. It is projected that at temperatures above 30°C, cattle, sheep, goats, pigs and poultry reduce their feed intake by 3-5 per cent for each 1°C increase. These impacts will have varying effects on the millions of African farmers who depend on livestock for incomes and food security. "Temperature changes also have a much stronger impact on yields than precipitation changes. It is clear that the economic cost of natural disasters in agriculture sector is expected to increase because of climate change," says Tarfa.

An estimation by the UN Environment Programme (UNEP) shows that African countries would face 2-4 per cent annual loss in GDP by 2040 due to climate change. However, there will be a strong regional variability in the degree of loss experienced in the agriculture sector. FAO estimates that parts of Sahara would suffer the maximum agricultural losses, followed by western and central Africa and northern and southern Africa.

To increase climate resilience among farmers, several African countries have introduced novel adaptation initiatives. In fact, 50 of the 54 African countries have made these initiatives part of their climate action plans submitted to the UN Framework Convention on Climate Change (UNFCCC). One such initiative is the establishment of African Risk Capacity. The specialised agency of the African Union aims to help member states improve their capacities to plan, prepare and respond to extreme weather events, and thereby improve food security and vulnerability of their populations. The other initiative is setting up Agriculture and Climate Risk Enterprise (ACRE), the largest agricultural index insurance programme in sub-Saharan Africa in which the farmers pay a market premium. The programme now spans across Kenya, Rwanda and Tanzania. A similar insurance programme in Ethiopia allows farmers to pay the insurance premium through labour. But implementation of these initiatives is still a challenge.

Says Omari, "Many African countries still lack comprehensive disaster risk management plans because of reasons, such as lack of guidelines, insufficient capacity at the regional, national and sub-national levels to assess and address loss and damage, and insufficient research in understanding the scope, magnitude and character of the climate risks and impacts." Magenya says unless countries prioritise and integrate climate change programmes into their development plans, the

TOO MUCH WATER IN DRYLANDS

Sahel will see floods in the future, followed by droughts

I N THE past few decades, the semi-arid tropical Savanna region Sahel, stretching from Mauritania in the west to Eritrea in the east, has seen several devastating floods. The Niger floods of 2010 and 2012 are two such deluge witnessed at Niamey weather station since record keeping began in 1929. In 1995, 1998 and 1999, five, eight and 11 countries in the region were hit by heavy rainfall respectively. A 2008 study by the University of South Wales and University of Ghana suggests that Sahelian countries "lay to rest the desertification narrative" and "consider the possibility of both floods and droughts, and mobilise local memory for anticipatory learning and practical adaptation". That suggestion has gained much relevance over the years, with the IPCC report predicting that high-intensity rainfall events could increase by 20 per cent over the next decades.

Scientists attribute this weather anomaly to global warming. As the surface temperature of the Atlantic Ocean in the west and the Mediterranean Sea in the north increases, more water evaporates. The moist air drifts onto land, where vapour is released as rainfall. A study by climate scientists at Potsdam University, Germany, and Columbia University, US, shows moisture flux from the Atlantic into Sahel will increase more strongly than from the Mediterranean by the end of the 21st century. "We looked at 30 climate models to understand projections of summer rainfall in Sahel. Out of those, seven models showed a doubling of average summer rainfall by 2100, including three models that project an increase of over 100 per cent in average summer (July-September) rainfall across the central and eastern Sahel," says Jacob Schewe, co-author of the study. The increase in rainfall is also attributed to a northward shift in West African monsoon circulation dynamics. "West African monsoon, which generally covers the region between latitudes 9°N and 20°N, tapers off as it moves further north. But in future, it can make inroads into new territories," says Schewe. What explains this shift is the fact that the northern hemisphere has been heating up faster than southern hemisphere since 1980, largely because the former has more land and less ocean, and greenhouse trapping is larger over land than ocean at the same temperature.

effects of climate change on agriculture in Africa are likely to persist. Seid says there is an urgent need to integrate solutions offered through technologies, institutions and government policies to manage the risks of drought and climate variability in Africa.

There is also a need for the international community to safeguard agriculture from climate change impacts. The Paris Agreement, the landmark climate change deal that came into force in November 2016, talks of safeguarding food security and ending hunger, and the vulnerabilities of food production systems to the adverse impacts of climate change in the preamble. But the word agriculture finds a miss in the Agreement. ■

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Talking heads

Agriculture ministers from key African countries speak to *Down To Earth* on strategies to make Africa food-sufficient once again

“Agriculture has to be made relevant and lucrative to the youth in Africa. In Kenya, we have introduced a programme to increase youth’s access to productive lands through lease so that they can take up agribusiness. Also, the produce of small farmers must have an assured market. We should introduce programmes like the Food Acquisition Programme to create demand as well as to stabilise market prices for products from small-scale farmers. We need to change our approach, from just food to food security in all related programmes.”

Willy Bett, Kenya

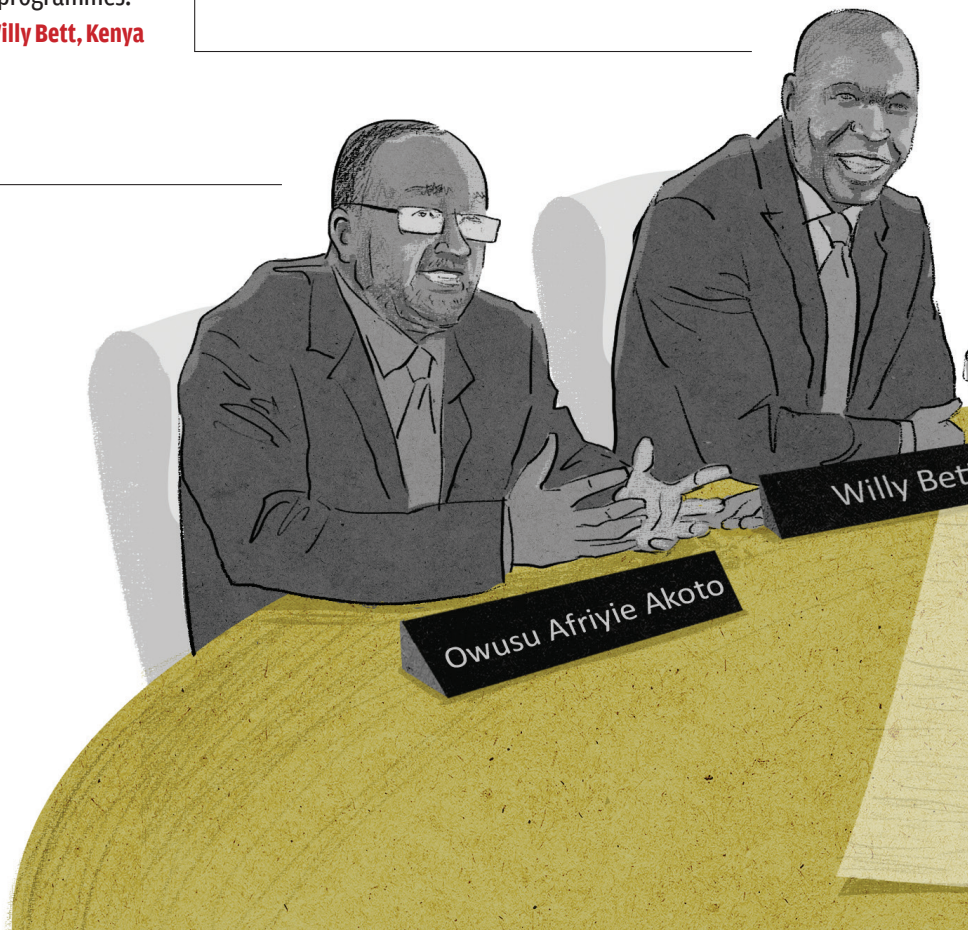
“African countries must set a target, as we have done, to achieve food self-sufficiency by using local staple by 2018.

To make agriculture relevant means that we must increase its share in our national GDP. For this, we have a target of four years. Crops that are popular in other countries should be encouraged for export. This earning can be used for other developmental programmes.”

Audu Ogbah, Nigeria

“Ghana is implementing the Planting for Food and Jobs Campaign to revive agriculture. The campaign’s five pillars are focusing on seed, fertiliser, extension services, marketing and e-agriculture platform. Despite having fertile lands, food is unnecessarily expensive in our country. Our production methods are not modern and income levels of farmers and fisherfolk remain low, making the sector unattractive to the youth as a viable means of livelihood.”

Owusu Afriyie Akoto, Ghana



TARIQUE AZIZ / CSE

“The government must focus on bringing back the agriculture trade balance. Our programmes, like the Food Security and Nutrition, are examples of how to think strategically to become food sufficient. African governments must urgently formulate policies to improve agricultural productivity. As we have done in our country, we must start with one staple crop and then spread the programme to other crops to increase productivity.”

Joseph Made, Zimbabwe

“Malawi has met its targets under the Comprehensive Africa Agriculture Development Programme for budgetary allocations to agriculture and for agricultural growth. The impact was instant. In 2005, Malawi recorded a grain surplus of half a million tonnes. In subsequent years, we exported grain to Lesotho and Swaziland, as well as 400,000 tonnes of maize to Zimbabwe. We must move away from sustenance to market-oriented agriculture. This will increase agricultural production, create a market for surplus crops and this will ultimately lead to real income growth.”

Joseph Mwanamveka, Malawi

