

perspectives

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POLITICAL ANALYSIS AND COMMENTARY

AFRICA

Ecological and Social Transformation in Africa:

Rethinking food systems for a +2°C world



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Contents

- 4** Editorial
- 6** Transforming Africa's Food Systems to Withstand a +2°C World
Busiso Moyo and Dr Laura Pereira
- 13** Interview
Smarter than Climate-Smart: Agroecological Strategies for Food Security in a Changing Climate
Million Belay
- 17** Adapting Through Agroecology: Restructuring Morocco's Agricultural Sector to Prepare for the Climate Crisis
Hazim Azghari
- 22** The Role of GMOs in South Africa's Response to the Climate Crisis
Harald Witt
- 27** Interview
Peri-Urban Agriculture and Food Security in a Changing Climate: A View from Cape Town
Nazeer Soday
- 32** Realising the Right to Food: Kenya's Approach to Food Security in the Context of the Climate Crisis
Layla Liebetrau
- 38** Biting the Hand That Feeds Us: A Feminist Analysis of Food Rights and Food Politics in Kenya
Brenda Wambui
- 43** Food Security in Tunisia: A Need to Move Back to Sovereignty
Aymen Amayed
- 47** Interview
Building Alliances and Changing Policies: Women Farmers in Nigeria respond to the Climate Crisis
Azubike Nwokoye
- 51** Glossary

Editorial

The UN's Food and Agriculture Organisation (FAO) estimates that in 2017, about 375 million Africans – almost 30 percent of the population – suffered from severe food insecurity, meaning that nearly every third person on the continent had gone entire days without eating. Chronic and acute hunger remain enduring problems, despite decades of work to alleviate them. In fact, the decreasing prevalence of undernourishment, chronic food deprivation and severe food insecurity in some African regions has been reversed in the past three years, and hunger has increased in almost every region.

Food insecurity and hunger are caused by a range of intertwined factors, including poverty, conflict, lack of investment in agriculture, and unstable markets. The climate crisis is fast becoming another major variable. According to the Intergovernmental Panel on Climate Change's 2018 report, farmers will have to contend with higher temperatures, increasing heatwaves, prolonged droughts and flash floods. As the recent cyclone in Mozambique shows, extreme weather events also lead to widespread displacement, loss of livelihoods and, consequently, hunger. The current shifts in climate, and those anticipated if the average global temperature increases by 2°C, are predicted to further exacerbate food insecurity in Africa, threatening at least half of the population with malnutrition. The impact will likely be most severe for women, children and those with low incomes, thereby deepening existing inequities within countries, between them, and with the “developed” world.

Yet – as this edition of *Perspectives* demonstrates – there are available solutions that could not only enhance the resilience of

agricultural production to withstand the climate crisis but also contribute to reducing poverty, inequality and unemployment. However, many of these options struggle to be heard in a mainstream discourse that is dominated by a pro-growth productivity paradigm. The articles from Tunisia, Morocco, South Africa and Kenya show that government policy has been captured by a narrative of “modernisation” that favours large-scale, input-intensive agricultural production for global markets, supported by technological fixes such as genetically modified organisms (GMOs). This dominant approach threatens key resources such as biodiversity, water, and soil fertility, which are also under threat by the climate crisis. At the same time, it undermines the local and traditional knowledge systems upon which climate-change resilience and the necessary shift towards agroecological production depend.

It is understandable that governments faced with the daunting task of ensuring food security in unstable climatic conditions would want to follow an orthodox path, but there is plenty of evidence that the industrial agricultural model only delivers short-term production gains at high environmental costs. In 2016, the FAO found that the industrial “green revolution's ‘quantum leap’ in cereal production has come at the price of soil degradation, salinisation of irrigated areas, over-extraction of groundwater and the build-up of pest resistance”¹. It also concluded that “past agricultural performance is not indicative of future returns”².

This special edition of *Perspectives* was compiled with the Heinrich Böll Foundation's North Africa offices and the *Transform Africa* project. It is dedicated to the emerg-

ing conversation of alternative approaches that challenge the historical bias towards the industrialisation of agriculture and the food system as the main strategy to address food insecurity while preparing for a +2°C world.

With approximately three-quarters of all farms on the African continent being small in scale, our contributors agree that small-holder farmers, and particularly women farmers, hold the key to sustainable, socially inclusive food systems. From Kenya, Brenda Wambui reminds us that women should be at the centre of all efforts to eliminate hunger and poverty. Azubike Nwokoye writes of Nigerian women farmers organising to break the barriers of a patriarchal system in order to own land, to access extension services that have been biased towards men, and to make decisions that enable them to boost production while adapting to the uncertainties of the climate crisis.

In line with a growing body of evidence, other articles here call for – or provide examples of – localised agroecological farming systems whose benefits include carbon storage, biodiversity support, the rehabilitation of soils, and sustained yields, while providing a basis for secure livelihoods. As Harald Witt outlines in his article about GMOs in South Africa, agroecological farming would “empower farmers rather than substituting for labour, skills and knowledge”. Our interview with food-sovereignty activist Million Belay further debunks the myth that agroecology does not increase productivity and hence may not provide a solution to food insecurity. Both experts agree that political commitment to a fundamental food-system transformation is required for agroecology to be adopted on a large scale. Witt calls for “new champions, vision and imagination” to challenge the prevailing system that entrenches inequality and food exclusion.

One such champion is farmer Nazeer Sunday, chair of the Philippi Horticultural Area (PHA) Food and Farming Campaign in Cape Town, South Africa. In an interview, he describes the ongoing fight with authorities and property developers to preserve a crucial farming area close to the city and to transform it into a horticultural production zone that would enhance the city’s water

resources in conditions of drought and a growing population, provide thousands of jobs in a context of chronic unemployment, ensure good quality food at affordable prices, as well as provide an opportunity for post-apartheid land reform. Hazim Azghari’s article argues that Morocco should implement on a national level what the PHA campaign envisions for Cape Town. He criticises the country’s focus on mitigation at the expense of investing in adaptation in the agricultural sector, which could deliver a win-win solution of short-term production gains, long-term resource protection, and poverty alleviation through the provision of income and food security.

Our contributors agree that, for the necessary policy shifts to happen, decision-making power needs to shift away from markets and transnational corporations back to the majority that produces, distributes and consumes food. Aymen Amayed calls for Tunisia to return to the principle of food sovereignty to liberate the country’s farming community from the high social and environmental costs of competing in the European market. Layla Liebetrau warns that misguided policy decisions in Kenya could lock the country into decades of input-intensive production systems that are vulnerable to the effects of the climate crisis, destructive to the environment and will ultimately fail to ensure food security.

To safeguard and expand human well-being and development on the continent in the likely scenario of a +2°C world, African food systems need a transformation – not through a new industrial “green revolution”, but by fundamental shifts in political values and decision-making. Instead of being profit-centred, food systems need to be farmer- and community-centred and driven by bottom-up and localised alternatives to address poverty and inequality as well as food security. We hope that this edition of *Perspectives* contributes to realising this task.

Katrin Seidel
Regional Director

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Deputy Director

1 Moore, H. Can agroecology feed the world and save the planet? The Guardian, 9 October 2016. <https://www.theguardian.com/global-development-professionals-network/2016/oct/09/agroecological-farming-feed-world-africa>

2 Ibid.

Transforming Africa's Food Systems to Withstand a +2°C World¹

Busiso Moyo and Dr Laura Pereira

Africa is a continent rich in land, fisheries, natural resources and biocultural diversity, all of which are critical assets for a well-functioning food system². Despite this, Africans remain some of the most food-insecure citizens on the planet. The situation is most problematic in sub-Saharan Africa where the prevalence of chronic undernourishment appears to have risen from 20.8 to 22.7 percent in just over a year between 2015 and 2016.³ Poignantly, Africa and Asia together bore the greatest share of all forms of malnutrition in the year 2018, accounting for more than nine out of ten of all stunted children, over nine out of ten of all wasted children, and nearly three-quarters of all overweight children worldwide.⁴

Juxtaposed with the projected impacts of the climate crisis on food production, livelihoods and hunger, this grim picture becomes even more ominous. Unmitigated global heating could lead to a permanent increase in the variability of agricultural yields, excessive food price volatility, and a perpetual disruption to livelihoods, presenting many poor countries and communities with potentially overwhelming food-security challenges.

Impacts of The climate crisis on Africa's Food System

Warming trends are already evident on the continent and it is reported that Africa's mean annual temperature change will

likely exceed +2°C of 2000 levels by 2100.⁵ Changes in precipitation patterns are also of concern in a warmer climate, as it is likely that heavy rainfall will increase and be produced by fewer, more intense events. This in turn will mean longer dry spells and a higher risk of floods. Even if rainfall remains constant, increased temperatures will amplify water stress, putting pressure on agricultural systems, especially in semiarid areas.

Generally speaking, such changes are likely to reduce the productivity of cereal and high-value perennial crops, while higher temperature increases could decrease yields by 20–30 percent by 2080⁶ and, according to one estimate, even as high as 50 percent in Sudan and Senegal.⁷ Maize-based systems in southern Africa are particularly vulnerable to the climate crisis, with yield losses for South Africa and Zimbabwe currently predicted in excess of 30 percent.⁸ Pests, weeds, and diseases are expected to increase, along with their detrimental effects on crops and livestock.

Africa's vulnerability to the climate crisis is largely due to agricultural systems that remain rain-fed and underdeveloped.⁹ The majority of farmers are small-scale, with few financial resources, limited access to infrastructure, and disparate access to information. These agricultural systems are highly reliant on their environment and the farmers are dependent on farming for their livelihoods. At the same time, and because of this, the diversity and context specificity of their farming practices and the existence of generations of traditional knowledge offer elements of resilience in the face of the climate crisis. Overall, however, the combination of climatic and non-climatic drivers and stressors will exacerbate the vulner-



Busiso Moyo is a human rights defender and scholar. His current research projects shine light on three important areas: inequality and decolonization struggles in South Africa; the geographies of hunger; and the geopolitics of food and agriculture. The latter examines the global political economy of food, which in turn illuminates the persistence of imperialism and neocolonialism in contemporary world politics. He is pursuing his PhD at the University of the Western Cape

AFRICA AT +2°C: ANTICIPATED CLIMATIC IMPACTS

NORTHERN AFRICA

Temperature increases of about 2°C have been observed over the 20th century. In recent decades, temperature has increased by about 0.16°C per decade. Temperature increase by the end of the century is likely to be between 3.3°C and 6.5°C, relative to the 1961-1990 baseline, and higher than the global average. While there are no clear trends in precipitation, it is likely to decline by around 16 per cent by the end of the century.

EASTERN AFRICA

Temperatures across East Africa have increased by 1.5 - 2°C in the 20th century, and models suggest that between 2050 - 2100 the number of days warmer than 2°C above the 1981- 2000 average will rise sharply in equatorial eastern Africa. Temperature is likely to rise between 2.7°C and 5.4°C above the 1961-1990 baseline by 2100.

CENTRAL AFRICA

While observations are scarce, climate models suggest an increase of 0.6°C in the 20th century. Climate projections suggest temperature increases of up to 5°C, compared to the 1960-2000 baseline values.

SOUTHERN AFRICA

Southern Africa has experienced increases in temperatures of up to 2°C over the last century. The most rapid heating has been observed post-1980. Temperature is expected to continue to increase through the century, and is likely to be anywhere between 2.8°C to 6.3°C above the 1961-1990 baseline.

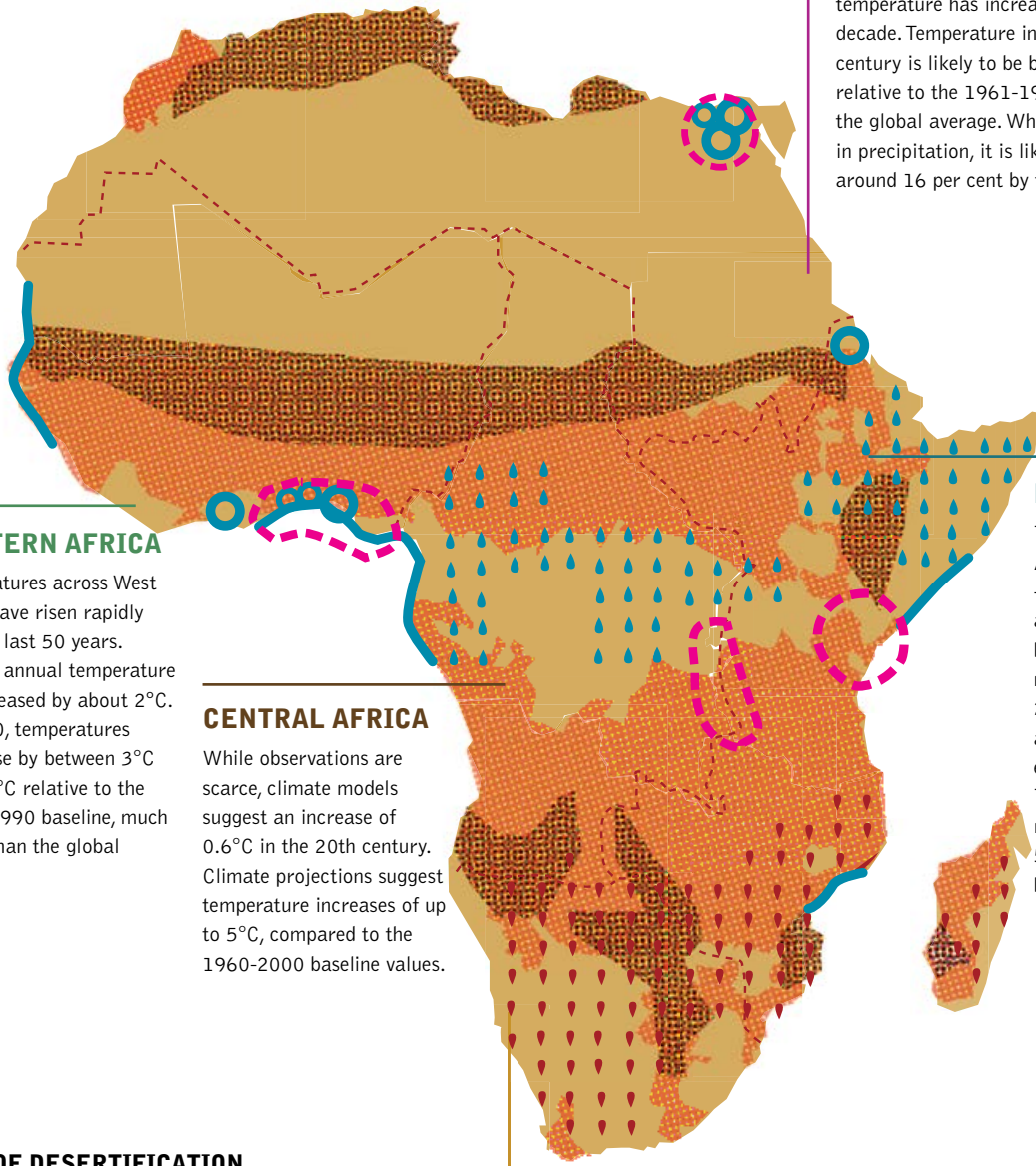
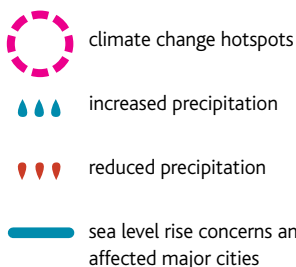
WESTERN AFRICA

Temperatures across West Africa have risen rapidly over the last 50 years. Average annual temperature has increased by about 2°C. By 2100, temperatures could rise by between 3°C and 6.4°C relative to the 1961- 1990 baseline, much higher than the global average.

RISK OF DESERTIFICATION



CLIMATE CHANGE IMPACTS (OBSERVED)



Map based on the following sources:
 Ionesco D., Mokhnacheva D. and Gemeine F., Routledge, Abingdon (2017), The Atlas of Environmental Migration. IOM and Gemeine, Zoï Environment Network. p. 63. Based on data from IPCC (2013, 2014) Singh, K., Venkatesh for www.downtoearth.org.in/ infographics. based on data from Assessment Report 4, IPCC, and Climate Change Scenarios for the Congo Basin by Van Garderen, Ludwig F.

ability of Africa's agricultural systems to the climate crisis.

Such predictions are substantiated by the degree to which the shifting seasons are already making it difficult for small- and large-scale farmers alike to remain productive. In South Africa, 2016 ushered in a three-year-long drought, the worst in 34 years,

Women smallholder farmers make up nearly 50 percent of the sub-Saharan agricultural labour force but are often inadequately considered in national agricultural policies.

and, in the Western Cape province, the most severe drought within living memory, pushing food prices to unprecedented levels.¹⁰ Droughts have devastated agriculture in Zimbabwe and Zambia over the same period. Together with Malawi, these countries have been most affected by the warming and drying trends of recent decades, suffering severe food shortages over recent years.

Pathways Towards Ensuring Food Security in a Changing Climate



Dr Laura Pereira completed her BSc at Wits in Zoology, Ecology and Law before moving to Oxford where she did an MSc in Nature, Society and Environmental Policy and a DPhil on the private sector's adaptive capacity to climate change impacts on the food system. Following her DPhil, she was a Giorgio Ruffolo fellow in sustainability science at Harvard's Kennedy School. She then moved back to South Africa and completed a post doc at UCT under the bio-economy chair and was then employed at the Centre for complex systems in Transition at Stellenbosch university under the GRAID project to work on sustainability transformations in the food system. She is now based at the Centre for Food Policy, City University of London, working on a Wellcome Trust funded SHEFS project that focuses on healthy and sustainable food systems in South Africa, India and the UK.

As the climate crisis continues to take hold, we need to think about what transformative measures can be taken to shift African food systems to a trajectory where healthy and sustainable food is available to all citizens, even under the stress of a changing climate. We discuss some of these below.

Recognise the role of women in the food system

A 2016 FAO report suggests that, if women farmers had the same access to resources as men, the number of hungry people in the world could be reduced by up to 18 percent.¹¹ Women smallholder farmers make up nearly 50 percent of the sub-Saharan agricultural labour force but are often inadequately considered in national agricultural policies.¹² In general, women carry the brunt of food insecurity and malnutrition much more than men: although they prepare up to 90 percent of meals in households worldwide, they may be the first to eat less during

difficult times. They are also especially vulnerable to the impacts of the climate crisis because they shoulder an enormous – but imprecisely recorded – burden of responsibility for subsistence agriculture, whose productivity will likely be adversely affected by the climate crisis and overexploited soil¹³. We need to recognise the violence, that poverty and injustice inflict on women every day.

Given that access to nutritious food is a necessary (albeit insufficient) condition for eradicating poverty, economic conditions must be transformed to ensure that mothers have available resources to feed their children and households and that the agri-food system can provide food that is wholesome, affordable and easily accessible. Governments could make a significant difference by eliminating discrimination against women and by ensuring that all policies, programmes and projects take account of the different roles and responsibilities of women and men in the food system and the constraints that women face in agriculture and rurality more broadly. Greater and more effective involvement of women and utilisation of their knowledge, skills and experience will advance sustainability and development goals on the continent.

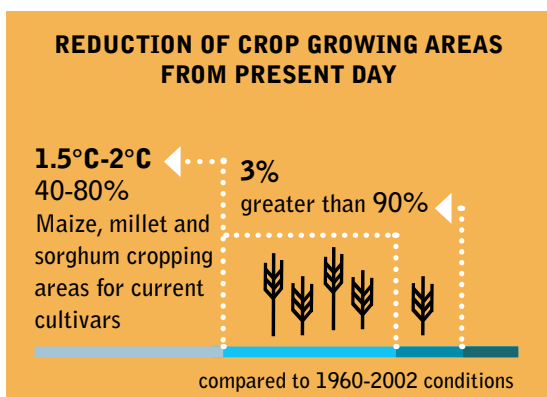
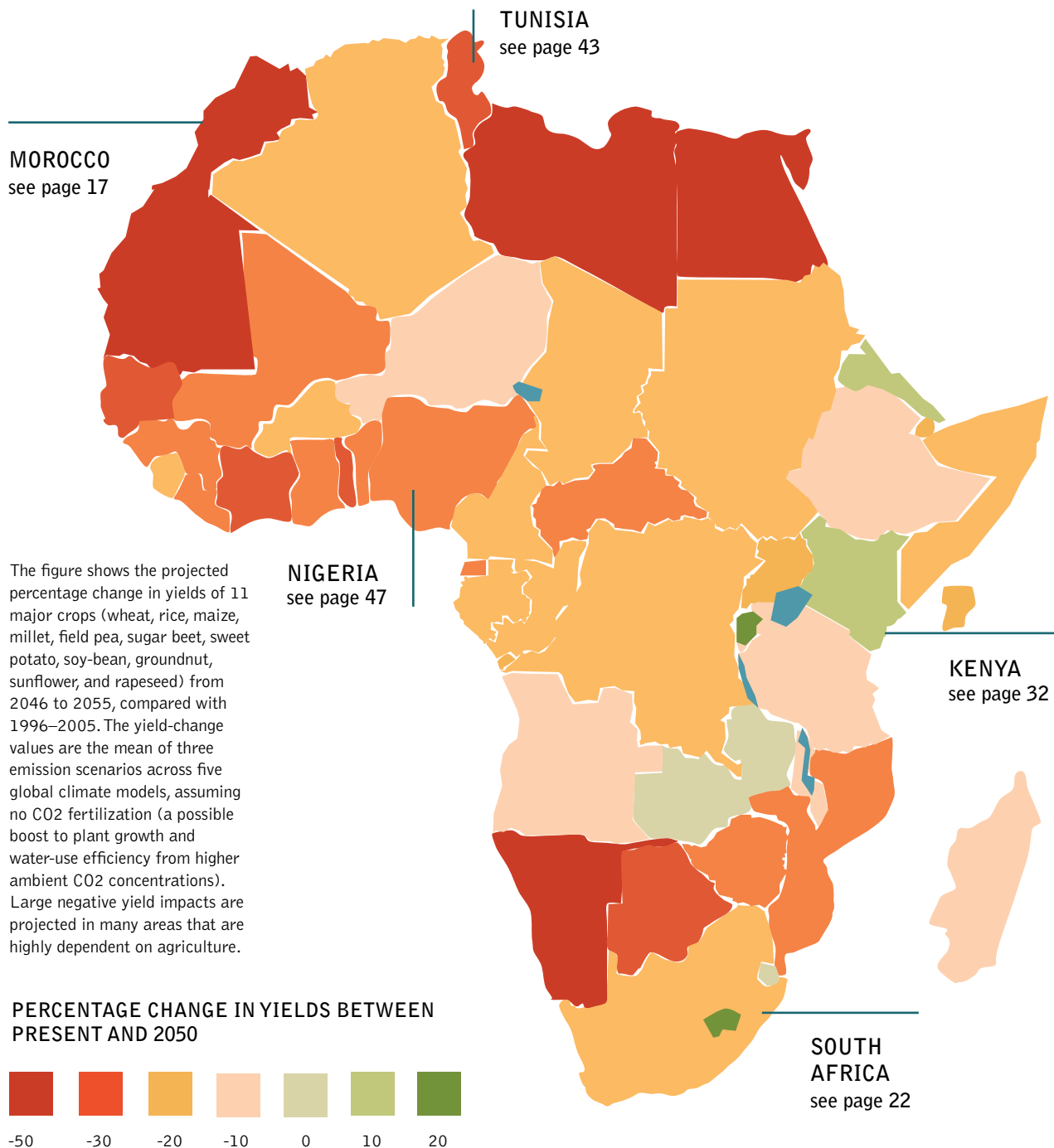
Tackle the industrialisation of agriculture and the food system

A small number of large and transnational corporations now dominate Africa's value chains in the agricultural, food and beverage sectors, as well as specific food commodity chains. Regrettably, this economic power has been accompanied by enormous political clout, such that effective protection policies and mechanisms have generally not been established.

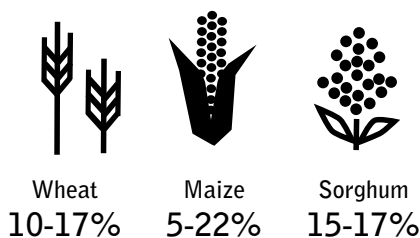
Consequently, the corporate agribusiness sector has been able to influence food-system governance in its favour. This threatens many countries' capacity to develop and realise their population's right to food. Poor regulation has contributed to the marginalisation of indigenous agriculture and crops and resulted in an environment saturated with unhealthy, cheap, ultra-processed food products and sugary beverages.

The biodiversity that is so critical to adaptation and resilience is threatened by large-scale mono-cropping, pesticides and seed and crop standardisation utilised by industrial agriculture¹⁴. In particular, the

AFRICA AT +2°C: PROJECTED CHANGES TO AGRICULTURAL YIELDS



CROP YIELD CHANGES AT +2°C



REDUCTION IN CROP PRODUCTION

Map based on:
C. Muller (2010) Climate Change Impacts on Agricultural Yields, background note to the World Development Report 2010.

As cited in Carty, T., Magrath, J. 2013. Growing Disruption: Climate change, food, and the fight against hunger. Oxfam Issue Briefing. Oxfam GB: Oxford, UK.

promotion of genetically modified agriculture products has created a vertical integration between seed, pesticides and production to increase corporate profits. Eighty-five per cent of all plantings of transgenic crops are soybean, maize and cotton varieties that have been modified not “to feed the world or increase food quality” but to reduce input and labour costs in large-scale production systems.¹⁵ Food security requires more than producing enough calories and more than just agricultural interventions: it requires the availability of and access to healthy, nourishing food. Much stronger economic policies (such as subsidies and taxes) and regulation are needed in the food value chains to make healthy foods cheaper and unhealthy foods more expensive.

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The UN's 2019 World Economic Situation and Prospects report¹⁶ notes that many countries pursue policies and strategies for realising the right to food, including subsidies for the production of staple foods. It recognises that some of these strategies may not be economically viable or optimal for diversification and structural transformation, but does not rule out their use for strategic and defined purposes.

Ironically, the state of the agricultural sector is seldom the major factor when governments consider what support to give it. Identifying support strategies that are economically sustainable, let alone environmentally and politically appropriate, is a complex task. However, such policies must be locally appropriate and reflect the local farmers' needs and the range of their knowledge and methods. Their skills are at the heart of the continent's potential for resilience, and the loss of diversity associated with industrialised agriculture must be recognised as the threat it is.

Strengthen the right to food

The issues of endemic hunger and malnutrition in Africa in the face of the climate crisis demands a dedicated and commit-

ted resolve by international, regional and domestic actors. Legislative and constitutional provisions that guarantee the right to food for all, including secure access to land and water, can be established and implemented in developing countries.

The right to food, along with other economic, social and cultural rights, must take its proper place in politics, in human rights systems, and in people's minds. Emphatically, the optimal use of the available human-rights monitoring systems requires mutually supportive action by local, national and international civil society organisations.

In recent years, national human rights institutions like the South African Human Rights Commission (SAHRC) have significantly advanced the dialogue on the right to food. Networking and cooperation are necessary for strategy and efficiency but also for formal reasons. For example, institutions – like the SAHRC and other civil society organisations – that have a consultative status with the Economic and Social Council of the United Nations can submit parallel reports to the UN Committee on Economic, Social and Cultural Rights. They can also accredit grassroots activists who wish to submit information to the Committee concerning their government's human rights record.

Acknowledgement of the right to food means that governments have to keep the promises they have made to move towards sustainable development and reduce poverty. In this context, human rights defenders should acknowledge that food security in a +2°C world is ultimately a political issue.

Mobilise for climate action that strengthens governance capabilities and tackles hunger

Shifting the power of vested interests in the business-as-usual economy will require broad-based movements. To achieve the scale of mobilisation needed, the fight for a low-carbon future must be embedded in struggles for rights and equality. This means a pro-poor low-carbon agenda in Africa that does not just target the climate crisis but tackles inequality and hunger, too.

Agriculture is not explicitly mentioned in the ground-breaking 2016 Paris Agreement to address the climate crisis, despite efforts to include it. This is a cause of concern for many African countries, given the essential role that agriculture must play in

the socio-economic development of the continent. All the same, Africa has generally welcomed the Paris Agreement because it is the first time that food security has appeared in a global climate change accord or agreement. At COP24, which took place in December 2018 in Katowice, Poland, Africa's common position was for adaptation to be on par with mitigation, and the majority of African countries submitted their Nationally Determined Contributions to the global reduction of greenhouse gas emissions. These also project the national costs of both adaptation and mitigation. By and large, Africa's adaptation efforts will require significant non-domestic conditional finance if they are to be implemented.¹⁷

An African-led response to the impact of the climate crisis on the agriculture sector is provided by the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods. The Malabo Declaration is emphatic about the need to build the resilience of Africa's agricultural sector – including livelihoods and production systems – to climate variability and other related risks. Verging on a policy of food sovereignty, it envisages the benefits of a higher level of regional integration and rational use of the opportunities offered by global markets.

The Malabo Implementation Strategy and Roadmap (IS&R) defines four thematic areas of priority action, each aiming to transform agriculture in the context of sustained inclusive growth.¹⁸ In light of the strong corporate presence in the sector, the IS&R's particular attention to African farmers' capacities is encouraging. In another step in the right direction, its systemic capacity-strengthening objectives provide a credible framework for dealing with key stakeholders and their relations to economic policies. The Malabo Declaration envisions that, by the year 2025, at least 30 percent of African farm, pastoral, and fisher households will be resilient to climate- and weather-related risks. Unfortunately, of the 47 member states that reported progress in implementing the Declaration, less than 50 percent are on track to achieve this commitment.¹⁹ This again indicates the imperative to elevate agriculture's place on the political agenda.

Strengthening the implementation of the Malabo political programme as well as meeting the adaptation and resilience

demands of global climate-change negotiations will require tackling key barriers to adaptation. These include²⁰:

- inadequate infrastructure and finance that prevent the use of cutting-edge equipment in meteorological departments, which means that decision-makers do not have enough appropriate data and information on climate variability and change, as well as their impacts
- weak governance structures and institutions coupled with a lack of human resources and capacity, resulting in poor coordination among organisations and departments involved in adaptation to the climate crisis, as well as a breakdown in, or even a complete lack of, communication of climate information to farmers.
- at the household level, there are financial barriers that hinder adaptation, and also barriers to growing drought-tolerant crops, such as lack of acceptance, availability, and ready markets, which in turn are linked to sociocultural barriers, as people maintain their preferences for existing staples.

Both civil society and government interventions are required to address these barriers.²¹

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Conclusion

Ensuring food security in a +2°C world requires simultaneous progress in poverty eradication, inequality reduction, guaranteed resource rights, the promotion of stable livelihoods, and gender equity. The challenges of global disparity and achieving the right to food for all in a highly variable climatic context are connected and cannot be solved separately.

Global heating adaptation and mitigation policies have to be integrated with the development agenda to fight poverty and hunger. The effects of the climate crisis will

be widespread, but they may be less significant for those who have insurance or the ability to adjust their activities. Many African households depend directly on natural resources and agriculture and will not be able to move or otherwise buy their way out

of problems. Thus, the continent will face particular problems as temperatures rise and floods and droughts impact agricultural production, water supplies, diseases and infrastructure, and the rural and urban poor will be the hardest hit. ■■■

- 1 Parts of this article quote directly from: L. Pereira. 2017. Climate Change Impacts on Agriculture Across Africa, Oxford Research Encyclopedia of Environmental Science. Available at <http://environmentalscience.oxfordre.com/view/10.1093/acrefore/9780199389414.001.0001/acrefore-9780199389414-e-292>. Indication is given in relevant paragraphs.
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Smarter than Climate-Smart:

Agroecological Strategies for Food Security in a Changing Climate

Million Belay

Interview

Acknowledging that agriculture is both under threat from the climate crisis and a driver of it, the UN Food and Agriculture Organisation (FAO) introduced the concept of “climate-smart agriculture” in 2010. It was defined as agriculture that “sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals”. Although these read like noble goals, the concept has been a bone of contention from its earliest days.

Million Belay is the coordinator of the Alliance for Food Sovereignty in Africa. For more than two decades, he has immersed himself in issues of sustainable agriculture and the rights of local communities to seed- and food-sovereignty. *Perspectives* spoke to him about the specific challenges of food security on the continent.

Perspectives: The African Union and the New Partnership for Africa’s Development, alongside many African governments and research institutions, promote climate-smart agriculture as a solution for food resilience in the context of the climate crisis. Do you see it as the best way forward for the continent?

Million Belay: I am not surprised that these institutions see climate-smart agriculture (CSA) as a solution. This is because the bulk of the support to these institutions comes from the proponents of industrial agriculture. The proponents of CSA – including the FAO, the World Bank and developed-country government promoters – have formed in 2014 the Global Alliance for Climate-Smart Agriculture to help them push their agenda under the guise of providing a solution to the climate crisis. Since then, private corporations such as Syngenta, Yara, Kellogg’s and McDonald’s have also become actively involved.

CSA advocates to increase sustainable production, using agriculture as a climate-change adaptation strategy, promoting practices that reduce emissions and avoid deforestation and so on. But personally, I do not think that CSA is the best strategy for climate-change adaptation. CSA is a technical fix and does not address the fundamental problem of the climate crisis. It does not outlaw agrochemicals, genetically modified crops, large-scale industrial monoculture, biofuel plantations and the commodification of carbon and the creation of priced carbon rights in the name of “green growth”. CSA thus presents a continuation of business-as-usual industrial agriculture, in which farmers are increasingly dependent on agrochemical corporations for external inputs and global commodity-markets for sale of their products.



In addition to his work with the Alliance for Food Sovereignty in Africa (AFSA), **Million Belay** is a researcher at the Stockholm Resilience Centre, where he is studying the transformation of food systems in Ethiopia. He is a founder and former director of MELCA-Ethiopia, an NGO working on issues of agroecology, intergenerational learning, advocacy and improving the livelihoods of indigenous peoples.

If this is not the best way forward, what makes climate-smart agriculture so attractive to the continent's governance institutions?

What makes it attractive is the financial and technical support coming from those who have an interest in pushing their agenda under the guise of increasing productivity and climate resilience. Even more worrying is the narrative under which the financial and technical support is operating. There is a very powerful narrative that is designed and packaged to convince African countries to support CSA and related initiatives.

In short, the narrative runs like this: "Africa's population is exploding and, in a few years' time, countries' agricultural systems will be overburdened and unable to support the burgeoning population. Therefore, we need to bring in agribusiness to inject funding and technical skill to support the transformation of agriculture. For production to increase, we need to bring in hybrid seed and use agrochemicals. We also need to bring new forms of knowledge and put land in the hands of those who can produce more."

This narrative is pumped into the mind of African elites and hammered into the population through media and other forums – but is there sufficient conversation about the health, environmental, cultural and even human-rights impacts of these policies? There is a need for another narrative. Yes, it is true that the population is increasing and we need to enhance the productivity of our seeds. But we can do that through agroecology. We can build our soils and protect our ecosystem and find solutions through combining the wisdom of our farmers with conventional scientists.

How does agroecology differ from what is packaged as climate-smart agriculture, and why is it a better solution for food security in these conditions?

Agroecology understands that the problem in our food system lies in the economic model that the neoliberal agenda espouses. Agroecology initiatives aim to transform industrial agriculture by moving away from fossil-fuel-based production and encouraging small-scale production systems based on local innovation and resources. It recognises and promotes the rich knowledge that food producers have about food systems.

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Since 60 to 80 percent of farmers in Africa are small-scale farmers, agroecology fits them very well. But this only happens if their rights to their land, seeds, water and other systems are respected. Research by the Alliance for Food Sovereignty in Africa (AFSA) shows that agroecology increases productivity, is good for local agrobiodiversity, produces diverse, healthy and nutritionally rich foods and increases income.

CSA uses approaches like "conservation agriculture", a concept for resource-saving agricultural crop production that was successful in the US and Australia when done on a large scale. It did not show similar results in small-scale farms in Africa. More than this, such approaches do not address the structural and political problems which are at the heart of the food system.

I do not think that focusing on fixing problems at the farm level will address the crisis at the macro level, which is the main culprit in perpetuating poverty. Agroecology is about democracy at the local level;



MARKET CONCENTRATION
Monocropping, the private patenting of seeds and the consequent reliance on chemical inputs has created large multi-national monopolies that are increasingly vertically integrated. This market concentration both prevents competition and enables policy and regulatory capture as corporate power eclipses that of political representatives.



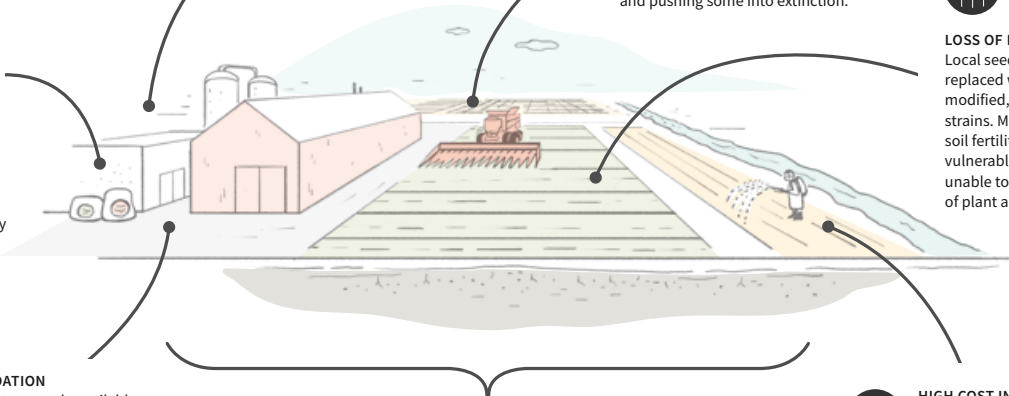
ORIENTATION AWAY FROM LOCAL NEEDS
Agricultural investments, crop intensification and monocultures that respond to market needs are encouraged at the expense of local ecosystems and communities – for example the cultivation of water intensive crops in water scarce regions.



ECOSYSTEM DESTRUCTION
Local natural habitats are replaced on a large scale with uniform plantations, endangering plant and animal species and pushing some into extinction.



LOSS OF BIODIVERSITY
Local seed varieties are replaced with genetically modified, hybrid or controlled strains. Monocropping exhausts soil fertility leaving it more vulnerable to erosion and unable to sustain a diversity of plant and animal life.



FARM CONSOLIDATION
As high input costs are only available to better-resourced (generally male) farmers, rural communities experience (disproportionally gendered) economic differentiation, leading to land-grabs and dispossession. As smaller farmers are forced off their lands, unemployment and precarious work increase, as does rural-urban migration.

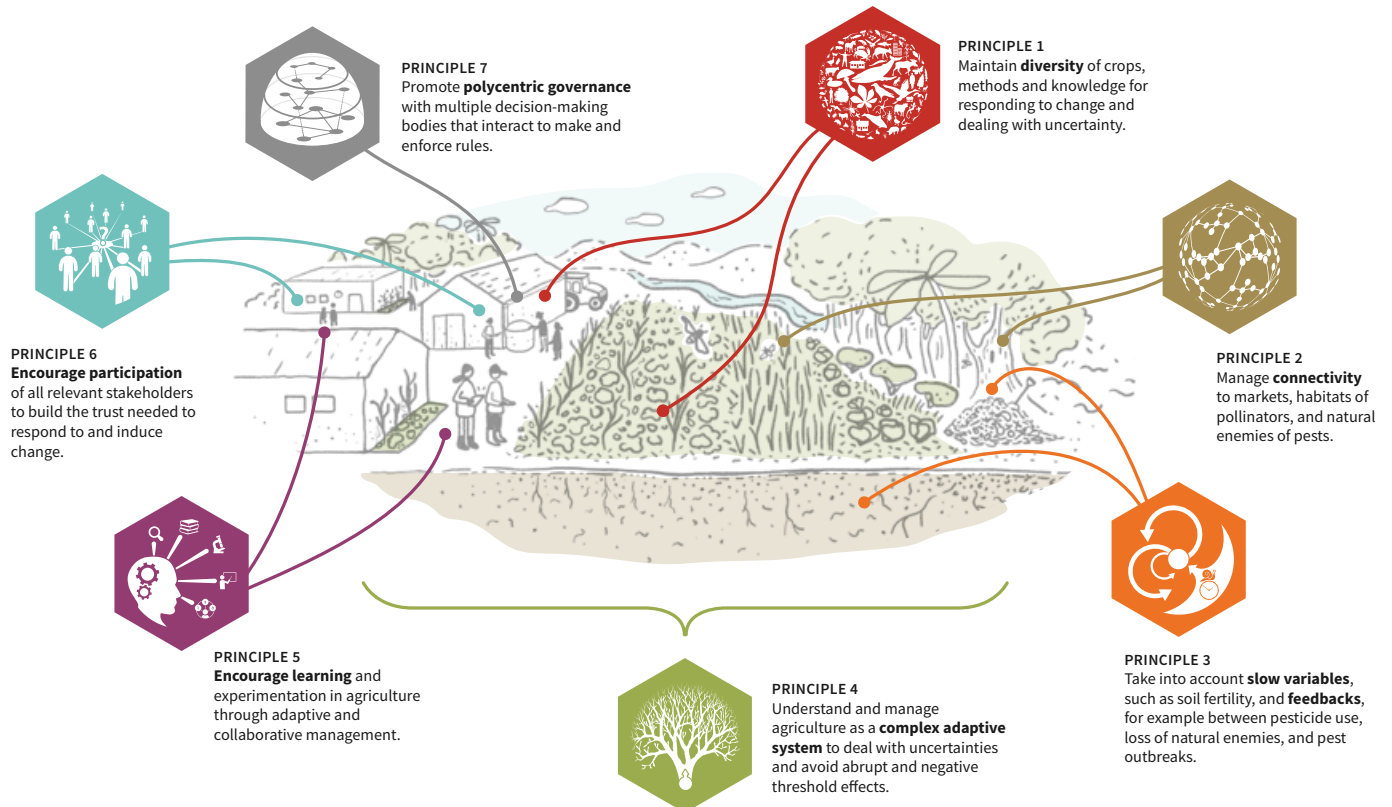


EXTERNALISATION OF COSTS
The use of pesticides and chemical fertilisers makes industrial agriculture the biggest user and polluter of water in the world. The food produced is less nutritious, leading to malnutrition, while inputs pose public health risks. While individual farmers must pay high costs for services previously provided by ecosystems, corporate agribusiness externalises – does not have to pay for – these natural and social costs.



HIGH COST INPUTS
Increasing amounts of external chemical inputs become necessary to compensate for degraded soils and loss of ecosystem services, polluting water sources and further degrade the soil, as well as poisoning local ecosystems, including insects and pollinators.

INDUSTRIAL AGRICULTURE VS AGROECOLOGY



it is about recognition of the huge contribution of food producers to our food system; it is about an economy which is based on connecting food producers and consumers and which is circular; and it is about rethinking the economic and market agenda.

What would food production and consumption look like if agroecology were adopted on a mass scale?

Large-scale adoption of agroecology means, first of all, accepting at the political level that the core source of the problem is the political appropriation of the food system. It is about countries taking on the responsibility of feeding their populations with healthy and nutritious food without harming their environment. At the landscape level, it means working extensively in regenerating the soil and the biomass. It means implementing participatory research, where farmers and scientists define the agenda for research and explore solutions together to enhance the production of nutritious and healthy food. It means reallocating the subsidy from agrochemicals to agroecology. It also means massive consumer education, where people are taught to choose healthy and diverse food instead of packaged and sugar-laden foods. In general, it means a political commitment for a fundamental food-system transformation.

Some argue that it is difficult to achieve economic viability using agroecological approaches. Do you agree? If so, what existing policies and practices would need to change to ensure economic viability?

I am not sure where this argument comes from. I think it emanates from false beliefs that agroecology does not increase productivity. It has been demonstrated that it can. I agree that it will be difficult to transition to agroecology in a year or so, but the focus on soil regeneration and increasing plant biomass will gradually increase productivity and will even surpass that of conventional agriculture. My personal experience in Ethiopia and AFSA's research have shown that agroecologically produced food has markets. I know the focus in agroecology has to go in tandem with consumer education, which is happening in Africa, to create enough markets for agroecological products.

I think there needs to be a broader level of integration among policy frameworks related to food. Policies related to agriculture, environment, health, trade, education, etc. need to be coherent. In so many cases, countries may have a very good policy on nutrition but the trade or agricultural policy goes against that. This policy incoherence leads to inefficiency of efforts and exposes the population to numerous health and economic crises. ■■■

Adapting Through Agroecology: Restructuring Morocco's Agricultural Sector to Prepare for the Climate Crisis

Hazim Azghari

Like most countries of the global South, Morocco is disproportionately affected by the climate crisis relative to how much it contributed to creating it. Although Morocco contributes only 0.18 percent¹ to global greenhouse-gas emissions each year, current predictions of its future feature increased temperature, decreased rain regularity, sea-level rise and a feedback effect on both forest-cover and fish populations. With somewhat ambitious renewable-energy production targets and other policies to reduce the carbon footprint of the economy, Morocco presents itself as an environmental leader in Africa. However, these are all climate-mitigation actions; it budgets considerably less for climate-adaptation projects.² In this essay, I argue that Morocco, on the forefront of emissions reductions in Africa, should be more concerned about the adaptation of its agriculture sector, a main pillar of its economy. Moreover, within the framework of sustainable development, doing so could be a great vector for development, considering the sheer number of people who derive a living from agriculture and would otherwise be on the brink of poverty and food insecurity.

Defined simply, “climate mitigation” is any action that aims to reduce greenhouse gas emissions and “climate adaptation” is any action whose purpose is to adapt to already existing or expected climate conditions. In the case of agricultural production, climate-mitigation efforts would try to minimise transport and the resulting emissions

by employing local workers, minimising inputs that have to be brought in from elsewhere, and selling locally. Another mitigation strategy would be to reduce reliance on greenhouse-gas-intensive industrial products, such as nitrogen-based fertiliser. Measures for climate adaptation in agriculture could work towards drought-proofing crops by curtailing the use of water and reducing evaporation rates; making use of different varieties to minimise crop losses due to changing pest and disease patterns; and increasing soil fertility to compensate for predicted depletion. Adaptation techniques generally deliver in the long term and require some upfront costs.

It might already be clear that, due to financial instruments such as carbon taxes or emissions trading schemes, mitigation might be more profitable than adaptation in the short term, while adaptation will only deliver in a decade or so when the effects of the climate crisis are fully felt and recognised. This might be why many developing countries are prioritising mitigation over adaptation, with some perhaps thinking that mitigation now might finance adaptation later. Let us not forget, however, that “short-termism” is partly, if not wholly, responsible for creating the climate crisis in the first place. Apart from the fact that most developing countries cannot afford to do mitigation and adaptation at the same time, I still argue that prioritising mitigation is problematic for them. Not least because mitigation supports better-off actors in the industrial sector while long-term investment in adaptation will also help the poor by providing future food and financial security.



Hazim Azghari's interests range from climate-change adaptation to sustainable low-tech solutions. Hazim works for an environmental NGO and teaches sustainable development, agroecology and other topics. His current research revolves around the adaptation of sustainable traditional techniques in building and agriculture for contemporary rural settings and the contribution of such techniques to a decentralised climate-change adaptation plan for the sake of a low-carbon future.

Agriculture's Coming Suffering

The climate crisis will certainly hit diverse sectors of Morocco's economy, but it is particularly important to highlight the agricultural sector, as this will suffer badly under even the most optimistic climate-change scenario. Agriculture contributes 14.8 percent of Morocco's GDP and employs 38% of the workforce.³ The sector is not only affected indirectly by increasing input prices but also directly by changing weather patterns. Irregular rainfall is of particular concern, as many vegetable crops need reasonably predictable rain to determine ploughing and planting schedules accordingly and not lose soil fertility or seeds to birds and insects. Longer heatwaves, which are also on the agenda of the climate crisis,

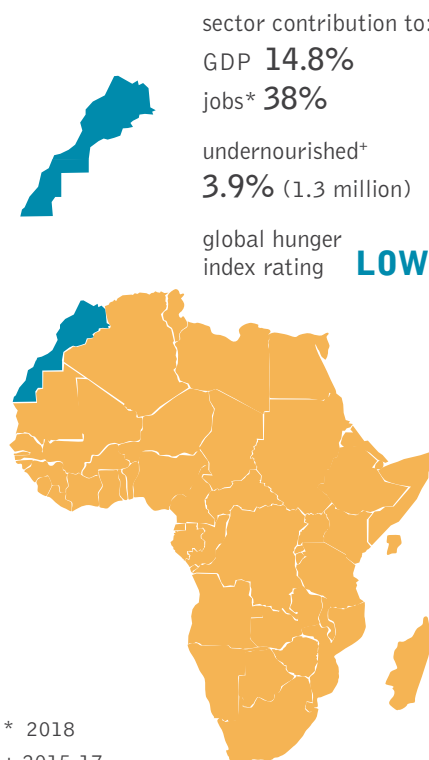
can burn the flowers of fruiting trees. A heatwave prolonged by only one or two days can have devastating effects on Morocco's olive trees. Higher temperatures might be generally perceived as good in some mountainous regions, but they also lead to increased agricultural demand for water in an already water-stressed country.

The overall ecosystem will also respond to the climate crisis, with indications of a potential increase in locust infestations due to the redistribution of insect populations. The possibility of pollinators dying out has alone been quantified at a cost of US\$200 billion worldwide.⁴ The climate crisis is also intertwined with social concerns. Affordable food will no longer be affordable to workers in Morocco's agricultural sector if they suddenly fall below the poverty line or lose their jobs. Smallholder farmers, who constitute the bulk of the sector's workforce, will be more adversely affected than farmers who can afford a few dips in their profit margins.

Many people in the various ministries and organisations concerned are thinking about solutions and some are already being implemented. Unfortunately, they are generally piecemeal, picking up one issue and disregarding others. For example, the International Centre for Agricultural Research in the Dry Areas (ICARDA) in Rabat studies alternative pollinators to see whether the bumblebee, grasshopper or even the butterfly could respond to the pessimistic scenario of major honeybee die-off.⁵ Such an initiative is laudable, but it does not take into consideration the intricate nature of entomology: most insects rely on each other to survive, and the insect food-web might not persist in the absence of such a major actor as the honeybee. The introduction of new insect populations could also constitute an invasive species in a particularly fragile region. Tech-fixes like this would benefit from a holistic perspective in which each particular solution is part of a system of solutions, all working towards a common goal. A surgical intervention or replacement created from an engineering mindset does not succeed when nature proves not to function like a machine.

Smallholder farmers, who constitute the bulk of the sector's workforce, will be more adversely affected than farmers who can afford a few dips in their profit margins.

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Adaptation Techniques

So, if adaptation is a priority and it demands to be done in a holistic manner, what would a win-win scenario look like? It could be



one in which adaptation techniques deliver short-term gain as well as long-term protection, cost very little upfront and do not demand a huge technology transfer. A series of water-saving techniques derived from agroecology might provide just that.

Agroecology is a science that applies insights from ecological processes to agriculture. For example, drought-proofing through the application of compost made of agricultural residues to increase water retention (turning soil into a sponge, basically), the use of mulching to reduce evaporation, plus low-tech remedies such as drip irrigation, which is already available in much of the country, could alone save up a large amount of water.⁶ Multistorey tree planting can also create shade for shade-loving crops to flourish without too much water, as they are protected from evaporation and benefit from the trees' transpiration. The oasis model – although in decline in Morocco and mostly small-scale – has a lot of insight to deliver. Palm trees provide an overstorey that shades fruiting trees, which in turn provide shade to crops growing under them, namely bushes, tubers and shoots such as alfalfa, which is a prime fodder crop in Morocco. The difference in the trees' height also reduces competition for water as it occurs at different depths in the soil. Bigger oases can be created by replicating the same model, irrigating with drip irrigation, turning all the residue and cattle manure into compost and applying it, and mulching on top of it with all the dried leaves from

the over-storey trees. Such a system would provide short-term gain in water costs, provide long-term protection from heat and hydraulic stresses due to a humid microclimate, costs very little in infrastructure, and would only demand basic technologies such as drip irrigation and, ideally, a chipper to facilitate the shredding of agricultural waste for compost, which could also be shared by farmers from the same village.

Picture courtesy of Mohammed Erribani, 2019. Notice the diversity, mulching, and multistorey planting.

Instead of opting for risky genetically modified organism (GMO) varieties, which are designed to be drought-resistant but whose impacts on the ecosystem are untested, a mix of diverse varieties will provide genetic resilience in the face of disease and climate stress.

Such a radical departure from a conveyor-belt type of efficiency would require more complexity in its management and, in most cases, more human labour than machine labour. Rather than one big tractor working the field, there might be twenty farmers doing different jobs, from flipping compost to mulching trees. This working strategy would lead to the establishment of stronger farmer unions and cooperatives to advocate for greater control over conditions and decision-making regarding farm work, for different systems of profit-sharing than the risky daily employment schemes used conventionally today in Morocco, and

generally for a worker-centric rather than produce-centric approach to subsidies in the agricultural sector. On a farm level, such a system might look like the image on the left of a project in India, which was implemented by Moroccan consultant Mohammed Erribani in collaboration with The Hans Foundation.

Another win-win strategy might be termed “adaptation through fertility management”. Instead of opting for risky genetically modified organism (GMO) varieties, which are designed to be drought-resistant but whose impacts on the ecosystem are untested, a mix of diverse varieties will provide genetic resilience in the face of disease and climate stress.

As different subspecies perform differently under the same conditions, artificial selection and seed-saving of the best performing plants will yield resistant varieties while, at the same time, saving the cost of buying hybrid seeds or expensive copyright-bearing GMO seeds every year. In addition,

To maintain their business role, big agricultural companies can transform their operations towards “transitional agriculture”, helping farms to set up new agroecological systems and selling them low-tech equipment.

succession management through the use of summer cover crops such as maize or clover during the hottest months can help protect the soil from losing its fertility.

Inoculating the soil with compost and irrigating with compost tea (a fermented brew of compost soaked in aerated water overnight) can multiply the number of micro-organisms present in the soil, which in turn leads to better aeration, decomposition of the mulch, and ultimately increased fertility through the creation of a layer of humus every year. As the layer's thickness increases with each passing year, along with the water-retention capacity of the soil, the land becomes cheaper and cheaper to manage for fertility. This strategy can indeed provide a short-term gain in terms of added fertility, resistance to disease, and reduced seed costs as it safeguards the future of the farm against fertility loss due to the climate crisis, and leads ultimately to a better-suited environment for agriculture under harsher conditions.

While this all might seem very logical, it cannot be denied that many agricultural service providers (and thus economic actors) will be made irrelevant. Economic losses would be felt by the big agricultural conglomerates that sell fertiliser and pesticide, such as Syngenta, Dow Chemical and Bayer-Monsanto, and those selling the equipment required for large-scale agriculture. Knowing that some of these actors may constitute a powerful lobbying force in politics, there is need for a sustainable-agriculture lobby to counter potential resistance to change.

Both of the climate-adaptation strategies mentioned here also provide a sizeable contribution to climate mitigation by increased carbon-sequestration (carbon capture) in the soil.⁷ In fact, the adaptation of agriculture through agroecology could very well deliver mitigation benefits down the line – although it may be argued that it would come too late.

A better adaptation strategy for mitigation purposes would be to train farmers and professional agriculturalists in agroecology and in-house water-saving and fertility management. Doing so might reduce the need for industrial nitrogen fertiliser and expensive seed imports, both of which are energy- and greenhouse-gas-intensive industries. Developing agriculture that is centred on small-farm production through knowledge transfers in a decentralised fashion will surely provide Morocco with a blueprint to emit less greenhouse gas without cutting corners in its economy, and to alleviate the risk of a big increase in poverty. The ideal scenario would be to develop a Moroccan sustainable-development strategy that is radically different from what is conceived as sustainable development in other contexts, or simply reducing greenhouse gas emissions.

The new strategy, which will involve less high technology and make innovative use of low technology, would replace the current agricultural model that requires massive subsidies and keeps the wealth concentrated in the hands of a few. To maintain their business role, big agricultural companies can transform their operations towards “transitional agriculture”, helping farms to set up new agroecological systems and selling them low-tech equipment such as chippers, composters, compost-tea brewers, and even hand-powered mini-tractors. The economic opportunity then switches from the ever-increasing drive for more efficient

use of big machinery to the development of a supply chain of sustainability, such as providing local labour and local materials for the manufacture of equipment, decentralising operations, developing region-specific innovations in low-tech machinery, seeds and techniques, and creating new farmer-worker economic schemes.

Conclusion

To conclude, climate adaptation is a necessary priority for Morocco to avoid many risks. Morocco's economy and population are both exposed to the climate crisis, and the country's budget and administrative resources remain hard-pressed to engage in both adaptation and important mitigation actions. For example, renewable energies are only expected to provide 52% of Morocco's installed capacity of energy production by 2030, which is a tiny figure as the coun-

try currently imports almost all of its energy needs in the form of coal (31%), hydroelectricity (22%), fuel oil (25%), and natural gas (10%).⁸

For a developing country like Morocco, sustainable development entails staying within the carrying capacity of the environment as well as improving human development. A focus on adaptation serves both goals, particularly through holistic agroecological strategies in the agriculture sector that can deliver short-term gain, long-term protection and poverty alleviation through the provision of income and food security. It surely represents a win-win approach as it also mitigates the climate crisis by reducing dependency on the carbon-emitting industries that constitute the backbone of today's agriculture. Nevertheless, the necessary economic restructuring will demand strong political will and lobbying from organised civil society. ■■■

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The Role of GMOs in South Africa's Response to the Climate Crisis

Harald Witt

Despite claims of a vibrant democracy in South Africa, validated by one of the most progressive rights-based constitutions in the world, widespread hunger and malnutrition persist in the country, marked by child stunting, lack of dietary diversity, increased vulnerability to disease and an obesity epidemic. Recent statistics indicate that, in a population of approximately 55 million, 6.8 million people experienced hunger and 10.4 million people had inadequate access to food in 2017.¹ This indicates the failure of the South African government to adequately deal with the complex and multifaceted question of food security. This issue will undoubtedly become more significant as the climate crisis and climate instability impact more dramatically and unpredictably on the fabric of society. In this context, questions arise as to whether technological "fixes" in agriculture, such as genetically modified organisms (GMOs), could be the panacea for achieving food security in a context of the climate crisis.

Threats to Food Security

The food and agriculture sector is unique in that it is both a major contributor to the climate crisis and especially vulnerable to its impacts. Crop and livestock production will undoubtedly experience the most observable effects of climate instability. Increases in temperature (heat stress), evaporation and plant transpiration, and the frequency of extreme climatic events such as droughts, floods, heatwaves and

cyclones will directly impact crop health and yields as well as livestock productivity. Agricultural pests and diseases will increase, soils will be eroded, and soil nutrients will be lost. Irrigation regimes will have to be more regulated or phased out altogether as groundwater and surface water sources become depleted or unreliable. Croplands, pasture and grazing lands will be more susceptible to bush encroachment and the spread of invasive alien plants. The increase in general biomass, due to higher levels of carbon absorption, will contribute to more devastating fires with direct and indirect effects on agricultural productivity. Employment opportunities and livelihoods associated with agriculture could decrease, thus intensifying food insecurity. A decline in the availability of food would lead to increases in food prices (price volatility) through the interplay of declining supply and growing demand, reliance on imported foods, and the increased cost of transportation due to shifts in production areas. Quantifying the actual impact that increased climate instability may have on agricultural production is difficult. Nonetheless, the recent drought and widespread fires in the Western Cape province – which led to a production decline of about 20 percent, along with the loss of approximately 30 000 jobs – may offer some foresight.²

As more than 90 per cent of South Africa's grain is rain-fed, any changes in rainfall patterns will impact directly on this sector, which includes some 2.3 million households. Some estimates indicate that "subsistence farmers could suffer revenue losses of up to 151% and commercial farmers 111% by 2080 due to the climate crisis".³ Climate-change modelling predicts a wide

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range of potential impacts on the average annual yield of dry-land crops, “although for most crops a decline is likely”.⁴ In terms of maize, production in the North West and Free State provinces will decline substantially, while the Eastern Cape and southern KwaZulu-Natal may become new centres for maize production. Predictions on the possible impact on maize yields due to these spatial shifts range from a “national reduction of 25 per cent to an increase of 10 per cent”.⁵ Other models predict possible decreases from 10 to 40 percent in the more distant future.⁶

The Government's Response

The 2012 National Development Plan (NDP) states that South Africa's “capacity to respond to the climate crisis is compromised by factors such as social vulnerability and dispersed and poorly planned development, rather than inadequate climate-specific policy”.⁷ Numerous legislative frameworks, policies and political statements do speak to the climate crisis adaptation and mitigation, but meaningful implementation of interventions remains poor.

A number of national, provincial and municipal programmes related to food security have been introduced, including:

- projects to support agricultural production, such as farmer settlements, community food production, one-household-one-hectare programmes, and tractor support
- poverty packages, which include seed and livestock handouts
- nutrition education and the pro-

motion of staple crops containing increased levels of vitamin A, iron and zinc

- marketing support; loan schemes; small enterprise development; and the provision of infrastructure.

At a broader level, the government continues to prioritise funding for social programmes, such as school feeding schemes, general food assistance, emergency food relief, social grants, free health services, and public works programmes. Additional assistance may come in the form of agri-parks, agro-processing opportunities and land reform, as well as investment in research and technology to respond to production challenges such as those brought about by the impact of the climate crisis.

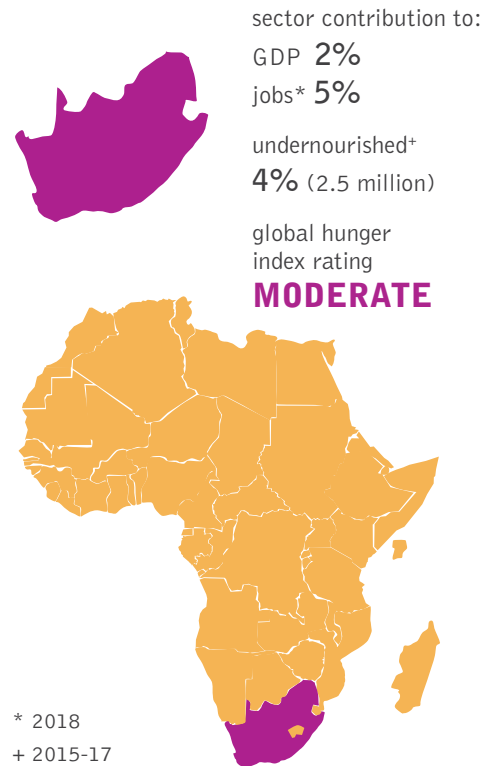
Mama Mamrhasi from Hobeni Village, South Africa, displays wild spinach ('imifino' in Xhosa) from her home garden. Imifino is gathered from the nearby forest and replanted in home gardens, providing an important safety net in times of food scarcity. Imifino is based on indigenous knowledge held by elder women in the community, and reflects their critical role as custodians of agricultural biodiversity.

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The emphasis on soil conservation and fewer industrial inputs should be applauded – yet the promotion of CSA strategies does little to change the existing system or challenge the policies that led to the crisis in the climate–food system in the first place.

In the sphere of crop production more specifically, one of the main adaptation strategies is the promotion of “climate-smart agriculture” (CSA).⁸ This includes practices such as conservation agriculture and no-till agriculture. According to the national department of agriculture, forestry and fisheries (DAFF), CSA is more environmentally sustainable than current

SOUTH AFRICA AGRICULTURE & HUNGER



practices, reduces production risk, utilises fewer industrial inputs and therefore brings down the cost of production. All of this may be true – and the emphasis on soil conservation and fewer industrial inputs should be applauded – yet the promotion of CSA strategies does little to change the existing system or challenge the policies that led to the crisis in the climate–food system in the first place.

Although the NDP notes public concern over the “genetic modification of food crops”, this has not prevented the government from presiding over Africa’s only “mega-biotech country”.

In terms of the role of GMOs, there is some ambiguity in government documents, although less so in practice. DAFF’s development plans speak of planting “different varieties of the same crop and maintaining seed varieties”⁹ and the “adoption of appropriate technology, such as the development and use of drought resistant yellow maize

varieties”.¹⁰ Yet there is little real evidence of the former taking place, and the term “appropriate technology” appears to apply primarily to conventional industrial fixes, including GMOs.

Although the NDP notes public concern over the “genetic modification of food crops”,¹¹ this has not prevented the government from presiding over Africa’s only “mega-biotech country”,¹² with a total of 2.73 million hectares dedicated to the planting of GMO crops.¹³ South Africa is also the first country to allow the genetic modification of its staple crop, namely maize. It is thus not surprising that state-driven CSA research is “aimed to produce low-cost drought tolerant conventional and transgenic (GM) hybrids”.¹⁴ Despite the contradictory and ambiguous statements by various organs of the state on the issue of GMOs, there is little doubt that GMOs will play a significant role in government climate-change adaptation programmes, primarily in the form of public-private partnerships.

Arguments For and Against the Use Of GMOs

Despite state support of biotechnical solutions for the regeneration of rural economies, the debate for and against the use of GMOs to ensure food security remains a contentious one. Although the biotech industry acknowledges that GMOs are not a panacea, this has not prevented proponents of technological solutions from promoting GMOs as such. They argue that the risks are manageable and far outweighed by the need to “develop faster maturing and better yielding disease-resistant and drought-tolerant crop varieties to counter a changing climate”.¹⁵ The polarised nature of this debate was recently reflected in an exchange on the Daily Maverick, one of South Africa’s foremost digital news platforms.¹⁶ Columnist Ivo Vegter maintains that GMOs are “environmentally more sustainable than conventional crops”, lead to “improved yields”, “increased incomes”, and create more employment opportunities, and that nutritionally enhanced crops such as Golden Rice can help satisfy the nutritional needs of the poor in developing countries.¹⁷ For proponents, the application of new biotechnologies – like GMOs – is the gateway to a technologically enhanced food-secure future, in which a broader

spectrum of biotech solutions will increasingly be applied in food manufacturing and agriculture.

The critique of GMOs in the food security discourse is based on broader developmental and environmental concerns. In this view, agricultural development is not only about yields and productivity: it's about people and ecologically sustainable agrosystems. Critics also argue that the patent rights associated with corporate control of GMOs undermine indigenous knowledge systems and the social and cultural aspects of traditional agriculture. Such patents negate the ancient work of agriculturalists in the development of crops and, by disallowing the exchange of seeds, undermine the social cohesion of farming communities.

As GMOs are still associated with a larger package of inputs that is only available to better resourced (generally male) farmers, rural communities will experience economic differentiation (disproportionally gendered), leading to the dispossession of land. Moreover, GMOs foster dependency on external inputs – often imported – rather than supporting localised low-input systems. Heirloom and local landrace crops are also at risk of contamination by GMO crops, again affecting the integrity of traditional varieties and impacting seed diversity. Critics also question the claims of increased yields and decreased chemical use with GMO crops and argue that GMOs are part of the conventional agricultural mindset that has contributed directly and indirectly to the climate crisis.

Alternative Approaches

Whether the existing food system can be sufficiently modified or transformed to become truly sustainable and climate-resilient remains an open question. Change is constrained by the vested interests of agribusiness as well as the seductive power of a dominant developmental narrative that focuses exclusively on efficiency and productivity. Nonetheless, the biophysical contradictions inherent within industrial agriculture¹⁸ and the emerging crisis resulting from the historical externalisation of costs by industrial agriculture has led to a groundswell of resistance. There are calls for a significant change to the system and even a complete paradigm shift that would alter the composition of the entire food sys-

tem. Such a system would challenge existing power relationships by democratising the production and distribution of food and prioritising the interests of consumers and farmers and sustainable and ethical farming practices. It will also require rethinking agriculture's place “in conceptions of development and modernity”.¹⁹

What such an alternative system will look like and how it will function is highly contested. This is unsurprising as it involves conflicts over fundamental values and definitions in a web of general uncertainty as to what a climatically unstable future may actually entail. The emergence of a progressive farmer, farmworker and consumer

As GMOs are still associated with a larger package of inputs that is only available to better resourced (generally male) farmers, rural communities will experience economic differentiation (disproportionally gendered), leading to the dispossession of land.

movement that could push back against the dominant productivist agricultural system is still in its infancy in South Africa. Nonetheless, its key considerations would focus on more localised, biodiverse and less energy-intensive production based on agroecological principles and framed by the concept of food sovereignty. Skills would replace inputs: rather than one set of inputs replacing another, agricultural work would once more be valued, and there would be fewer mechanistic applications of bioscience. More effective soil and water management strategies, soil nutrient recycling and biocontrol would be introduced. A variety of agricultural enterprises would be encouraged, including mixed farming systems, agroforestry systems, food forests, and polycultures rather than monocultures. Such systems would be more adaptable to climate instability. In addition, appropriate technological innovations should be adopted and adapted to enhance the practice of sustainable farming – regardless of scale – and empower farmers rather than substituting for labour, skills and knowledge. Resilience in the face of the climate crisis would also include a rethinking and re-imagining of urban and peri-urban environments as holistic entities that pro-

duce food, generate energy from renewable sources, recycle waste, and so forth.²⁰

Concluding Comments

The inability of the South African state to meaningfully address the burning issue of food insecurity in the current context does not bode well for a future where the climate crisis and climate instability will magnify key problem areas in the entire food system. There is also little appetite for challenging the structure of an agri-food system that appears to be entrenching inequality and food exclusion. Furthermore, the historical bias towards agricultural production as the major strategy for food security remains and continues to shape the food security discourse. More pertinent questions about how food is accessed and consumed or how the broader food system functions are not on the table. Regardless of what its policy documents may state, the government's focus continues to be framed by a produc-

tivist paradigm in which technological fixes such as GMOs and other inputs play a key role, especially in the context of climate instability.

What is required is a dynamic and flexible production system, one that integrates rather than disaggregates, includes rather than excludes, is farmer-centred rather than profit-centred and, most importantly, is sustainable and adaptable. This will ultimately involve the development and implementation of appropriate policies. Yet, as Lang and Heasman point out in *Food Wars: The Global Battle for Mouths, Minds and Markets*, the science of policy-making (and, in South Africa, policy implementation) is "inevitably political ... is not precise: it is a product of politics and the (im)balance of forces. It is a matter of timing, mechanized by champions, vision and imagination – both private and popular".²¹ The time to activate new champions, vision and imagination is now. ■■■

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Peri-Urban Agriculture and Food Security in a Changing Climate: A View from Cape Town

Nazeer Sunday

Interview

Since the relocation of German Lutheran farmers to Cape Town in 1885 to assist with food provision for the growing settlement, the Philippi Horticultural Area (PHA) has been the breadbasket of Cape Town. Its microclimate is ideal for producing horticultural crops (vegetables, herbs and flowers), and the abundance of aquifer water from the Cape Flats Aquifer below make these 3 000 hectares of farmland the most productive peri-urban agricultural hub in the country. Numerous City of Cape Town studies and independent reports identify the PHA as critical for meeting the food security needs of the city and addressing the government's 2030 land reform targets. Its farmworkers are primarily women and youth.¹

But the PHA land is also highly prized for urban development. With the pressure to create more housing for a growing population and the prospect of converting low-rates-paying agricultural land into more fiscally lucrative housing developments, the city has led a relentless charge to "develop" this "rundown" area for almost a decade.

Perspectives spoke to PHA farmer Nazeer Sunday, chair of the PHA Food and Farming Campaign that was born from the need to protect the area from proposed development and to promote urban food security and agroecological farming in a changing climate.

Perspectives: Food insecurity is generally discussed in terms of rural agriculture. Why is this misleading in the South African context?

Sunday: It starts with the simple fact that 63 percent of South Africans are living in urban areas and the number is expected to rise to 71 percent by 2030.

It's unimaginable to think that farmworkers in the PHA, located in a seemingly modern city like Cape Town, are food insecure. But this is the reality. Low wages and the high cost of living in the city mean that choices about food purchases are made after fixed expenses such as rent, electricity, water, transport are covered. The high price of a basket of basic foodstuffs negatively affects the nutritional quality of food choices made.

A 2012 African Food Security Urban Network study of a thousand households in three low-income wards in the city – Ocean View, Philippi and Khayelitsha – found three-quarters of these households are food insecure. Urban poverty, unemployment and inequality coupled with high crime rates impact families' ability to purchase food and the level of food insecurity in the city.

Another factor that contributes to the food insecurity in the city is the high competition for job opportunities available and this is exacerbated by the migration of rural people into the city looking for work.



Nazeer Sunday is the chairperson of the PHA Food & Farming Campaign. Having been born in the PHA, his family was removed when he was six years old. He returned nearly 26 years ago, and wants to leave a viable, small farming legacy for his children.

This pushes wages down. The rural exodus is largely due to the lack of a government rural-development plan, the lack of agrarian reform, corruption, and the concentration of resources in cities.

What makes peri-urban agricultural areas like the PHA so important?

Only 12 percent of South Africa's land is suitable for crop cultivation, and only 3 percent is considered to be highly fertile. Two million hectares have been lost over the last 25 years. This is a direct threat to household food security, via high food prices, and food sovereignty as a country, as it leads to increasing dependence on imported food.

Agricultural land on the periphery of cities and towns plays a major role in the provision of locally produced and affordable food through horticultural crops such as vegetables, fruits, flowers, berries and nuts. With 3.5 crop cycles per year – arguably double that of other horticultural production areas – the PHA provides a significant amount of Cape Town's vegetables. This could easily be expanded to include more polyculture, i.e. the integration of small animals such as chickens for eggs and meat, ducks, rabbits, geese, pigs and farmed fish. Even milk and dairy can feature to some extent in the peri-urban farming landscape. The suburb

of Durbanville in Cape Town was a dairy producing area before urban sprawl laid waste to the farming.

Moreover, agricultural land on the periphery of cities could help unlock smallholder farming that can create jobs and livelihoods. If, with city council support, small-scale farmers' produce could enter communities not via supermarkets but through informal traders and farmers' markets, it could potentially address issues of access and affordability, reduce the impact of food production on the climate, and build climate resilience.

Peri-urban agricultural areas are also essential for the provision of ecosystem services such as stormwater harvesting, flood mitigation, the recharging of aquifers, waste-water recycling, protecting biodiversity, recycling nutrients and carbon sequestration.

If, with city council support, small-scale farmers' produce could enter communities not via supermarkets but through informal traders and farmers' markets, it could potentially address issues of access and affordability, reduce the impact of food production on the climate, and build climate resilience.

What are the main threats to peri-urban agricultural lands like the PHA?

Most of the high-potential agricultural land in the periphery of cities and towns is under high threat by the development of country-living estates; the development of low-income housing – away from economic opportunities; mining; and non-food agricultural activities such as boutique wine farms or game farms. With housing developments becoming extremely lucrative business for banks and property developers and for the council that benefits from the income of upwardly spiralling rates-valuations, land speculation is actively pursued to increase the rand value of peri-urban land. The cabal of banks and property developers – I would add the political estate – forms what [Josh] Ryan-Collins calls the "real estate-financial complex" in his book *Rethinking the Economics of Land and Housing*. The value of a newly built house can increase by as much as 50 percent in five years: Cape Town is third in the world for property inflation.

Of course, housing for low-income households is an imperative. But these should be located where the most marginalised have access to services and economic opportunities. For the past 25 years, our



housing policies have failed to address spatial apartheid and have created a situation where the poorest are forced to spend the bulk of their wages getting to and from work. National, provincial and local governments all own roughly 10 000 hectares in well-located Cape Town suburbs – this is the land on which affordable housing must be provided.

The pressures on peri-urban land directly impact food availability and affordability as well as the climate crisis, due to the high carbon footprint of our food. The benefits of primary food-production areas to secure affordable, locally grown food with a minimal carbon footprint are currently not considered in the City of Cape Town's planning.

Feline, a volunteer, collects produce from the Vegkop farm.
© Nicky Elliott

Why are the values of ecosystem services embedded in agricultural land and land reform not assigned their proper worth in Cape Town's economic development discourse?

This is largely a political issue. Twelve studies – city, provincial and independent – produced between 1997 and 2018, and generated in response to the struggle to protect the PHA, have been ignored by political decision-makers. These confirmed the importance of the PHA in keeping food prices down and highlighted the area's potential to support 5 000 small-scale farmers which can create 30 000 direct jobs, 55 000 indirect jobs, with 2 million tonnes of organic food for local and export markets. For city and provincial officials to take decisions counter to these reports' recommendations required direct political interference in various departments like spatial planning, environment, development planning, safety and security, water and sanitation, economic development, etc. Where this interference was resisted by officials, threats, victimisation and even sacking of officials occurred. In the case of Cape Town, both the spatial planning and housing departments were dismantled in an extensive restructuring exercise in 2016–17 that saw many of the city's most competent civil servants lose their posts and the concentration of power in the mayor's office. The ruling party's caucus voting instruction is also used to keep independent-minded councillors in check.

It's become clear: collusion between property developers, politicians and more broadly political parties forms a nexus that results in state capture, undermining the role of agriculture and peri-urban farmlands in the city's economy. Property has become the primary focus of an economic development discourse that is said to promote economic growth to address poverty, unemployment and inequality. But, as Josh Ryan-Collins notes, and as confirmed by experiential learning in the PHA, this economic development discourse does not create jobs (except some short-term construction jobs), does not provide affordable housing, excludes social housing, does not bring down housing rentals and does not create new goods and services – all factors which would address poverty, unemployment and inequality. Housing is a consumption item.

How can peri-urban agricultural land be better protected?

We need to advocate for a more balanced economic development discourse. To achieve this balance, the protection of agricultural land needs to be enforced. More than that, land for horticultural production must be expanded.

Drawing on the research done for the city of Rosario [Argentina], feeding a population of 5 million – as Cape Town is projected to have by 2030 – will require 30 000 hectares. Expansion of horticultural land offers an immense opportunity for land restitution based on food security and climate resilience. The pool of human capital with traditional farming knowledge and experience exists in the city, as evidenced by urban farmers and the vibrant food-garden culture. Emeritus professor of economics Sampie Terreblanche

In our ongoing court battles against the City of Cape Town, the Western Cape Province and developers, we are arguing for the explicit integration of food security and climate crisis concerns into the environmental impact assessments required before developments are allowed to proceed.

–marginalised by the ANC and business elites – noted in his book *Lost in Transformation* that, to decrease South Africa's poverty, unemployment and inequality and secure food security, the country needs to expand its manufacturing sector and its peasant agriculture. Re-peasantising Cape Town is not only possible, it's an imperative.

In our ongoing court battles against the City of Cape Town, the Western Cape Province and developers, we are arguing for the explicit integration of food security and climate crisis concerns into the environmental impact assessments required before developments are allowed to proceed. If this case is lost, the destruction of peri-urban agricultural land will proceed at a rapid rate in the city and across the country. Food security and, more broadly, food sovereignty and land reform – key components of a developmental state – will not be achieved.

What are some of the main constraints faced by existing small-scale farmers in the PHA?

Society puts a low worth on small-scale farmers and small-scale farming; industrial-scale farming is perceived to be a model of success. This impacts on the confidence of small-scale farmers and withholds support for appropriate resources and training from government. Education and awareness are key to reverse this. This is the subject of ongoing work of the PHA Campaign, centred around the message, "Do you know where your food comes from?" The development of small-scale farmers requires the whole society's support.

Best practise breeds success. To promote small-scale farming, a small-scale farming model in horticulture is being developed that can act as the repository of knowledge – traditional and scientific – and a space for learning. The PHA Campaign's Vegkop Polyculture Farm is an attempt to build a two-hectare farming model that could be used for land reform in the PHA. The farm is doing farmer-to-farming learning with evicted and unemployed women farmworkers to build capacity to become farmers.

How could their productivity be ensured in a changing climate?

Access to land with terroir qualities – good soil, water, climate – that is located near markets. This will make farming an economically viable option for many small-scale farmers juggling multiple jobs to survive. The PHA offers such a space.

Peer-to-peer learning in agroecological farming practise – such as diversification of crops, conservation tillage, green manures, natural fertilisers and nitrogen fixation, biological pest-control, rainwater harvesting, and production of crops and livestock in ways that store carbon and protect forests – is another important avenue.

The development of a *proefplaas* [experimental farm] that can function as a repository of knowledge and best practise wherein farmers can learn and engage would play an important role in this context.

How can urban agriculture contribute to urban climate resilience?

Firstly, let me be clear about what we mean by urban agriculture: it's the education of city folk around issues of nutrition and food gardening, and the establishment of roof or food gardens. There is little evidence that "urban agriculture" can be used as an adequate response to food insecurity or as a path to food sovereignty. However, rooftop gardens can improve micro-climates, increase food production and waste recycling. Urban greening – let's re-fynbos the City of Cape Town and plant one million trees on the Cape Flats Aquifer that will clean surface water for cleaner aquifer recharge – is imperative for reducing urban temperatures and the energy demand for cooling.

The Philippi Horticultural Area is not this. The PHA is a farming area, a peri-urban farming area, the location, size and scale of which is adequate to contribute significantly to both mitigation of climate emissions and resilience to the pending market fluctuations that will come about as climate shocks hammer various food source streams.

A key victory from the drought and water crisis was that the authorities acknowledged, for the first time, the value to the city of the Cape Flats Aquifer. The PHA is the recharge zone for the Cape Flats Aquifer and the PHA is drought-proof because of the aquifer. The aquifer is able to supply the city with a third of its potable water use under the condition that its recharge area – the farmlands – is protected. Ironically, a managed aquifer recharge programme was initiated, and yet city and provincial governments are still doggedly opposing the PHA Campaign in court alongside developers. Developments which will destroy both resources and thus the city's climate resilience. ■■■

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Realising the Right to Food: Kenya's Approach to Food Security in the Context of the Climate Crisis

Layla Liebetrau

Like many other African nations, Kenya is looking at its agricultural sector as a base from which to grow the economy and boost foreign exchange earnings while attempting to reduce food insecurity. As one of the key pillars of its development agenda, known as the "Big Four Plan", President Uhuru Kenyatta's Jubilee government proposes to "modernise" the agricultural sector by supporting the growth of large-scale industrial food production. The country is therefore at an agricultural crossroads, where decisions taken now will impact the country's food security and socio-ecological transformation for decades to come. As this article shows, however, such policy decisions may be based on a lack of appreciation of the current realities in the sector, a misdiagnosis of the causes of the country's food security problem, and an inadequate consideration of the effects of climate change.

which dominates the diet of sub-Saharan Africans – makes up more than half of smallholders' household production in Kenya. Smallholders also cultivate sorghum, millet, cassava, potatoes, beans and vegetables.³

Eighty percent of the rural population relies on small-scale farming for their livelihood⁴, where labour is provided disproportionately by women, although they have little ownership and control of the farms they work. Women provide 80 percent of Kenya's farm labour and manage 40 percent of the country's small-scale farms, yet only own roughly 1 percent of agricultural land and receive just 10 percent of the available credit.⁵

A History of Food Insecurity

Despite the relatively large participation of households in the agricultural sector, systemic hunger and routine food crises have been a recurring feature since independence in 1963. The 2019 Global Hunger Index ranks Kenya as 86th of the 117 countries it measured for food security and classifies the country's condition as "serious".⁶

Over time, successive regimes have committed to address the matter. In 1972, Kenya signed the International Covenant on Economic, Social and Cultural Rights, obligating the government to respect, protect and fulfil the realisation of the right to food. Article 43(1)c of the Constitution adopted in 2010 guarantees every person "the right to be free from hunger, and to have adequate food of acceptable quality".

Nevertheless, an estimated 25 percent of the population still experiences chronic



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The Status Quo: Kenya's Agricultural Sector and Food Economy

Agriculture in Kenya is predominantly characterised by small-scale farming. Of the estimated 4.5 million farmers who cultivate approximately 90 percent of the country's agricultural land,¹ about 3 million work in smallholdings, that is, roughly 75 percent of all farms.² Small-scale farmers use a mix of conventional and organic farming practices to produce over 70 percent of the gross value of marketed agricultural produce. Maize –



food insecurity, a category that ranges from people who cannot afford to eat enough food to those whose diets lack nutritional diversity and who are either undernourished or obese. An average smallholding family in Kenya generates a gross income of about USD2 527 per year. With an average family size of approximately five persons, this amounts to about USD1.4 per day per person. With this little money, the family must buy food, clothes and other goods as well as pay for housing, education and health services. Kenya's national food-poverty headcount rate is an alarming 32 percent of the population. This means 14.5 million Kenyans are classified as "individuals unable to consume the minimum daily calorific requirement of 2 250 kilocalories (Kcal) based on expenditures on food". In rural areas, the food-poverty headcount rate stands at 35.8 percent, while it is also high in core urban areas, at 24.4 percent.⁷

Kenya's overall poverty headcount rate at the national level is estimated at 36.1 percent of households. Hence, an estimated 16.4 million Kenyans have limited or diminished access to food at all price levels.

Table 1 summarises the food and overall poverty rates in Kenya.

Kenya's National Food and Nutrition Security Policy (2012) recognised that, primarily due to food not being affordable, most Kenyans subsist on diets based on staple crops, mainly maize, that lack nutritional diversity. This has had particularly devastating consequences on the nutrition

Early Childhood Development project in Baba Dogo Ward in Nairobi, Kenya.

© AKDN / Lucas Cuervo Moura

Kenya's overall poverty headcount rate at the national level is estimated at 36.1 percent of households. Hence, an estimated 16.4 million Kenyans have limited or diminished access to food at all price levels.

of women and children. Twenty-six percent of children under age 5 are stunted, 4 percent are wasted, and 11 percent are underweight. Nine percent of women aged 15–49 are thin or undernourished, while 33 percent are either overweight or obese.⁸

The impacts of climate change will

Table 1: Food and Overall Poverty Rates in Kenya by National / Sub-national Level

	Overall Poverty Headcount		Food Poverty Headcount	
	Rate (%)	Individuals (Millions)	Rate (%)	Individuals (Millions)
National Level	36.1	16.40	32.0	14.54
Rural Areas	40.1	11.69	35.8	10.42
Peri-urban Areas	27.5	0.92	28.9	0.97
Core-urban Areas	29.4	3.79	24.4	3.16

Source: KNBS Economic Survey 2018 & 2015/16 Basic Report on Well-Being in Kenya. Table 19.2: Summary of Headcount Poverty Measures, 2015/16, page 298.

worsen food insecurity. Kenya's arid landscapes have been identified as some of the most vulnerable to higher temperatures and inconsistent rainfalls.⁹ The effects of such changes on agriculture and food production are well documented: over the past two decades, four drought-related food shortages have been declared national disasters. In a country heavily dependent on rain-fed agriculture, unreliable rainfall reduces food production for both subsistence and marketing, which increases the cost of food.

The government's approach suggests that Kenya's food insecurity is a production problem. By contrast, an assessment of the situation and its history shows that it is a problem of physical and economic access as well as the unequal and inefficient distribution of food.

Increasingly dry, hot conditions and weather variability have exacerbated the devastation caused by the fall armyworm invasions.¹⁰ In May 2017, a drought that affected 23 arid and semi-arid counties pushed the annual food-basket inflation rate 21.52 percent higher than the same month the previous year. In practice, this meant that basic food-stuffs – maize meal, rice, wheat flour, cooking oil, sugar, milk – became unaffordable for most households. Data from Kenya's consumer price index shows that a household with an average monthly spend of KES40 700 (about USD390) spends 45 percent of their income on food.¹¹

Government's Response

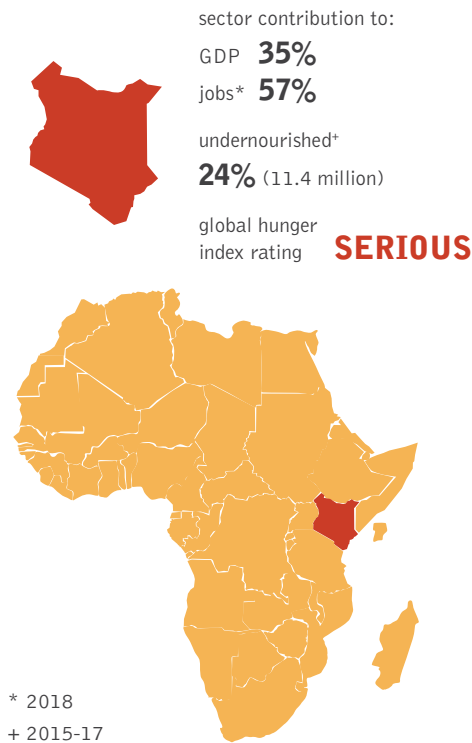
The government's Big Four Plan expects to achieve food price reductions and 100 percent food and nutrition security by encour-

aging large-scale farming and boosting smallholder productivity, thereby increasing production. The ten-year Agricultural Sector Growth and Transformation Strategy (ASGTS) proposes to achieve these goals by improving small-scale farmers' access to inputs, facilitating large-scale cultivation on more high-potential agriculture land, improving the productivity and profitability of large-scale producers, improving extension services and investing in research and digitisation.¹² These plans represent a significant departure from how farming systems have been established in the past. They are also not supported by a meaningful political commitment to implement change. For example, the 2019/20 national budget has not altered the adverse trends of low and declining allocations to the agriculture and food sector. As a proportion of total voted expenditure, the current allocation is 2.9 percent, down from 3.5 percent in 2016/17. Kenya continues to default on the commitment made in the Maputo Declaration to spend at least 10 percent of its budget on agriculture. Moreover, there is no evidence of incremental budgetary increases that would attest to the state's constitutional obligation to progressively realise the right to food.

Misdiagnosis and False Solutions

The government's approach suggests that Kenya's food insecurity is a production problem. By contrast, an assessment of the situation and its history shows that it is a problem of physical and economic access as well as the unequal and inefficient distribution of food. Even as many people are unable to afford or access a proper diet, approximately 20–40 percent of food grown

KENYA AGRICULTURE & HUNGER



in Kenya is wasted because of a lack of storage facilities or poor infrastructure to access markets.

The proposed policy remedies do not take sufficient account of the current agricultural context, which includes declining biodiversity and increasing effects of climate change. The Big Four Plan promotes industrial agriculture and large-scale production of staples, which encourages monoculture. The plan has also justified political pressure to lift the ban on importing genetically modified organisms (GMOs) and to commercialise transgenic Bt Maize and Bt Cotton. GMOs and monocropping both reduce resilience to climate change by undermining natural biodiversity. Conversely, case studies from Zimbabwe¹³, Nigeria, Tunisia, Morocco and Senegal¹⁴ show that agroecological approaches to farming improve resilience because they mimic nature, increase the soil's moisture retention, and make use of indigenous seeds and food crops that are better adapted to the local environment.

Monocultures also negatively impact soil quality. Like other parts of sub-Saharan Africa, Kenya suffers from soil constraints including acidity and toxicity, nutrient depletion, soil erosion and shallow soils.¹⁵ Planting the same crop in the same place

each year causes an imbalanced and inefficient uptake of nutrients from the soil, which reduces soil quality as well as creating greater crop vulnerability to attacks by pests or diseases.

In many parts of the country, poor soil structure and quality mean that farmers are forced to use expensive chemical fertilisers and pesticides to encourage plant growth and production. Although the ASGTS proposes to reduce the price of such inputs, their use will not only result in poorer soils but also fuel a vicious cycle of costly dependence for those who can least afford it. Moreover, the effects of pesticides and fertilisers that make their way into groundwater or become airborne can be disastrous for the health of humans and other creatures, public health costs, and food production. Food and seed production relies on pollination, but 31 percent of all registered products are currently classified as toxic or very toxic to bees, which threatens the survival of bee populations and other pollinators and negatively affects food security. The Kenyan Pest Control Products Board has registered 699 products, of which 27 percent contain active ingredients that have been withdrawn from the European market.¹⁶

Alternatives

Appropriate solutions would begin with a correct diagnosis of the causes of food and nutrition insecurity in Kenya and a proper emphasis on the risks of climate change. They would include providing contextually appropriate and adequate extension services that specifically address the needs of

To support Kenya's economic growth and mitigate against the effects of climate change and changes in global food market trends, extension services should focus on post-harvest management, water harvesting and storage, nutritional diversity and agroecological systems of farming.

small-scale farmers, and mechanisms for achieving food safety and promoting food diversity. Extension services are a critical mechanism for disseminating information and capacity building to small-scale farmers. To support Kenya's economic growth and mitigate against the effects of climate change and changes in global food market



Eldoret market, Kenya
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Committee

trends, extension services should focus on post-harvest management, water harvesting and storage, nutritional diversity and agroecological systems of farming.

Despite rising food safety concerns in the country and the Big Four Plan's prioritisation of environmental conservation as an economic enabler, the widespread use and regulation of chemical pesticides that have been withdrawn from the European market – the country's primary source of import – is not addressed in national policies. One

To shift the scenario in agriculture and food security, all stakeholders in the food system, including non-farming communities and consumers, should take part in these processes of political engagement.

proposal to address the problem would be to levy environmental taxes on pesticides based on their toxicity to the environment (land, water, air), and to human and animal health. This would mobilise fiscal revenues while mitigating the negative effects associated with pesticide application and encouraging a shift towards environmentally and ecologically friendly agricultural systems.

Instead of promoting monocropping, Kenya's agricultural policy should ensure the cultivation and availability of adequate quantities of diverse food commodities, such as non-maize cereals, fruits, vegetables and animal products. Government policies and investment should, therefore, go beyond large-scale production of staples towards supporting food diversity and indigenous food crops that are climate-resilient and nutritionally rich. This policy approach would encourage the increasing number of farmers around the country who have adopted a permaculture philosophy, as well as the many civil society actors that advocate agroecology as the scientific solution for sustainable, socially inclusive food systems, food sovereignty and the right to food. Grassroots farmer coalitions, such as the Biodiversity and Biosafety Association of Kenya and the Kenya Organic Agriculture Network, and organisations like the Laikipia Permaculture Centre are leading positive change and pushing for a shift in the way that farming is thought about and practised in the country.

In line with Article 118 of the Kenyan Constitution, which provides for public participation in making and implementing policy decisions, grassroots organisations have opportunities for civic engagement on

matters relating to food security and agriculture. Currently, it is mostly stakeholders and civic right-to-food advocates who submit memoranda on proposals for the agricultural sector. To shift the scenario in agriculture and food security, all stakeholders in the food system, including non-farming communities and consumers, should take part in these processes of political engagement.

Conclusion

Kenya is at an agricultural crossroads that poses significant implications for the country's food security and socio-ecological transformation. The government's political roadmap, the Big Four Plan, has captured the attention of public discussions and penetrated policy documents. It advocates for industrial agriculture in service of the country's GDP and export market. On the other hand, there is a growing consciousness among producers and consumers about

the effects of climate change on food security and, therefore, the need to establish food systems that are resilient, nutritionally diverse and grown in a way that supports critical biodiversity and natural ecosystems.

Any truly transformative agenda that aims to provide a holistic and sustainable solution to food insecurity in Kenya in the context of climate change and biodiversity challenges also needs to address inherent gender and economic inequalities. Annual budget allocations and fiscal policies provide key opportunities to do this. The government needs to increase the current allocations to the agriculture and food sectors. Members of the public need to make the most of their right to participate in the legislative affairs of parliament. Every opportunity to engage in shaping the country's policy framework and implementation is a critical opportunity to push for the creation of a fair and sustainable food system in Kenya. ■■■

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Biting the Hand That Feeds Us:

A Feminist Analysis of Food Rights and Food Politics in Kenya

Brenda Wambui

If global poverty had a face, it would be a woman's. Women account for half of the world's population, but 70 percent of its poor (UNDP, 1995). In 1978, Dianne Pearce coined the term "feminisation of poverty" to indicate that women experience poverty at rates that are disproportionately higher than those of men. The meaning of this term can be taken in three ways: that women have a higher incidence of poverty compared to men; that women's poverty is more severe than men's; and that, over time, the incidence of poverty among women is increasing compared to men (Catagay, 1998).

If poverty in Africa had a face, it would be a woman's. The roots of poverty for African women are found in a myriad of interrelated issues, including restricted property rights, weak governance and frequency of civil conflict. With regard to major productive assets, such as land or cattle, women's property rights are weakly defined, and a combination of custom and laws restricts their ability to own and manage land in many countries (McFerson, 2010). Weak governance interacts with traditional patriarchal structures and customs to perpetuate women's poverty by denying them property rights and the use of essential economic assets, perpetuating a system in which African women have diminished citizenship, which is in turn reflected in gender-based violence. Yet women are the main cultivators of food, undertaking about 90 percent of the work of hoeing and weeding, 80 percent of the work in food storage and transportation, and 60 percent of the work in harvesting and marketing (IFPRI, 1995).

If poverty in Kenya had a face, it would be a woman's. According to the Kenyan Institute of Economic Affairs (IEA), although the overall poverty incidence declined from 56 percent in 2000 to about 47 percent in 2005/06, the poverty headcount was higher among women in both rural and urban areas (50% and 46% respectively). The poverty level for female-headed households (50%) was slightly higher than male-headed households (48.8%) and, although poverty prevalence among all socioeconomic groups in urban areas was lower than that for rural areas, female-headed households exhibited higher poverty incidence in both rural (50%) and urban (46.2%) areas (vis-à-vis male-headed households, which had poverty incidence rates of 48.8% and 30% respectively) (IEA, 2008). Women and children are more vulnerable to both absolute and food poverty (both of which occur mainly in female-headed households) because tradition gives them less decision-making power over assets than men, while at the same time limiting their opportunities to engage in remunerated activities and acquire their own assets (Blackden and Bhanu, 1999).

Agricultural Challenges

Agriculture is a key pillar of the Kenyan economy. The agriculture sector directly contributes approximately 35% of our annual GDP and accounts for 65 percent of Kenya's total exports. It is the primary source of livelihood for the majority of the Kenyan population by way of its contribution to food security, income, employment creation and foreign exchange earnings. Small-scale agriculture and pastoralism account for



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about 42 percent of the total employment (UNEP, 2014). While 80 percent of the rural population relies on smallholder farming for their livelihood, this labour is provided disproportionately by women, despite them not having ownership and control of the farms they work on. Women provide 80 percent of farm labour and manage 40 percent of the country's smallholder farms, yet they own only roughly 1 percent of agricultural land and receive just 10 percent of the available credit (KNBS, 2017a).

Kenya is a particularly drought-prone country – only 11 percent of the country's landmass receives high and regular rainfall. The other 89 percent (29 of 47 counties) is classified as arid and semi-arid land (ASAL), where annual rainfall is low. ASAL counties are home to about 36 percent of the population, 70 percent of the national livestock herd and 90 percent of wildlife (GOK, 2018). Despite the aridity of the land, Kenya still relies on rain-fed agriculture, as opposed to

irrigation, for 75 percent of total agricultural output (UNEP, 2014).

Drought is a key challenge to the achievement of food security in Kenya as it frequently leads to famine. Biamah (2005) observes that rain-fed crop farming in the semi-arid areas has a 25–75 percent risk of crop failure, while the arid regions have a 75–100 percent risk of crop failure due to drought. To make things worse, drought events associated with the climate crisis and climate variability have become more pronounced in Kenya, adversely affecting agricultural production (UNEP, 2007).

Kenyan saleswoman selling African Leafy Vegetables in a local market in Tunyai village in Kenya.

Indigenous leafy green vegetables used to be an integral part of the Kenyan diet. But once crops such as cabbage and kale were introduced from abroad, these traditional greens lost popularity and came to be seen by many as 'food for the poor'.

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Women provide 80 percent of farm labour and manage 40 percent of the country's smallholder farms, yet they own only roughly 1 percent of agricultural land.



A woman in a market in Taita Taveta County prepares collard greens. The swahili name of this plant, Sukuma Wiki, literally translates to “push/stretch the week”. Collard greens are available year-round in East Africa, and are used to stretch meals out to last all week.

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Women’s Food and Nutrition Insecurity

We are what we eat, and women simply aren’t eating enough. More than 16 percent of Kenyan women live in households that go without food at least once a week (NGEC, 2016).

Pregnant and lactating women are most affected by food insecurity. Women

Since we know that women face challenges peculiar to them, it is surprising that insufficient focus is given to achieving food security for all women.

are generally considered lower priorities for household food intake in drought situations in ASAL regions, with men and children given higher precedence. Women and girls are also responsible for water collection, fetching water twice daily for between 30 minutes and two hours each day. This strenuous work creates a high demand for calories, which is frequently not adequately met. The longer trips in search of water during drought also mean that women and

girls are more exposed to sexual, domestic and street violence as well as prostitution (Dometita, 2017).

Kenyan women’s right to food is secured in Article 43(1)(c) of our Constitution, which states that every person has the right to be free from hunger and to have adequate food of acceptable quality. Since we know that women face challenges peculiar to them, it is surprising that insufficient focus is given to achieving food security for all women. Existing policy, such as the National Food and Nutrition Security Policy (NFNSP) (GOK, 2011), provides a progressive and detailed framework for the realisation of the right to food and food security. It recognises that young women and girls are vulnerable to iron, folate and other micronutrient deficiencies, and also that hunger reduces school attendance (more for girls than boys) and impairs learning capacity.

However, the NFNSP’s greatest concern with women’s needs is related to maternal and newborn nutrition. It sets out a typical poor-nutrition scenario that applies to many women in sub-Saharan Africa, including Kenya: a woman enters pregnancy already undernourished, suffering from or developing iron-deficiency anaemia or other micronutrient deficiencies. Her poor

micronutrient status may lead to adverse effects on foetal development, such as brain and neural-tube defects (respectively related to iodine and folate deficiencies). Poorly nourished women often give birth to low birth-weight infants, who start life at a disadvantage that is likely to continue to affect their nutritional status and development in infancy, childhood, adolescence and into adult life.

Proposed legislation, such as the Food Security Bill (2017), only makes specific provision for the intersection of food security and gender when it comes to pregnant and nursing women who are food-poor. The Bill states that every woman has the right to adequate food during pregnancy and lactation. But what about all the other times of a woman's life?

Patriarchal Norms and Institutions

This gap fits directly into patriarchal norms that find women valuable only when they give service to the patriarchy – in this case, when procreating and caregiving. Patriarchal norms and institutions also underlie women's hunger and poverty. They are why women work so hard but have so little to show for it. In patriarchal societies, the allocation of opportunities and resources is based on gender: women simply do not have the same access that men do. Social patriarchal norms dictate who works on farms (women) and who reaps the reward (men); who owns the land (men) and who tends it (women); who eats first (men) and who eats last (women).

In addition to food poverty, women also experience time poverty arising from the expectation that they will contribute their time and labour to (typically) unpaid domestic work. This reduces the time they have available to participate in more economically productive work, again rendering them unable to take full advantage of economic opportunities and participate in income-generating activities. It also impedes their ability to expand their capabilities through education and skills development (Catagay, 1998).

Women in Kenya are socially, politically and economically excluded because of their gender. Kenya's gender-equality index rating, where 100 represents full gender equality, is 38 (NGEC, 2016). The index

measures three aspects of human development: reproductive health, empowerment, and economic participation, all of which are directly affected by food insecurity. To fix this, we need to expand women's access to assets, opportunities and income. Women are the key to eliminating hunger and poverty.

To shift old norms and beliefs, we must invest more in the civic education of women and society at large on the rights of women. The Constitution of Kenya (2010), the Matrimonial Property Act (2013), and the Marriage Act (2014) have improved women's property rights, thereby increasing their status and bargaining power within the household and community. They also provide greater incentives to adopt sustainable farming practices and invest in natural resource management (IFPRI, 2005). However, the legislation does not address customary restrictions on women's land ownership and control, nor does it provide a framework to increase women's awareness of their rights and to support their ability to meaningfully challenge past

Patriarchal norms and institutions also underlie women's hunger and poverty. They are why women work so hard but have so little to show for it.

and present injustices. The state must also take measures to achieve gender equality in both the private and public sectors. Men are employed at double or more the rate of women in all sectors, excluding the education and service sectors (KNBS, 2017b).

We also need to ensure that women have public and political representation to advocate for their rights, including the right to food. Women's representation still falls short of the constitutional requirement that no more than two-thirds of the appointees of elective or appointive bodies shall be of the same gender. Currently, women comprise less than one-third of the personnel in the majority of such offices, including the cabinet, the National Assembly, the Senate, the diplomatic corps, as well as governors, deputy governors, sub-county commissioners, Supreme Court judges, Kadhis, chiefs and assistant chiefs. The only bodies that currently meet the constitutional requirement are principal secretaries, county commissioners, High Court judges, magistrates,

practising lawyers and members of county assemblies (KNBS, 2017b).

Lastly, we need to ensure that women have access to education, income, assets such as land and cattle, expanded opportunities and, most importantly, to food security. Educating women is a key method for boosting agricultural productivity as well as income. If women farmers are given the same levels of education, experience, and farm inputs as their male counterparts, they

increase their yields for maize, beans, and cowpeas by 22 percent. Simulations using data from women farmers in Kenya suggest that yields could increase by 25 percent if all girls attended primary school (IFPRI, 2005).

As a society, we have to place women front and centre in our efforts to eliminate hunger and poverty. Women are the key. It's time we stopped biting the hand that feeds us. ■■■

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Food Security in Tunisia:

A Need to Move Back to Sovereignty

Aymen Amayed

Since the end of French colonisation in 1956, successive Tunisian governments have managed to ensure access to healthy and sufficient food for the vast majority of its citizens. Tunisia has a low level of hunger, with a 2018 score of 7.9 out of 50 on the Global Hunger Index (GHI), and this number has continued to trend downwards. Most Tunisians eat their fill and some even allow themselves luxury food products from time to time. Physical access to something to eat without too much trouble is not the challenge. The question is, given the context of a stagnant economy and high unemployment: at what cost?

Food Security at a High Cost

Tunisia is not self-sufficient in terms of food production: more than 50 percent of the food the country consumes is imported. In 2008, agri-food products worth TND3 679.9 million (USD 4 400 million) were imported. In 2017, that figure was TND6 340.6 million (USD15 500 million). While the imports allow Tunisia to meet food demand, and although the state subsidises certain basic foodstuffs to ensure that the population has access, affordability increasingly becomes an issue. Because many agricultural inputs such as seeds and fertilisers are imported, locally produced food is also subject to price pressure and fluctuation related to currency exchange rates and other uncertainties of international trade.

At the same time, the country's his-

torically rich bio-genetic heritage is gradually depleted through the importation of hybrid seeds and tree seedlings. Their use promotes the rapid disappearance of local seeds and varieties and puts farmers at the mercy of pesticide sellers. In the cereal sector, which is a state monopoly, Tunisia is 60 percent dependent on imports, but the Grains Board only buys from farmers who grow species that are registered in the official catalogues, which do not include local varieties.

Tunisian policymakers consider the agricultural sector not only as a producer of food but also as “a buffer against shocks destabilising the rest of the Tunisian economy”, in the words of the Tunisian Institute of Strategic Studies (ITES), a thinktank under the supervision of the Presidency. This explains why Tunisian agricultural policies encourage crop intensification, irrigation, monocultures and agricultural investments to support the export of several crops that are very demanding of water, such as tomatoes, watermelons and citrus fruit.

The Triple Burden of Tunisia's Agricultural Policy

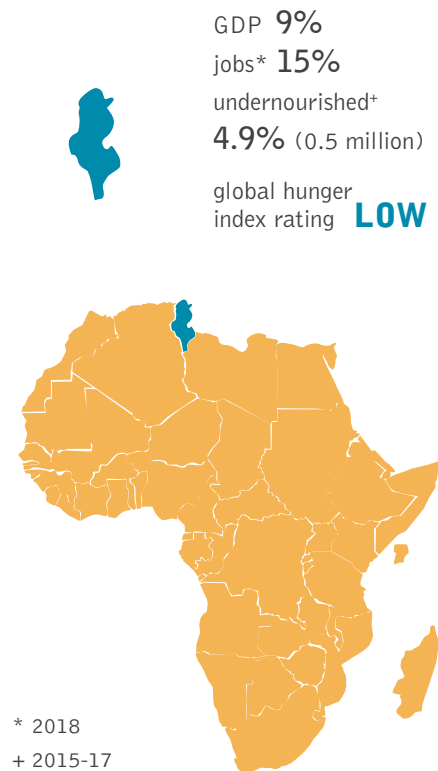
Tunisia pays for this agricultural policy on three levels. Economically, the country suffers from the burden of high agricultural imports in a world market characterised by price fluctuations and governed by demand-and-supply factors that are determined by major producers. With its relatively low economic weight, Tunisia can neither negotiate nor influence these production factors. The country struggles to promote its export



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TUNISIA

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products for the same reasons. Production choices are also often restrained by donor countries and development funds that arrive with predetermined guidelines. Small-scale farmers are especially dismayed by the rising cost of production caused by price hikes for inputs like fertilisers, seeds

Farmers' protests have been frequent in recent years throughout the country, demonstrating that the sector is in crisis.

and pesticides – and even more so when they see the selling price of their products. Farmers' protests have been frequent in recent years throughout the country, demonstrating that the sector is in crisis. Despite popular support for their demands, the situation has not changed.

Meanwhile, social inequalities are widening as small-scale producers are marginalised and disappear. This category (under 5 hectares) represents 54 percent of farms, which occupy only 11 percent of the country's total agricultural land, while large

farms (more than 50 hectares), representing 3 percent of the total, occupy 34 percent of the farmland. The living conditions of people in these categories drift further apart every day. Small-scale farmers are crushed under the weight of rising costs and do not benefit sufficiently from state incentives, as they are considered to be unproductive. In addition, they do not fit into the production model of the decision-makers. Thus, more than half of Tunisia's existing 516 000 farms are at risk. Farming is usually the only livelihood of these farmers. Their collapse will lead to a considerable increase in unemployment and to an exodus of young rural people into the cities where there is no work for them, and where migration is considered as an alternative. As the situation worsens, many farmers have already been forced to sell their land because they lack resources or young workers.

Affected women are particularly vulnerable as they cannot travel to seek work elsewhere due to the patriarchal nature of Tunisian rural society. They find themselves forced to work for large producers in deplorable conditions, without social security, with meagre salaries and staggering working hours. In the long term, all of this can all have a serious effect on Tunisia's stability. This will further affect food security, as countries in crisis face greater threats of food insecurity than do more stable countries.

Projected Effects of the Climate Crisis

The current agricultural policy has serious implications for the environment and the sustainability of the country's natural resources, but these are further aggravated by the impacts of the climate crisis. In 2015, Tunisia submitted its Intended Nationally Determined Contribution (INDC) document under the United Nations Framework Convention on Climate Change, which sets out the country's objectives to reduce carbon intensity 41 percent by 2030, relative to 2010. It projects that extreme droughts caused by the climate crisis will particularly affect the land area used for cereal crops and arboriculture, mainly in regions in the centre and the south, with an estimated decrease of 200 000 and 800 000 hectares, respectively, by 2030. It estimates a 30-percent reduction in the available land area for



rain-fed cereal production and, as a result, that the agricultural GDP will fall by 5 to 10 percent by 2030, compared to 2010.

In terms of water resources, the INDC acknowledges that Tunisia already experiences water scarcity, which will be intensified by climate-related droughts and the salination of coastal aquifers due to rising sea levels. Water is already overexploited by an agricultural sector that accounts for 79 percent of all water use. Despite this, there are policies in place to intensify irrigation. Irrigated monocultures that stretch as far as the eye can see already cover large parts of the Tunisian rural landscape. Due to the lack of resources, maintenance and equipment, water wastage is enormous. Tunisia's water is being exported to European countries in the form of olive oil, dates and citrus fruits.

What Is to Be Done?

The economic, social and environmental costs of policies that engage Tunisia in direct competition with agricultural producers in Europe and America can be counted in terms of a rising rate of debt to financial investment as well as in the loss of critical natural resources. The import and export of agricultural inputs and products also contribute to carbon intensity, making

the situation even worse. Intensive farming practices are degrading soil quality, and natural biodiversity is declining in the face of monocultures. Fauna and flora are killed by pesticides, polluted waters and soils. The food produced is polluted with chemical residues and not healthy. Thus, the goal of food security is in jeopardy.

These problems and challenges are significant: ad-hoc solutions will not change the situation. Radical political decisions and policy changes are needed, and not only at the local level. To cope with the climate crisis while ensuring food security, Tunisian agriculture must opt for a production sys-

Many analysts argue that the 2011 protests in Tunisia against former President Zine El Abidine Ben Ali were fueled at least in part by rising food prices.
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The economic, social and environmental costs of policies that engage Tunisia in direct competition with agricultural producers in Europe and America can be counted in terms of a rising rate of debt to financial investment as well as in the loss of critical natural resources.

tem that will consider the peasantry as an essential and vital component of the sector: true craftspeople and engineers of the land who, through their ancestral knowledge, could bring us to our destination by safe-

guarding the rights of future generations without denigrating the environment. The transfer of know-how from one generation to the next is already compromised by the rural exodus. Therefore, rural development should be deeply re-thought and programmes envisioned to recognise and integrate the needs of young people in the agricultural sector.

Local crop varieties have adapted to local climate conditions and are less demanding of water and chemical inputs, allowing farmers to largely coexist with the environment. Unlike the hybrid seeds that Tunisia imports and imposes on farmers, local seeds allow farmers to manage and

Solutions exist, but they require strong local political will and well-founded agrarian reforms that break with the policies of profit accumulation that have brought the country to where it is now.

adapt according to the conditions of the season. Being rooted in this genetic heritage can achieve a significant reduction in chemical inputs and provide healthy food for the local population.

Tunisian decision-makers should pursue reforms that would limit exports and invest in sustainable and responsible agriculture offers. Such a policy framework could increase the country's self-sufficiency and fortify its sovereignty, while at the same time feeding its people. It could promote laws and regulations to support the rights of small producers, preserve water resources, limit the use of chemical inputs, and promote the marketing of local seeds. Scientific research should be pushed in this direction to build a reliable basis for reform towards sustainable development.

However, Tunisia and other countries of the North African region remain highly dependent on Europe and the United States of America. This situation, which is governed by international policies and often very fragile, should be revised towards greater stability and predictability. Currently, the

European Union and Tunisia are negotiating ALECA (*Accord de libre-échange complet et approfondi*), a comprehensive free trade agreement that will deepen Tunisia's dependence by flooding the local market with low-cost food products – a battle that local farmers have already lost in advance. Saying “no” to ALECA is not to break with Europe and the West as partners in the Tunisian transition process, but it does mean breaking with dependence and irresponsible policies of plunder.

The principle of “food sovereignty” should guide policies to achieve sustainable food security for all. This principle was initially defined by Via Campesina, the international movement of peasant organisations, as a country's right to determine its own agriculture and food policies. It ensures smallholder-farmers' access to resources and land, secures their potential to produce food, and protects them from the influx of cheap imported food. In addition, they should have privileged access to seeds and water resources to be produced and used on a sustainable basis.

Solutions exist, but they require strong local political will and well-founded agrarian reforms that break with the policies of profit accumulation that have brought the country to where it is now. Tunisia needs reforms to break with the policies of marginalisation, overexploitation and extraction. The political will to change should be strengthened by the international community, rather than misguided by pressures from the ALECA negotiations, the international market, and multinational agri-food companies.

Food security must remain an absolute priority for Tunisia. Current policies compromise the country's sovereignty and raise the fear of food insecurity in the country. The Tunisian government needs to defend the interests of the Tunisian farmers and to courageously break with the expansive, non-sustainable and exploitive practices that protect the interests of close-knit business circles. A commitment to food sovereignty needs to underly any decision-making in the agricultural sector. ■■■

Building Alliances and Changing Policies:

Women Farmers in Nigeria respond to the Climate Crisis

Azubike Nwokoye

Interview

Small Scale Women Farmers Organisation in Nigeria (SWOFON) is a coalition of women farmers' associations and groups across Nigeria. It was started with the support of ActionAid Nigeria in August 2012 to advocate for and support women farmers, especially those in rural areas, to spur rural village economic development and increase food production. It does this through deepening smallholder women farmers' knowledge of and demand for their rights and the state's duties, as well as serving as a vocal and visible pressure group on behalf of smallholder women farmers in Nigeria. SWOFON has state chapters across thirty-five states and the federal capital territory.

Osara is a rural community in Kogi State where farming is central to livelihood. The Osara community cooperatives are members of SWOFON Kogi State and linked to SWOFON at the national level. Perspectives spoke to Azubike Nwokoye, the agricultural programme coordinator for ActionAid Nigeria, about the challenges faced by female farmers, how the climate crisis will affect them, and what ActionAid has been doing to support them.

What are some of the gender-based challenges faced by women farmers in the Osara community, and how do they hamper their productivity as farmers?

Nwokoye: The challenges relate to all the required inputs and across the entire farming lifecycle. It begins with a lack of access and control over land, which limits women's choice of crops. Most land farmed by Osara women is owned by their families or is rented. However, it is often the men in the families who decide which crops will be planted. Historically, men have always owned land due to the patriarchal culture of the community. Therefore, they allow women to only farm less profitable crops so that they can dominate the production of the more profitable ones. There have been instances where the men will refuse to renew a land-leasing contract with a woman farmer for the next planting season because the land seemed to have increased fertility.

Lack of access to simple labour-saving equipment is also an issue. Without tools such as hand tractors, harvesters and threshers, women are forced to use crude manual implements such as hoes, increasing their workload and impacting their health.

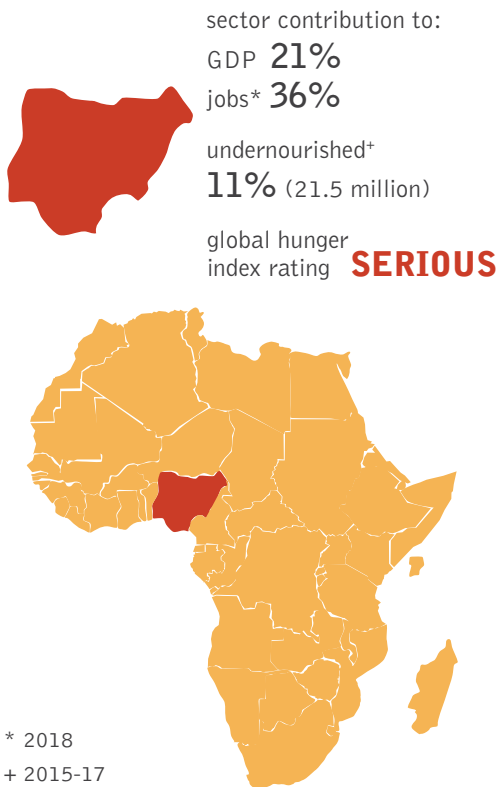
Because the men own the land, it is easy for them to access credit facilities using the landed property as collateral. The women find it difficult to access these loans and other credit facilities. Therefore, it limits their productivity as well as affecting their ability to purchase or hire labour-saving equipment for efficient farming. This has stifled growth and expansion of these smallholder women farmers and has



Azubike Nwokoye is the Food and Agriculture Programme Coordinator of ActionAid Nigeria. He is a development expert with over fifteen years national and international experience in campaigns coordination, and coalition and alliance building. He provides regular analyses of agriculture budgets, and supports citizens' efforts to analyse, monitor and advocate on agriculture budget issues. He is currently training ActionAid International Country Programmes and partners in Economic Literacy and Budget Accountability for Governance (ELBAG). Azubike's additional areas of expertise include gender justice in value chain development, agricultural value chain development programme design, implementation, monitoring and impact evaluation, and small-scale agricultural project design.

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resulted in high post-harvest losses and missed opportunities to add value to farm produce that could be sold for higher prices.

The poor rural road network causes increases in transportation costs, thereby limiting market access for these women farmers. Women are more vulnerable to the challenges of transportation than their male counterparts. For example, coupled with the difficulty in navigating the rough terrain of the roads, a woman farmer's commute to the market is more likely to be subject to intimidation and sexual harassment. Due to these challenges, their husbands often restrict a lot of their movement to the market. Some women farmers also suffer from the lack of access to extension services, especially in Northern Nigeria, where the culture does not allow men to interact with married women, and almost all the extension workers in the region are men. Therefore, they are not able to provide services that would be beneficial to women farmers. This is the reason that part of our work is to advocate for increasing the number of female extension workers to interact with the women farmers.

The extra responsibilities of women as caregivers tend to expand existing challenges. Some women do not receive any further support from husbands who believe that their wives, being farmers, should also be able to handle every domestic responsibility.

The absence or inadequate provision of network services such as water reticulation, electricity and roads has similar effects. Without water points in their homes or fields, smallholder women farmers must trek kilometres every day and put both themselves and their families at risk of water-borne diseases. Without electricity, they cannot use simple labour-saving technologies such as grinding mills. Limited access to small irrigation facilities means that smallholder women farmers are dependent on rain-fed agriculture and cannot plant during the dry season.

Low productivity and profitability also result from limited access to inputs such as organic fertilisers, improved seeds and seedlings, as well as inadequate extension services. Without either the knowledge of farm practices that improve yields or the technology that enables them, production remains limited.

How has the climate crisis exacerbated these problems?

The climate crisis has already resulted in crop and livestock failures and threats to community food security. Rainfall patterns have become less predictable. Before, the first major rainfall of the year would signal the beginning of the planting season. Now, because rainfall patterns have changed, farmers who planted after the first major rains most times end up losing their crops as no more rainfall may be experienced during the period needed for the crops to survive. Flooding is another significant climate-change-induced challenge faced by Osara farmers. There have been times that, due to extreme rainfall, farms have been entirely swept away by floods.

What kind of support has ActionAid provided to the Osara women farmers, and how effective have these been in helping them grow resilient crops and increase their income?

To address the impacts of the climate crisis, climate-resilient agricultural practices were introduced to the women farmers. To cope with these climate-change challenges, we have been training the women on soil- and water-management practices like mulching to conserve soil moisture and reduce evaporation so that crops can survive the irregular rainfall patterns. This soil moisture-retention practice, cou-



pled with the use of organic fertiliser, is helping to improve the fertility of the soil. Water harvesting from rainfall is another climate adaptation technique that we've employed. The women have also been taught to build special trenches around the farm to help mitigate the adverse effects of floods when they occur. They were also trained on correct spacing, compost-making, mixed cropping, combining both crops and livestock, home gardening (livelihoods diversification), organic control of pests and diseases, and alternatives to bush-burning and tree-cutting.

To tackle some of the other issues, we supported the women farmers' ability to self-organise. While providing training on several climate-resilient farming practices, we realised that the women farmers' voices were not adequately represented. Women were often excluded from participation in planning and development processes that could have been beneficial to them and their farms. And because the leadership of large farmers' associations in Nigeria are mostly men (who are often big commercial farmers), the interests of smallholder women farmers are not well represented. This poor representation has been one of the reasons why these women continue to be vulnerable to the challenges we mentioned earlier. We decided to support the women farmers in this community to form coopera-

Osara women working in the cassava milling facility, Kogi State, Nigeria.

© Action Aid Nigeria.

Right now, the women in this alliance have access to credit and land because they are more organised, they know how to advocate their issues and present them to the relevant local authorities.

tives, which was done in partnership with local partners and provided training such as dynamic management and cooperative operations. This alliance of women farmers has grown to become a recognised network and movement for women farmers across Nigeria. They are also affiliated to other women's groups in Nigeria and have a working structure and constitution. So far, this women-farmers' group has a presence in about seven different states in Nigeria.

How has the intervention shifted political and community dynamics?

Their engagement as a group has given them a voice to engage collectively on their own issues. The results include increased access to land for individual women and increased access to cooperative lands from the community leaders.

ActionAid Nigeria has encouraged the women to share knowledge with their peers. Because of the benefits of the training, the small-holder women farmers' productivity started improving and their peers that were not in cooperatives were attracted to join them. Right now, the women in this alliance have access to credit and land because they are more organised, they know how to advocate their issues and present them to the relevant local authorities. They have formed cooperatives in several other communities, which enables them to own land as a cooperative. They are also able to collectively access government benefit programmes like the anchor borrowers' scheme, which was difficult to access as individual farmers.

How has the government responded to the women farmers organising themselves?

Government has responded through the provision of extension services, access to inputs and training to support their livelihoods. These women are now able to engage policymakers and make demands for what would be beneficial for their members. Such benefits could range from the provision of extension services to grants. The Osara community women have also been shortlisted to benefit from the government's Small and Medium Enterprises Development Agency (SMEDAN) support for cassava processing under the One Local Government, One Product (OLOP). ■■■

Glossary

Climate-Smart Agriculture

The FAO defines climate-smart agriculture (CSA) as an approach to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate. CSA has three main objectives: to increase agricultural productivity and incomes, adapt and build resilience to climate change, and reduce and/or remove greenhouse gas emissions where possible. However, as there is no restriction on what approaches may or may not be considered “climate smart”, CSA can include all models of agriculture and lacks any social or environmental safeguards. Consequently, corporate agribusinesses that promote synthetic fertilisers, industrial meat production and large-scale industrial agriculture – all of which are widely recognised as contributing to climate change and undermining the resilience of farming systems – have called themselves “climate smart”. There are also concerns that CSA strategies will prioritise climate-change mitigations such as carbon sequestration over adaptation and food security, and undermine efforts to promote agro-ecology.¹

Food insecurity

A situation in which people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level. Food insecurity, poor conditions of health and sanitation, and inappropriate care and feeding practices are the major causes of poor nutritional status. Food insecurity may be chronic, seasonal or transitory.

Food security

A situation in which everyone at all times has physical, social and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security is measured across four dimensions:

- *availability*. This addresses whether or not food is actually or potentially present, and includes aspects of production, food reserves, markets and transportation, and wild foods.
- *access*. If food is actually or potentially present, do households and individuals have sufficient access to that food?
- *utilisation*. If food is available and households have adequate access to it, the next question is whether or not they are consuming adequate food for their nutritional and energy needs. Sufficient energy and nutrient intake by individuals is the result of good care and feeding practices, including food preparation, dietary diversity and intra-household distribution of food. Combined with good biological utilisation of the food consumed, this determines the nutritional status of individuals.
- *stability*. If the dimensions of availability, access and utilisation are sufficiently met, stability is the condition that maintains the whole system, thus ensuring that households are food secure at all times. Households may suffer short-term instability, which can lead to acute food insecurity, or medium- to long-term instability, which can lead to chronic food insecurity. Climatic, economic, social and political factors can all be sources of instability.

Food sovereignty

Broadly speaking, food sovereignty is the right of nations and peoples to control their own food systems, including markets, production modes, food cultures and environments.² It emphasises the need to:

- place people's need for food at the centre of policies and recognise food as more than a commodity;
- respect and value food providers by ensuring their livelihoods are sustainable;
- localise food systems by reducing the distance between suppliers and consumers, rejecting “dumping” and other inappropriate food aid, and reducing dependence on remote and unaccountable corporations;
- empower local food suppliers by recognising the need to inhabit and share territories and rejecting the privatisation of natural resources;
- promote knowledge and skills by building on traditional knowledge, using research to support and pass it on to future generations, and rejecting technologies that undermine local food systems;
- work with nature by maximising ecosystem contributions and rejecting energy-intensive, monocultural, industrialised and destructive production methods.³

Hunger

In its State of Food Security and Nutrition in the World 2018 report, the FAO defines “hunger” as synonymous with “chronic undernourishment”. It is the condition in which an individual's habitual food consumption is insufficient to provide the amount of dietary energy required to maintain a normal, active, healthy life.

Malnutrition

An abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes undernutrition and overnutrition as well as micronutrient deficiencies.

Severe food insecurity

Someone experiencing severe food insecurity, as measured by the Food Insecurity Experience Scale, is likely to have gone entire days without eating due to lack of money or other resources.

Stunting

Low height-for-age, reflecting a past episode or episodes of sustained undernutrition. In children under five years of age, stunting is defined as height-for-age more than two standard deviations below the WHO Child Growth Standards median.

Undernourishment

See hunger.

Wasting

Low weight-for-height, generally the result of weight loss associated with a recent period of inadequate calorie intake and/or disease. In children under five years of age, wasting is defined as weight-for-height more than two standard deviations below the WHO Child Growth Standards median.

Unless otherwise indicated, all definitions are taken from FAO, IFAD, UNICEF, WFP and WHO, 2018, The State of Food Security and Nutrition in the World 2018. Building Climate Resilience for Food Security and Nutrition, Rome: FAO.

1 See Climate Smart Agriculture Concerns, 2015, COP 21 Statement. <http://www.climatesmartagconcerns.info/cop21-statement.html>

2 Wittman, H., Desmarais, A. and Wiebe, N., 2009, The Origins and Potential of Food Sovereignty, *Food Sovereignty: Reconnecting Food, Nature and Community*. Fernwood Publishing, 1–14. <http://fernwoodpublishing.ca/files/food-sovereignty.pdf>

3 Adapted from Gordillo, G., 2013, Food Security and Sovereignty (Base Document for Discussion), Rome: FAO. www.fao.org/3/a-ax736e.pdf







TransformAfrica is a multi-annual program promoting a participatory, just and sustainable socio-ecological transformation in Africa. Its objective is to establish a transnational platform for networking, exchange and advocacy for civil society actors, experts and decision-makers from across Africa. The thematic foci of transformAfrica evolve around the 5 clusters of agro-ecology, energy efficiency, natural resources governance, waste management and participatory urban development. The program is managed by the Rabat office of the Heinrich Böll Foundation and supported by a variety of partner organisations.

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About the cover artwork

Mapping not only geographies but also histories requires delving into the cracks, whenever possible. This collaborative layering of geographies and histories reveals Amílcar Cabral's double agency: his life as an agronomist and as an anti-colonial leader. Cabral was a "seeder" of African Liberation – he politicised soil and challenged the ongoing colonisation of land as a critical soil scientist. This site-specific installation – a collaboration between Filipa César, Ahmed Isamaldin, and Ali Yass – unfolds through readings of his life and work, inscribed into the cracks and erosions of the floor at SAVVY Contemporary.

FILIPA CÉSAR is an artist and filmmaker interested in the fictional aspects of the documentary, the porous borders between cinema and its reception, and the politics and poetics inherent to moving image. Her practice takes media as a means to expand or expose counter narratives of resistance to historicism. Her first feature-length essay film *Spell Reel* premiered at the Forum section of the 67. Berlinale.

AHMED ISAMALDIN is a graphic designer and blogger from Khartoum. He has participated in exhibitions in Khartoum, Cairo, Amsterdam, Brussels, and Berlin. His work explores the topics of immigration and psychology, as well as processes of revolution and anti-colonial cartography.

ALI YASS is a painter, draftsman, printmaker and archivist from Baghdad. Ali tries to capture and represent fear in his works, and believes it is one of the most rooted and clear human feelings. He has exhibited in Amman, Amsterdam, Istanbul, Berlin, Nottingham, Gera, and New York City.



Cover Image: Mapping Agropoetics Of Liberation
– © Filipa César, Ahmed Isamaldin, and Ali Yass. Photo: Raísa Galófre. Courtesy of SAVVY Contemporary.