RESEARCH PROGRAM ON
Climate Change, Agriculture and Food Security

CGIAR

CCAFS

The SmartAG Partner

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Message From
The Program Leader

We are pleased to share with you our SmartAg Partner newsletter, highlighting policy engagement and ongoing research from the first half of 2020.

This year marked the official close of the trailblazing Rwanda Climate Services for Agriculture project that trained all of the country's districts in participatory climate services for agriculture and won the inaugural Climate-Smart Agriculture Project of the Year.

We participated in several meetings with Kenya's Ministry of Agriculture, Livestock and Fisheries on agriculture and climate change, including hosting the virtual meeting of the Kenya Climate-Smart Agriculture Multi-Stakeholder Platform, focused on financing and investment for climate-smart agriculture in Kenya. We also participated in the 54th Greater Horn of Africa Climate Outlook Forum in Mombasa, Kenya, convening under the theme "Mitigating Climate Risks for Resilience."

Social inclusion is at the core of our agenda for climate-resilient food systems. To keep up this momentum, our scientists shared first-hand experiences in climate-smart agriculture with hundreds of agricultural students at the University of Nairobi, as part of the Climate-Smart Agriculture Youth Network's CSA Campus Forum. In addition, we participated in a strategic workshop on Children Eating Well, a dynamic partnership between the EAT Forum and the United Nations Children's Fund to ensure sustainable food systems support child health and nutrition.

As the pandemic continues to put pressure on the global food system, we co-hosted the online discussion and webinar: Youth in agribusiness: Coping with COVID-19 in the context of a changing climate, in collaboration with 2SCALE, the Food and Agriculture Organization of the United Nations, AgriProFocus, Practical Action, the Climate Smart Agriculture Youth Network, and the Swedish International Agricultural Network Initiative.

The Climate Resilient Agribusiness For Tomorrow project facilitated strategic workshops and training sessions on climate risks and resilience for key climate-smart agriculture value chains with farmer cooperatives, extension officers, service providers and small and medium enterprises across East Africa.

In June, we co-hosted the CCAFS led virtual event: A New Era for Food and Climate to launch the Transformation Initiative Report: Actions to Transform Food Systems Under Climate Change. Our East Africa session, Enabling markets and public sector actions to incentivize climate-resilient and low emission practices, featured insightful speakers from the Ethiopian Agricultural Transformation Agency, the New Partnership for Africa's Development of the African Union, the Eastern Africa Farmers Federation, Digital Green and Safaricom.

To ensure timely and accurate agro-climate information reaches farmers through Ethiopia's Digital Agro-Climate Advisory Platform, we have developed a collaborative partnership with Fana Radio to disseminate seasonal forecasts and agro-climate recommendations via radio broadcasts to Ethiopia's smallholder farmers.

Read on for details from the first half of 2020 and please share this newsletter with your networks.

Dr. Dawit Solomon

1

As COVID-19 fractures food systems, global experts issue roadmap to avert post-pandemic food shocks caused by climate change

Influential voices from six continents present path to climate-smart, food-secure future in wake of new UN report warning climate stress contributing to COVID "food emergency"

WAGENINGEN, THE NETHERLANDS – Influential voices from six continents present path to climate-smart, food-secure future in wake of new UN report warning climate stress contributing to COVID "food emergency".

With COVID-19 intensifying hunger even in wealthy countries, influential food, agriculture and environment experts from six continents today responded to this bracing wake-up call with an ambitious roadmap for resetting food systems that were already being hit hard by climate change. It offers the most comprehensive global plan to date to rebuild all types of food production around the world—from smallholder farming to large-scale production—that have been rocked by the pandemic but will face even greater challenges from climate change.

The report, "Actions to Transform Food Systems Under Climate Change," was developed under the guidance of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). It comes close on the heels of a new assessment from the United Nations warning the pandemic could precipitate a "global food emergency." The UN is especially concerned about food systems in places like sub-Saharan Africa that prior to the pandemic were reeling from a surge in droughts and floods—and where global heating is likely involved in East Africa's ongoing battle against locust swarms.

"It's time for all of us to get talking about food and most importantly about food systems," said David Nabarro, a World Health Organization Special Envoy for COVID-19 and Curator of the Food Systems Dialogue who is kicking off a round-the-world "relay" briefing on the action plan. "That's all the different elements—from food production to processing to marketing and consumption, and all the steps along the way."

The report lays out a clear, 11-part plan—and points to a wide number of readily available innovations—that can make food systems far more resilient to both climate and non-climate shocks.

The 11 actions (listed in detail at the bottom of this page) include efforts to sustainably increase food production in developing countries in ways that increase incomes and food security in poor, agriculture-dependent rural communities. Doing so, the report states, could dramatically reduce the need for humanitarian assistance in the coming years,

K. Trautmann (CCAFS)

Food systems that were already being hit hard by climate change have been rocked by the pandemic but will face even greater challenges from climate change

freeing up billions of dollars for investing in social safety nets. The report also offers strategies to avoid expanding food production into carbon-rich tropical forests and explores options that can support healthy, climate-friendly diets.

In addition, the report lays out a policy framework for directing US$320 billion in public and private finance to food systems transformation. And it seeks more support for "youth-centered social movements" committed to building sustainable food systems, noting they can be especially effective agents of change.

"Our work over the last 10 years to address the impacts of climate change on food production, and vice versa, has produced a series of transformative interventions that can energize efforts to 'build back better' in the aftermath of COVID-19," said CCAFS Director Bruce Campbell. "This endeavor is especially important for several hundred million smallholder farmers in the developing world. They were already struggling against climate change before this pandemic hit and will face even greater climate threats long after it has ended."

Climate change: The slow-moving counterpart to COVID-19

While there are concerns the pandemic could significantly increase hunger and malnutrition in the short-term, the report points to even greater dangers looming in the coming decade as temperatures rise, weather extremes become more common and rainfall less predictable. It cites recent research findings noting that:

- By 2050, climate change could displace 200 million people, the equivalent of roughly two-thirds of the population of the United States.

- Rain-fed crop production that currently sustains Southern Africa may not be possible in most of the region.
- Fish catches will decline by up to 10% in tropical regions.
- Droughts, floods and heat waves will become more frequent and intense. Just a small increase in drought severity alone could raise the risk of violent conflict in places like Somalia.
- By 2050, the impact of elevated carbon dioxide emissions on crop nutrients could cause an additional 175 million people to suffer zinc deficiency and 133 million to become protein deficient.

Food solutions from around the world present opportunities in time of crisis

At the same time, the report offers an abundance of evidence that farmers and food systems around the world are not destined for disaster—especially if the lessons from COVID-19 awaken action to confront climate impacts. The launch today features more than a dozen farmers and influential food and agriculture voices speaking live in a global "relay" from Ethiopia, Australia, Vietnam, India, Mali, Italy, the Netherlands, the United Kingdom, Colombia and the United States. They will present a wide array of solutions for creating a new era of climate-smart food production. For example:

- **Imelda Bacudo, Advisor on Food Security and Climate Change for the ten-country Association of Southeast Asian Nations (ASEAN),** will discuss the how the pact's efforts to deal with the food challenges caused by the pandemic—including activating established emergency food reserve measures, specifically, rice interventions—is revealing the need for a more comprehensive plan for contending with other food system shocks.

"We felt the effects of this pandemic far earlier than many other regions and quickly moved to mobilize resources and policy changes," Bacudo said. "It's clear that dealing with the food impacts of these external shocks requires action far beyond the food and agriculture sector. And that kind of cross-sector collaboration remains a challenge, at the regional and national level."

- **Rikin Gandhi, CEO of Digital Green,** will show how his groundbreaking company uses videos and digital content delivered via mobile phones to share content and train more than one million farmers in India and 500,000 farmers in Ethiopia every two weeks in practices like Zero-Budget Natural Farming or ZBNF. ZBNF combines the latest in agriculture science with traditional farming practices to help farmers use locally available inputs to sustainably increase crop productivity and adapt to changing growing conditions.

"In Ethiopia and India, with COVID-19 and a desert locust outbreak spreading just as the cropping season is getting underway, digital technologies are enabling extension agents and farmers to stay connected," Gandhi said. "It means they can share data and insights from the field that can be critical to overcoming these twin challenges."

- **Ambassador Seyni Nafo** from the Republic of Mali, a guiding force behind the African Adaptation Initiative (AAI) and former chair of the African Group of Negotiators on Climate Change, will discuss large-scale, integrated rural agricultural development programs that could have limited the food impacts of COVID-19—and will be critical for coping with climate change. He notes that work is underway in East Africa, facilitated by AAI and the Global Commission on Adaptation (GCA), to mobilize at least US$300 million in public and private sector financing to improve access to affordable credit, digital farmer services and sustainable farming technologies like drip irrigation— all made available to local communities via a single initiative.

"There are many proven approaches to making our food systems far more resilient to external shocks," Ambassador Nafo said. "But they have not been implemented at an adequate scale to provide rural communities with the support they need."

- **Dr. Lindiwe Majele Sibanda, Co-Chair of the Global Alliance for Climate-Smart Agriculture (GACSA)** will discuss the potential of the newly formed African Continental Free Trade Area (AfCFTA) to increase regional trade in food commodities in ways that can fortify local food systems and encourage greater investments in smallholder farmers. She notes that border shutdowns prompted by COVID-19 have highlighted the important role of imports and exports to maintaining adequate supplies of affordable, nutritious food. She believes AfCFTA could play a crucial role in building resilience to climate change by, among other things, stimulating investments in production and marketing infrastructure that enable local farmers and food companies to supply consumers across the continent.

"Promoting intra-regional trade in agriculture commodities and food products is crucial for Africa's food security, both in the short and long-term," Dr. Sibanda said.

- **Ruben Echeverria, Emeritus Director General of the International Center for Tropical Agriculture** (known by its Spanish language acronym CIAT), noted the growing practice in the tropics of Latin America—with great chance of spreading to other parts of the global south—of combining crop-livestock-forage systems with trees. These so-called "silvopastoral" systems increase cattle productivity and improve animal welfare—for beef and dairy. They are very different from the industrial "feedlots" and from the extensive low-productivity more traditional livestock production systems and add trees to the landscape, instead of cutting forests for grazing land, all coming together to dramatically reduce emissions.

"If you take into account that two-thirds of the agricultural land on the planet is grazing land, these are the types of systems that should be taken to scale for huge planetary impacts," Echeverria said.

Four action areas and 11 actions for food systems transformation

"The disruptions caused by this terrible pandemic have at least awakened the world to the fact that our food systems are far more vulnerable than many realized," said Campbell. "Climate change is already compounding these problems, but the solutions we present—which seek bold transformations in everything from farming to trade, diets and government policies—offer an opportunity to pursue a much brighter future for people and our planet."

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Transforming Food Systems Under a Changing Climate is an initiative that brings together leaders in science, business, farming, policy and grassroots organizations to identify pathways for transformation. The initiative is led by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) together with a wide range of partners that aims to realize a transformation in food systems by mobilizing knowledge and catalyzing action.

2

Enhancing capacity for resilient agriculture planning and programming in Kenya

Insights and lessons learned on disseminating Kenya's climate-smart agriculture strategies, frameworks and investment plans.

By Hannah Kamau, Ivy Kinyua and Victor Mugo

Kenya has made significant progress in the development of agricultural policies, yet implementation remains elusive, aggravating food insecurity challenges. To address this gap, recent field visits were conducted across the counties of Nyeri, Kajiado and Taita Taveta to disseminate Kenya's Climate-Smart Agriculture (CSA) Strategy and Implementation Framework. This groundwork strived to support efforts to operationalize CSA into county-level action planning. Key insights have been drawn in the following lessons for communities and officials who seeks to operationalize CSA at multiple levels.

Lesson 1: Strike while the iron is hot

The period between policy launch and dissemination is very crucial. Often times, policies have been made and disseminated too late or just when policy review is due. It is only through dissemination that the disconnect between policymakers and implementers can be bridged. The implementation lag is worsened by national commitments such as the Nationally Determined Contribution (NDCs) that seek to report progress within a specified period of time. We advise quicker and efficient dissemination programs that can reach as many sub-national implementers as possible to give them ample time to review and shape the policy, as well as operationalize it to their relevant contexts.

Lesson 2: Two flints can make a fire

When not limited to multilateral parties, effective partnerships are a major plus for transformative agriculture. More than just creating synergies, collaborative partnerships help organizations to combine their expertise in delivering innovative and scalable climate change and agriculture solutions. For example, the Climate Change Unit of the Ministry of Agriculture, Livestock and Fisheries (MoALF), the United Nations Food and Agriculture Organization (FAO), the International Center for Tropical Agriculture (CIAT) and World Agroforestry (ICRAF) came together to disseminate the climate-smart policies and support sub-national governments in identifying their CSA investments. A partnership that yielded more wins than if we had worked in isolation.

Lesson 3: Finances

Climate finance is a key driver for promoting CSA. For example, when carrying out our mission we had to separate the different levels of actors in the counties. In a week-long exercise per county we sensitized the Members of County Assembly (MCAs), the members of County Executive Committee Members (CECMs) and the implementers – technical officials in the County Agriculture Department. These activities, while important, called for financial planning and consideration while formulating policies that require local action. These should not be limited to sensitization

S.Kilungu (CCAFS)

Farmers applying climate-smart practices in Nyando Climate-Smart Village in Kenya.

and dissemination stages but instead reach as far as implementation on the ground.

Lesson 4: Harmonized approaches

During an exercise of mapping county initiatives with the technical teams, we discovered that many organizations were already working independently with the communities to build resilient agricultural systems. Risks of initiatives duplication and sometimes information conflict are inevitable. Leveraging the independent organizations to form one platform guided by an end goal could increase efficiency in the dissemination process, mobilization of funds and promotion of CSA. Currently, in Kenya, several climate change and agriculture multi-stakeholder platforms could be leveraged at the sub-national level to promote resilient agriculture and reduce isolated interventions, in particular, the national multi-stakeholder platform on CSA.

Lesson 5: Target audience

It is important to select the right stakeholder groups to engage so as to convey information that is relevant, appropriate and leads to action. Understanding their roles, needs and priorities cannot be understated if we are to effectively deliver on intended objectives. Therefore we identified the political leadership (Members of County Assembly, County Executive Committee Members, Technical Officers) as important stakeholders to engage. Having acknowledged their diverse roles, we tailored the activities, language and design which ultimately led to facilitating separate sessions for effective sensitization.

Lesson 6: Peg implementation on scientific evidence

As part of the mission activities, we supported the counties to develop CSA investments through their technical officers based on their sub-sector (crops, livestock and fisheries) expertise. To do this we used the CSA compendium databooks and Evidence for Resilient Agriculture (ERA) developed by ICRAF, with support from the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and CIAT, to pinpoint agricultural practices for specific contexts and geographies. This provided the technical officers with multiple technologies, innovations and interventions to understand, identify and select practices that would contribute to CSA.

Through these county missions, it became apparent that CSA is still a confusing and complex concept that requires multifaceted approaches to effectively deliver on its triple wins. More than that, there are many underlying factors (finance, data, attitudes, inclusivity) that influence its success. Therefore, as we strive to ensure food and livelihood resilience, we must continually recognize these gaps and develop lasting solutions. We must also acknowledge our individual organizational strengths and combine powers to promote resilient agriculture.

Read more:

News update: Kenya launches Climate-Smart Agriculture Strategy for 2017-2026: https://bit.ly/3g2nK2p
News update: Kenya launches framework to implement climate-smart agriculture: https://bit.ly/2Ef2pog
News update: Stakeholders come together in Nairobi to create a vibrant platform for climate-smart agriculture across Kenya: https://bit.ly/30RUrJm
News update: Guiding investments in climate-smart livestock systems in East Africa: https://bit.ly/39szmsW

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3

Strengthening strategic partnerships between science and policy in Kenya

At a recent meeting in Kenya, scientists advised decision-makers to prioritize building resilience in crops, livestock, and fisheries.

By Catherine Mungai, Laura Cramer, Joab Osumba and Maren Radeny

The Government of Kenya has made great strides in developing polices and frameworks to address and integrate climate change across different sectors of the economy such as agriculture, energy and water. Given the complex nature of climate science and the evolving adaptation and mitigation strategies, there is a need for continuous awareness and capacity building. This is especially true within the political context of the country in which those holding critical decision-making positions change constantly.

Decision-makers in the agriculture sector at national and county levels were invited for a high-level breakfast meeting on 23 January 2020. The meeting brought together 45 participants from various departments and institutions such as the Council of Governors (COG), Kenya Agricultural and Livestock Research Organisation (KARLO), Swiss Agency for Development and Cooperation (SDC) and the Agricultural Sector Development Support Programme (ASDSP), among others.

Linking science and agricultural policy

The meeting provided a platform for scientists from the CGIAR, universities and NGOs to share evidence and priority policy actions. Discussions focused on building resilience in crops, livestock, and fisheries sub-sectors including capacity building which cuts across all the sectors.

Evan Givertz of the Alliance of Bioversity International and CIAT (the Alliance) gave a presentation on policy options for building the resilience of crop production under climate change. He highlighted that while wheat, maize and beans are particularly sensitive to climate change, multiple stress-tolerant varieties (to heat, pests and diseases) can help farmers to adapt. In addition, there is a need to strengthen the acquisition and dissemination of climate data and information for enhanced agro-advisories to farmers and other crop value chain actors. This can be done through extension services and ICTs as one of the priority actions for the crop sub-sector.

Focusing on livestock, Todd Crane from the International Livestock Research Institute (ILRI) pointed out the need to domesticate livestock data collection to support the use of locally-derived emissions calculations in reporting on Nationally Determined Contribution (NDC) targets. He called on the State Department of Livestock to implement climate-proof policy instruments and frameworks for the livestock sub-sector, including the proposed Livestock Master Plan, taking into account climate change and low-emission development opportunities.

The fishing communities are also being affected by climate change. Edward Kimakwa of the World Wide Fund for Nature (WWF) highlighted the need for the fisheries sub-sector to be included in the updated NDC. He added that county climate change adaptation and mitigation plans should integrate fisheries.

G.Smith (CIAT)

At the meeting, scientists shared evidence and priority policy actions focusing on building resilience in crops, livestock, and fisheries.

In concluding the presentations, Evans Kituyi of the Aga Khan University's East Africa Institute (EAI) noted that existing policy instruments provide an enabling environment for capacity development across the different sub-sectors in agriculture. While the National Strategy for Agricultural Education is currently being developed, climate change has not been adequately captured in the curricula and this provides an opportunity to integrate climate considerations. In terms of priority actions, he called for a review of the curricula for tertiary-level institutions to reflect climate-resilient and low carbon solutions.

Way forward

Political will is critical and necessary for policy implementation. And while science is a critical component of developing solutions for climate change, the meeting attendees recognized the need for action. Some of the next steps include:

- Strengthening the climate change units at national and county level and creating a coordination and information sharing mechanism specifically for agriculture; and
- Engaging with the science community to update the agriculture component of the NDCs which is due to be revised this year including capacity building for livestock Measurement, Reporting & Verification (MRV).

The CGIAR partners, along with the African Group of Negotiators-Expert Support (AGNES), EAI and WWF will continue to engage with the Ministry of Agriculture, Livestock, Fisheries and Cooperatives to move forward with these actions and help bring evidence-based decision-making to Kenyan agriculture and climate arenas.

Read more:

Kenya county climate risk profiles: https://bit.ly/3jF8pHh
See photos from the meeting on Flickr: https://bit.ly/2OZm91w
Brief: Policy actions for building resilience of livestock production under climate change: https://bit.ly/32ZIKD9
Brief: Strengthening education, extension and training to accelerate climate resilience and low carbon development in the agriculture sector: https://bit.ly/2EcciD9
Brief: Policy options for building resilience of crop production under climate change: https://bit.ly/30L8kJv
Brief: Policy actions for building resilience of fisheries development in a changing climate: https://bit.ly/2EmlDsf

The high-level breakfast meeting was held by the Ministry of Agriculture, Livestock, Fisheries and Cooperatives partnered with the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), the African Group of Negotiators-Expert Support (AGNES), the International Livestock Research Institute (ILRI), the Alliance of Bioversity International and CIAT (the Alliance), Aga Khan University's East Africa Institute (EAI) and World Wide Fund for Nature (WWF).

Catherine Mungai is the Partnerships and Policy Specialist at CCAFS East Africa. Laura Cramer is the Science Officer at the CCAFS Priorities and Policies for CSA Flagship. Joab Osumba is the Research Officer at CCAFS East Africa. Maren Radeny is the Science Officer at CCAFS East Africa.

4

Integrating gender and nutrition in Ugandan policy: An assessment

A recent study on Ugandan climate and food security policies assesses gender and nutrition mainstreaming in national policy.

By Lili Szilagyi and Patricia Bamanyaki

Most of Uganda's population relies on rain-fed agriculture for their livelihoods. Agriculture is highly vulnerable to the impacts of climate change: decreasing soil fertility, rainfall variability, extreme weather events, as well as pests and diseases, are only some of the challenges farmers are facing. Rural women in Uganda are especially vulnerable to these challenges, given their cultural responsibility to provide their families with nutritious food, fuel and safe water–resources that are becoming scarce following weather extremes.

The challenges notwithstanding, Uganda is still considered the "regional food basket" due to its high agricultural production. However, undernourishment has been on the rise, despite recent improvements in child nutrition. Adult obesity has also somewhat increased in the last few years, adding to the issue of malnutrition in the country.

Adequate focus on gender and nutrition in climate change and food security policies could help tackle these challenges. A recent study carried out by the International Institute of Tropical Agriculture (IITA)* shows that there is evidence of government efforts to include gender and nutrition perspectives in national policies, but that these are not consistently mainstreamed across climate change and food security policy documents.

Recognizing the importance of agriculture, nutrition and gender in national plans

Uganda's Comprehensive National Development Planning Framework consists of the major national plans and policies, such as their Vision 2040 and five-year national development plans, as well as sectoral policies, among others.

This framework acknowledges the impacts of climate change on the environment and economy, including agricultural production, productivity and incomes. It highlights agriculture as a key sector to be supported to improve access to food, boost income and increase nutrition security. The framework also emphasizes the major role of women in agricultural production and that women should be empowered to participate as equal partners in development.

This shows that gender and nutrition are being considered relevant to national policies. While this is promising, to help the government advance on these commitments, the study looked at how well a number of policy documents integrate gender and nutrition, and made specific recommendations based on the findings.

Taking a closer look at gender and nutrition sensitivity in policy documents

The study examined 26 policy documents across 10 criteria to assess gender and nutrition sensitivity. The policy documents were selected from the vital sectors of water, environment, agriculture, health and education; 10 relate to climate change and 16 documents focus on food security. The 10

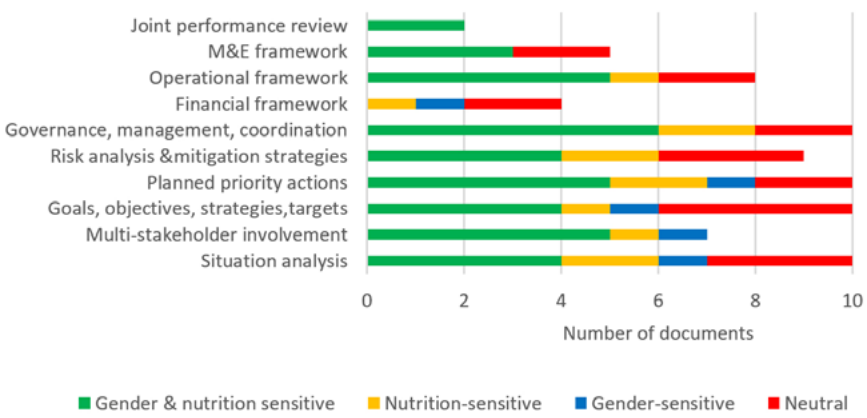
G.Smith (CIAT)

Female farmer in Uganda showing bean harvest. A new CCAFS Policy Briefs explains what's required to solving food insecurity and undernutrition through gender- and nutrition-sensitive policy in Uganda.

criteria were adapted from the Food and Agriculture Organization of the United Nations (FAO) key recommendations for improving nutrition through agriculture and food systems and the UN Network for Scaling up Nutrition (SUN) criteria and characteristics of "good" national nutrition plans. The criteria used are described in Table 1 of the Policy Brief.

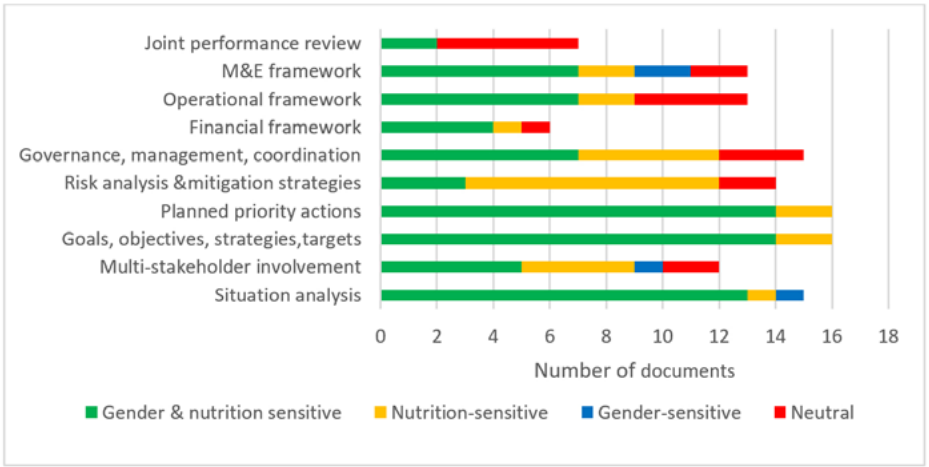
The figures below show how many of the examined documents were gender and/or nutrition sensitive, listed by the 10 criteria.

In climate change policies:



Analysis of gender- and nutrition-sensitivity of climate change policies

In food security policies:



Analysis of gender- and nutrition-sensitivity of climate change policies

Signs of ambition but still room for improvement

There is evidence of efforts to mainstream gender and nutrition in national policies. However, the study finds that gender and nutrition aspects are integrated unsystematically in both climate change and food security policies.

While effective policy implementation will require a systematic and coherent development of guiding documents (policies, implementation strategies, implementation guidelines, action plans and budgets), the study reveals the absence of some important documents along the hierarchy of guiding documents in both sectors. Other key documents, such as the Uganda Nutrition Action Plan 2018-2025 and the National Nutrition Policy are still in draft form. There is also a lack of financial frameworks in more than half of the documents, which makes it difficult to track explicit sector allocations on gender and nutrition. Lastly, gender, climate change and nutrition are cross-cutting responsibilities of multiple sectors, however, very few policy documents provide for joint sector performance reviews.

Recommendations for policy-makers

The study makes some recommendations for policy-makers to consider:

1. Sectors should systematically develop policies and guiding documents and align their provisions for gender, climate change and nutrition with the national targets set by the Comprehensive National Development Plan Framework.
2. Sectors should systematically mainstream gender and nutrition throughout sections of the national guiding documents by stating explicit commitments. This should be informed by sector-specific gender analyses.
3. Joint performance reviews involving various stakeholders should be held regularly to evaluate progress snd alignment with national vision as well as reduce the duplication of efforts.

Implementing these recommendations will advance Uganda's efforts to improve gender, climate change, food, and nutrition outcomes, and thereby contribute to a more food-secure, resilient and equal world.

Read more:

Policy Brief: Climate change, food and nutrition policies in Uganda: Are they gender- and nutrition-sensitive?: https://bit.ly/CCAFS-PB14

** The study was done as part of the CCAFS Policy action for nutrition-sensitive climate-smart agriculture in Uganda and Ethiopia project, led by the International Institute of Tropical Agriculture (IITA).*

Lili Szilagyi is the Communications Consultant for the CCAFS Priorities and Policies for CSA Flagship. Patricia Bamanyaki is the Project Leader for the Policy action for nutrition-sensitive climate-smart agriculture in Uganda and Ethiopia project in Uganda and Ethiopia, based at the International Institute of Tropical Agriculture (IITA) in Uganda. Edited by Leanne Zeppenfeld, Communications Student Assistant for the CCAFS Program Management Unit.

5

Climate change and Africa: Connecting land, food security, and gender

Innovative policy approaches can help tackle land degradation, desertification, food insecurity, and gender inequality within the context of climate change in Africa.

By Kathlee Freeman and Seble Samuel

A large proportion of Africa's population is vulnerable to climate change due to their dependence on climate-sensitive livelihoods—including rainfed agriculture and natural resources—to meet food, nutrition, and income needs. In the coming decades, climate change will continue to strain resources such as soil, land, water, and forests, putting undue burdens on the most vulnerable as a result.

To avoid the most dire climate change predictions and increase the adaptive capacity of vulnerable populations, climate-related policies must be data-driven and scientifically informed. An example of this includes the work done by the Africa Group of Negotiators Expert Support (AGNES), who are committed to informing and increasing the capacity of African policymakers and leaders to make climate-related policy decisions. AGNES spearheaded the process of unpacking Climate Change and Land—an Intergovernmental Panel on Climate Change (IPCC) special report—from which four policy briefs have been prepared, covering desertification, land degradation, food security and gender.

Desertification

A type of land degradation, desertification is specific to drylands, and is often caused by unsustainable human activities and worsened by climate change. Desertification exacerbates reductions in crop yield and weakens the resiliency of agricultural and pastoral systems, with adverse impacts on human health, food security, economic activity, physical infrastructure, natural resources, physical security, and the environment, often disproportionately affecting women and youth. Africa is especially vulnerable to this threat as an estimated 66 percent of the continent is classified as drylands and about 319 million hectares are considered especially vulnerable. According to AGNES, combating desertification requires multi-faceted approaches and tools, including policy interventions, integrated land management practices, and the use of indigenous knowledge at local and regional levels.

Land degradation

Agriculture and deforestation are dominant drivers of land degradation, especially the inefficient use of agricultural resources, soil loss in cultivated lands, and expansion of cultivated land. Available estimates show that 46 percent of Africa's land is degraded, affecting at least 485 million people, translating to an annual cost of USD 9.3 billion. Continued land degradation will render more than half of all cultivated land in Africa unproductive by 2050, with the cyclical relationship between land degradation and climate change intensifying food insecurity, biodiversity loss, and economic underdevelopment. To curb degradation, AGNES calls for inclusive early warning systems and an integrated landscape approach to land management.

S. Kilungu (CCAFS)

Climate change adaptation and mitigation require data-driven and science-backed policy.

Food security

Climate change directly impacts food systems, and likewise, food and nutrition security. As productive land becomes increasingly scarce, food security in Africa will require a coordinated effort across multiple sectors. Empowering women is critical to develop synergies between food security and climate change adaptation and mitigation. AGNES stresses the need for an evidence-based approach, with food production research focused on resilience to both acute and long-term climatic events. Another set of tools lies in the development and diffusion of innovations and technologies. Additionally, priority should be given to food security across climate-related adaptation and mitigation plans at local, regional, and national levels.

Gender

While gender is colloquially used to describe the needs and issues facing women and girls, AGNES stresses the term's broader implications, including the social norms, roles, relationships, access to and control of resources, and responsibilities afforded to men and women. Women are constrained by traditional household and care duties as well as social norms which prevent them from taking an active role in power and decision-making spaces. Applying a gendered perspective to climate change policies and projects includes gender analysis, the collection of sex-disaggregated data, and proper budgeting for gender needs. AGNES also points to the need for national Gender Action Plans (GAPs) with well-designed monitoring and evaluation tools and regular audits to track gender equity progress.

Accelerated transformation across the continent must include enabling policy environments accompanied by early warning systems, support to scientific innovations, capacity building, and equitable knowledge and technology transfer systems to ensure widespread uptake. Building inclusivity into integrated landscape approaches is critical to address the needs of distinct agro-ecological and climatic zones across Africa. Inclusive actions and policies must be participatory, with tracked gender outcomes, the creation of learning platforms, and training and capacity building for policymakers. Development strategies should contribute to low-emissions and climate-resilient agricultural pathways that center food security, are bolstered by data-rich analysis, and include climate modelling.

Climate change is a profound threat the African continent is currently facing and is especially devastating for vulnerable populations. The themes explored in these briefs are important not only for understanding the current and ongoing impacts of climate change in Africa, but also for charting the way forward, towards a more resilient and equitable Africa.

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), along with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), New Partnership for Africa's Development (NEPAD), Food and Agriculture Organization of the United Nations (FAO), The Aga Khan University's East Africa Institute, African Centre for Technology Studies (ACTS), International Development Research Council (IDRC), International Livestock Research Institute (ILRI), International Center for Tropical Agriculture (CIAT), and the African Union Commision (AUC), provided financial and technical support to the production of the briefs.

Read more:

Policy Brief No. 1: Desertification and Climate Change in Africa: https://bit.ly/2Bv7lEv
Policy Brief No. 2: Land Degradation and Climate Change in Africa: https://bit.ly/2WZSJ7P
Policy Brief No. 3: Enhancing Food Security in a Changing Climate in Africa: https://bit.ly/3g1Bz19
Policy Brief No. 4: Closing the Gender Gap in African Agriculture in the Face of Climate Change: https://bit.ly/305vNWN

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6

Why our food systems must be transformed

Despite ravaging the Earth for industrial agriculture we can't provide nourishing food globally. That has to change.

By Seble Samuel

Our food systems face a perilous moment: they are surpassing the fundamental ecological limits of the Earth while leaving billions of people overweight, undernourished or lost in food deserts. As we enter ever further into the climate emergency, continuing to transgress these socio-ecological limits is both immoral and impossible if we want to preserve healthy communities on a habitable planet.

What exactly are we gambling with?

Currently, almost half of global food production relies on conditions that cross planetary boundaries of sustainability. As of today, we have deforested, degraded or otherwise transformed about 50% of the earth's entire land surface to grow food.

However, the vast majority of agricultural land is used to grow feed to fuel the industrial production of livestock, glucose syrups and biofuels, and this problem is growing day by day. The accelerating expansion of agricultural territory has damaged ecosystems and increased water stress, biodiversity loss and species extinction. On top of these problems, the agricultural sector has become the single largest emitter of greenhouse gas emissions globally, wreaking havoc on the climate.

The marine world has fared no better, since we have depleted coastal and freshwater fisheries at an alarming and often non-rechargeable rate, while continuously sucking up around 70% of global freshwater use for agriculture. Excessive fertilizer use and runoff into streams and rivers has left algae blooms and dead zones where marine life simply can't survive.

But despite this ravaging of the Earth - supposedly to feed and sustain our survival - we are failing to keep up with rising demand for food and provide nourishing food globally. Around two billion adults across the world are either overweight or obese, while more than 820 million are undernourished.

Of all the food produced globally, around one third is lost or wasted from farm to fork. In the poorest corners of the world, communities are plagued with food deserts where healthy and affordable food is simply a mirage.

The problem doesn't stop there. By 2050 there will be almost 10 billion people living on the Earth, which means about 2.2 billion more mouths to feed than today. The critical question, therefore, is how to create a sustainable food system that can feed and nourish this growing population within known and predictable environmental limits.

One thing is clear: we won't be able to do this by using current dysfunctional food systems; instead, they have to be transformed, but how?

A number of initiatives have been launched to tackle various elements of food systems transformation. One new initiative, Transforming Food Systems Under a Changing Climate, brings over 100 organizations together to identify the most strategic

N.Palmer (CIAT)

We need to revamp the entire agricultural infrastructure to tackle our socio-ecological food crisis in order to create food systems that are de-carbonized, diverse, inclusive, circular and resilient.

levers for change and the most urgent actions we need to take collectively.

The key elements of this transformation require revamping the entire agricultural infrastructure to tackle our socio-ecological food crisis in order to create food systems that are de-carbonized, diverse, inclusive, circular and resilient. An indispensable element of this revamping concerns our diets, so what will we eat in a transformed food system?

Shifting diets is a key component of the agricultural overhaul we need to make. At present, the world of food is riddled with contradictions. For example, the World Resources Institute (WRI) estimates that half of the world consumes 50% more protein than they need, mainly from red meats.

This level of consumption is demonstrably unequal, with overconsumption across the Global North and scarce consumption across much of the Global South (with the exception of Latin America). Animal-based food intake is set to increase by more than 70% by 2050, particularly across lower-income countries where current meat consumption is small.

This trajectory of rising meat demand globally will be impossible to sustain. Not only is the overconsumption of red meat triggering public health crises in the form of high cholesterol, heart disease and cancers, it is also generating the largest portion of agricultural emissions - and is therefore the biggest contributor to the trend to surpass ecological boundaries. In fact, the Global Footprint Network estimates that we would require 1.75 Earths to meet the future human demand for meat. But of course, we only have one Earth.

As our collective food choices continue to threaten the planet's integrity, we need to radically rethink what we eat, since each choice weighs very heavily on the ecosystems of the Earth. The higher we climb up the food chain, the more

destructive the impacts become on landscapes, freshwater use and emissions.

To curb this destruction, we have to shift what we eat individually, collectively and at scale, particularly across high- and middle-income countries. Consuming lower on the food chain, finding alternative proteins, building agro-biodiversity, eating locally and promoting plant-based diets will need to become commonplace.

According to a report from the EAT-Lancet Commission, this planetary shift in diets means that our plates will be filled with more whole grains, legumes, fruits, vegetables, nuts and seeds, but less red meat, starchy vegetables and refined sugars. It also means we have to waste much less food generally.

These changes will be exceptionally important across the Global North in order to secure a dramatic drop in agricultural emissions and free up the ecological space for much of Africa and Asia to meet their dietary needs, especially in terms of protein. The diversification of diets to plant-based alternatives will allow for healthy climate-friendly eating while reducing the largest driver of agricultural emissions: beef and dairy consumption.

To make this happen we will need to end subsidies for processed and environmentally damaging foods, and replace them with support and incentives to healthy, affordable and locally-sourced alternatives. The Organisation for Economic Co-operation and Development (OECD) estimates that agriculture globally is propped up by USD $600 billion in annual subsidies. What we choose to subsidize therefore has a massive influence on dietary outcomes, especially for low-income communities.

We will also have to create public health campaigns to promote these alternatives and make clear to consumers that there are ecological and health consequences that stem from their food choices. Just as there are cigarette warnings, our food must reveal its true contents and the risks of eating it.

An indispensable element of this transformation is that we eliminate food waste. This can mean redistributing excess food to the hungry, taxing all food waste, and creating circular food systems that use compost to return food scraps to the soil. In the Global South, we need to modernize transport and storage infrastructure to tackle the brunt of food losses during the post-harvest period and processing.

The challenge of reducing the environmental impacts of what we eat by closing food, land and emissions gaps while moving towards a food future that can feed 10 billion people healthily and sustainably by 2050 is a herculean task. But it's also a challenge that we can tackle collectively if we decide to grow our food and feed ourselves in a radically different way.

In the era of climate emergency, such a collective shift in our diets is no longer optional; it's a necessity for a healthy, sustainable and equitable future – for both people and planet.

Seble Samuel is the Communications and Knowledge Management Officer for CCAFS East Africa.

7

Scaling climate-resilient agribusinesses in East Africa

A combination of horizontal and vertical scaling is critical for inclusive scaling models across food systems.

By Helena Shilomboleni, John Recha, Jan Ubels, Maren Radeny and Dawit Solomon

There are growing private-sector driven efforts to scale up climate-smart agriculture (CSA) interventions in East Africa. These measures are aimed at building resilient farming systems through sustainable intensification across different agroecological zones. The Climate Resilient Agribusiness for Tomorrow (CRAFT) project is one such initiative. It supports a market-driven scaling agenda through inclusive business models along selected oilseed, pulse and potato agricultural value chains in Kenya, Uganda and Tanzania. The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is one of the partners in the CRAFT project that is implemented by SNV Netherlands Development Organization.

Crops that are included in the initiative are potatoes, green grams, common beans and sorghum in Kenya; soybeans, sesame, sunflower and potato in Uganda; and common beans, sunflower, sorghum and potato in Tanzania. These crops were selected based on:

- Sufficient private sector interest and capacity for co-investment;
- Adequate domestic consumption to drive market development opportunities;
- Ample evidence of climate change risks projected to impact their value chains.

SNV has co-partnered with several high-potential small and medium enterprises (SMEs) across these value chains. CCAFS is working with SNV to enhance the capacity of SMEs to increase the availability of improved farm inputs, train farmers in CSA production practices and post-harvest management, and deliver climate information services.

Among these SMEs is Equator Seeds Limited (ESL) in Uganda. ESL handles the production, processing and distribution of improved seeds; provides extension support to out-grower farmers; and operates agricultural equipment hire services. The company will work with SNV to scale up the supply of improved sesame seeds from its current levels of production of about 190 tons per year to 1,000 tons per year. Such seeds will be marketed through agro-dealers to a target population of about 30,000 sesame producers.

Finding the scaling sweet spot

Reaching large numbers of beneficiaries or clients with a specific technology or practice as described above is how scaling is commonly understood. In the scaling literature, this approach is referred to as horizontal scaling. This type of scaling entails the replication, roll-out or expansion of proven innovations to more people in existing or new markets and contexts. In the vast majority of agricultural development contexts, however, the adoption and continued use of new innovations by small-scale farmers do not happen in isolation.

G.Smith (CIAT)

Successful climate-resilient scaling combines both horizontal and vertical scaling elements.

It requires engaging with various complementary non-technological mechanisms (rules, policies, institutions, etc.) to create an enabling environment for innovations to go to scale. This process is usually referred to as vertical scaling and focuses on changing or strengthening existing policies and practices by governments, the public and private institutions.

Successful strategies to scaling tend to combine elements from both horizontal and vertical approaches. This ensures that relevant key actors and multiple levels of governance come together to facilitate the uptake of proven innovations. An innovation may be "ready" in a technical sense, in that its core components have been successfully tested to meet specific objectives in a specific environment. However, if existing systemic barriers (institutional, structural, policy, etc.) in the intervention context or landscape are not sufficiently understood and adequately addressed, the innovation may fail to go to scale.

Indeed, CRAFT recognizes the important role that public institutions play in facilitating and implementing climate-resilient farming and adaptation to climate change at the national and local levels. Among the project's core objectives is to support policy efforts to address the most significant institutional and socio-economic barriers for large-scale CSA interventions. Given this, the project's scaling activities are guided by a private-sector driven agenda that supports business champions to horizontally scale their innovations. To complement this, CRAFT will engage and collaborate with relevant institutions and actors to harness additional support and resources through vertical approaches.

In each implementing context, CRAFT will need to understand well and engage the system dynamics that determine the 'scalability' of innovations. These include incentives, required services, conducive policies and regulations and other relevant characteristics of the sector. For instance, a widespread sale of counterfeit seeds in Uganda's agricultural sector stifles not only yield potential but farmers' trust to invest in improved CSA farm inputs. Addressing this problem requires collaborative institutional action to effectively enforce quality standards and regulations in the production, multiplication and distribution of sesame seeds. Overall, developing effective and realistic scaling strategies demands flexibility in project design and implementation. This allows for the delivery of innovations that answer to local conditions and work within the confines of the wider agricultural systems of a particular context.

Read more:

Brief: Common Beans Tanzania: Climate change risks and opportunities: https://bit.ly/3jOKLbx
Brief: Green Grams Kenya: Climate change risks and opportunities: https://bit.ly/2WXUrXn
Brief: Potato Kenya: Climate change risks and opportunities: https://bit.ly/2WSPlLV
Brief: Sesame Uganda: Climate change risks and opportunities: https://bit.ly/32WITHC
Brief: Soybean Uganda: Climate change risks and opportunities: https://bit.ly/30R4jmG
Brief: Sunflower Tanzania: Climate change risks and opportunities: https://bit.ly/301Z5FF
News update: Integrating climate resilience into Farmer Field School methodology in East Africa: https://bit.ly/32Y9C6G

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8

The struggle to halt food loss and waste amidst the pandemic

"Almost a billion people are going hungry, while we waste 1/3 of the food we produce." -CCAFS Big Facts

By Seble Samuel

COVID-19 has exposed a great number of ugly truths that are more easily made invisible under cheerier circumstances: some people have no home to quarantine inside, others face domestic violence at home, some have no public safety nets to speak of and others are more threatened by hunger than an ominous virus. A society of hunger is unacceptable. But this becomes even more unacceptable when one third of our global food supply is lost or wasted every single year.

As hoarding mentality and panic buying spike, market stalls and grocery aisles are being cleared out, leaving barren shelves where food staples were once stocked. Laid-off workers and daily-wage earners in informal economies struggle to feed themselves, while temporary foreign workers are flown in to fill labor gaps across agricultural fields. From farm to fork, COVID-19 puts a spotlight on the troubling issues of our broken global food system – not least of which is the scandal of food loss and waste.

This scandal looks very different in distinct corners of the world. While there are fairly uniform proportional production losses across the continents, there are massive divergences in post-harvest losses and consumption waste, largely demarcated along wealth lines.

Not surprisingly, the Global North is the largest culprit of food waste at the consumption stage, including the prosperous economies of East and Southeast Asia. Whereas across the developing world, and particularly sub-Saharan Africa, consumption waste is basically unheard-of, and most of the damage comes from post-harvest losses.

None of these impacts tread lightly on the earth and none of them are negligible. The Food and Agriculture Organization of the United Nations (FAO) estimates that 1.4 billion hectares of land, or 28 percent of the planet's agricultural area, is used to produce food that is lost or wasted. And consumer food waste in high-income countries is on par with Sub-Saharan Africa's total net food production. These food losses and waste amount to up to one tenth of the planet's carbon footprint.

As millions go hungry while food excess is wasted, the social injustices of hunger point to broken global food systems characterized not only by flawed systems of production, but also by unequal distribution. These dynamics create destructive feedback loops, in which carbon is released from the deforestation of land, which is used to produce food that never feeds mouths but instead ends up in landfills, and emits even more potent greenhouse gases, such as methane.

There are no quick fixes. But there are approaches that point our food systems in a more equitable and efficient direction.

Across developing regions, supply chains are largely informal and supply-driven, with farmers holding very little awareness of the market, remark Heike Axmann and Jan Broeze, Senior Researchers at Wageningen Food & Biobased Research.

S.Maylon (CIAT)

When millions go hungry while excess food is wasted, the social injustices of hunger point to broken global food systems characterized not only by flawed systems of production, but also by unequal distribution.

Matching farming production with market needs, as well as putting the different stages of the value chain in conversation with each other, can help to bridge some of these gaps.

According to the Transforming Food Systems Under a Changing Climate initiative, information management for food demand and supply in distinct contexts, through smart marketing and data platforms, can help to facilitate this exchange. In turn, such setups can influence inventory movement and optimize warehouse storage, procurement approaches and supply chain policies.

Lini Wollenberg, Flagship Leader on Low Emissions Development at the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), emphasizes that storage at this time is critical, as lockdowns globally can limit access to food, making it important to stretch what is available to communities in need.

A solid understanding of crop physiology and ideal handling, as well as a comprehensive look at the whole value chain, are important elements in developing a tailored approach to reduce food loss and waste. Any approaches that incorporate hardware or technology solutions must ensure that market needs, quality, volumes and variation are equally part of the equation. This will allow struggling food systems to move from a push market to one that meets benchmarks and holistically reflects demand.

A deep dive into Ethiopia's dairy sector has revealed important pathways for reducing food loss and waste. A critical component of the population's nutrition, 98% of milk

in Ethiopia is produced by smallholder farmers. However, milk factories commonly face limited supply from farmers, whose ambient temperature storage, collection and transport of milk often lead to rejection due to poor quality. Cooling the milk, in cooling centers or on-farm chillers, is a key element in averting these losses.

Further research highlights that efficient packaging and transportation conditions can also play a transformative role in cutting food loss and waste. For example, using hermetically sealed bags can reduce post-harvest loss from cereal production in Tanzania from 14 percent to less than one percent, and transporting tomatoes in Nigeria – Africa's second largest tomato producer – in plastic crates instead of stacked baskets, can reduce losses from 41 percent to five percent.

But let us not forget the climate crisis, and that solutions to curb food loss and waste must not hike up emissions. In fact, food loss and waste is often a missing piece of the climate puzzle. Project Drawdown – a collaborative resource for information on the leading climate solutions – has spotlighted food loss and waste reduction as the top-ranked solution to cut emissions. A greenhouse gas hotspot analysis is being conducted by the CCAFS Regional Program in East Africa and Wageningen Food & Biobased Research across key value chains in the region to pinpoint where food loss and waste reductions can best influence emissions reductions and climate co-benefits. This emissions calculator can even be applied to calculate the carbon footprint of your food choices.

Across high-income countries plagued by consumer waste, a different approach is needed. Linear food systems need to become a relic of the past, and instead all "waste" should be entered as inputs to the food system—in the form of compost, for example—to create circular food systems. All food excess needs to be redistributed, especially at this time of crisis where millions face hunger. Public awareness campaigns can help reduce over-purchasing and associated food waste, while taxation schemes can push food retailers to curb food waste and remove the aesthetic standards that lead to the discarding of so-called flawed food.

As large swaths of the global population are thrown into precarity, on the verge of facing what the World Food Programme Chief warns could be a 'famine of biblical proportions,' food loss and waste cannot be ignored. It is unthinkable that food is lost and wasted when communities around the world face an urgency of hunger that precedes, and is aggravated by, this pandemic. To give this world a fighting chance, ending the scandal of food loss and waste must become everyday practice.

Seble Samuel is the Communications and Knowledge Management Officer for CCAFS East Africa.

9

Strengthening the capacity of agriculture in Rwanda to adapt to a variable and changing climate

If we are to feed the world's population under a changing climate, farmers must be supported to better manage the climate-related risks that threaten their livelihoods. For several years, USAID and DFID have invested in better climate services for Rwanda's smallholder farmers and agriculture sector.

By James Hansen, Desire Kagabo, Livingstone Byandaga, Karis McGill, Jean Damascene Nyamwasa, Hayley Jones and Kate Ferguson

Driven in large part by its agriculture sector, Rwanda's recent economic growth has doubled per capita GDP between 2007 and 2018, and greatly reduced poverty and child mortality. Along with its fragile natural environment and the highest population density in sub-Saharan Africa, the risk imposed by a variable and changing climate works against efforts to improve Rwanda's agricultural economy and the livelihoods of its 2.1 million smallholder farm households.

Climate services that help farmers and other decision-makers de-risk agricultural livelihoods and value chains—one of the four priority action areas identified by the Transforming Food Systems Under a Changing Climate initiative of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in a flagship report due out June 25th—is the focus of recent efforts in Rwanda supported by the US and UK governments, and coordinated by CCAFS through the International Center for Tropical Agriculture (CIAT) Rwanda office.

US and UK invest in Rwanda's climate service capacity

The "Rwanda Climate Services for Agriculture" project was launched on World Meteorological Day in March 2016, to develop climate services for farmers and institutional decision makers across the country's agriculture sector, and to strengthen the capacity of the national meteorological service, Meteo Rwanda, to provide information that enables them to anticipate and manage climate-related risks. This initiative, funded by the United States Agency for International Development (USAID) and led by CCAFS, is a partnership of CIAT, Meteo Rwanda, the Rwanda Agricultural Board (RAB), the International Research Institute for Climate and Society (IRI), the University of Reading and World Agroforestry Centre (ICRAF).

Then in 2018, the Weather and Climate Information Services for Africa (WISER) programme, funded by the UK Government's Department for International Development (DFID) and managed by the Met Office (the UK's national meteorological service), launched a project in Rwanda

A. Nyandwi (MINAGRI Rwanda)

Proper climate services help farmers and other decision-makers access information that enables them to anticipate and manage climate-related risks.

designed to enhance and scale up the co-production of climate services for improved climate risk management and to deliver an impact-based early warning system. This partnership between CIAT, the Met Office, IRI and Meteo Rwanda aims to enhance and scale up the co-production of climate services and impact-based early warning for improved climate-risk management in Rwanda.

The synergies between these complementary efforts are preparing a legacy of effective climate services and climate risk management. For example, the USAID initiative developed processes to bring climate services to farmers, while the WISER initiative developed mechanisms to bring farmers' feedback back to the service providers. The USAID project has a strong focus on making climate services work for the country's farmers, but recognized a gap in the use of climate services by local government for agricultural planning—a gap that the WISER project was able to target. The complementary efforts supported Meteo Rwanda to develop a range of information products—high-resolution historical data and analyses, improved downscaled seasonal forecasts, impact-based early warnings—that the agriculture sector needs to understand, anticipate and manage risks.

> "WISER was developed to target specific weather and climate challenges in East Africa, and the Rwanda project is a great example of how the programme has been able to help deliver relevant and accessible climate services. These will continue to have an impact on lives and livelihoods in Rwanda beyond the life of the project, having built capacity in the country". - Kate Ferguson, Met Office WISER Programme Manager, June 2020

Rwanda at the cutting edge

Rwanda is gaining a reputation as an innovator. In health, Rwanda pioneered the use of drones to deliver vital medicines and supplies to remote locations, and the use of robots to reduce the risks of spreading COVID-19 as medical

staff treat patients. As the two climate service projects draw to a close in 2020 and 2021, it is clear that they have helped position Rwanda at the cutting edge of agricultural climate services:

- Face-to-face participatory climate communication and planning processes have been implemented at an unprecedented scale. Working through the Twigire Muhinzi agricultural extension service, 112,000 farmers across all 30 districts were trained and supported to access, understand and incorporate climate information into their planning, using the Participatory Integrated Climate Services for Agriculture (PICSA) process.
- Radio Listener Clubs piloted in Rwanda combine the benefits of participatory, broadcast media and mobile phone communication channels. These clubs meet weekly to listen to climate services broadcasts (accessed by roughly 40% of Rwanda's farmers), share and record their plans to act on the information, and take turns participating in interactive call-in programs.
- Rwanda was the first country in Africa to implement an objective seasonal forecast system based on statistical downscaling of output of an ensemble of multiple climate models.
- In addition to improved future climate analytics, Meteo Rwanda was supported to reconstruct about 15 years of lost climate data and generate historical records for every 4 km across Rwanda.
- Meteo Rwanda now provides localized climate information at a national scale, through one of the most advanced suites of online climate information available for agricultural decision makers in Africa. Online "Maprooms" developed in Rwanda have since been adopted by the national meteorological services of Ethiopia, Senegal, Bangladesh, Colombia and Guatemala; and by the IGAD Climate Prediction and Applications Centre (ICPAC), the regional climate center for East Africa.
- Sixteen cooperatives in four districts now have climate risk assessments and adaptation plans for six priority agricultural commodity value chains.
- An ICT-based "5Q" (Five Question) monitoring tool has been introduced to efficiently and continuously capture farmers' feedback on the services they receive. Seven thousand, five hundred (7,500) farmers trained to use the 5Q tool provide regular feedback, and plans are in place to extend it to 100,000 potential participants.
- M.Sc. scholarships for seven Meteo Rwanda staff members, and three from RAB, have raised the capacity of these national institutions.

A. Nyandwi/MINAGRI Rwanda

Through the Twigire Muhinzi agricultural extension service, 112,000 farmers across all 30 districts were trained and supported to access, understand and incorporate climate information into their planning.

Rwanda's leadership is gaining international recognition, for example through the inaugural Climate Smart Agricultural Project of the Year Award.

> "A joint initiative … has rebuilt 15 years of lost climate data. The program has also helped our national weather agency build an advanced online climate information system for Rwandan farmers. These results could only have been achieved with sustained partnership over many years." - His Excellency President Paul Kagame
> Columbia University, New York, 26 September 2019

Climate services make a difference

Following investment in climate information products and training for local government, district agricultural officers have begun to use the information to improve the services they provide to farmers. For example, in the Western highlands, agronomists used climate information to match crop varieties to local conditions, providing more suitable hybrid maize seeds to 87,872 farmers. While in Bugesera District, authorities used crop water deficit calculations based on climate information to provide supplemental irrigation water, pumped from a lake into a lined reservoir, to enable 188 farmers to cope with prolonged dry spells.

Even without improved public sector resource mobilization, participation in PICSA and Radio Listeners Clubs is associated with a substantial increase in the proportion of farmers

that report changing management decisions in response to weather and climate information. Examples include changing what crops and varieties they plant, how they prepare their land and manage crops and livestock, and changing the scale of crop and livestock enterprises. Participation in PICSA is associated with a 24% increase in the value of crop production and a 30% increase in income from crops. When PICSA was combined with Radio Listeners Club participation, the increase in crop value (47%) and resulting income (56%) was even greater.

> "I received training on the use of climate information in agriculture; I since then respect my seasonal calendar which allows me to know practices that I should do during dry or wet days. I now prepare myself on time and wait for the seasonal forecast for me to adjust my plans before planting. This opened my eyes and I now do farming, livestock keeping and my family is wealthy." - Kabarisa Wellars, a Rwandan farmer, 2017

What's next for climate services in Rwanda?

Despite these successes, the work is far from over. Rwanda is preparing for a 1.4–2.3 °C increase in average temperature by 2050, coupled with increased risk from heat waves, dry spells and extreme rainfall. But as a result of USAID and DFID intervention, local systems are in place to anticipate and respond to these climate risks. Building on their increased capacity, Meteo Rwanda's stated priorities moving forward are to fully operationalize the National Framework for Climate Services, and to explore the formation of a Rwanda Meteorological Training and Research Centre (RMTRC).

Read more:

Website: Transforming Food Systems Under a Changing Climate: https://bit.ly/30SLcsF
Website: Building climate services capacity in Rwanda: https://bit.ly/3g4CAoT
News update: New partnerships launched to bolster climate services in Rwanda: https://bit.ly/39v5Z9j
News update: Trainings in climate services for agriculture reach all of Rwanda: https://bit.ly/32VpqH7
Publication: Rwanda Climate Services for Agriculture: Evaluation of farmers' awareness, use and impacts: https://bit.ly/2CFUIat
Publication: Climate risk assessment for selected value chain commodities in Rwanda: https://bit.ly/3hHkAl9

James Hansen is a Senior Research Scientist at IRI. Desire Kagabo is the Rwanda Climate Services for Agriculture Project Coordinator at the Alliance of Bioversity and CIAT. Livingstone Byandaga is the Project Coordinator for WISER at CIAT. Karis McGill is an Agriculture Markets Specialist at USAID. Jean Damascene Nyamwasa is the Agriculture Productivity Team Leader at USAID. Hayley Jones is a Senior Communications Executive at the UK Met Office. Kate Ferguson is the DFID WISER Programme Manager at the UK Met Office.

10

Reducing the carbon footprint of dairy in Sub-Saharan Africa

Research suggests that dairy farmers can reduce their carbon footprint by improving animal and herd management.

By Sadie Shelton

The growing global population and increasing consumption of meat and dairy will increase global animal protein demand by 60% by 2030. The livestock sector is responsible for about 15% of human-induced greenhouse gas (GHG) emissions. The high carbon footprint (CF) from milk production by smallholders in Africa is predicted to increase significantly in the coming decades; scaling mitigation practices to curb emissions from the dairy sector is vital to reducing emissions and addressing dairy's role in climate change.

> "To meet the growing demand for dairy in Kenya and other developing countries while also addressing climate change, it is essential to identify the most effective mitigation practices and then identify the interventions required to catalyze change." - Andreas Wilkes, UNIQUE Forestry and Land Use Gmbh

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) helped support and implement a survey and analysis of 382 smallholder dairy farmers in central Kenya. The study describes the first assessment of the CF of milk production in Sub-Saharan Africa based on actual farm management practices of the dairy farms in central Kenya. The study aimed to determine whether there were significant differences in the CF of farms with different feeding systems (i.e. zero-grazing, grazing and mixed systems), and identify factors associated with variability in CF between farms. This analysis identified options for mitigating GHG emissions from Kenya's growing dairy production.

Mitigation options for dairy in Kenya

The study identified various management factors at the individual cow and farm levels associated with the increase or decrease in the CF of milk production in central Kenya. CFs were found to largely depend on milk yield, feed characteristics, manure management practices, and herd size and composition. In particular, the level of feed concentrate used increased the CF and was the most important factor explaining the variation of the CF not attributable to a difference in milk yield. Customizing feed rations and concentrates according to animal needs throughout the lactation cycle could provide opportunities to increase milk production and reduce the carbon footprint of milk production.

Supporting smallholder farmers to implement these mitigation options will require interventions at several levels in feed supply chains in the dairy sector. Breed improvement is also a mitigation practice relevant in many African countries, and other research has shown that women's involvement in breeding decisions is associated with higher milk yield. Encouraging and demonstrating the benefits of

S. Odeyo (ICRAF)

Demand for dairy is ever increasing along with the carbon footprint of the dairy sector. Farmer support is needed to incentivize practice changes.

best practices in feeding and breeding could simultaneously reduce GHG emissions and increase production to meet the growing demand for dairy.

Read more:

Journal article: Variation in the carbon footprint of milk production on smallholder dairy farms in central Kenya: https://bit.ly/339vigj
Database: CCAFS Big Facts | Food security - Diets: https://bit.ly/3jGXvkf
Guidance document: Livestock Activity Data Guidance (L-ADG): https://bit.ly/3gfIXpP
Info Note: Further evidence that gender matters for GHG mitigation in the dairy sector: https://bit.ly/2WSVh7F
Info Note: Youth opportunity spaces in low-emission dairy development in Kenya: https://bit.ly/2WXoVZr
Outcome story: Kenya's State Department of Livestock catalyzes investments of USD 223 million in the dairy sector: https://bit.ly/2P1twVS

Sadie Shelton is the Communications Officer for the CCAFS Flagship on Low Emissions Development.

11

Learning to grow vegetables: A novel way to transfer knowledge in Hoima, Uganda

Ugandan farmers experiment, innovate and exchange local knowledge in vegetable production.

By Tobias Recha, Ronnie Vernooy, Annet Kizza, David Baguma, Joshua Mwanguhya, Elizabeth Kabakoyo, Moses Kasozi, Sylvester Dickson Baguma, Jasper Ahumuza and Ronald Kakeeto

Growing vegetables is a means to diversify agricultural production, improve nutrition and health and adapt to climate change. Therefore, between 4–5 March 2020, over 600 farmers from eight villages in Hoima, Uganda, came together to learn about this practice. The event provided an opportunity for farmers and experts to share knowledge and skills in vegetable production.

The novel activity promoted experimentation, collective learning, innovation and entrepreneurship. Pilot farmers and vegetable experts talked about and demonstrated key elements of five production steps, including seedling production, soil and water conservation, fertilization, crop protection and safe use of pesticides. These approaches were tested on tomato, green cabbage, eggplant and green pepper crops.

> "Take full advantage of this day and the knowledge that you will receive to start growing vegetables in the right way. First, we are learning about tomatoes; then we will visit the cabbage, eggplant and green pepper pilot farmers. All these crops have high market demand, apart from nutritional benefits." Mr. Mbabazi Benson, Local Council Leader

East West Seed Knowledge Transfer, the Alliance of Bioversity International and the International Center for Tropical Agriculture (the Alliance), in collaboration with Wageningen Centre for Development Innovation, the World Vegetable Centre and the National Agricultural Research Organization (NARO) of Uganda, are implementing a one-year pilot project on vegetable production in Uganda. The project started in October 2019 and is being implemented in Hoima District, Kyabigambire sub-county, where the Alliance and NARO already collaborate on participatory crop improvement, conservation of agrobiodiversity and adaptation to climate change, with the support of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). If successful, the collaborating organizations aim to scale the pilot to many more farmers in the Hoima area.

Innocent Kaija, a pilot farmer from Katikara Village, shared his experience with the project. "I was supported by East West Seed and the Alliance to establish a demonstration farm with three different varieties of tomatoes: two newly-introduced varieties and one purchased at the local market."

Innocent noted that prior to beginning this pilot, he faced the challenges of poor extension services and was reliant on trial and error in his farming. He shared that the vegetable pilot now guides him technically, and he is learning different techniques to deal with pests and diseases.

R. Vernooy (the Alliance)

Farmers and experts share knowledge and experiences on vegetable production in Hoima, Uganda.

Scaling prospects

Farmers pointed out that most of the local varieties of vegetables face many challenges, in particular early and late blight disease. "We received some rain when we planted, although it stopped raining immediately after that. Due to the rain, the local varieties were infected by blight. However, Padma, an East West Seed tomato variety, performed well and had lower susceptibility to early and late blight," noted Innocent Kaija. "Padma produced 70 to 100 fruits per plant while the local varieties only had 7 to 15 fruits per plant." Padma has good resistance to water stress compared to the local varieties. It is a fast maturing type whose fruits can be harvested within two months of transplanting.

R. Vernooy (the Alliance)

Knowledge exchange on innovations, experiments and entrepeneurship in vegetable production takes place in Hoima, Uganda.

Eggplant farmer Evelyn Kugonza said that, after the promising pilot, she planned to produce eggplants on a larger piece of land, targeting bigger markets in Kampala, apart from the already available local market. She enthusiastically added: "I am bringing women and youngsters together so that we can form a vegetable growing group and buy a vehicle to transport the fruits to market."

The vegetable project has provided an opportunity for farmers to learn and appreciate the importance of five key tips for a successful vegetable farm: strict usage of top quality seeds, provision of daily attention and care to the plants, quick intervention when problems arise (e.g. pests and diseases), maintenance of the fields from weeds, invasive plants and rubbish and lastly, on-time harvesting, consumption and selling. Combining these elements will support farmers in diversifying their food systems, producing nutritious alternatives while also catering to high market demand.

Read more:

News update: Nyando Climate-Smart Village launches community seedbank: https://bit.ly/3hFtNKw
News update: Building resilience across East Africa one seed at a time: https://bit.ly/39u1k7A
Handbook: Resilient seed systems: https://bit.ly/39uxNe2
Workshop highlight: Scaling community seedbanks and farmer seed enterprises in East and Southern Africa: https://bit.ly/3g5n38m

We acknowledge the financial support of the Ministry of Agriculture, Nature and Food Quality of the Government of the Netherlands.

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12

Integrating climate resilience into Farmer Field School methodology in East Africa

The fusion of climate resilience into Farmer Field School methodologies is a novel approach in East Africa.

By Joab Osumba and John Recha

Farmer Field Schools (FFS) were introduced in East Africa in the late nineties as an alternative to top-down extension methods. At the time, climate change and variability were not key elements of the approach. The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in East Africa is working with partners to integrate climate resilience into the region's FFS methodology, to promote climate-resilient agricultural practices in selected value chains.

This is undertaken within the five year Climate Resilient Agribusiness for Tomorrow (CRAFT) project funded by the Ministry of Foreign Affairs in the Netherlands, and implemented by the Netherlands Development Organisation (SNV) in partnership with CCAFS, Wageningen University and Research (WUR), Agriterra and Rabo Partnerships. The consortium offers a strong platform to not only manage and coordinate a robust climate-smart agriculture (CSA) project, but also provide targeted technical assistance, business facilitation, as well as research and knowledge management support.

Farmer Field School 101

The FFS is a group-based learning process that brings together concepts and methods from agroecology, agroclimatology, and experiential learning through regular field observations and group analysis. The synergy of climate resilience and FFS methodologies, known as CR-FFS, is a novel approach. Given this, building the capacity of key resource people on the integration of these two concepts has been critical. Key stakeholders have included farmers, small and medium-sized enterprises (SME) employees, and public extension agents.

Throughout the training, CCAFS and SNV facilitated courses on the nexus of FFS and climate resilience in Uganda, Kenya and Tanzania. The sessions included Training of Trainers (ToT) and more advanced Master Trainers (MToT) events. The capacity building process involved partner cooperatives, SMEs, farmer representatives, and local government agricultural extension workers.

The training events were instrumental in empowering participants with knowledge and skills in the CR-FFS methodology, with the following objectives:

- Equiping trainees with knowledge about climate change, climate variability and climate related risks affecting agriculture
- Providing participants with the right tools for facilitating CR-FFS learning
- Transferring skills to identify relevant stakeholders in CR-FFS
- Preparing participants on how to plan improved CR-FFS implementation
- Preparing a climate-resilient crop production curriculum for selected crops
- Sharing knowledge, skills and experience in different farming systems to improve production

The training process followed a mixed approach of brainstorming, presentations on key scientific concepts and

L.Tato (FAO)

Climate resilience must be an integral element of Farmer Field School methodologies.

theories, group work to expose participants to Participatory Rural Appraisal (PRA) tools commonly used in FFS, plenary sessions to stimulate debate, and field visits for on the ground experience.

Making an impact in critical value chains

Throughout the course of the trainings, a total of 339 participants (24% female) from six cooperatives and SMEs focused on sesame and soybean value chains were trained in Uganda. In Kenya, 99 participants (28% female) were trained from 15 cooperatives and SMEs on green gram and potato value chains. In Tanzania, 210 participants (51% female) from six cooperatives and SMEs on sunflower and common bean value chains.

The participants sharpened their decision-making skills when faced with production constraints, including the use of climate information and appropriate climate-smart technologies and practices in different agroecological zones. Lessons from the trainings reflect a strong need to work more closely with meteorological agencies to ensure that farmers are guided to collect agrometeorological data which they can interpret easily and utilize for their agricultural production purposes.

Read more:

Research highlight: Scaling climate-resilient agribusinesses in East Africa: https://bit.ly/2CKnMxA
Brief: Common beans Kenya: Climate risk assessment: https://bit.ly/2D908KY
Brief: Sorghum Kenya: Climate risk assessment: https://bit.ly/3jNlGxE
Brief: Potatoes Tanzania: Climate risk assessment: https://bit.ly/2P1EJWJ
Brief: Sorghum Tanzania: Climate risk assessment: https://bit.ly/2P1p75C
Brief: Potatoes Uganda: Climate risk assessment: https://bit.ly/2OX4Pdd
Brief: Sunflower Uganda: Climate risk assessment: https://bit.ly/2WZP0Hs

Joab Osumba is a Research Officer for CCAFS East Africa. John Recha is a Climate-Smart Agriculture Policy Scientist and the CRAFT Coordinator for CCAFS East Africa.

13

The secret recipe for scaling climate-smart agriculture: Youth

Counting on agriculture students to scale climate-smart agriculture in Kenya.

By Victor Mugo, Ivy Kinyua, Catherine Mungai and John Recha

Research trends reveal massive gaps in students primed to become Kenya's next generation of agricultural professionals and agripreneurs. Degree enrolment in agriculture courses decreased from 24,221 students in 2017 to 18,165 in 2018, a 25% drop, as students reported a lack of motivation and a negative perception of career prospects in the future of agriculture. However, youth—as future decision makers and drivers of agricultural transformation in Kenya—have an opportunity to contribute to the country's food security.

For this, the Climate Smart Agriculture Youth Network (CSAYN) in collaboration with the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), the Alliance of Bioversity International and CIAT (the Alliance) and the University of Nairobi (UoN), held the inaugural Climate-Smart Agriculture (CSA) Campus Forum at UoN. This aimed to build the capacity of students taking agriculture courses in CSA and equip them with knowledge to harness the massive opportunities in agribusiness.

The Forum attracted 464 students from the College of Agriculture and Veterinary Sciences (CAVS), research scientists in CSA, professionals from research and development organizations, young champion farmers implementing CSA and faculty from UoN. The forum was broadcast on television and livestreamed by TV47 to Kenya's 47 Counties.

Scientists unpack CSA and young farmers share first-hand experiences

Dr. John Recha, a CSA scientist with CCAFS who studied agriculture at UoN 25 years ago, explained the science of climate change and the effects on agriculture. He highlighted why CSA is a suitable approach to address climate change impacts on agriculture.

Dr. Evan Girvetz, Principal Scientist at the Alliance, unpacked practical examples of how youth are being engaged in numerous agribusiness activities. For example, the Alliance

B. Wema (Independent Photographer)

Agricultural student participants at the CSA Campus Forum at the University of Nairobi.

B. Wema (Independent Photographer)

Victor Mugo, Country Coordinator for the Climate Smart Agriculture Youth Network (CSAYN), presents at the CSA Campus Forum in Nairobi, Kenya.

has partnered with John Deere, a tractor manufacturer, and Hello Tractor, a digital platform that connects smallholder farmers to mechanization services on a conservation tillage program, where farmers can request a tractor though mobile digital platforms as easily as requesting an Uber.

The opening session was followed by an interactive experience with two young agripreneurs: Ronald Dianga, who runs Kenarava Agribusiness, a company that provides agribusiness consultancy in farm management and farmer training; and Anthony Malovi, who farms on five acres of land in Kitale. They advised students to take a business approach to farming, leverage their academic skills in agriculture and tap into opportunities in climate-smart farming.

Key takeaways from the CSA Campus Forum

1. Knowledge is power – climate education for youth is vital

Developing tailor-made knowledge and information sharing platforms could be useful in raising awareness and informing youth about CSA, building their capacity, tapping into their growing energy and drive for climate action, and identifying avenues to transition to CSA.

2. Gaining insight from fellow young people – the efficacy of peer to peer learning

Experience sharing through multi-medium dialogues creates space for positive youth influencers to dispel negative perceptions and stereotypes and facilitate young people to become more engaged in agriculture.

3. Seeing is believing – practical demonstration is needed

Pictorial articles, videos and CSA demonstration farm visits, will enhance knowledge of locally appropriate and environmentally sound farming approaches and technologies.

4. Climate-smart innovations – digital farming key to youth involvement in agriculture

The digital agriculture revolution has the potential to birth the twin benefits of scaling out CSA while attracting, engaging and retaining youth in the sector.

5. Research – the need for evidence to inform programmatic interventions

Gaining insights on youth perceptions and attitudes in agriculture could enable relevant actors in the CSA space to develop scalable methods and tools that effectively engage young people, and base policies on these research outcomes.

Based on the insights and building on the conference momentum, the partners and organizers hope to scale out the CSA Campus Forum. Participatory learning platforms for students will be key in changing any negative perceptions towards agriculture, and increasing knowledge and impact.

Read more:

Blog: Investing in the future: Youth-led research and its role in combating climate change: https://bit.ly/3jMoZVx
News update: Is climate-smart agriculture the silver bullet to attract youth to agriculture?: https://bit.ly/2DbFLwq
News update: Diverse youth groups come together for climate-smart agriculture: https://bit.ly/303MwcJ
News update: Practical and innovative solutions to engage African youth in agriculture: https://bit.ly/32X9B2P

Victor Mugo is Country Coordinator for the Climate Smart Agriculture Youth Network (CSAYN). Ivy Kinyua is Research Assistant at the Alliance of Bioversity International and CIAT. Catherine Mungai is Partnerships and Policy Specialist at CCAFS East Africa. John Recha is Participatory Action Research (PAR) Specialist at CCAFS East Africa.

9

How can young African agripreneurs survive COVID-19 and the climate crisis?

Young people across Africa are implementing innovative ideas to address the current food availability crisis using various digital platforms.

By Catherine Mungai, Matthew Fielding, Mary Thiong'o, Alphaxard Gitau, Sharon Anyango and Victor Mugo

The COVID-19 pandemic is disrupting agricultural value chains in Africa by threatening food, nutrition and security, as well as the livelihoods of farming communities. In addition, climate-related catastrophes, such as floods and the desert locusts, have contributed to the challenges faced by the most vulnerable populations, especially the rural youth.

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), 2SCALE, the Food and Agriculture Organization of the United Nations (FAO), AgriProFocus, the Climate Smart Agriculture Youth Network (CSAYN), the Swedish International Agricultural Network Initiative (SIANI) and Practical Action held an online discussion followed by a webinar to explore and discuss how young people working in agribusiness are coping with the effects of the pandemic in the context of a changing climate. The insights from this collaboration highlight struggles, coping innovations and policy response options.

Whilst development partners and governments have been encouraging youth to embrace agriculture as a source of income, it is worth noting that young rural people, especially young women, are among the most vulnerable groups and are at high risk of disproportionately suffering the pandemic and its aftermath. The youth already face higher rates of unemployment and underemployment, and are overrepresented in the informal economy where they are 40% more likely to be in casual work arrangements than those above 35 years old. Most earn their income on a daily or weekly basis and have little or no access to health insurance or social security.

At the same time, it is increasingly observed that some of the policy responses and measures put in place by governments to halt the spread of the virus are exacerbating the existing challenges that rural youth face in engaging in agriculture and agribusiness. For example, several formal and informal businesses, which employ many young people have been forced to close or downscale significantly as a result of lockdowns and movement restrictions at national and local levels.

However, all is not lost: Many young people are implementing innovative ideas to address the current food availability crisis using various digital platforms, as highlighted in an online discussion hosted on the Climate and Agriculture Network for Africa (CANA) platform from May 20, 2020. Some of the interesting insights that came out from these discussions include:

> "I have seen some interesting innovations with an example of youth activities in the suburb where I stay, who told me his story of how he has lost his job and to survive he has acquired an old bicycle

G Smith (CIAT)

Many young people are implementing innovative ideas to address the current food availability crisis using various digital platforms.

and loads it with fruits and vegetables. He uses a loudspeaker to call out to whoever needs the items he has as he rides through the neighborhood," commented Stella Naggujja, (CANA) in the online discussion.

During the webinar held on June 18, 2020, Ian Mutwiri of HomeRange Poultry shared how his team has developed online manuals on poultry farming, which are freely available online, and how his team is using social media platforms, such as Youtube and Facebook, to conduct training sessions targeting the youth. Antony Malovi (CSAYN) has developed a solar drier using locally available materials given that he could not import any as a result of COVID-19 lockdown.

Marzia Pafumi, Youth Engagement Specialist (FAO), argued that youth agripreneurs responded to COVID-19 very fast, trying to adapt their business models and thinking outside the box to find new opportunities. She mentioned that as a result of the pandemic, there has been an accelerated move to online marketing and sales, such as orders on social media, home delivery and an increase in mobile payments. Agripreneurs also started to work more with adding value to primary products. Many of them started to use locally sourced agricultural inputs.

Mr Jacob Ochieng (Practical Action) highlighted the unprecedented impact COVID-19 is having on the economy worldwide. Practical Action is supporting agribusinesses and youth so they can remain safe by providing access and distributing information on the best practices about stopping the spread of the virus. Ochieng also underscored the importance of keeping essential agricultural services running. He mentioned that marketing and networking for

C.Schubert (CCAFS)

Young rural people, especially young women, are among the most vulnerable groups and are at high risk of disproportionately suffering the pandemic and its aftermath.

Online channels have provided avenues for interactions among agripreneurs

agripreneurs is not possible during a lock-down, but digital platforms and social media that will help to coordinate are key when people can not physically meet to negotiate, transact or receive training. In conclusion, he mentioned that innovations and the combined learnings about climate change and COVID-19 should be utilized in activities related to resilience for youth in agribusiness.

Webinar Outcomes

The discussion during the webinar revealed that young agripreneurs need empowerment in the following critical areas:

- Mentorship – Young female agripreneurs are underrepresented and this can be attributed to various challenges including socio-cultural barriers, such as access to land and lack of technical skills. Mentorship from established young male and especially female agripreneurs was seen as essential for upcoming young agripreneurs.
- Financial Access – There is a need to offer access to capital for the youth as well as the development of youth-focused financial tools to support the establishment and sustainable operations of youth-led agribusinesses
- Capacity building – Governments and development partners can work in partnership with established agribusinesses and with youth-centered organizations to establish centers of excellence which include demonstration sites and knowledge sharing activities for young people, including those on ICT, a field that has become vital in light of the COVID-19 crisis.

The discussions at the webinar made it crystal clear that when youth innovation in agribusiness is complemented with financial and non-financial support, young agripreneurs can not only survive but continue to thrive in the post-pandemic new world order.

Out & About

1&2. Kenya's Ministry of Agriculture, Livestock and Fisheries convened a breakfast meeting with key stakeholders in Nairobi in January 2020 on agriculture and climate, raising awareness of the impacts. **3.** CCAFS East Africa Dr. John Recha adressing students at the Climate-Smart Agriculture Youth Network (CSAYN) and the University of Nairobi (UoN) organized the CSA Campus Forum in Nairobi, Kenya. **4.** Participants at the Climate-Smart Agriculture Youth Network (CSAYN) and the University of Nairobi (UoN) organized the CSA Campus Forum. **5&6.** CCAFS led a monitoring data collection training in Doyogena climate-smart landscape in Southern Ethiopia in November 2019.

In our diary

September
8-11
2020

African Green Revolution Forum (AGRF)
Venue: Online

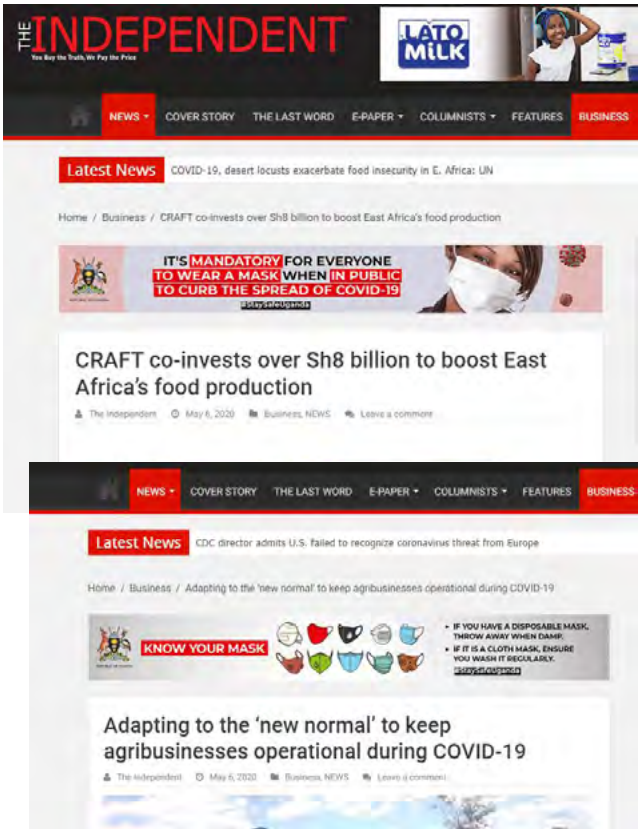
September
16
2020

International Day for the Preservation of the Ozone Layer 2020
Venue: Saudi Arabia

September
21-27
2020

Climate Week NYC 2020
Venue: New York

CCAFS EA in the media



Eastern Africa focus on cutting emissions, boosting productivity | ACIAR Partners in Research for Development: https://bit.ly/39H7oJY
Adapting to the 'new normal' to keep agribusinesses operational during COVID-19 | The Independent: https://bit.ly/3gdiOHW
CRAFT co-invests over Sh8 billion to boost East Africa's food production | The Independent: https://bit.ly/2PggTX7
Kenyan farmers hit by worst locust swarms in 70 years | Voice of America: https://bit.ly/3114Mmt
Webinar: Subnational climate-smart agriculture action planning: lessons from Kenya and Tanzania | Africa LEDS Partnerships: https://bit.ly/317mSDc
#CSACampusForum | TV47 DIGITAL: https://bit.ly/2DmAi64

Further reading

CCAFS latest publications

Country outlook: Ethiopia - Agriculture, food security and climate change outlook: https://bit.ly/3gdYcQ1

Country outlook: Kenya - Agriculture, food security and climate change outlook: https://bit.ly/2D3nMsy

Country outlook: Tanzania - Agriculture, food security and climate change outlook: https://bit.ly/3hO6Dlp

Country outlook: Uganda - Agriculture, food security and climate change outlook: https://bit.ly/2CUhsUk

Info Note: Review of policies and frameworks on climate change, agriculture, food and nutrition security in Ethiopia: https://bit.ly/30g21i6

Journal article: Climate-smart agriculture, household income and asset accumulation among smallholder farmers in the Nyando basin of Kenya: https://bit.ly/2YglTPA

Journal article: Assessing the impacts of different land uses and soil and water conservation interventions on runoff and sediment yield at different scales in the central highlands of Ethiopia: https://bit.ly/3hUGBgu

Project newsletter: Rwanda Climate Services for Agriculture: Transforming Rwanda's rural farming communities and national economy through improved climate risk management: https://bit.ly/30itkbD

Transformation Initiative: Actions to Transform Food Systems Under Climate Change: https://bit.ly/2D6GfED

Working paper: Rwanda Climate Services for Agriculture: Evaluation of farmers' awareness, use and impacts: https://bit.ly/32awWMy

CCAFS Tools

CCAFS website and blog Updated daily with news on policy and practice, research, events and downloadable publications from the CGIAR and partners. http://bit.ly/1gX2uKi Blog: http://bit.ly/Blogs_EastAfrica

Adaptation and Mitigation Knowledge Network (AMKN) Map-based platform for sharing data and knowledge on agricultural adaptation and mitigation. http://bit.ly/AMKN_Maps

AgTrials Large public repository of agricultural trial data sets, with different crops, technologies and climates. http://bit.ly/AgTrials

Food Security CASE maps Map-based projections of crop area and yields, average calorie availability, and international trade flows across the world. http://bit.ly/Casemaps

MarkSim II Generator Future location-specific rainfall series, based on a choice of General Circulation Models: http://bit.ly/MarkSimGCM

GCM data portal Set of downscaled climate data sets. http://bit.ly/Climate_Data

Dataverse public portal Full CCAFS data sets such as the baseline surveys from CCAFS East Africa sites that include information on farmers' current adaptive practices. http://bit.ly/Baseline-Surveys

Big Facts website Get all the links on climate change, agriculture and food security: http://bit.ly/1gYWjWt

Atlas of CCAFS sites Browse colorful maps of CCAFS research sites in three regions: East Africa, West Africa and South Asia: http://bit.ly/1iSfwHd

Core sites in the CCAFS regions This portfolio includes brief descriptions of CCAFS core sites in East Africa, West Africa and South Asia, including coordinates of the sampling frames of the baseline surveys: http://bit.ly/1dKwrfG

Adaptation and Mitigation Knowledge Network Map-based platform for sharing data and knowledge on agricultural adaptation and mitigation: http://bit.ly/1kiEnng

Climate Analogues This is a tool that uses spatial and temporal variability in climate projections to identify and map sites with statistically similar climates across space and time: http://bit.ly/1pzmVhl

Climate and Agriculture Network for Africa This web-based platform seeks to link scientists with policy makers to address climate change, agriculture and food security issues in Africa. http://bit.ly/1BHmhG0

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