



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



The SmartAG Partner

CCAFS East Africa Quarterly Newsletter

April - June 2015



© 2015 CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), East Africa

Editing: Vivian Atakos, Maren Radeny, Catherine Mungai and James Kinyangi
Design and Layout: Solomon Makau

Printing: Ecomedia

Photo Credits: Cover page S.Kilungu (CCAFS) From Left to Right Pg ii. N.Palmer (CGIAR) iii. S.Kilungu (CCAFS) 3. G.Smith (CIAT) 4. E.van de Grift (ICRAF) 7. V.Meadu (CCAFS) 9. N.Palmer (CGIAR) 11. N.Palmer (CGIAR) 13 F.Fiondella 16 C.Schubert (CCAFS) 18 T.Muchaba(CCAFS) 19 S.Kilungu (CCAFS) 21 P.Kimeli (CCAFS) 23 Petterik Wiggers (IWMI) 25. IITA 28 - 31 V.Atakos, S.Kilungu (CCAFS). 33. P.Kimeli (CCAFS) 34. S.Kilungu (CCAFS), DFID, S.Kilungu(CCAFS), V.Meadu (CCAFS), P.Kimeli (CCAFS), S.Kilungu (CCAFS) Back Page P.Kimeli (CCAFS)

CONTENTS

	POLICY NEWS		
1	Closing the gap in agriculture and climate science and policy in Africa Catherine Mungai and Mary Nyasimi		
2	Scenario-guided policy planning makes headway in Tanzania Edidah Ampaire, Perez Muchunguzi and Cecilia Schubert		
3	Steady progress on agriculture at recent climate talks Vanessa Meadu, Lili Szilagyi and Sonja Vermeulen		
4	Policy formulation and implementation gaps hamper climate change adaptation in Uganda Edidah Lubega Ampaire, Happy Providence and Maren Radeny		
	SCIENCE NEWS		
5	Accurate, timely early warning systems for east African policy makers now possible Kindie Tesfaye Fantaye		
6	How can climate-smart agriculture enhance food security and community-based adaptation? Estibalitz Morras and Catherine Mungai		
7	Livestock mitigation: opportunities for farmers, climate agreements across the globe Julianna White and Susan Onyango		
8	Outscaling climate-smart agriculture in East Africa Vivian Atakos		
9	Making the most of climate information for community-based adaptation Mary Nyasimi and Catherine Mungai		
		More effective implementation of adaptation interventions needed in Ethiopia Catherine Mungai	10
		Crops under a changing climate: what are the impacts in Africa? Cecilia Schubert	11
		Drought and pest epidemics among top climate risks in rural Uganda Vivian Atakos and Maren Radeny	12
		FIELD UPDATES	
		Responding to climate related risks to address food insecurity in Nyando, Kenya Vivian Atakos	13
		Learning from adaptation experiences of local communities in Makueni, Kenya Phillip Kimeli	14
		Out and about and diary CCAFS EA in the media Further reading and CCAFS tools	

Climate & Agriculture Network for Africa



canafrica.com

Message From The Program Leader

We are pleased to share the ninth issue of the SmartAG Partner- a quarterly newsletter of CCAFS East Africa.

After being mostly overlooked for the last ten years, agriculture was on the agenda of the Subsidiary Body for Scientific and Technical Advice (SBSTA42) in Bonn, Germany. SBSTA42 presented an opportunity for science generated from the CGIAR to inform negotiations on critical issues related to agriculture and food security. These included the urgent need for early warning systems and the impacts of climate change on African agriculture with a focus on pests and diseases. Read more about progress made in Bonn from two articles describing progress on agriculture and how to bridge the science-policy gap.

Additionally, read about a recently launched project led by the International Maize and Wheat Improvement Center (CIMMYT) on a user-friendly forecasting system that integrates improved seasonal climate information and how it will make it possible for east African policy makers to access accurate and timely early warning systems. Under the science section, new research data shows drought and pest epidemics are among top climate related risks faced by smallholder farmers in rural Uganda. Read on to learn how farmers are designing strategies to cope with these risks.

In May, we hosted CCAFS Program Management Committee and Independent Science Panel members at the Nyando climate-smart villages in Kisumu, Kenya. We share lessons from the local community in Nyando on how to respond to climate related risks while addressing food insecurity.

Dr. James Kinyangi



Closing the gap in agriculture and climate science and policy in Africa

Climate-related pests and diseases do not respect borders and Africa needs early warning systems to anticipate and prepare for these risks.

By Mary Nyasimi and Catherine Mungai

Due to the sensitivity and fragility of its natural environment, coupled with a variable climate, Africa is home to some of the populations most vulnerable to climate-related shocks. Therefore, strategies such as early warning systems linked to local weather patterns need to be highlighted in current adaptation plans. This should go hand in hand with planned investments in financing, index-based insurance and continued technological advances to build a climate resilient and low emissions agricultural sector.

“Many African countries have developed their climate change response strategies and plans that set visions for low carbon development and climate-smart programs that are being mainstreamed in national planning processes that will build resilience in the agricultural sector,” said Charles Mutai, Kenya’s National Focal Point to the United Nations Framework Convention on Climate Change (UNFCCC). He was speaking during an official side event held on June 6 on the sidelines of the Bonn climate talks (SBSTA 42) in Germany.

Scientists, development workers and policy makers engaged in discussions and shared scientific evidence and lessons on how vulnerability to climate change is impacting Africa’s agriculture and how farmers can be supported by governments and other development agencies to adapt. The event was organized by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), together with the

Government of Kenya (Ministry of Environment, Water and Natural Resources) and the Southern African Confederation of Agricultural Unions (SACAU).

More climate research needed

Considering that long-term climatic changes will have significant repercussions on food security and poverty, there is need for transformative adaptation of African agricultural systems that are backed by scientific evidence.

“Research on and development of early warning systems and contingency plans in Africa can be beneficial to farmers in preventing and mitigating climate risks in the agricultural sector. Indicators developed by scientists can help farmers and policy makers to understand the nature of the risk, ascertain the expected impact, and determine a sufficient response,” said Kevin Coffey from CCAFS.

Improving early warning systems for agricultural resilience in Africa

A recently published CCAFS Info Note highlights six key messages that can improve early warning systems for agricultural resilience in Africa. “We need scientific vigor for early warning systems in Africa to enable farmers plan early action to address crop and livestock pests and diseases,” emphasized Julian Smith from Fera Science.

Of interest is increasing investment in the quality, accessibility and integration of data, which determine confidence in early warning information. By investing in quality data, farmers and local level institutions will have access to early warning systems and develop contingency plans that are responding to their needs. For instance, farmers need to make informed decisions in terms of what crops to grow, where, when, what type of inputs to use and what breeds of animals to keep. Climatic shock events including emerging pests and diseases destabilize farmers.

Enabling research-policy dialogue and partnerships for adaptation

“Why don’t African governments respond to early warnings so that communities can be cushioned against climate shocks such as pests and diseases?” asked George Wamukoya from the Common Market for Eastern and Southern Africa (COMESA) who facilitated the side event.

With the uncertainty of the extent and impacts of climate change at different scales (continental, regional, national, local), there is need to improve the scientific knowledge base to enable policy makers to act. This calls for research-policy partnership and dialogue to enable effective communication and use of scientific research outputs.

The African Group of Negotiators Expert Support (AGN-ES)

In Africa, gaps on biophysical, social and economic data of climate change impacts, risks and vulnerability are evident. In some regions, data is completely missing and thus providing opportunity to bring on board African scientists to bridge the gaps. Under the aegis of the Africa Group of Negotiators Expert Support (AGN-ES), scientists across Africa are working to support evidence-based policy making.

“African negotiators now have an opportunity to interact with climate scientists who are generating scientific evidence and data that can support negotiations and policy making,” pointed out George Wamukoya.

The AGN-ES team made three submissions to UNFCCC, SBSTA 42 on early warning systems, risks and vulnerability in agricultural systems and gender and climate change.



New studies are emerging on the extent and impact of climate change and variability on smallholder farming, and solutions to tackle droughts, floods, pests and diseases in Africa.

Key meeting recommendations

The generation and use of evidence is becoming important for Africa in informing climate negotiations, designing of National Adaptation Plans (NAPs), Nationally Appropriate Mitigations Actions (NAMAs), Intended National Determined Contributions (INDCs), climate-smart agriculture (CSA) programs, low carbon development strategies and National Agricultural Investment Plans (NAIPs). Scientists must work together with policy makers to avail user-friendly early warning information that has mechanisms to integrated feedback from users. Also, successful adaptation strategies across Africa should be scaled up bearing in mind that Africa’s farming systems are shifting with the changing climate. Robust multidisciplinary partnerships are can allow for the quantification and evaluation of risks, vulnerabilities and impacts of climate change and adaptation strategies at various scales. Finally, there was a call to increase funding for climate-related research in Africa.

Read more: <http://bit.ly/1etl3H5> <http://bit.ly/1QFzZru>
New briefs highlight critical agriculture issues for UN climate talks:
<http://bit.ly/1CgvKli>

This story was written by Mary Nyasimi, Gender and Policy Specialist and Catherine Mungai, Partnerships and Policy Specialist. Both work for CCAFS East Africa. James Kinyangi, Regional Program Leader from CCAFS East Africa also gave contributions. Editing by Vivian Atakos, Communications Specialist CCAFS East Africa.

Scenario-guided policy planning makes headway in Tanzania

Extensive CCAFS-supported research project uses future scenario perspectives to help policy-makers review Tanzania's new environment policy.

By Edidah Ampaire, Perez Muchunguzi and Cecilia Schubert

A collaborative spirit and continued engagement with project stakeholders usually make for great success and progress. That is also how the Policy Action for Climate Change Adaptation (PACCA) project works, as they are continuously supporting policy-makers from Uganda and Tanzania as they implement proposed scenario-guided improvements into national strategies; improvements drafted during two successful back-to-back future scenarios workshops in February.

The PACCA project works to develop climate-resilient food systems in the two countries through relevant and flexible institutions and policies. The project is led by the International Institute for Tropical Agriculture (IITA) as part of CCAFS policies and institutions research.

PACCA has teamed up with CCAFS Future Scenarios group from the University of Oxford, to collaborate on providing scenario-guided advice to further improve relevant policies and strategies under climate change.

Taking a look at Tanzania's environment policy

For the February workshop, policy-makers and researchers from Tanzania were interested to see how their newly drafted National Environment Management Policy (NEP) would fare under various socio-economic and climate scenarios.

These scenarios have been quantified through two agricultural economic models: GLOBIOM, developed by International Institute for Applied Systems Analysis (IIASA), and IMPACT by

International Food Policy Research Institute (IFPRI).

During the intensive two-day workshop, the policy was put through the test by looking at different future scenarios for Tanzania. This future casting helps make assumptions and create policies against multiple, all highly potential scenarios for a country.

In a sense, the activities help 'crash test' policy frameworks and through suggested changes make it more robust against climate change and other challenges.

After the workshop, the PACCA team has supported the process remotely, but at the end of April members and participants got to meet up for a second time in a writeshop aimed to support a second scenario-guided implementation and improvement round of the Tanzanian environmental policy.

Preparing for a third policy draft

The writeshop kicked-off by presenting the developed scenarios to the participants, a helpful reminder allowing participants to carry on for another four days of intensive policy advancement and reviews. The members were also set to integrate comments received from the National Multi-sectorial Taskforce and the Technical Review Panel Committees in Tanzania. These two committees are national level entities with the overall responsibility of the policy review process.



Policy-makers in Tanzania engaged in scenario-guided policy planning in February. Now those efforts are being integrated into Tanzania's new National Environmental Policy.

The days comprised a series of small group activities, reviewing and rewriting specific sections of the policy, allowing for further comments from plenary presentations and again incorporating these into the strategy, so that all key elements were captured.

The environment policy has been sectioned into four different themes, namely (i) agriculture and land use (ii) industry and services, innovation and resilience, (iii) environment and ecosystems and (iv) socio-economic and health. Each of these themes has been reviewed against recommendations of the previously developed scenarios.

Everyone supporting this process participated in the workshop, including the consulting firm Social Economic Research Foundation (ESRF) who prepared the policy, and the Future Scenarios team, guiding the activities remotely.

Other participants included officials from the Vice President's Office, various ministries including Prime Minister's Office Regional Administration and Local government, Ministry of Agriculture Food Security and Cooperatives, Ministry of Livestock and Fisheries Development, Ministry of Natural Resources and Tourism, Ministry of Water, Ministry of Health and Community Welfare, Ministry of Transport, Ministry of Education and Vocational Training, and representatives of PACCA's Learning Alliance and other stakeholders.

The activities helped complete the draft of the policy along with further scenario-based comments.

The document will be handed over to the consulting firm to integrate the comments and thereafter develop a third scenario-guided draft. This third draft is very much based on the scenario development work undertaken in February and throughout, up to the April workshop.

In fact, government process leaders said that the scenario-based review in February showed that a third review round would be essential. The policy draft will be advanced through stakeholder consultations before being handed over to the Tanzanian cabinet.

In parallel, the PACCA team will meet with ESRF separately to discuss ways to best integrate the scenario comments into the draft. The scenario development process was specifically appreciated for providing the space for constructive criticism of some of the issues that had been identified.

The meeting with the consulting firm co-responsible for the policy writing process will develop a joint way forward to ensure that the scenario development process can further benefit the review process where necessary.

Lessons learned

It may be a tough journey to achieve development outcomes, particularly in a multi-stakeholder setting, but the team is thrilled that efforts are starting to yield great results. A few factors have led to this seemingly fast process:

- Continuous identification of potential opportunities for achieving outputs, hinged on result-based management principles;
- Willingness to network with others and pool collective effort where applicable;
- Creativity, innovativeness and flexibility in the way things are done;
- Openness, flexibility and a focus on user ownership in the method (scenario-guided policy design) and the content (the scenarios and the policy recommendations).
- Openness and transparency in communication; about project objectives, mandates, resource availability and outcomes.

Through the nature of PACCA's work, there are also great opportunities to share lessons learned between Tanzania and Uganda. With Tanzania leading the process, anything learned in the engagement with participants and drafting the policy can now be used in Uganda. Practice makes perfect as is usually said. The PACCA team is now close to reaching one of its set outcomes, thanks to engaged participants, the support from CCAFS Future Scenarios team and dedicated staff members and colleagues.

Related reading:

Project takes action for climate-responsive policies in East Africa:

<http://bit.ly/1BrUf3W>

Testing climate and agriculture policy against future scenarios:

<http://bit.ly/1JZ6h7V>

Researchers Edidah Ampaire and Perez Muchunguzi both work with the PACCA project, based at the International Institute for Tropical Agriculture (IITA). Cecilia Schubert works as Communication Officer for CCAFS Policies and Institutions Flagship.

Steady progress on agriculture at recent climate talks

The Bonn climate change conference marked one of several important opportunities to ensure that agriculture does not get shut out of a global climate deal in December in Paris. Did we succeed?

By Vanessa Meadu, Lili Szilagyi, Sonja Vermeulen

Agriculture was high on the agenda at this month's meeting of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UN Framework Convention on Climate Change (UNFCCC). The meetings presented an opportunity for science to inform discussions on critical issues related to agriculture and food security, with dedicated workshops on agriculture scheduled in the first week and plenty of side events highlighting progress at the country level. The time could not be more right, as scientists warn El Niño could disrupt food production and cause disease outbreaks worldwide.

The two official workshops on agriculture focused on the assessment of risk and vulnerability of agricultural systems to climate change, and the development of early warning systems to reduce the impacts of extreme weather events on farming and food security. Participants were highly interested and engaged, according to Sonja Vermeulen, Head of Research of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), who attended. Indeed, many parties have made submissions on the two topics, notably the Africa Group of Negotiators and G77+ China.

In preparation for the workshops, and to help inform countries' positions on agriculture, CCAFS researchers prepared an array of background studies and briefing materials for SBSTA. The studies focused on how climate change will impact small-holder farmers, fishers and pastoralists, and reviewed some

of their options for adapting. The key messages from these studies were summarized in two Info Notes:

- **Improving early warning systems for agricultural resilience in Africa:** Extreme climate events can undermine agriculture and rural development – how can this be avoided? The info note sets out six recommendations to African policy makers for strengthening existing and developing new early warning systems that would provide an alert of a potential weather-related disruption in food production.
 - **Impact of climate change on African agriculture: focus on pests and diseases:** Climate change impacts on agricultural systems include a likely increase of pest and disease outbreaks, affecting crops, livestock and fisheries. This creates a new threat for Africa's food security. One of the key recommendations is to build multi-country coordination for new and adapted pest and disease management systems that are based on sound science.
- To complement the technical submissions, CCAFS and partners presented research and policy advances in two side events:
- **Closing the gap in agriculture and climate science and policy in Africa:** This side event gathered scientists, practitioners and policy makers to share scientific evidence and lessons on how vulnerability to climate change is impacting Africa's agriculture and how farmers can be supported by governments and other development agencies to adapt. One of the key messages that emerged

from the panel discussion was that scientists must work together with policy makers to avail user-friendly early warning information that has mechanisms to integrated feedback from users.

- **Reducing emissions from livestock through Nationally Appropriate Mitigation Actions (NAMAS):** The side event co-organized by the World Agroforestry Centre (ICRAF) focused on three active NAMA proposals in Costa Rica, Kenya and Mongolia. These examples showcased progress and pathways for countries interested in climate finance for agricultural mitigation through livestock. Participants agreed that agricultural NAMAs can finance reduced emissions while also supporting agricultural production and smallholder livelihoods.



Steady progress for agriculture as the sun sets on the UN Climate discussions in Bonn in June 2015

Next steps for agriculture on the road to COP21

Despite slow progress on an overall agreement, this year's SBSTA showed steady advances on agriculture. There is a lot of good work happening at the technical level – countries are engaged and information is being shared. This momentum should be sustained, as there will be further sessions on agriculture at SBSTA in June 2016, on topics related to adaptation measures, and agricultural practices and technologies to sustainably enhance productivity, food security and resilience. Parties and observers can make submissions to the secretariat on these topics until 9 March 2016. Our Guide to UNFCCC Negotiations on Agriculture is a useful resource for any groups interested in making submissions.

In the meantime, all sights are set on COP21 in Paris, where countries need to settle on a new global climate change agreement in December. According to George Wamukoya, Climate Change Advisor from the Common Market for Eastern and Southern Africa (COMESA), “agriculture is not going to feature in the agreement as ‘agriculture.’” If it's not an explicit topic, this makes the challenge more critical: “we have the urgent task of ensuring that a global framework for climate action from 2020 does not shut out agriculture,” said Manyewu Mutamba, from the Southern African Confederation of Agricultural Unions.

Wamukoya, who has been working very closely with African governments in the negotiations, explained that “[agriculture] may find space [in a global agreement] through food security or resilience and low-carbon development, those types of broad areas.” Our Guide to UNFCCC Negotiations on Agriculture is a useful resource for identifying some of these entry points for agriculture.

It is likely that any UNFCCC decisions and actions on agriculture will only be made following the June 2016 session. However, it would be a huge victory for food and farming if the Paris negotiations resulted in an agreement that acknowledges the importance of agriculture for food security and livelihoods, and the role it can play to help meet global adaptation and mitigation goals.

Access A Guide to Negotiations on Agriculture and Climate Change: <http://bit.ly/1GIFADa>

Research highlight: New briefs highlight critical agriculture issues for UN climate talks: <http://bit.ly/1FqArJj>

Opinion: Seizing the Opportunity for Agriculture in a New Climate Change Deal <http://bit.ly/1GvJSLs>

Vanessa Meadu is CCAFS Global Communications and Knowledge Manager. Lili Szilagyi is a student assistant at the CCAFS Coordinating Unit. Sonja Vermeulen is CCAFS Head of Research.

Policy formulation and implementation gaps hamper climate change adaptation in Uganda

Study explores the role of policy in facilitating adoption of climate-smart agriculture in Uganda.

By Edidah Lubega Ampaire, Happy Providence and Maren Radeny

Policy formulation processes and implementation gaps are likely to increase the vulnerability of smallholder farmers in Africa to climate change. This is despite significant efforts in agricultural research for development that try to address farmers' vulnerability to climate change effects.

A recent case study in Rakai district, Uganda carried out by researchers from the International Institute of Tropical Agriculture (IITA) shows that for policies to be effective, there is need to include all key players in the formulation and implementation processes. In most cases, policies were formulated through a top-down and unidirectional approach with the main actors being government agencies. There is little involvement of other actors such as civil society organizations, local governments and local farming communities, who are expected to implement such policies. The study targeted policies relevant to climate change adaptation.

“There is lack of appreciation regarding the ability of communities to shape effective policy implementation,” noted one of the District Officers who took part in this study. Subsequently, farmers were unaware of the existence and provisions of the policies.

Rakai district is one of CCAFS learning sites in East Africa and is increasingly getting drier due to climatic changes.

In a baseline household survey for Rakai District the site was selected as a case study to represent sub-national policy implementation levels.

Policy formulation and implementation constraints

Researchers found that involvement of communities during policy development was limited by lack of time and financial resources to invest in local consultations. Links between districts and national ministries were mostly limited to donor assisted interventions. However, when projects closed, actors reverted to the status quo and linkages remained largely inactive. The Uganda National Adaptation Plans of Action (NAPA), for example, was formulated and implemented as a project and implementation stopped when the funding ran out.

At the local level, institutional structures such as environmental committees that support implementation of policies needs to be strengthened. This could be done through availing adequate financial and human resources. Significant political interference across different implementation levels was also found to be a challenge. Interference modes included conflicts of interest, for instance, between enforcing the policies/by-laws versus becoming ‘unpopular’ with the electorate; promoting ‘development’ projects known to have negative impacts on the environment; and lack of transparency in leasing out public or communal land.



To have a widely accepted policy in Uganda, the community, key sector players and policy makers should be involved from the initial steps of formulation.

“We do not report cases of interference with wetlands and community land because we do not know where and who to report to. We have seen culprits walk free and we felt that reporting would not help us,” a village chairman explained.

Implications of the current status on adoption of climate smart technologies

Poor implementation of macro policies at national level due to the challenges mentioned above may result in a lack of enabling strategies or by-laws at lower levels because there is no

framework to guide local initiatives. This implies that a lack of policy implementation directly or indirectly increases farmer’s vulnerability to climate change effects.

When smallholder farmers lack access to water (for livestock and irrigation) due to poor implementation of policies protecting wetlands for instance, as is the case in Rakai, their adaptive capacity is reduced.

With effective implementation of policies, accompanying regulations and by-laws, the prevailing circumstances (leasing of protected areas, restricting access to buffer areas, poor farming methods) can change, reducing further farmers’ vulnerability and paving way for increased adoption of climate-smart agriculture technologies. These technologies include crop diversification, planting of drought tolerant crop varieties and expanding irrigation systems among others, including and supported by timely access to climate information services.

Recommendations

To enable effective policy implementation, all key players must be brought on board right from the policy formulation stage. There is also need to create awareness of the various policies so that end-users know and demand enforcement from respective actors. Other constraints to policy implementation also need to be addressed. Translation of policies into local languages might help in reaching out to more people.

There is also need for more focused research to generate more knowledge regarding constraints to policy implementation and enforcement. For example, identifying the right actors for effective implementation would help in resolving the redundancy in roles among actors. Also, analysing trade-offs would highlight the most cost-effective implementation strategies. Scenario modelling would help identify trade-offs and synergies between actors and scales.

Read more on policy work: <http://bit.ly/1yAORdF>
 Searching for better bean varieties in Uganda: <http://bit.ly/1db1TUX>
 Access the Rakai/ Kagera Basin site atlases: <http://bit.ly/1db216S>

Edidah Lubega Ampaire is a Social Scientist and Providence Happy is a Research Assistant. Both work for the International Institute of Tropical Agriculture (IITA), Uganda. Maren Radeny is a Science Officer, CCAFS East Africa.

Accurate, timely early warning systems for east African policy makers now possible

National governments, relief agencies will benefit from accurate and timely forecasts with additional crop production and food security components.

By Kindie Tesfaye Fantaye

A new project entitled ‘Integrated Agricultural Production and Food Security Forecasting System for East Africa (INAPFS) was launched in April 2015 in Nairobi, Kenya. The project aims at developing a robust, scientifically sound but user-friendly forecasting system that integrates improved seasonal climate, production and food security forecasts for the east Africa region. This will lead to provision of accurate and spatially disaggregated early warnings to local and national governments and relief agencies to respond to climate crisis in a timely and efficient manner.

“When policy makers have the right information, they make the right decisions and take the right actions,” said Mr. Bwango Apuuli from the IGAD Climate Prediction and Applications Centre (ICPAC) during the launch workshop at the World Agroforestry Centre (ICRAF). The workshop brought together participants from national weather services and disaster risk management offices in Ethiopia, Kenya, Tanzania, Uganda and Burundi, and NGOs and research institutions operating in the region.

In the context of climate change and food insecurity “early warning information is now a necessity for all decision makers to enable them take timely action against risks such as droughts and floods,” continued Bwango Apuuli on behalf of ICPAC director Dr. Guleid Artan.

Led by the International Maize and Wheat Improvement Center (CIMMYT), INAPFS project is a multi-partner initiative involving several institutions: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Center for Tropical Agriculture (CIAT), (ICPAC) IGAD Climate Prediction and Applications Centre, Famine Early Warning Systems Network (FEWS NET), the UN World Food Program (WFP), and Partnership for Economic Policy (PEP). Furthermore, there is a strong linkage with national weather services and disaster risk management and food security offices in the targeted east African countries. According to Dr. Clare Stirling from CIMMYT, her organization’s involvement in the project was quite timely considering their involvement in climate change research globally with an aim to help vulnerable communities in maize and wheat based farming systems to adapt to climate change.

The project is supported by CCAFS under the theme climate risk management (flagship 2). Moreover, INAPFS is one of nine core flagship 2 projects globally that will contribute to the vision of supporting the livelihoods of farmers across Asia, Africa and Latin America by effective climate information services, and timely and well-targeted food security safety nets.



With the right information, policy makers can make the right decisions and take the right actions.

“We are working with governments, private sector, agro-advisory service providers, non-governmental organizations, national agricultural research systems and international research institutions to build together a food and nutrition secure east Africa by 2025,” said James Kinyangi, Program Leader of CCAFS East Africa (EA). The INAPFS project is one of three projects under flagship 2 in the EA region that will contribute to the 2025 vision.

INAPFS workshop methodology

The first day of the workshop was mainly dedicated to presentations that highlighted the general overview of the new project, the focus of CCAFS’s East Africa program, and experiences from major regional and international organizations (ICPAC, FEWS NET and WFP) operating in the region that are involved in the provision or use of early warning systems. In addition, presentations were made on potential tools (e.g. CRAFT) and methodologies that are going to be considered as inputs to the new project. Apart from that, group discussions were made on the rationale, objectives and approach of the project and on the opportunities, strengths and limitations of the current early warning systems being used in the region. The second day of the workshop was spent on project planning and discussing partnerships, data exchange and communication.

During the group discussions, it was highlighted that the current early warning systems have been quite useful but are mainly for humanitarian purposes. Subsequently, the current project would enhance forecasting skills by adding accuracy (spatial and temporal resolutions) and incorporating additional components of crop production and food security.

“We need crop production forecasting models that are suitable to our country and local conditions. We don’t want a model to be imposed on us that doesn’t solve local problems,” said Michael Nkalubo, Commissioner of Ugandan Meteorological Authority.

Following this workshop, a common understanding has been created on the different component activities, and how those activities would finally integrate to help achieve the intended project goal. In addition, the proposed work plan was refined and responsible partners assigned to each of the project activities. More importantly, partners and stakeholders have identified what role they could play to achieve the project’s objectives.

Dr. Kindie Tesfaye works at CIMMYT as a Crop Modeler/GIS expert. Blog edited by Vivian Atakos, CCAFS EA Communications Specialist.

How can climate-smart agriculture enhance food security and community-based adaptation?

Delegates who attended CBA9 in Nairobi agreed on the need to recognise and make use of indigenous knowledge from local communities and use this as a basis for building resilience.

Climate-smart agriculture (CSA) is a context-specific approach that takes into consideration the bio-physical and socio-cultural environment in which it is applied. This was the one of the key messages of the session on monitoring and scaling up CSA practices for enhanced food security (FS) and community-based adaptation (CBA) at the recently concluded ninth International Conference on Community-Based Adaptation (CBA9).

The session was facilitated by James Kinyangi from the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and Estibalitz Morras from the International Fund for Agricultural Development (IFAD). The aim was to provide a platform for CBA9 participants to share and discuss their experiences around CSA to achieve food security, increase resilience and enhance community-based adaptation globally.

Linking CSA and CBA for technology justice

According to Chris Henderson from Practical Action, CSA is gaining acceptance and momentum. It appears to be taking centre stage in the delivery of agricultural development assistance. For many, CSA is often linked to new technologies that deliver immediate productivity or adaptation benefits – however this often bypasses the marginalized and smallholders, or has only short-term benefits. This is why we need to

By Estibalitz Morras and Catherine Mungai

ensure CSA is relevant to CBA, especially to marginalized and smallholder farmers.

In that regard, the technologies and approaches need to be: accessible to smallholders (by building on the resources they already have); the natural capital must be sustainably used and lastly innovative – building on the wealth of local, traditional and indigenous knowledge and experience that already exists.

“The adaptation benefits of agro-ecological approaches, among others, can be a powerful tool for achieving adaptation, especially for resource poor, risk averse smallholders,” emphasized Chris during his presentation.

Practical Action is helping small-scale farmers through technology to build on their skills and knowledge to produce sustainable and practical solutions.

Integrating local and indigenous knowledge

Based on his experience working in the Mekong Delta, through the Project for Adaptation to Climate Change in the Mekong Delta (ADM), Pham Vu Bang from IFAD Vietnam called for the recognition and respect of local knowledge and involvement of community members in the planning process to ensure the prioritization of locally appropriate and



Monitoring CSA is about measuring the capacity of farmers and communities, especially marginalised and smallholder farmers, to identify, develop and use different agricultural practices

sustainability of interventions. This is the approach applied in the ADM projects supported by the Adaptation for Smallholder Programme (ASAP) of IFAD. In order to enhance the resilience capacity of rural poor communities, it was agreed that vulnerable groups and communities must be allowed to decide the best way for them to cope with the impact of climate change.

“New technologies are certainly a part of the solution, but should be linked to indigenous knowledge and farming systems to ensure and promote traditional value, biodiversity and culture or bio-cultural heritage” reiterated Bang.

The importance of incorporating local knowledge into CSA was further elaborated by John Mbaria from the Nation Media Group in Kenya who recommended the documentation and sharing of such knowledge and the integration of appropriate long-held community resource-use norms and practices into local government and national policy processes. With most food producers located in poorly developed rural areas, John noted that targeting local food production systems represented the biggest opportunity to increase food production, reduce vulnerabilities and improve livelihoods.

From the land of a thousand hills, Rwanda, Lucia Zigiriza who is working in the ASAP-supported project “Post-Harvest and Agribusiness Support Project (PASP), informed participants that communities in Rwanda are involved in the planning and monitoring of land restoration, which are informed by the National Strategy on Climate Change. Farmers are organized in cooperatives and this facilitates monitoring and also sharing of information. In order to address climate change effects, these farmers now have timely access to climate information such as seasonal and weekly forecasts to aid their decision making. The PASP project will provide incremental support for climate resilient post-harvest infrastructures and related investments that will focus on facilitating introduction of climate-smart post-harvest technologies and infrastructures. Notably, Rwanda is engaged in adopting and encouraging the CBA approach within existing national policies and sectorial strategies tackling climate change and promoting green growth economy.

Monitoring and upscaling CSA

Monitoring CSA should not be about the rate of technology transfer – e.g. the uptake of new ‘adapted’ or ‘improved’ varieties. It should be about measuring the capacity of farmers and communities, especially marginalised and smallholder farmers, to identify, develop and use different agricultural practices. It is their capacity that will enable them to respond to unpredictable climate-related changes and make better farming and livelihood decisions in the long-term.

Vijayasankaran from Samaj Pragati Sahayog in India pointed out that CSA is a holistic approach that requires multi-pronged investment and a multi-disciplinary approach towards participatory research.

“Water is the key to enhancing resilience of production systems to climate variability and climate change. Hence, public investment in water, especially low-cost solutions which could be taken up by smallholder farmers, lies at the core of CSA,” said Vijayasankaran.

While the role of private sector investments needs to be emphasised, scaling up of small, scattered initiatives on CSA is not possible without incorporating these into national government programmes with substantial investments sustained over a period of time.

According to Caitlin Corner-Dolloff from the International Center for Tropical Agriculture (CIAT), many governments are currently working to mainstream CSA into national programs or policies. Consequently, CIAT, with support from CCAFS, is developing tools and frameworks for prioritizing investments in CSA. These processes must be stakeholder-driven and facilitate the linkage of national decision-makers with local realities and community priorities, running parallel prioritization processes across levels. Indicators used to evaluate ‘climate-smartness’ of practices or services are most effective at identifying priorities when selected with stakeholders. This ensures the criteria for successfully achieving food security, resilience, and low-emissions developed is incorporated. Scaling out CSA also requires iterative planning to use results of monitoring and evaluation of practices and altering CSA initiatives to adapt to changing conditions.

As a way forward, participants called for the upscaling of climate-smart practices and services that are working well. This will entail a careful assessment of the barriers to the uptake of these practices by local vulnerable communities. Also, governments, with support from non-governmental organizations, international agencies and research institutions, need to establish enabling environments, including incentives, to support community-based adaptation through climate-smart agriculture. The pitfalls of existing programmes for food security and climate change resilience could be addressed by recognizing the vital role of CSA in ensuring access to and sustainable use of innovative solutions by smallholder farmers.

Estibalitz Morras is a Portfolio Officer, Environment and Climate Division at International Fund for Agricultural Development (IFAD) while Catherine Mungai is the Partnership and Policy Specialist at CCAFS East Africa.

Livestock mitigation: opportunities for farmers, climate agreements across the globe

At climate change talks in Bonn, leading countries, scientists and specialists show they are ready for climate finance in the livestock sector.

By Julianna White and Susan Onyango

Global climate change agreements now support the widespread adoption of agricultural practices that improve productivity and decrease emissions, including the livestock sector, which causes 14% of all human-induced greenhouse gas emissions and has significant, achievable mitigation potential.

At climate change talks in Bonn, leading countries, scientists, and specialists show they are ready for climate finance in the livestock sector. The CGIAR Research Programme on Climate Change and Food Security (CCAFS) and the World Agroforestry Centre (ICRAF) hosted a side event to showcase progress and pathways for countries interested in climate finance for agricultural mitigation through livestock. Experts, including a lead negotiator, explained three active NAMA proposals that will reduce emissions while improving livestock productivity in Costa Rica, Kenya and Mongolia, and panelists addressed monitoring, reporting and verification (MRV), public-private partnerships and financing opportunities.

As countries plan to scale up mitigation in the livestock sector through support from the NAMA Facility, CCAFS, the International Centre for Tropical Agriculture (CIAT) and ICRAF, are supporting the NAMA process and other climate financing opportunities in developing countries through research, planning and technical support, conducted in collaboration with

partners governments and other CGIAR centers and programs. Existing work includes measurement of greenhouse gas emissions through the SAMPLES project, livestock NAMA support by CIAT in Costa Rica and ICRAF in Kenya and Mongolia, and technical and policy capacity building support with national country offices and development organizations.

Costa Rica on track to be carbon neutral with livestock NAMA

“Twenty three percent of all emissions in Costa Rica come from the livestock sector,” said Giovanna Valverde, lead negotiator for the government of Costa Rica. “We can mitigate emissions in livestock by choosing climate-smart practices that are informed by science and may also reduce use of labour, increase soil fertility, save water, and bring more benefits to farmers.”

With 80% of the country’s population supporting low-carbon activities, Costa Rica has ambitious targets for its livestock NAMA. Costa Rica’s 15-year greenhouse gas mitigation target will cover 70% of the country’s herd and 60% of the land area, amounting to savings of 6 million tons of carbon dioxide. The strategy involves the use of rotational grazing, pasture management, improved fertilization plans and live fencing.



Farmers can improve productivity, reduce greenhouse gas emissions and attract climate finance through climate-smart livestock management.

Impressive potential emissions reductions, livelihood gains in Kenya and Mongolia

Timm Tennigkeit of Unique Forestry and Land Use presented findings that existing climate-smart livestock management practices can reduce livestock emissions by 18-30% without a decrease in gross production. In livestock, as in agriculture in general, mitigating emissions does not mean slowing production.

“Potential improvements to the livestock sector are wide and include increased market access, decreased fragmentation of value chains, improved private sector participation and stable milk supplies. In turn, this increases incomes and improves nutrition for rural people engaged in livestock-based livelihoods,” Timm explained.

The Government of Kenya has been working with UNIQUE, CCAFS and ICRAF to implement dairy NAMAs. They estimate that the dairy sector alone could:

- Decrease the country’s emissions by 3.3% of its 2010 emissions
- Scale up to reach 1.8 million households
- Increase smallholder farmer income by USD 1,000-2,000 per year

Sustain the existing 180,000 jobs in the dairy value chain. UNIQUE is also working in Mongolia, where livestock mitigation is tied to grassland restoration and is likely to inform the Central Asian region. Livestock interventions include changing herd size and structure and improved breeding.

Both interventions increase herders' climate resilience and improve livelihoods as well as generate potential reductions that equal almost one-third of Mongolia's energy sector.

CCAFS and partners gathering data, identifying options

Science plays a critical role, providing the research and data that inform and shape low emissions programs. CCAFS, CGIAR centres such as CIAT and ICRAF, and their public and private partners, are committed to providing the science base and support that countries around the world need to develop and implement climate-smart livestock innovations. Existing data on agricultural greenhouse gas emissions in Africa and other smallholder countries is scant, but growing.

"Through the SAMPLES project, we have developed low-cost measurement methods for agricultural greenhouse gas sources and sinks, and we have established emission factors for smallholder systems that are much more accurate than rough emission factors commonly adopted because of lack of information," said Henry Neufeldt, ICRAF's climate change leader. "Use of aerial photography, remote sensing and crowd sourcing provides better data on greenhouse gas emissions."

Farmers, private sector are key actors

Panelist Manyewu Mutabmba of the Southern African Confederation of Agricultural Unions (SACAU) noted that many crop farmers are transitioning to also have livestock or even switch to livestock to meet demand.

Along with consumer demand from the local market, farmers depend on their products' value chains for dependable markets. In all three case studies, participation of the private sector in livestock is essential to operationalize and sustain low-emissions activities.

Private sector support is being garnered at smaller and larger scales. In Kenya for example, Livelihoods, a fund supported by the dairy giant Danone and conservation organizations, is investing in the dairy sector and is supportive of the same mitigation activities that would compose a dairy NAMA.

NAMA Facility, Green Climate Fund to expand financing

Nationally Appropriate Mitigation Actions (NAMAs) were introduced in the Bali Action Plan of 2007 as a commitment by developing countries to reduce greenhouse gas emissions. Agriculture, being the major economic activity in several

countries, is the most effective strategy to achieve mitigation for many developing countries. Despite the recognition of the role of agriculture in climate change mitigation and adaptation efforts, agriculture was first addressed in official climate agreements only this year.

In tandem with this recognition, the NAMA Facility has an open call for proposals, and the Green Climate Fund is preparing to make its first awards in 2016.

NAMAs can support the implementation of Intended Nationally Determined Contributions (INDCs). They are designed to be aligned with country and sector specific needs, and they include private and public resources. And resources for mitigation in agriculture are growing.

"The Green Climate Fund is expected to be the main financing mechanism for livestock NAMAs going forward," Rutger de Witt Wijnen from the Green Climate Fund said. "Since the assessment criteria for the NAMA Facility and the Green Climate Fund should be similar, countries can see which climate finance mechanism best matches their trajectories."

Support for mitigation in the agricultural sector, including NAMAs and expected funding from the Green Climate Fund, is expected to increase in the context of the SBSTA, COP and the submission of INDCs.

Participants at the side event agreed that agricultural NAMAs can finance reduced emissions while also supporting agricultural production and smallholder livelihoods.

"Livestock provides an opportunity to mitigate and help farmers," one participant at the side event said. "Climate finance is an opportunity to scale up mitigation."

Learn more about other climate-smart agricultural practices:

Alternate wetting and drying of paddy rice (AWD):

<http://bit.ly/1N0qJ63>

Conservation agriculture: <http://bit.ly/1K6as0j>

Laser land leveling: <http://bit.ly/1SCANWD>

Julianna White is Program Manager of low emissions agriculture research at CCAFS. Susan Onyango is the communications specialist for climate change research at ICRAF.

Outscaling climate-smart agriculture in East Africa

In order to scale up climate-smart agriculture, we need to share lessons with stakeholders through open forums such as knowledge days.

By Vivian Atakos

In May 2015, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) East Africa researchers joined over 50 other participants from CGIAR centres, NGOs, private sector and the Kenyan government to discuss and share pathways for outscaling climate-smart agriculture (CSA). The meeting was organised by the International Centre for Tropical Agriculture (CIAT).

Participants learnt about the climate-smart villages (CSV) model being implemented in East Africa, West Africa, Latin America, Southeast Asia and South Asia. Through the CSV model, CCAFS and partners are focusing on improving local knowledge of climate risks and variability in seasonal rainfall, dry spells, and diseases and pests to inform farming decisions. The goal is to respond to climate variability, improve food security and enhance household incomes. This is achieved through the participatory testing of resilient technologies, training to build the knowledge and capacity to change local practices and improve planning for adaptation to changing farming conditions. Through participatory action research approaches, we are testing a portfolio of CSA interventions, allowing farming households to make progressive changes to their crops and cropping patterns as well as introducing new resilient livestock breeds.

During the meeting, we shared emerging lessons from the Nyando CSVs in Western Kenya where a shift in farming techniques has reduced the number of households eating one or more meals each day.



The CSA Knowledge sharing day provided an interactive forum to share methods, tools, and experiences currently being used and developed to prioritize CSA in Africa.

Original blog on the CIAT website was written by Leigh Winowiecki (soil scientist) and Caroline Mwangera (post doctoral scientist)
Access the story here: <http://bit.ly/1dzTY4v>

Read findings: Climate-smart villages and the hope of food secure households: <http://bit.ly/1K6cWM8>

Written by Vivian Atakos, Communications Specialist CCAFS East Africa.



Climate-smart agriculture seeks to empower smallholders with knowledge and skills that will see them improve livelihoods under a changing climate.

Making the most of climate information for community-based adaptation

Communicating climate information to local communities needs to be revisited. Cultural issues such as language, indigenous as well as technical knowledge must be carefully considered and incorporated.

By Mary Nyasimi and Catherine Mungai

Over 400 participants during the 9th Conference on Community-Based Adaptation to climate change (CBA9) held in Nairobi, Kenya debated about the potential loss in translation of climate information, especially in Africa where most of the population is not literate in English or French. This discussion was held during a parallel session on climate information services for effective adaptation on 27th April 2015.

There are over 3,000 cultural languages spoken natively in Africa with English and French used as business languages across the continent. About 38% of the adult population in Africa, lack the basic literacy and numeracy skills. In fact, there are some countries with illiteracy levels higher than 70% such as Burkina Faso, South Sudan, Niger, Mali, Chad, Somalia, Ethiopia, Guinea and Benin. Women account for more than 60% of the continent's adult illiterate population. Scientific climate information in Africa is usually in English and French. Subsequently, this information has to be downscaled and translated into appropriate cultural languages. This means that the potential of losing critical climate information during translation is very high.

The importance of climate information

Information on climate change and variability for Africa's population is becoming increasingly important as the continent grapples with other stressors such as increasing population,

rapid urbanisation, environmental and natural resource degradation. In the agriculture sector that employs more than 60% of Africa's population and contributes significantly to countries' gross domestic product (GDP), availability and access to climate information will decrease the uncertainty that farmers face in decision making. This will enable them to start engaging in adaptation and risk management strategies eventually building agricultural resilience and improving their livelihoods.

"Climate information generated by different stakeholders (local weather scientists, traditional weather forecasters, pastoralists, veterinarians and extension agents) at local level will be easier to translate into our local Maasai language compared to data collected at a global scale. This data is also more useful to us, especially our women who are transitioning into vegetable production and do not speak English or Kiswahili languages", Maasai elder, CBA9 2015.

Effective communication tools and channels are essential in making climate information accessible and usable to local communities in languages that they can understand. The challenges that local communities face in understanding climate information is not only related to language but the information is often communicated in graphs, pie-charts, models and percentages, which can be confusing to some. This might create a widespread lack of confidence in climate information in local communities and especially among women.



Climate scientists need to work closely with local communities to ensure they are able to make sense of Daily and Seasonal forecasts.

“Translating and communicating climate information will be useful to the local community if indigenous technical knowledge is combined with simplified scientific knowledge. In this regard, the climate information will be familiar and easily understood and acceptable to the local community because their own forecasts collected in the local environment using local languages was considered” noted one participant from Benin.

The reverse, that is, losing meaning of climate information from local community back to scientists can also occur. The precise meaning of words contained in climate information can be misinterpreted depending on the local language being used. For example, the words ‘climate change’ translated into Kiswahili, a common language in four east African countries is ‘mabadiliko ya tabia nchi’ can literally mean “a country’s behavioral change”.

“As a development worker operating amongst communities whose local language I do not know, I find it extremely difficult to discuss such terms as ‘climate change’ using their local language. I do engage a translator but I have no idea whether she is communicating the right message. When a community member asks a question, and it is translated back to me, I am not sure that the correct translation was done. Furthermore, we share climate information to farmers through radios and on phones using English and Luganda languages. We have not conducted an impact assessment to know who is using the information and whether it is understood”, reported one participant.

There are many other potential problem areas where climate information can be confusing when translated into local languages including slang and the correct use of grammar and punctuation marks. To avoid this pitfall, a participant from Malawi said translating and communicating climate information requires one to be consistent, using the same words, slang and punctuation marks.

In conclusion, the current way of communicating climate information to local communities needs to be revisited. Literacy levels, socio-cultural environments combined with the community scepticism to “scientific outsiders” can contribute to low usage of climate information. Communicating climate information must be addressed in the interface between science languages (English, French among others) and the thousands of local languages across Africa. Governments that are ready to address climate change need to start organising climate information to include a wider range of sources (scientific and indigenous) and translation into different languages needs to be done consistently and through consultations with the local communities to ensure a common understanding of the key messages.

Read about indigenous knowledge: <http://bit.ly/1GCf5wl>
Read about using local language radio to transmit climate information: <http://bit.ly/1QLTtWo>

Mary Nyasimi is a Gender Expert while Catherine Mungai is a Partnerships and Policy Specialist. They work for CCAFS East Africa.

More effective implementation of adaptation interventions needed in Ethiopia

Ethiopia's policies and institutions can be considered well-suited to tackle the adverse effects of climate change on its agricultural production. However, there are crucial knowledge gaps and a need for better implementation of its adaptation strategies.

By Catherine Mungai

Small-scale subsistence farming predominates in Ethiopia's agricultural production. It is mainly rainfed and therefore highly exposed to climate variability and extremes. This working paper synthesizes four case studies focusing on the impacts, vulnerabilities and local adaptation practices in Ethiopia's agricultural sector, including policy and institutional responses. The case studies were carried out in nine districts, representing the major agro-ecological and farming systems.

Findings

Results show that there are changes in local climatic conditions, manifested through several indicators such as increased temperatures, changes in rainfall amounts and patterns, and increased incidence of drought and flood events. Drought was a major problem in almost all sites, while floods affected localized areas in some of the sites. Informants attributed climate change to poor management of natural resources (forests and grazing lands), with rapid population growth as a key driver.

Coping and adaptive strategies

Communities used a wide range of coping and adaptive

strategies that included adjustments in crop and livestock production, natural resource management, and diversification into new food and income sources. In terms of policies and institutional response, Ethiopia is arguably well prepared to address climate change. Despite the communities' coping and adaptation strategies, the policies and institutions in place, agriculture and food security are increasingly negatively affected by climate change. This implies that some climate change effects overwhelm local coping and adaptive capacities.

Key recommendations

As a way forward, the report cites the need for effective implementation of planned adaptation interventions as outlined in the national policy and strategy documents and to build resilience in agriculture, natural resources and food security sectors. Also, further research is needed to fill in crucial knowledge gaps, some of which are identified and discussed in the working paper.

This study was commissioned by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), in collaboration with the Ethiopian Ministry of Agriculture and Climate Change Forum – Ethiopia. The aim was to identify the

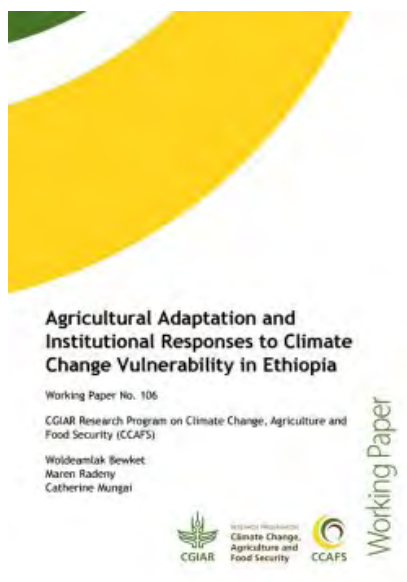


Ethiopia needs to fast track adaptation strategies that will help mitigate the harsh climate change effects that are slowly but surely hindering community based coping strategies.

vulnerable areas to climate change in Ethiopia. It is anticipated that the findings from this assessment will provide evidence to support climate-sensitive policy implementation in the agriculture sector.

Access the working paper: <http://bit.ly/1N0t7tI>

Catherine Mungai is a Policy and Partnership Specialist working with CCAFS East Africa.



Crops under a changing climate: what are the impacts in Africa?

Adaptation measures for especially maize, common beans, Arabica coffee, banana and finger millet are urgently needed in Africa to curb future negative climate impacts.

By Cecilia Schubert

When analysing the past few years we see a clear trend: over the past 30 years, climate change has reduced food production between 1-5% per decade across the globe. Now, mounting evidence points in a similar direction for future food production.

Even at relatively low levels of warming, i.e. keeping within the 2-degree target, agricultural productivity will most likely decline in the absence of adaptation. Tropical cereal crops such as maize and rice, usually grown in already vulnerable regions in South and Central America, Sub-Saharan Africa and Asia, will in particular be negatively affected.

In order to prepare for the globe's glaring climatic changes, and ensure policies and programs address food security needs, policy-makers have to receive context-specific climate data and information that they can use. Here, spelling out the various climate-related impacts on crops, and some of the available adaptation measures, is a first step to generate more climate-resilient food systems.

A newly released Working Paper by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) provides an overview of projected climate change impacts on crop production and suitability with a particular focus on Africa. Authors have used a combination of literature review, models and new data analysis.

The paper 'Climate change impacts on African crop production' analyses 9 staple crops grown on the continent: maize, common bean, cassava, sorghum, yam, finger millet, pearl millet, groundnut, and banana, as well as the cash crop coffee.

The findings bring valuable insights that can support African countries adapt their agriculture production to a changing climate. Authors also conclude that despite inherent uncertainties in producing climate projections for crops, most of the projected impacts, if no adaptation measures are undertaken, are robust.

Climate-related impacts on crops

The paper shows that common bean, maize, banana and finger millet are projected to reduce their suitable areas significantly (30-50%) across the continent, and will need some kind of adaptation plan, or be replaced with other crops. At the country level, West African countries in or near the Sahel are projected to be the most negatively impacted with 70% decreases in suitable areas for the 9 crops.

On the other hand, sorghum, cassava, yam, and pearl millet show either little area loss or even gains in suitable areas. Suitability projections suggest that opportunities may arise from expanding cropping areas in certain countries and regions: cassava production may move towards more temperate regions in Southern Africa, and yam suitability outside West Africa may increase.



New Working Paper outlines projected climate change impacts on crop production and suitability with a particular focus on Africa.

Common bean

The common bean is an important source of nutrition and food security for many African countries. However, common bean yield is also highly sensitive to climate change. Substantial yield losses for the beans in most of sub-Saharan Africa have been projected for a range of different scenarios for the current century. Recent work on common beans at the International Centre for Tropical Agriculture (CIAT) demonstrates a potential game changer in new breeding experiments. For some 50% bean growing areas where heat stress is the major constraint, beans that can tolerate up to +3 °C, which have been successfully bred in greenhouse trials, could carry East African common beans throughout the entirety of the 21st century under most climate scenarios.

Coffee

Arabica coffee producers will soon have to look for alternate growing areas as climate change will lead to changes in suitability in major growing countries in eastern Africa. In Mozambique, Uganda and Tanzania, suitability will almost disappear for Arabica coffee production (> 50% reduction), suitability in Burundi and Rwanda will reduce significantly (20-50% reduction), and the least significant (but still noticeable) negative effects on Kenya and Ethiopia (< 15% reduction). For Robusta coffee impacts will not be as massive as for Arabica coffee.

For global coffee producer East Africa, climate change will most likely lead to two parallel events for: (1) an overall reduction in arabica growing areas accompanied by migration and hence concentration towards higher altitudes, and (2) a replacement of heat-stressed arabica areas (< 1,500 meters above sea level) by the more heat-tolerant robusta.

Maize

Maize is a vulnerable crop. Research shows that geographically, the majority (~90%) of currently cropped maize area is projected to experience negative impacts, with production reductions in the range 12-40%. West African countries will in particular feel the negative impacts, with mean production losses between 20 and 40% by 2050s, while other countries, such as Kenya, Mozambique, Botswana will face less severe reductions in production. With maize being one of the greatest sources of calories, while being grown across the greatest area on the continent, adaptation measures, especially for the Sahel, are pivotal.

Download the Working Paper for additional impacts on crops. Suitability areas and adaptation measures: <http://bit.ly/1GNAuKn>

Cecilia Schubert works as Communication Officer for CCAFS Flagship 4 Policies and Institutions for Climate-Resilient Food Systems.

Drought and pest epidemics among top climate risks in rural Uganda

The traditional coping strategies developed by local communities provide useful foundations for effective adaptation strategies.

By Vivian Atakos and Maren Radeny

“We find it difficult to plan our farm activities; rainfall patterns are very variable and confusing. Dry spells are common during crop production seasons,” said farmers in rural Uganda, during a focus group discussion session convened by researchers to understand farmers’ perception of climatic trends and climate-related risks.

Smallholder farmers in Uganda face a wide range of agricultural production risks, with climate change and variability presenting new risks and vulnerabilities. Climate-related risks such as prolonged dry seasons have become more frequent and intense with negative impacts on agricultural livelihoods and food security.

A new working paper by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) assessed farmers’ perceptions of climate change and variability and analysed historical trends in temperature and rainfall in two rural districts of Uganda. The paper ‘Climatic trends, risk perceptions and coping strategies of smallholder farmers in rural Uganda also identified the major climate-related risks affecting crop and livestock production and the existing innovative strategies for coping with and adapting to climate-related risks, with potential for upscaling in rural districts.

The paper uses household survey data and historical climate data from two rural districts of Rakai and Hoima in Uganda. The districts represent diverse agro-ecological, production,

social and institutional settings and are representative of East African farming systems.

The findings show a need to demonstrate and promote early maturing; drought tolerant and water efficient crops and crop varieties; pastures and fodder varieties; rainwater harvesting and soil nutrient and moisture management technologies; and livestock management options and strategies that restore sustainable productivity. Research and farm development initiatives need to foster integration of crops and livestock that exploit synergies of indigenous traditional practices and modern technologies and innovations. Efforts should be mobilized to establish effective climate risk management information flow networks to inform farm-level decision making, taking into account the already existing communication channels or structures.

Farmers’ perceptions and knowledge of climate change

Changes in climatic conditions perceived by farmers included erratic rainfall onset and cessation that were either early or late, poor rainfall seasonal distribution and little rainfall. Farmers also reported variations in temperatures pointing to an increase. The farmers’ perceptions were consistent with the observed historical trends from meteorological data.

Climate-related risks and impacts on crop and livestock production



Emergence of new diseases and pests for some crop varieties has affected farm productivity in Uganda.

Farmers across the two districts have experienced major climate-related risks that threaten current and future agricultural production. Major climate-related risks included drought, disease and pest epidemics and hailstorms. These conditions result in declining water resources, reduction of pasture productivity, bush fires, crop failure and physiological changes in crop flowering and fruiting times.

Understanding farmers' perceptions of climate change and how climate-related risks impact smallholder crop and live-

stock production is important in designing climate change adaptation strategies and formulation of policy recommendations.

Farm-level strategies for coping with and adapting to climate change

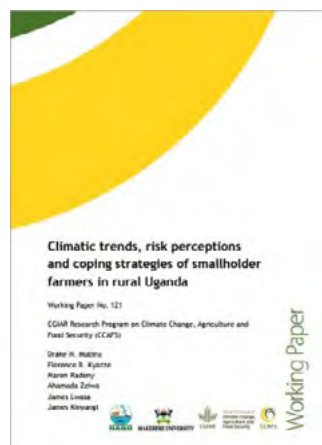
Local farmers in East Africa developed a number of local coping strategies that enabled them reduce vulnerability to climate

variability and change. Farmers often use a combination of technologies and strategies, and these include the use of indigenous traditional innovations and modern technologies; mulching, intercropping, use of manure and improved crop varieties. Other local innovations included the establishment of kitchen gardens, rainwater harvesting for domestic and agricultural use, use of organic pesticides, micro irrigation, and use of non-conventional organic fertilizers.

Although traditional coping strategies provide important lessons on how local communities can better prepare and adapt to climate change in the long-term, the increasing climate variability, frequency and more severe shocks are likely to surpass traditional coping strategies. Moreover, some of these local coping strategies can only assist families in the short-term.

Access the working paper: Climatic trends, risk perceptions and coping strategies of smallholder farmers in rural Uganda.: <http://bit.ly/1ROSkZo>

Vivian Atakos is a Communications Specialist and Maren Radeny is a Science Officer at CCAFS East Africa.



Responding to climate related risks to address food insecurity in Nyando, Kenya

Field visit to see first-hand how the Nyando climate-smart villages respond to climate related risks in an attempt to address food insecurity.

By Vivian Atakos

On 7th May 2015, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) Program Management Committee and Independent Science Panel members visited Nyando climate-smart villages in Kisumu County, Kenya.

Background information on Nyando

Since 2011, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) has been facilitating a partnership around collective action in seven villages that integrates a science approach to deliver development outcomes in Nyando. The approach is based on a climate-smart village (CSV) model, focusing on improving local knowledge of climate risks and variability in seasonal rainfall, dry spells, and diseases and pests to inform farming decisions.

The goal is to respond to climate variability, improve food security and enhance household incomes. This is achieved through the participatory testing of resilient technologies, training to build the knowledge and capacity to change local practices and improve planning for adaptation to changing farming conditions. Through participatory action research approaches, the partnership is facilitating the testing of a portfolio of climate-smart agriculture (CSA) interventions, allowing farming households to make progressive changes to their crops and cropping patterns as well as introducing new resilient livestock breeds.



New opportunities for scaling out climate-smart agriculture: Obinju smart farms



In order to address challenges of degraded land, declining land size and seasonal rainfall variability, the young farmers in Obinju are testing the smart farm concept. The smart farm technologies include greenhouse farming of up to one-quarter of a hectare, combined with drip irrigation with the advantage of saving water. Other smart farm technologies include water conservation and management, seed bulking of fodder for livestock and horticultural crops.



The smart farms serve as demonstration sites for youth groups engaged in agriculture. They require intensive knowledge and skills to manage. Therefore, CCAFS is partnering with the private sector — Magos Farm enterprises — and government extension agencies to train youth groups as part of the process of advancing local adaptation actions. By linking farmers to credit providers and agrodealers, and working with the county government, CCAFS is proposing to scale out smart farms throughout the county.



Kenyan policy makers also took part in this field visit to interact with farmers and researchers. During this visit, the Permanent Secretary Ministry of Environment, Water and Natural Resources (MEWNR) was represented by Engineer Omedi Jura (left in the picture above). In the CSVs, we work closely with the county department of Agriculture, Livestock and Fisheries who offer extension support on sustainable land management, crop husbandry and seed systems, post-harvest processing, soil and water conservation. The department also offers extension support on livestock fodder development and capacity building on improved livestock management.

Resilient small livestock (Galla goats, red Maasai sheep) and agroforestry



From 2011, CCAFS through the International Livestock Research Institute (ILRI), and other partners are working to improve productivity of small livestock — sheep, goats and poultry. Joshua Omollo (second right in blue) is one of the farmers actively involved in this initiative. On his 0.1 hectare farm, he has diversified into better adapted cross breeds of Galla goats to meet food security and income needs of his household. These goats mature and reach market weight faster than the indigenous East African goats.



Apart from the Galla goats, Joshua has planted agroforestry tree species on his farm (*Grevillea robusta* and *Gliricidia sepium*). About 23,500 multipurpose trees have also been planted in homesteads and the local community is establishing a two acre demonstration woodlot. These efforts aim to at least ensure each climate-smart farm meets the government policy to have 10 percent on-farm tree cover.



Farmers in Nyando are now keeping Red Maasai sheep, set up with the help of ILRI researchers. The Red Maasai sheep is reared for meat and is preferred due to its faster growth rate, resistance to internal parasites, tolerance to trypanosomes, drought and heat stress.



Champion farmers in the CSVs have established a number of land management initiatives. This includes construction of water pans and terraces to control soil and water movement on their farms.

Climate Services



CCAFS is working with Maseno University, University of Reading and Kenya Meteorological Services to test models for developing and delivering seasonal forecast and climate services and information. This includes the use of information communication technologies (ICTs) to improve decision making in agriculture. Through Magos Farm Enterprises, seasonal forecasts are disseminated via mobile telephone, together with agro advisories to enable farmers to know when and what to plant.

Standard Assessment of Mitigation Potential and Livelihoods in Smallholder Systems (SAMPLES)



CCAFS is supporting work by ILRI, the World Agroforestry Centre (ICRAF) and the Center for International Forestry Research (CIFOR) on measurement of greenhouse gas (GHG) emissions under different farmer practices and systems in the villages. Evidence from the project (Standard Assessment of Mitigation Potential and Livelihoods in Smallholder Systems - SAMPLES) will be used to develop an inventory of on-farm mitigation strategies which will be used to inform the government to develop policy on managing emissions in changing agricultural practices.

Greenhouse gas emissions measurements demonstration during the field visit to Nyando. This ongoing work could lay the groundwork for similar efforts across the continent.



In Nyando, CBOs are helping farmers increase their capacity to adapt to climate change through collective action. The CBOs bring together over 50 mixed farmer and youth groups across 106 villages in Nyando. More than 60% of the members are women or youth below the age of 25. The CBO members appreciated the visit and urged participants to call on them more often.

Read more about the smart farms: <http://bit.ly/1SCGlew>
 Read more about the initiative: <http://bit.ly/1N0z4qs>
 Read more about agroforestry: <http://bit.ly/1eDqQdi>
 Read more about climate services in Nyando: <http://bit.ly/1THLskk>
 Read more about GHG measurement in Kenya: <http://bit.ly/1BwOphF>

Vivian Atakos is a Communications Specialist CCAFS East Africa.

Learning from adaptation experiences of local communities in Makueni, Kenya

Delegates to the 9th conference on community-based adaptation visited Makueni, Eastern Kenya and interacted with local communities thereby learning about various initiatives being implemented to address climate change and food insecurity.

By Philip Kimeli

“We have heard the challenges these farmers face first hand due to climate change impacts. The various adaptation initiatives being demonstrated here are quite encouraging since farmers are now able to feed their families as well as earn income to address other household needs. However, the big question is: how can we upscale such initiatives?” asked Jean-Pascal Van Ypersele, Vice-Chair of the Intergovernmental Panel on Climate Change (IPCC).

Jean-Pascal was speaking during a field visit to Makueni, a CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) East Africa learning site organized for delegates who would later attend the 9th International Conference on Community-Based Adaptation to Climate Change (CBA9) held from 27 to 30 April in Nairobi. The visit provided an opportunity for shared learning based on ongoing work in the field for delegates from 21 countries.

Climate change and variability in Machakos and Makueni, Eastern Kenya, has led to increased frequency of severe droughts in the last 50 years. Incidences of failed seasons are reported in two out of every five seasons. Consequently, malnutrition and poverty levels are very high; over 65% of the population lives below the poverty line, on less than one dollar a day. The impacts of climate change have hit most of the villages in these regions. Short rains, high temperatures and emerging crop diseases are problems commonly experienced by these farmers.

“Sometimes you expect it to rain so much but unfortunately it rains very little, for example in February there was a false start of the season, I planted but my entire crop failed and I had to replant again in March,” explained Moses Mukita, a farmer in Kiboko village, Makueni, to the delegates.

CCAFS has partnered with government ministries in the area as well as research institutes such as the Kenya Agricultural & Livestock Research Organization (KALRO) in Katumani to help farmers manage climate-related risks in the area. “Our mandate is to conduct research in drylands and develop technologies that farmers use in agriculture to promote productivity,” said Dr. Charles Kariuki, KALRO Katumani Director as he welcomed delegates to Makueni. He noted that the main challenges include high rainfall variability, increased drought frequencies and soil problematic hard pans which lie 15 cm deep and impair the root development and water infiltration. He further pointed out that some of the technologies they are developing include improved crop varieties which are drought resistant, early maturing and pest and disease resistant. Additionally, soil and water conservation technologies including terraces, stone bunds and micro catchments such as negarims and zai pits are being promoted among farmers in the area. The micro catchments collect surface run-off, increase water infiltration and prevent soil erosion.

Drought tolerant crop varieties as opposed to maize

Farmers have been dependent on maize as the staple food but the crop can no longer do well as a result of erratic rainfall as well as increasing temperatures. Continued capacity building of farmers has seen a good number adopt drought resistant crops like pigeon pea, sorghum, cowpea and millet. Many more have taken up fruit farming.

“A key strategy has been to convince farmers that they can grow other drought tolerant crops instead of maize and still have food for their families,” Dr. Kizito Kwena, Agricultural Researcher, KALRO said.



Local communities are interested in learning about technologies that will enable them to address various climate risks for food secure households.

Key lessons learnt during the visit include: farmers have taken up rain water harvesting technologies (in situ and ex situ) thereby boosting crop productivity. Secondly, the farmers have taken up crop diversification with a shift to new drought tolerant crop varieties. Thirdly, there has been an increase in household income leading to improved livelihoods. Finally, it is evident that various stakeholders have a role to play in climate change adaptation. These include communities through the civil society organisations, research institutions and the government.

Feedback from the delegates

“I am impressed by the gender dynamics in the project. Inclusion of more women is critical because the impacts of climate variability are rapidly changing the composition and structure of households and gender responsibilities are undergoing transformation. More women are becoming more responsible for household food security and therefore, their increased number in the project implementation ensures that the climate-smart agriculture knowledge learned is adopted and shared widely,” said Gillen Tania, Southern Voices on Adaptation, Nicaragua.

“Climate change adaptation initiatives are feasible and manageable at community level (group or individual) and some require little to no monetary resources,” said Nutsukpo Delali, Ministry of Agriculture Ghana.

“There is a great need to upscale these initiatives at national and regional levels. This calls for more investment and support by the county and national governments since most of these initiatives have been funded externally,” said Lamsal Krishna, Programme Coordinator, Community Resilience to Climate Change, Nepal.

“The field experience has been an eye opener. In this region, capacity building and empowerment of farmer groups and women has promoted uptake of technologies. We will apply this approach in Ghana,” said Getrude Owusu, ABANTU for development, Ghana.

Making the most of climate information for community-based adaptation: <http://bit.ly/1lu9mr1>

Phillip Kimeli is a Research Assistant at CCAFS East Africa. The field visit was organized by IIED and coordinated by ACTS. The hosts were CCAFS and KALRO Katumani.

Out & About



1. CCAFS Program Director Bruce Campbell (Left) with West Africa Program Leader Robert Zougmore during PMC and ISP Nyando field visit .
 2. CCAFS East Africa Regional Program leader James Kinyangi during a CSA stakeholders meeting with county representatives in Kenya. 3. Polly Ericksen from ILRI during the Seminar on Trade-offs between nutrition and Climate-Smart Agriculture in the Livestock sector. 4. SB42 Side Event: Linking agricultural and climate change science and policy in Africa 5. The International Community-Based Adaptation Conference (CBA9) participants at a CCAFS project in Wote, Makueni 6. Participants during the Climate and Agriculture Network for Africa training

In our diary

July
 Our common future under climate change
 Venue: Paris, France
7-10
 2015

July
 Food and farming under climate change: Moving towards a global agreement
 Venue: Paris, France
8
 2015

July
 Learning alliance meeting
 Venue: Kampala, Uganda
15-16
 2015

July
 2nd Africa Ecosystem Based Adaptation for Food Security Conference 2015 (EBAFOSC 2)
 Venue: Nairobi, Kenya
30-31
 2015

September
 Africa Climate Talks: East/Southern Africa, and Indian Ocean SIDS
 Venue: Dar es Salaam, Tanzania
3-5
 2015

August
 September
 October
 November
 December

CCAFS EA in the media

China.org.cn
Africa Focus: Rising El Nino may disrupt food security in Africa: scientists
 Published: June 9, 2015

The rising El Niño trend caused by the impact of extreme weather events could disrupt food production across the world, particularly in Africa, scientists warned on Wednesday.

In a joint statement received in Harare, scientists with Consultative Group on International Agricultural Research (CGIAR) predict that 2015's rains will be less productive in Africa, could decline up to 40 percent due to increased temperatures.

"Unless farmers in places like sub-Saharan Africa are able to adapt to the impact of climate change, we will not achieve the level of stability and sustainable development that is absolutely essential to the success of any effort that seeks to curb greenhouse gas emissions," said James King'ong, CGIAR's East Africa program leader on climate change, Agriculture and Food Security (CAFS).

Climate change is the biggest threat that modern agriculture has ever encountered, King'ong added.

Scientists warn that substantial reductions in storage and farm-level yields could greatly reduce the productivity of livestock, which remains of Africa's depend upon for food, income and fertilizer.

"And of the world's 25 billion tons that are most at risk of being damaged by climate change, 21 are in Africa," they said.

CGIAR Director, Bruce Campbell, also pointed out that this recent severe global drought provides an unfortunate illustration of how quickly production and food prices, particularly in vulnerable areas like sub-Saharan Africa, can change.

"Climate change is already making food production more challenging in addition to any effects from an El Niño, which can develop if sea surface by just one degree above average could just utterly those problems."

REUTERS
El Nino to disrupt rains, cut Africa, East Asia harvests, scientists say
 By Chris Henshaw
 Updated: June 9, 2015 17:05 GMT

1 **Business** C
 2 **Business** E
 3 **Business** E
 4 **Business** I
 5 **Business** I
 6 **Business** I
 7 **Business** I

THOMSON REUTERS FOUNDATION
 Inform · Connect · Empower

El Nino to disrupt rains, cut Africa, E Asia harvests, scientists say
 Source: Thomson Reuters Foundation - 09:42, 9 Jun 2015 17:10 GMT

1 **Business** C
 2 **Business** E
 3 **Business** E
 4 **Business** I
 5 **Business** I
 6 **Business** I
 7 **Business** I

CAPTURE CORRUPTION
 LOCAL PARTNERSHIP
 MOST POPULAR

- 1 SPOTLIGHT: Super typhoon Haiyan: what happened to the survivors?
- 2 'Crazy' Kenyan grannies use tricks to save themselves from rape
- 3 Little girls bear the brunt in India's vicious cycle of malnutrition
- 4 Indian schoolgirl kills baby after secret birth in hostel - report
- 5 Two girls murdered in Texas taxi - Were they honour killings?

STANDARD Digital
El Nino to disrupt rains, cut Africa, E Asia harvests, scientists say
 By Standard
 Published: Thursday, June 11, 2015 11:45 AM

Biznet
 Network with entrepreneurs
 Get sales leads and tender alerts
 Buy/Sell/Grow
 www.biznet.africa

Breaking News

- 1 Thousands left in the dark when power shutoff caused an electricity transformer. They claim it could have been fixed by workers but union says it took them a week to get the job done.
- 2 Danish man caught raping 16-year-old girl in hotel - girl had claims for \$100,000 in damages.

BE FORWARD AutoParts Open
 Millions of Kenyan motorists are now able to buy auto parts online.

The rainy season has been delayed in several African nations, and it is difficult to predict exactly how long the current season will be, said some scientists.

THOMSON REUTERS FOUNDATION
El Nino to disrupt rains, cut Africa, E Asia harvests, scientists say
 Source: Thomson Reuters Foundation - 09:42, 9 Jun 2015 17:10 GMT

1 **Business** C
 2 **Business** E
 3 **Business** E
 4 **Business** I
 5 **Business** I
 6 **Business** I
 7 **Business** I

CAPTURE CORRUPTION
 LOCAL PARTNERSHIP
 MOST POPULAR

- 1 SPOTLIGHT: Super typhoon Haiyan: what happened to the survivors?
- 2 'Crazy' Kenyan grannies use tricks to save themselves from rape
- 3 Little girls bear the brunt in India's vicious cycle of malnutrition
- 4 Indian schoolgirl kills baby after secret birth in hostel - report
- 5 Two girls murdered in Texas taxi - Were they honour killings?

- El Nino to disrupt rains, cut Africa, East Asia harvests, scientists say (Reuters): <http://reut.rs/1B6fGY9>
- El Nino to disrupt rains, cut Africa, E Asia harvests, scientists say (The Standard): <http://bit.ly/1BwVvt2>
- Africa Focus: Rising El Nino may disrupt food security in Africa: scientists (China.org.cn): <http://on.china.cn/1F8csi4>
- El Nino to disrupt rains, cut Africa, E Asia harvests, scientists say (Thomson Reuters Foundation): <http://tmsrnt.rs/1ftgzAB>
- New goat breed promises high yields (Daily Nation): <http://bit.ly/1H6Nx86>

Further Reading

CCAFS Latest Publications

Working Paper: Climatic trends, risk perceptions and coping strategies of smallholder farmers in rural Uganda: <http://bit.ly/1GZ8tZm>

Working Paper: Agricultural Adaptation and Institutional Responses to Climate Change Vulnerability in Ethiopia: <http://bit.ly/1gbixpq>

Working Paper: Integrating Indigenous Knowledge with Scientific Seasonal Forecasts for Climate Risk Management in Lushoto District in Tanzania: <http://bit.ly/1Hfm4fR>

Report: The Role of Policy in Facilitating Adoption of Climate Smart-Agriculture in Uganda: <http://bit.ly/1bo0XMX>

Working Paper: Climate change impacts on African crop production: <http://bit.ly/1GNAukn>

Responding to Climate Related Risks to Address Food Insecurity in Nyando, Kenya: <http://bit.ly/1S5rooo>

Evidence of impact: Climate-smart agriculture in Africa: <http://bit.ly/1FybpOO>

Resources and Tools

CCAFS website and blog updated daily with news on policy and practice, research, events and downloadable publications from the CGIAR and partners.

Website: bit.ly/1gX2uKi Blog: bit.ly/Blogs_EastAfrica

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

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

MarkSim II Generator of future location-specific rainfall series, based on a choice of General Circulation Models. bit.ly/Mark-SimGCM

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

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

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

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

Adaptation and Mitigation Knowledge Network is a map-based platform for sharing data and knowledge on agricultural adaptation and mitigation. 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. bit.ly/1pzmVhI

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




CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), East Africa.

P.O. Box 30709 - 00100 Nairobi, Kenya

Phone: +254 20 422 3000 Fax: +254 20 422 3001

Email: ccafsea@cgiar.org

Website: <http://ccafs.cgiar.org/regions/east-africa>

 [@cgiarclimate_EA](https://twitter.com/cgiarclimate_EA)

 CGIARclimate



RESEARCH PROGRAM ON
Climate Change,
Agriculture and
Food Security



CCAFS East Africa is
hosted by ILRI



Led by:



Strategic partner:



Research supported by:



Russia (Ministry of Finance)