



Agro-Value Chain Finance and Climate Adaptation: The role of the banking sector

Julie Dekens (IISD) and Susan Bingi

This brief aims to stimulate thinking and discussion on ways to design and deliver agricultural finance that supports adaptation to a changing climate for all actors along agro-value chains from producers to exporters. Agricultural finance refers to financial services (savings, transfers, insurance and loans) needed by the agricultural sector. This brief primarily targets the banking sector, particularly credit institutions, involved in financing agro-value chains in developing countries, particularly in Africa. It builds on the results and recommendations of a six-month pilot initiative on mainstreaming climate risk along the coffee value chain in Uganda, which was conducted in 2013 through a partnership between the Ministry of Trade, Industry and Cooperatives (MoTIC), Makerere University (MAK) and the International Institute for Sustainable Development (IISD).





KEY POINTS:

- Climate change already threatens the sustainable development of agro-value chains around the world, including through impacts on finance service providers. Yet the integration of climate risk into the financial sector remains limited.
- While the provision of agricultural finance that supports climate adaptation remains low, some successful models are emerging. These new models are often made possible through the rise of new information and communication technologies.
- With an adequate enabling environment, improved access to finance can support climate adaptation along agro-value chains. However, access to climate-resilient and inclusive finance alone is not sufficient to support sustainable agro-value chain development in a changing climate.
- To remain profitable and competitive, the banking sector needs to take a more proactive and holistic approach to climate risk management. Four actions are recommended. First, banks should explicitly integrate climate risk in their risk management strategies. Second, they should incentivize adaptation and climate-proof their financial instruments to support climate adaptation (or at a minimum to prevent maladaptation) along agro-value chains. Third, banks should explore any potential new opportunities from climate change by developing new products and services in collaboration with other actors (e.g., research organizations, telecommunication and software companies). Finally, a more proactive approach to supporting climate adaptation also calls for greater financial inclusion, including financial services that explicitly target women with a framework in place to monitor and evaluate progress and impacts.



CHALLENGES

Climate change already threatens the sustainable development of agro-value chains around the world, including through impacts on finance service providers. An estimated 2.5 billion of the world's rural poor and the economies of about 55 developing countries depend on agro-commodities.ⁱ Production of these commodities is often rain-fed, leaving livelihoods and economic development highly dependent on climatic conditions. Climate variability and change can affect all stakeholders involved in the process of value addition of a specific agro-commodity and lead to value chain underperformance, compromising development aspirations at the local, regional and national levels. For example, coffee production remains an engine of development in Uganda and the negative impacts of climate variability and change are among some of the common barriers that cut across the entire coffee value chain (see overview, Box 1). Financial service providers, including agricultural banks, are negatively affected by climate hazards because any risk faced by clients generates risks for them. These risks include: low profits in the face of severe climate hazards due to reduced demand for credit, because customers are too busy managing emergencies to be able to seek credit; fewer savings deposits, because clients have lost their assets; delayed loan repayments and high default rates; reduced customers due to lower profits by agro-commodity traders and processors.

Yet the integration of climate risk into the financial sector remains limited. Risk management is a core element of any business and this is no exception for the financial services industry, but the new risks and potential opportunities from climate change in particular are not typically taken into account. "Climate risks" refer to climate hazards resulting from climate variability and change. They include extreme weather events such as floods; changes in location, timing, frequency, intensity of extreme weather events; and gradual changes such as rising temperatures and changing rainfall patterns.

One of the main risk management strategies for banks, as well as other actors along the chain, is to diversify activities so that, in the event that one economic activity fails (due to climatic or non-climatic factors), one can still rely on income from other associated activities to service credit. In case of climate hazards, banks also often reschedule the loan repayment period and encourage their clients at production and processing levels to diversify their own enterprises through sensitization. In agriculture, banks allow capital refinancing in case of complete crop failure so that farmers can be back in business the next season. While such activities are laudable, most of them are reactive (i.e., they minimize the negative impacts once the hazard has occurred).

However, awareness about climate risks is growing among financial institutions specifically, particularly in the insurance sector, and in the private sector more generally. At the same time, awareness about climate risks among financial service providers will have to include an understanding of not only the new risks posed by climate change, but also the opportunities it may present, such as the development of new, innovative partnerships (e.g., between banks and telecommunication companies) to respond to the demand for new services (e.g., mobile banking, lending in-kind inputs) and the adaptation of existing products that are more flexible and able to account for greater uncertainties (climatic and non-climatic).

The provision of agricultural finance that supports climate adaptation remains low. In most developing countries, where agricultural production is dependent on smallholder farmers, lenders tend to face high transaction costs due to the dispersion of such farmers and their lack of collateral security. They associate the agriculture sector with high risk, especially at the production level, as all farmers from the same area tend to be affected by risks as a group. This translates into high interest rates (that are mostly accessed by men). Farmers often need loans to avoid selling their crops immediately, even at low prices to meet basic needs such as school fees and medical treatments, while processors often need loans to procure and maintain equipment. But the banks' agriculture lending policies remain conservative. In Africa, agriculture represents approximately 65 per cent of total employment and 32 per cent of the GDP, but only five per cent of bank lending.ⁱⁱ



Box 1: The case of the coffee value chain in Uganda: Overview

Coffee production remains an engine of development in Uganda and benefits from political support at the national level. Uganda is among the top ten Robusta coffee producers globally and Africa's third largest Arabica coffee producer after Ethiopia and Kenya.ⁱⁱⁱ Most of the coffee produced is grown by smallholders, mostly women, with limited inputs on small landholdings averaging 0.5 to 2.5 hectares.^{iv} Most smallholder farmers depend on coffee for their livelihoods. In 2008–09, coffee was already a source of income for at least 1.82 million households.^v For the last 10 years, the coffee sector has been the largest employer in the agricultural sector. Between 2005 and 2010, coffee provided 17 per cent of the country's total exports by value.^{vi} The government is diversifying its export portfolio to non-traditional products (e.g., fish and fish products, flowers, fruits and vegetables, and cereals), but continues to support coffee production. Despite these aspirations, national coffee production remains low and has stagnated over the last 40 years. Various factors hamper coffee value chain development. The negative impacts of climate variability and change and a lack of access to financial services are among some of the common barriers that cut across the entire value chain.^{vii}

Climate change already threatens the sustainable development of the coffee value chain in Uganda. Uganda has been experiencing increased drought frequency and intensity and rising temperatures since 1960. These trends are projected to continue in the future.^{viii} Climate hazards such as drought, heavy rains, floods and changing rainfall patterns are directly associated with a reduction in coffee yield and quality. Indirectly, they are also linked to reduced incomes and increased transaction costs along the entire value chain.^x For example, road damages due to the 1997–98 El Nino were estimated to cost more than US\$47.5 million and were associated with a 60 per cent drop in coffee exports between October and November 1997 following the disruption of the transport system.^x Some studies projected that Arabica coffee production, which requires a cool tropical climate, will reduce drastically in Uganda (and elsewhere) as a result of climate change.^{xi} However, models need to be further improved to validate and refine this information. While the Government of Uganda recognizes the threat posed by climate change, the issue is relatively new and climate risk has not yet been fully understood and integrated into most of the national economic sector strategies, such as trade.

Despite a growth trend, access to affordable and inclusive finance along agro-value chains, such as coffee, remains limited in Uganda.^{xii} The banking sector in Uganda is relatively well developed with a growing number of international and local banks increasingly addressing agricultural investments. The country also benefits from a large number of microfinance institutions including, but not limited to, banks and Savings and Credit Cooperative Societies (SACCOS), both with a stake in increasing agricultural finance access in the country. However, agriculture lending by regulated financial institutions and institutions that take microfinance deposits declined by more than 21 per cent between 2007 and 2010.^{xiii} Specifically, the relationship between financial service providers and coffee value chain actors, especially farmers, remains relatively weak. Indeed, between 1950s and 1970s, coffee production in Uganda was organized along a cooperatives system that offered credit, extension services and marketing for the crop. Over the years of political turmoil, the cooperatives system collapsed, and in the process the coffee marketing structure was destroyed. The coffee value chain is now fragmented as a result of farmers' limited direct links with exporters. Exporters buy 70 per cent of their coffee from intermediaries (domestic middlemen and traders).



The demand for financial services along many agro-value chains is also low due to a general lack of financial literacy (i.e., farmers do not understand how banks operate). The current lack of access to finance along the chain constrains productivity and quality, resulting in limited economic returns and re-investment for all value chain actors, limited capacity for value addition and decreased ability to repay loans. The need to improve agricultural financing is already recognized by African governments and development partners as demonstrated by the initiatives calling for increased investment in agriculture. Initiatives include the Comprehensive African Agriculture Development Programme (CAADP) of the African Union, which aims to increase public investment in agriculture by a minimum of 10 per cent of the national budget and to raise agricultural productivity by at least 6 per cent by 2015.

OPPORTUNITIES

Some innovative agricultural finance models are emerging. Various studies have shown that the private sector can both serve the poor and be profitable if risks are well managed.^{xiv} Despite numerous challenges, agriculture can be a profitable business with growth prospects and positive impacts on the economy of countries. As such, business incentives exist for banks, including commercial banks, to invest in agro-value chains. Agricultural finance can attract an important number of new customers calling for new and expanded service offerings. As a result, new agriculture finance models are being piloted for various crops. For example, Centenary Rural Development Bank Ltd, one of the leading microfinance commercial banks in Uganda, is currently piloting a coffee credit scheme in Uganda (see Box 2) and also plans to provide credit in kind (rather than cash) for inputs to improve credit utilization. These models do not (yet) explicitly account for climate risks, but by improving access to finance at the farm level, they have the potential to reduce farmers' vulnerability to shocks and stresses.

These new models are often made possible through the rise of new information and communication technologies.

The role of technology is expected to reduce financial transaction costs and improve access to inclusive financial services (e.g., bank accounts, financial education and micro-insurance) for farmers and other actors along value chains. Banking institutions are increasingly penetrating the countryside by opening new branches, erecting standalone ATM kiosk services and introducing mobile banking vans in remote rural areas. Banks are also increasingly developing mobile banking services (e.g., mobile banking and money transfers through mobile phone networks).^{xv} Various technologies are being piloted by different development actors. For example, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the German software corporation SAP have piloted a smartphone application to improve access to finance along selected agro-value chains in Ghana and Uganda. The system allows farmers to register produce and money transactions, providing transparency and a comprehensive business records along the value chains. In Uganda, the system already supports mobile money payments and is expected to provide relevant data to support the banks' risk-evaluation process, which is required for coffee farmers to access loans and insurance products.^{xvi}



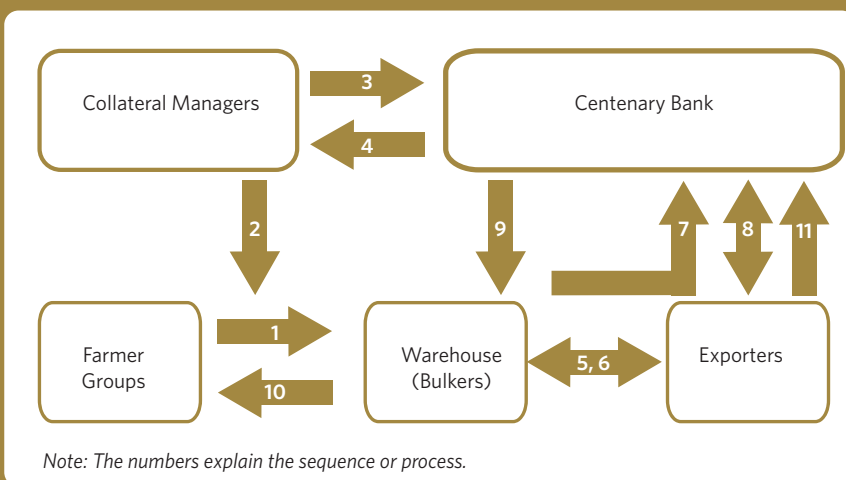
Box 2: The Centenary Bank's coffee pilot credit scheme in Uganda

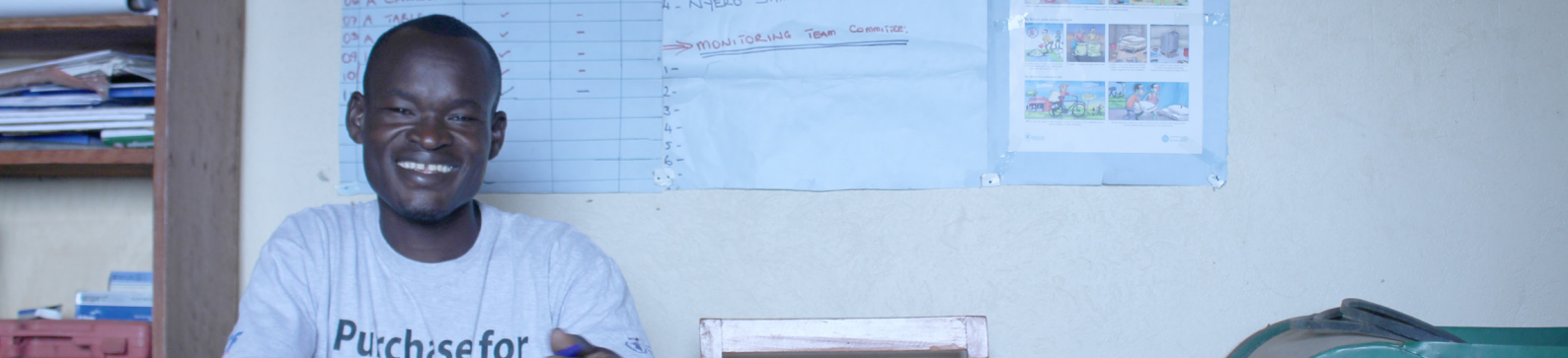
Uganda's Centenary Rural Development Bank Ltd (Centenary Bank) began operations in 1985 with the overall objective to serve the rural poor and contribute to the overall economic development of the country. The bank aims to "provide appropriate financial services especially, microfinance, to all people in Uganda, particularly in rural areas, in a sustainable manner and in accordance with the law."^{xvii} In the last few years, the bank started to focus on agricultural finance. A new agriculture department was created to look at finance from a value chain perspective. In 2013 agricultural finance already represented about 20 per cent of the bank portfolios covering approximately 32,000 farmers.

Since 2013 Centenary Bank has been piloting a credit scheme related to the Warehouse Receipt System (WRS), an agricultural financing model that has been legally operationalized in Uganda mainly to the grains subsector and especially for maize. The bank adapted the WRS model as a credit line to suit the needs of its clients and is already covering 10 coffee-producing regions across the country with their agricultural credit model (see Figure 1 below). The credit line to coffee suppliers is based on the factoring principle in commodity trade finance, also commonly referred to as the purchase of accounts receivable (i.e., invoices). This is a financing transaction where the bank (the "factor") agrees to pay its clients the value of the invoice less a discount for commission and fees. The bank advances most of the invoiced amount to coffee suppliers immediately.^{xviii}

The bank is working with Collateral Managers (CMs), private sector operators regulated by government who act as intermediary agencies between the bank and the producer associations or bulkers. The coffee farmers are organized by a bulker (or warehouse keeper), who negotiates a price range with the exporter and initiates the credit line with the bank. During the crop season, the coffee farmers deposit the commodity in the bulker's warehouse (approved by the CM), which is cleared by the CM based on the buyer's contract in terms of quality and quantities deposited. The CM then notifies the bank for clearance to release the stock based on the contract/invoice, and on verification of all required documentation, the bank makes a payment of 80 per cent of the invoice value to the bulker, who then makes payment to the farmers immediately (instead of the 90 days normally required). The cycle is continuous as long as the farmers continue to deposit their crops at the warehouse.

Figure 1: Adaptation of the WRS model by the Centenary Bank for coffee in Uganda^{xix}





The bank calls this model the “factoring principle.” It is reluctant to refer to this process as the Ugandan WRS model as the bank is not registered on the Uganda Commodity Exchange (UCE) platform. In the UCE model, depositors (e.g., crop producers, processors) put their commodities in a safe warehouse in exchange for an electronic receipt, which is transferable and can be used as collateral. The depositor gains access to safe storage infrastructure and can also access micro-credit by presenting the receipt to a financial institution and borrowing against it. In the absence of repayment, the financial institution can keep the commodity deposited at the warehouse. Through the UCE, the government licenses and monitors the activities of the warehouses that are privately owned.

The concept of the WRS scheme can help manage the negative impacts of climate hazards at different stages of the value chain. The scheme could help farmers reduce post-harvest losses through increased access to centralized, safe and regulated storage facilities, as well as increase access to affordable and timely credit, allowing them to invest and build their assets over the long term and therefore reduce their vulnerability to climate and non-climate risks. The scheme could also help processors and bulkers to increase their economic return by assuring supply continuity and quality. Exporters could have access to a quality product, reduced procurement costs and time spent, and do not need to pre-finance farmers for the supply. Policy-makers and regulators could benefit from a lower cost of quality enforcement, improved linkages between the different value chain actors, and enhanced quality product and country competitiveness. Finally, the bank could secure a higher profit due to increased demand for credit, higher savings deposits and reduced defaulting rates.

The WRS model (both the UCE and Centenary Bank adaptations) could be further strengthened to respond to the risks posed by climate variability and change—a gap that is currently examined by the MoTIC, the Uganda Coffee Development Authority (UCDA), MAK and IISD in collaboration with the Centenary Bank.

With an adequate enabling environment, improved access to finance can support climate adaptation along agro-value chains. Limited access to financial resources is one of the key barriers to agro-value chain development and exacerbates the negative impacts of climate hazards. The main assumption behind finance for climate adaptation along agro-value chains is relatively simple: improving value chain actors’ access to finance can help them build their assets and therefore reduce their vulnerability to climate and non-climate risks. If for reasons of drought or floods farmers produce less crops, financial assets will not directly contribute to increased climate resilience—that is to say, they will not directly protect crops from being damaged by climate hazards at the production level. However, indirectly and over the long term they can contribute to smoothing the negative impacts of climate hazards along the entire value chain.

For example, at the farm level, access to micro-credits can help farmers buy inputs (seeds, fertilizers, etc.), replace old perennial crops (which are more climate sensitive) and invest in land and water management (e.g., irrigation equipment, inter-cropping), ultimately reducing vulnerability to climate and non-climate risks. Access to credits can allow processors to invest in improved storage facilities. Improved farm management and post-harvest handling from improved access to finance at the farm and processing levels can further benefit exporters through improved coffee quality and higher prices and incomes. Ultimately, financial service providers can also benefit through increased demand for financial products and sale opportunities.

However, and importantly, access to finance alone is not sufficient to support sustainable agro-value chain development in a changing climate. A combination of other factors are needed, calling for the support of the government and



development partners. For example, greater sensitization and awareness on climate risk management is needed for all sectors and among the value chain actors. The governments and donor agencies should support the development and delivery of specific sensitization campaigns and training on climate risk management tailored to the needs and requirements of financial institutions as well as access to relevant climate data and information.

RECOMMENDATIONS

To remain profitable and competitive, the banking sector needs to take a more proactive approach to climate risk management. In agro-commodity-dependent countries, a climate-resilient and inclusive (i.e., pro-poor, gender-sensitive) value chain approach is proposed. This approach encourages investments to go beyond commitments to corporate social responsibility and consider the implications of climate change and other socio-ecological trends, in both the short and long terms. Banks should especially consider the following four actions:

- 1. Explicitly integrate climate risk in the bank's risk-management strategies.** In the current context of rapid change and uncertainty due to both climatic and non-climatic factors, the banking sector would do well to adopt a more holistic approach to risk management. This should be based on vulnerability assessments that measure the existing and potential future impacts and associated costs of inaction versus adaptation measures on lending activities. Banks should understand the current and future potential impacts of climate variability and change on their operations. The integration of climate risk into financial institutions' risk management framework requires that they can access relevant, tailored information such as the nature, location, frequency and magnitude of climate risks presently and in the future; their assets' exposure and vulnerability to climate hazards; and the impacts of climate hazards on their clients.
- 2. Incentivize adaptation and climate-proof the bank's financial instruments to support climate adaptation (or at a minimum to prevent maladaptation) along agro-value chains.** Additional action should be taken to anticipate and reduce potential losses from climate hazards along the entire value chain. This is important since risk-prevention strategies can save greater costs in the medium and longer terms compared to reactive strategies. For example, clients demonstrating adaptation actions to climate change could obtain preferential rates and/or access to specific financial schemes as incentives. However, this could effectively drive out the most "at risk" smallholders by raising their capital costs and making them more vulnerable to variability in production (decreasing margins and inducing greater volatility in profits). Lending programs should therefore encourage farmers to implement adaptive practices and technologies by reducing the capital cost of these (e.g., innovative financing for climate-sensitive practices and technologies). Thereby, the bank can reduce "climate risk" in its portfolio as these farmers become more resilient. The government could support such programs by making a pool of capital available to banks for such lending activities (i.e., impact investing). Other way to support a climate-resilient agro-value chain is to encourage savings (e.g., banks could offer incentives for saving activities such as advantageous interests rates, vocational training, financial literacy training, etc.) and develop innovative insurance products such as weather index insurance.
- 3. Explore any potential new opportunities from climate change by developing new products and services in collaboration with other actors (e.g., research organizations, telecommunication and software companies).** Banks need to be outward-looking and explore opportunities to strengthen value chain linkages across scales. Innovative and transformative solutions for climate adaptation call for new



partnerships (e.g., with high-tech enterprises to support investment capital in clean technology solutions; with standard organizations to support the use of sustainability standards; with research organizations to analyze customers' needs and the impacts of their activities) and strong links between the banks and their clients to adapt products to their needs in a context of greater uncertainties. Indeed, banking in developing countries may be based more on the relationship between the client and the financier than on robust due diligence risk assessment of loan applications. Further research is required so that banks better understand the needs of their customers and associated data requirements so that appropriate technologies are developed. For example, many of the rural customers in developing countries still prefer the physical presence of a banker over mobile banking.^{xx} The banks could also contribute to support, and further enhance, existing good practices that support climate adaptation building on local, traditional knowledge.

Some farmers have gained traditional knowledge of keeping Irish potatoes for as long as three months! We want to build upon this traditional knowledge.

— Ann Mwaka (Centenary Bank)

- 4. Explicitly target women and regularly monitor and evaluate progress and impacts along targeted value chains.** A more proactive approach to supporting climate adaptation also calls for greater financial inclusion, including financial services that explicitly target women. Indeed, despite women's major contribution to the agricultural sector, their access to agricultural credit is even more limited than their male counterparts. This is counterproductive considering that women in rural Africa are more likely to repay their loans than men and tend to reinvest most of their income into their families and productive income-generating activities—a trend that is generally not observed for men.^{xxi} The above actions could lead to greater financial certainty and the ability to build up the asset base among all actors along value chains, which would ultimately improve banks' relationships with their clients and generate benefits for financial service providers. However, to date, limited documentation exists on the linkages between micro-finance and climate change adaptation. Banks should have frameworks in place to monitor and evaluate their progress and impacts. This would improve the current, and still limited, understanding of the opportunities, limitations and potential risks associated with microfinance for climate adaptation.^{xxii} It would maximize benefits for the banking sector while ensuring co-benefits for other actors along the value chains.



Box 3: Key definitions^{xxiii}

Climate hazard: A potentially damaging event or phenomenon of a climatic nature (e.g., extreme weather events such as floods; changes in location, timing, frequency, intensity of extreme weather events; gradual changes such as rising temperature and changing rainfall patterns).

Climate mitigation versus climate adaptation (or climate risk management): Climate mitigation refers to activities designed to address the causes of climate change by reducing the sources of greenhouse gas emissions in the atmosphere (e.g., a rural electrification project using solar panels) and/or by enhancing the sinks (removal) of greenhouse gasses from the atmosphere (e.g., tree planting). Climate adaptation refers to a process of adjusting to current and future potential changes due to climate variability and change. Climate adaptation focuses on addressing the impacts of climate variability and change. Adapting to climate change is necessary because some impacts are inevitable; even if greenhouse gas concentrations were stabilized today, global warming would continue for centuries due to the nature of the climate system.

Climate-resilient agro-value chain: Agricultural value chain (or agro-value chain) refers to a chain of activities that add value, from the production of a raw agricultural material (crop, fish, livestock, fruits and/or vegetables) to the processing and consumption of a final product. Building the climate resilience of agro-value chains refers to the process of understanding the main risks and opportunities from a variable and changing climate that can influence agro-value chain development so that appropriate solutions to minimize risks or to take advantage of any potential opportunities can be devised and implemented.

Climate risk versus climate impact: Climate risk refers to the probability of harmful consequences or expected loss (e.g. crop loss, death, reduced economic activity) resulting from interactions between climate hazards, exposure to these hazards and vulnerable conditions. A climate impact refers to the realization of a climate risk.

Climate variability versus climate change: Climate variability refers to short-term changes in the climate beyond that of individual weather events—for example, extreme weather events such as heavy rains or drought that do not necessarily represent a trend. Climate change refers to long-term changes in the climate that persist for decades or longer arising from natural causes or human activity. Human activities generate greenhouse gas emissions that absorb and emit radiation and that contribute to human-induced climate change.

Weather versus climate: Weather refers to the day-to-day variation (24 to 72 hours) of climate variables such as temperature, precipitation, humidity and wind. Climate refers to long-term averages (across decades, usually 30 years) of climate variables.



ENDNOTES

- ⁱ International Institute for Sustainable Development, United Nations Conference on Trade and Development, AIDEnvironment and International Institute for Environment and Development. (2008). *The Sustainable Commodity Initiative: SCI rational and road-map 2008–2011*. IISD: Winnipeg. Retrieved from http://www.iisd.org/pdf/2007/sci_roadmap.pdf
- ⁱⁱ European Commission. (2013). *Agribusiness and development: How investment in the African agri-food sector can help support development*. Seminar co-organized with DG Development and Cooperation EuropeAid, Charlemagne, Brussels; Isaac, C. (2012). Catalytic capital, powering Africa's agricultural potential. *Handshake: IFC Quarterly Journal on Public-Private Partnership, Issue 5*, 82–83.
- ⁱⁱⁱ Ugacof. (2013). *Uganda coffee*. Retrieved from <http://www.ugacof.com/>
- ^{iv} Uganda Coffee Development Authority. (2013). *Background*. Retrieved from <http://www.ugandacoffee.org/>
- ^v Uganda Bureau of Statistics. (2010). *Uganda national household survey 2009–2010*. Kampala: Republic of Uganda.
- ^{vi} International Trade Centre. (2012). *The coffee exporter's guide*. (3rd Ed.) Geneva: ITC.
- ^{vii} Dekens, J. & Bagamba, F. (2014). *Promoting an integrated approach to climate adaptation: lessons from the coffee value chain in Uganda*. CDKN
- ^{viii} United Nations Development Programme & Bureau for Crisis Prevention and Recovery. (2013). *Climate risk management for sustainable crop production in Uganda: Rakai and Kapchorwa Districts*. New York, NY: UNDP BCPR.
- ^{ix} Dekens, J. & Bagamba, F. (2014). *Ibid*.
- ^x Ministry of Water and Environment. (2002). *Initial National Communication to the UNFCCC*. Kampala: Republic of Uganda.
- ^{xi} See for examples: Jassogne, L., Laderach, P.; & van Asten, P. (2013). The impact of climate change on coffee in Uganda: Lessons from a case study in the Rwenzori Mountains. *Oxfam Policy and Practice: Climate Change and Resilience*, 9 (1), 51–66; Jaramillo J. et al. (2011). Some like it hot: The influence and implications of climate change on coffee berry borer (*Hypothenemus hampei*) and coffee production in East Africa. *PLoS ONE*, 6(9).
- ^{xii} Dekens, J. and Bagamba, F. (2014). *Ibid*.
- ^{xiii} Ministry of Agriculture, Animal Husbandry and Fisheries. (2011). *National agricultural policy. Draft*. Kampala: Government of Uganda.
- ^{xiv} See for example: GIZ. (2013). *Value chain development by the private sector in Africa: Lessons learned and guidance notes*. Retrieved from <http://ccps-africa.org.winhost.wa.co.za/dnn7/Portals/O/VCP%20web%20en%2018-07-13m.pdf>
- ^{xv} Bertelsmann Stiftung. (2011). *Transformation Index (BTI) 2012: Uganda country report*. Gutersloh: Bertelsmann Stiftung. Munich University, Germany.
- ^{xvi} Chhatwal, L. A. (2014). *System-based agribusiness promotion for the coffee value chain. Mid-term report*. Germany: GIZ
- ^{xvii} Centenary Bank. (n.d.). *About Centenary Bank*. Retrieved from <http://www.centenarybank.co.ug/content/about-centenary-bank>
- ^{xviii} Investopedia. (n.d.). *Factor*. Retrieved from <http://www.investopedia.com/terms/f/factor.asp>
- ^{xix} Reprinted with permission from Centenary Bank
- ^{xx} Nolan, B. (2013). Mobile banking without a phone: Here comes the bank van. *The Christian Science Monitor*. Retrieved from <http://www.csmonitor.com/World/Making-a-difference/Change-Agent/2013/1111/Mobile-banking-without-a-phone-Here-comes-the-bank-van>
- ^{xxi} International Trade Centre. (2011). *Microfinance in East Africa: Schemes for women in the coffee sector. Technical Paper*. Geneva: ITC.
- ^{xxii} See: Hammill et al. (2008). Microfinance and climate change adaptation. *IDS Bulletin*, 39(4); Agarwala, S. & Carraro, M. (2010). *Assessing the role of microfinance in fostering adaptation to climate change*. Working Paper No. 2010.82. Fondazione Eni Enrico Mattei.
- ^{xxiii} Dekens, J. & McCandless, M. (2013). *Climate risk management for local agricultural cooperatives in Rwanda: A Training of trainers' manual*. Winnipeg: International Institute for Sustainable Development (IISD).



Photo credits: Photos on pages 2 and 3 - Matt McCandless. All other photos - Julie Dekens.

ACKNOWLEDGEMENTS

This briefing paper was written by Julie Dekens (IISD) and Susan Bingi. The authors also acknowledge the contribution of Fredrick Bagamba (MAK), Norman Ojamuge (MoTIC) and Moses Tenywa (MAK). We also thank Anne Hammill (IISD), Gabriel Huppé (IISD), Simbisai Zhanje (CDKN) and other anonymous reviewers for providing useful comments. The work was funded by the Climate and Development Knowledge Network (CDKN).

For further information, please contact: Julie Dekens, IISD (jdekens@iisd.org); Fredrick Bagamba, MAK (fbagamba@agri.mak.ac.ug); or Norman Ojamuge, MoTIC (nonmanojan@gmail.com). Information about IISD and its work can be found at www.iisd.org

This document is an output from a project funded by the UK Department for International Development (DFID) and the Netherlands Directorate-General for International Cooperation (DGIS) for the benefit of developing countries. However, the views expressed and information contained in it are not necessarily those of or endorsed by DFID or DGIS, who can accept no responsibility for such views or information or for any reliance placed on them.

This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and, to the extent permitted by law, the entities managing the delivery of the Climate and Development Knowledge Network do not accept or assume any liability, responsibility or duty of care for any consequences of you or anyone else acting, or refraining to act, in reliance on the information contained in this publication or for any decision based on it. Management of the delivery of CDKN is undertaken by Pricewaterhouse Coopers LLP, and an alliance of organisations including Fundación Futuro Latinoamericano, INTRAC, LEAD International, the Overseas Development Institute, and SouthSouthNorth.

