Info Note

Integrating climate and nutrition risk planning for improved food and nutrition security in Mbale district

Findings from interviews and focus group discussions with district experts and farmers

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Key messages

- There is need to address the disconnect between health, natural resources, and production departments at the district level to tackle climate risk effects on food and nutrition security. This can be done through structured regular meetings between the actors.
- Political and economic priorities tend to overshadow food and nutrition security concerns. Special care needs to be taken during planning and budgeting phases not to lose focus of value chains that promote nutrition and resilience.
- Mbale district is experiencing a shift from coffee and banana to emerging resilient food and nutrition value chain commodities such as onions, poultry, cabbage and ground nuts. The district planning and budgeting processes should prioritize them.

This info note summarizes findings of climate risk and nutrition profiling conducted by researchers from the International Institute of Tropical Agriculture (IITA) and International Center for Tropical Agriculture (CIAT) as part of a situation analysis for the second phase of the CCAFS project on Policy Action for Climate Change Adaptation (PACCA), which seeks to stimulate adoption of gender- and nutrition-sensitive climate smart agriculture by aligning the national level agenda with implementation.

The findings are based on 18 key informant interviews and 14 focus group discussions, conducted between June and August 2018, with district level experts (both public and private) and farmer representatives from two sub-counties in Mbale (Lukhonge and Bungokho Mutoto). The same district level experts and farmer representatives were gathered together in January 2019 at Wash and Wills Hotel for a stakeholder workshop to give feedback and validate the findings of the climate risk and nutrition profiling. During the three-day workshop, stakeholders prioritized four food and nutrition security value chain commodities, identified key risks across the value chains, and related these risks to underlying vulnerability factors of specific groups of people and adaptation options that addressed the vulnerabilities and risks.

Socio-economic situation in Mbale

Demographic and agricultural context information was gathered to describe the socio-economic situation of the district. Mbale has a population of 492,804 of which 237,610 are male and 255,194 are female, according to the National Housing and Population Census 2014. The district has a total land area of 538 square kilometers and population density of 915 persons per square kilometer; this is much higher compared to the national average of 207 persons per square kilometer (World Bank). The main economic activity is agriculture, supported by bimodal rainfall mainly March-June and September-November, with average rainfall of 1500mm per annum. The district is divided into three agricultural zones, i.e., lowlands, midlands, and highlands. The lowland areas mainly have sand to clay loam soils that support crops such as beans, maize, rice, cassava and horticulture while the highland areas have volcanic soils that support perennial crops such as coffee and banana. The crops grown in the midland areas are similar to those of the highlands.

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Mapping of priority food and nutrition security value chain commodities was part of the description of the Mbale district context. Initial mapping of food and nutrition security value chain commodities such as maize, millet, beans, bananas, onions, cabbage, cassava, coffee, sweet potatoes, piggery and dairy was based on existing literature, key informant interviews and focus group discussions. During the workshop, selection of priority value chain commodities was based on climate resilience, gender, nutrition and population involved. Four priority key value chains emerged. These were: poultry, onions, cabbage and groundnuts.

But the process of selection was contentious and very dynamic, with the district leaders suggesting that the crops prioritized may be resilient and contribute to income yet overall they were not key for food security in the district. A new list of priority value chain commodities was agreed upon by the stakeholders and these included bananas, onions, maize and beans.

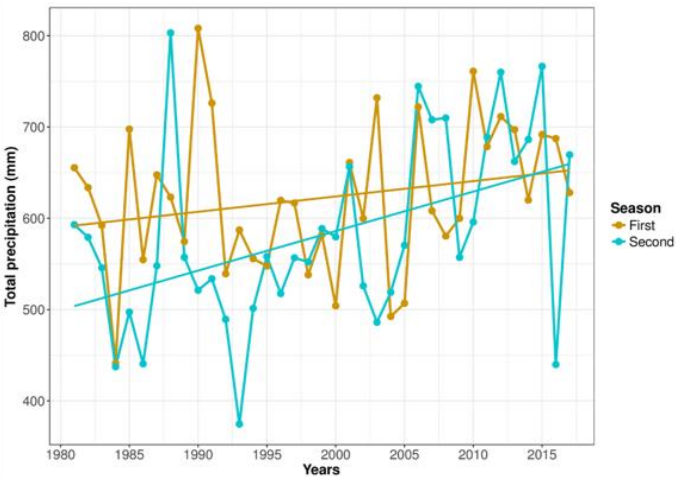

Figure 1. Showing total precipitation per season.

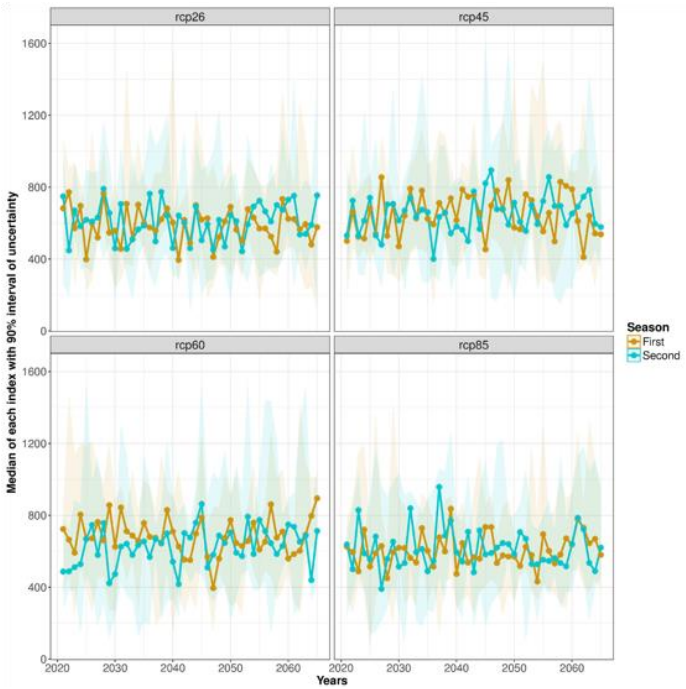

Figure 3. Showing precipitation 2021-2065.

Historic and potential climate scenarios for Mbale

Perceptions of climate change by district level experts and farmers related to increase in temperature, changing rainfall patterns, prolonged dry spells, and delayed on-set of the rainy season.

Historical precipitation and temperature changes for Mbale district from 1980 to 2015 showed that 1990 and 1987 were high precipitation years for the first and second seasons respectively while 1984 and 1992 were low precipitation years respectively for the first and second seasons.

Though the first season is predominantly the rainy season of the year, there has been an increase in precipitation and extremes such as floods, reduction in crop cycle and increase in mean temperature. The uncertain second rainy season has changed slightly, with a moderate increase in precipitation and mean temperature and reduction in the crop cycle.

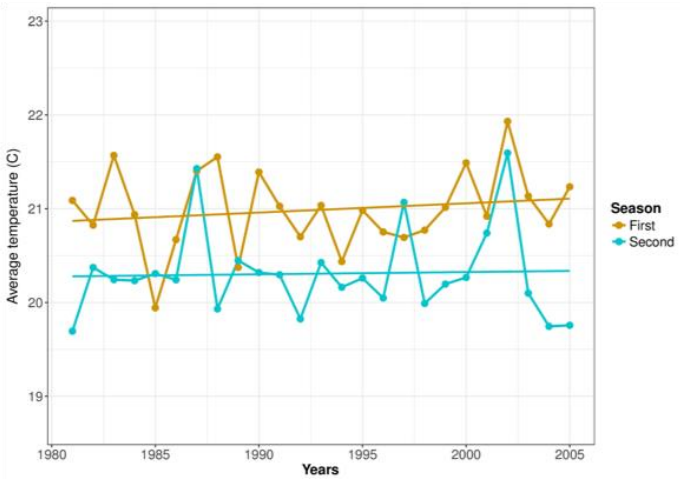

Figure 2. Showing mean temperature per season.

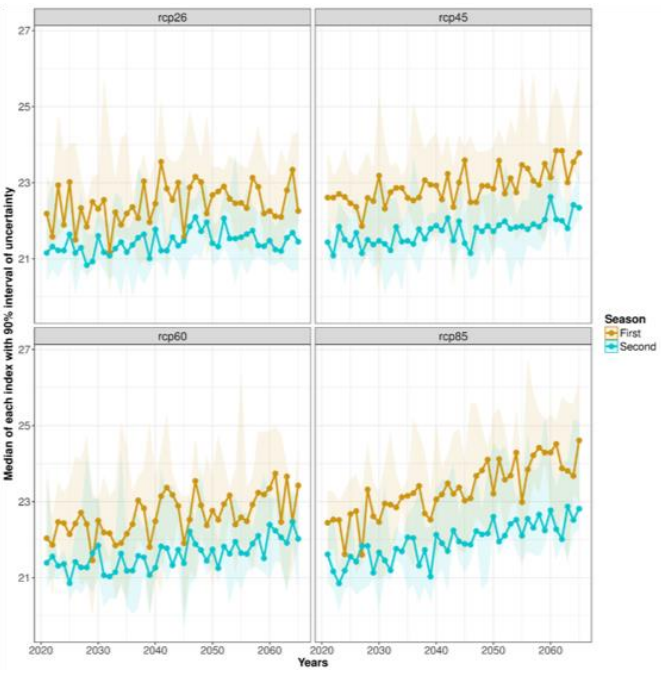

Figure 4. Showing temperature mean 2021-2060.

Two potential climate scenarios were predicted for Mbale district. Future climate scenarios 1 and 2 were presented and discussed in terms of hazards to prepare for based on what climate models say about changes from 2020 to 2060.

- Scenario 1: Moderate increase in temperature in both seasons/reduction in crop cycle in the first season. Moderate decrease of intense rain the first season. Less days with moisture stress in the second season. Moderate increase in drought spell length in the first season. Slight increase in stability in start of season in the second seasons. Slight increase in length of growing season in the second season.
- Scenario 2: High increase in temperature in both seasons/reduction in crop cycle in the first season. Moderate increase in rainfall in both seasons. Increase in drought spell length in the first season. Many more days with moisture stress in the second season. Moderate decrease in stability in start of season in the first season. High increase in heat stress in both seasons.

Notable in both scenarios was the temperature increase. Following the scenarios discussion, hazards identified for the priority value chain commodities included: dry spells, drought, soil erosion, excess rain, hail storms, storms, and late start of rainy season. For banana, onion, maize and bean value chain commodities, the consequences/impacts of agro-climate indices were identified along the input supply, on-farm production, postharvest, and output markets. The types of value chain actors most impacted by these consequences were differentiated in terms of gender, age and economic status. Additional factors – such as climatic, biophysical, social, economic, and institutional – that make some people affected by these consequences fare worse than others were identified.

On-going and potential/new adaptation options to value chain specific risks were identified. Who implements the adaption option (individual, organization, or department)? Who benefits most from the adaptation option (role of value chain on gender, age, economic status and/or education)? Adaptation options to manage climate risks and underlying vulnerabilities for banana, onion, bean and maize value chain commodities ranged from on-farm practices to government policies/strategies, as well as public/private services.

Beans

Dry spells and late start of rain season were hazards mapped for the bean commodity. The consequences/ impacts of dry spells on bean commodity included: low- and poor-quality yields, inability of farmers to have steady seed supply, delayed land preparation, increased cost of land preparation, delayed planting, and delayed weeding. The impacts of late start of rain season were delayed land preparation, shortage of seed amongst farmers, low viability of stored seed leading to poor germination rates and reduced yields, reduced linkage of farmers to buyers, and reduced prices.

Who is most affected by impacts of dry spells and late start of rain season? Men, women, poor and less educated farmers as well as vulnerable groups. Underlying vulnerability factors that contribute to some people being affected by dry spells and late start of rain season more than others include: lack of property to secure financial services, low income, limited access to improved technology, poor postharvest and collection techniques.

On-going adaptation options for bean commodity included: use of drought tolerant and early maturing seed varieties, use of farmer saved seeds, minimum tillage, use of small-scale irrigation technologies and use of herbicides, timely and proper harvesting, proper drying of the crop, processing to improve shelf life. Farmers, extension workers and NGOs were implementing the adaptation options. Who benefits most from this adaptation option (gender, age, economic status)? Farmer, women, low income peasants, researchers, and extension workers.

Potential/new adaptation options for bean value chain included: use of drought tolerant and early maturing seed varieties, minimum tillage, use of small-scale irrigation technologies, use of cover crop, mulching, and agroforestry, use of herbicides, agro-processing and value addition.

Onions

Grown mainly around the hilly places; soil erosion and drought were the hazards identified for the onion commodity. Consequences of drought on onion value chain were untimely acquisition of seed and agrochemicals, risk of buying unviable expired seed, poor selection of production site, few farmers involved in land preparation, reduced acreage for planting, excessive loss of weight due to desiccation, loss of quality due to over drying, high sorting costs, increased cost of packaging, deterioration of quality during transportation, increased cost of transport. The consequences of erosion on the onion commodity included: poor site selection, increased loss during establishment of nursery beds, increased pests and diseases, high costs of land preparation, late land preparation, reduced quality, loss of yields, poor quality of seeds, poor road infrastructure leading to increased transport costs, increased costs of packing materials and loss of crops.

Youth, men and women, as well as poor, less educated, and vulnerable persons, especially those with terminal diseases like HIV/AIDS were most affected by impacts of drought and soil erosion. Underlying vulnerability factors contributing to the severity of drought include: lack of

knowledge on weather, poor management practices, lack of proper and affordable packaging material, poor road networks, and inability to access loans. Due to low incomes farmers are unable to diversify. Women are not allowed to leave home in search for alternative livelihoods sources.

Women are more affected since they do not own property. Underlying vulnerability factors contributing to the severity of soil erosion on youth, men and women include: lack of enough sensitization and training on site selection for onion production, limited knowledge on managing onions, lack of community government store, lack of knowledge and skills for storage facilities, and inability to afford improved facilities.

On-going adaptation options for the onion commodity during drought included: early planting, timely acquisition of agrochemicals, conservation agriculture, promotion of drought tolerant crops, controlled drying, use of improved packaging materials and transport means, use of heat resistant varieties and proper timing of transportation, especially night transit. Adaptation options for onion value chain for the soil erosion hazard include: early planning for site and variety selection, use of local knowledge about site condition, early planting, use of sunken gardens, green house farming, mulching, improved seed, ploughing at the end of the season when the gardens are still moist, early weed control, use of appropriate varieties, control soil erosion runoff and timely harvesting, use of improved storage structures, improving community access roads, contingency planning, early planning, and securing a safe store. Implementers are individual farmers, agriculture departments, organizations. Men, women, youth are the key beneficiaries.

Potential/new adaptation options of onion commodity to drought include: regular meetings with technical people who are in line with agriculture and environment, making consultations with technical people on when to acquire agrochemicals, use of drought tolerant crops, use of certified seeds, promotion of conservation agriculture, use of integrated pest management, use of early maturing crops, training on postharvest handling, meeting with technical people in line with marketing, planning with transporters, and encouragement of collective marketing. Potential adaptation options for onion value chain on soil erosion include: train farmers on site and variety selection, land use planning, dissemination of weather forecast to the farmers, training in better farming methods, timely land preparation, timely planting, use of soil and water conservation measure and training farmers on timing harvesting, use of soils and water conservation measures, promotion of improved storage structures, enforcing policies on land use and community infrastructure, invest in market surveys and dissemination of weather information, disseminating market information.

Banana

Hazards identified for the banana commodity were drought, storms and hailstorms. The consequences of drought on banana commodity included: poor quality of suckers because drought makes them less available and suitable for planting, organic manure becomes less available as bananas are fed to animals during the drought, land preparation is slowed down and delayed, reduced availability of nutrient to plants, the suckers die due to desiccation, drought may reduce the prices as a result of ripening that leads to short shelf life, transportation reduces the banana shelf life, and drought results in bunches getting low prices. The consequence of storms and hailstones identified for the banana commodity were soils erosion, limited availability of suckers, manure is eroded, poor banana fingers hit by hail storms reduce marketability, delayed transportation due to impassable roads, hail hit bananas fetch lower prices at the market, and delayed transportation leading to losses due to impassable roads.

Banana value chain actors most affected by drought, storms and hail storms were men, women, and youth of all economic and education levels. The underlying factors contributing to severity of drought included: women are more constrained in terms of mobility while looking for suckers; sourcing for manure also becomes a problem because farmers have to travel long distances. Women are more affected because they constrained by other household multiple roles. Women are taken advantage of by middlemen hence lower value is realized. The economically poor are more vulnerable, especially in the transportation process in hard to reach areas. Underlying vulnerability factors contributing to severity of storms and hailstorms include: women are affected when it comes to sourcing for suckers during the rainy season. The less privileged financially are not able to afford manure and tissue culture plantlets. Economically the poor are vulnerable because they fail to buy manure to replace in case of erosion and they cannot afford tissue culture plantlets. When roads become impassable, it becomes difficult for women to buy transportation equipment like bicycles yet culture in the area also disagrees with a woman riding a bicycle. The poor also get handicapped for failure to afford better transportation means to the market. Women lack confidence when it comes to selling and they are limited in mobility making it hard for them to secure better prices and majority end up selling at home.

On-going adaptation options to drought for banana commodity included: using tissue culture plantlets, sourcing from farmers near the streams, storing of organic manure during times of planting, slashing, application of herbicides, mulching, waiting for rain, transportation during cool hours of the day, improving shelf life by storing in cool places, sprinkling water on them, wrapping with banana leaves, and storing under shades to cool them. On-going

adaptation options of banana value chain to storms and hail storms include: manure, sourcing from unaffected areas, promoting the recommended needle shaped suckers, using tissue cultured plantlets, mulching, contour farming and terracing, transporting bananas on the heads, selling at lower prices than expected, and calling middle men as a means of promotion. Mbale and the entire Elgon region is also known for coffee and banana intercropping. The bananas provide the shade and self-mulch to coffee. (van Asten et al. 2011, Jassogne et al. 2012). This address both climate adaptation and also the income generated. Most households in the highland and mid altitude own dairy which improves household nutrition.

Beneficiaries of the adaptation options are women, men and youth.

Potential/new adaptation options for banana commodity to drought include: using tissue culture plantlets, application of organic fertilizers and advanced storage of manure, using ox ploughs and hand tractors, mulching, use of irrigation through simple water harvesting technologies, collective transportation using cold chains to transport bananas, construction of advanced markets with cool conditions to allow prolonged shelf life of bananas, construction of cold chains to preserve bananas for longer time periods, value addition and collective marketing, establishment of community markets for bananas, collective selling to monopolize the market, and storage in a cool environment. Potential adaptation options of banana value chain to storms and hail storms include: mulching, using the small needle shaped suckers, using tissue cultured plantlets, contour farming, early cropping (planting grasses along the contours), terracing, proper storage of harvested bananas, using trucks hired through collective transportation, protecting bananas from being affected by constructing a shade, storing under shade, and collective marketing to take better advantage of the market.

Maize

The hazards mapped for the maize commodity were dry spells and excessive rain. Consequences for dry spells and excessive rain identified for maize along the input supply, on-farm production, postharvest and output markets included: wrong selection of land as farmers select land near water, and land becomes expensive to hire. Farmers tend to go for inferior sends in anticipation of dry spells. Farmer demonstrations are spoilt, and training programs are changed as farmers lose morale in attending trainings.

Men, women, youth, people with disabilities, and elderly are the most vulnerable maize value chain actors to dry spells and high temperatures. Underlying vulnerability factors contributing to severity of dry spells include: poverty and production land is expensive for a farmer who would like to hire such land. Access to quality seed is expensive for farmers in rural areas.

On-going adaptation options to drought for maize commodity included: dissemination of extension services on radio, farmers use their knowledge, field visits, farmers use home saved seeds, farmers suspend planting seeds, and farmers eat seeds. Government, NGOs, farmers, and local leaders benefit most from the adaption options.

Potential/new adaptation options to drought for maize commodity included: establishing small irrigation facilities, training on irrigation and alternative livelihood options like bee keeping, and government provision of improved seeds.

Workshop participants discussing adaptation options. Photo: John Francis Okiror (IITA)

Conclusions and policy implications

Based on climate information analysis (Fig 2), there is a steady rise in temperatures as well much less predictability for the onset of rains. There is an increase in dry spells as well as storms. This was further corroborated by the participants of the three-day workshop. The findings also reveal a link between climate, income, food, and nutrition risk in the district. There is a clear lack of connection between the production, natural resources and health departments to be able to address the tripartite challenge of climate, income, and food and nutrition security in the district. One of the pathways that was encouraged was making sure that there is better collaboration between actors so as to learn from one another, avoid duplication and build synergies. Establishment of a forum to bring together actors for discussion, sharing and accountability is recommended.

Further Reading

- Van Asten PJA, Wairegi LWI, Mukasa D, Uringi NO. 2011. Agronomic and economic benefits of coffee-banana intercropping in Uganda's smallholder farming systems. *Agricultural Systems* 104(4): 326-334.
- Jassogne L, van Asten PJA, Wanyama I, Baret PV. 2012. Perceptions and outlook on intercropping coffee with banana as an opportunity for smallholder coffee farmers in Uganda. International Journal of Agricultural Sustainability 11(2):144–158.

This series of briefs summarizes findings of a project entitled "Policy Action for Climate Change Adaptation (PACCA)" undertaken by researchers from International Institute of Tropical Agriculture (IITA), International Center for Tropical Agriculture (CIAT), and the Utrecht University.

The brief is part of a situation analysis for the second phase of the project that seeks to stimulate the adoption of gender and nutrition sensitive climate-smart agriculture by aligning national level agenda with implementation. This brief is based on findings of key informant interviews, focus group discussions, and feedback and validation workshop with district experts, politicians and farmers representatives from two sub-counties of Mbale district (Uganda).

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