CRAFT
Climate resilient value chains for improved livelihoods

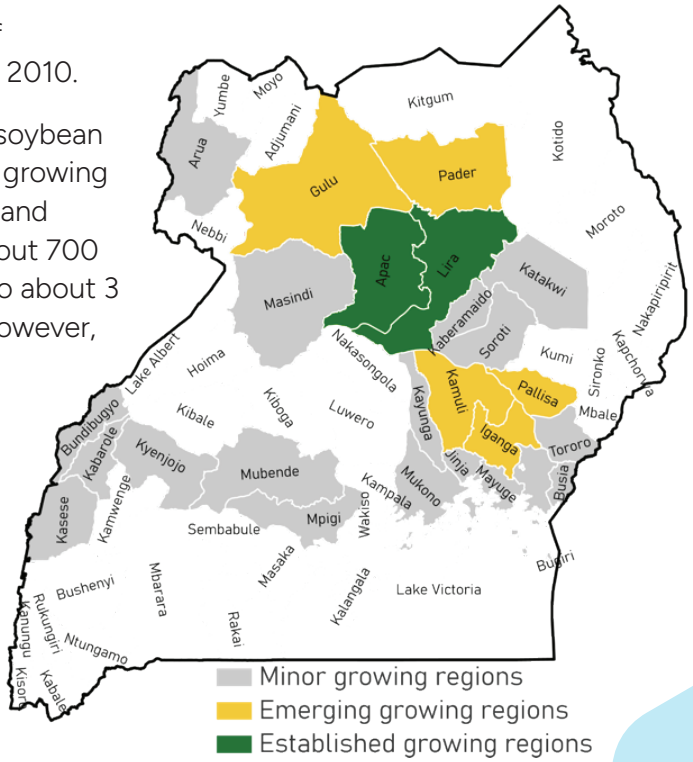
SNV Impact that matters

Climate Risk and Opportunities

Soybean in Uganda

Uganda is Africa's third largest producer of soybeans, producing about 180,000 MT in 2010.

Apac (~23427 ha) is the country's largest soybean production area. Other important soybean growing areas are Lira, Gulu, Pallisa, Iganga, Kamuli, and Pader. The average yield of soybeans is about 700 kg/ha (FAOSTAT, 2018), which translates to about 3 bags/acre (1 bag~100kg). Soybean yield, however, can go up to >5 bags /acre.



Note: RCP 8.5 emission scenario has been used to assess the climate change events and impacts. For future analysis, the 2050s (2006-2050) timesteps were used. For the current, the period 1981-2005 had been used. MAM refers to March, April, and May. OND refers to October, November, and December.

Data source: Ensembled CORDEX data.

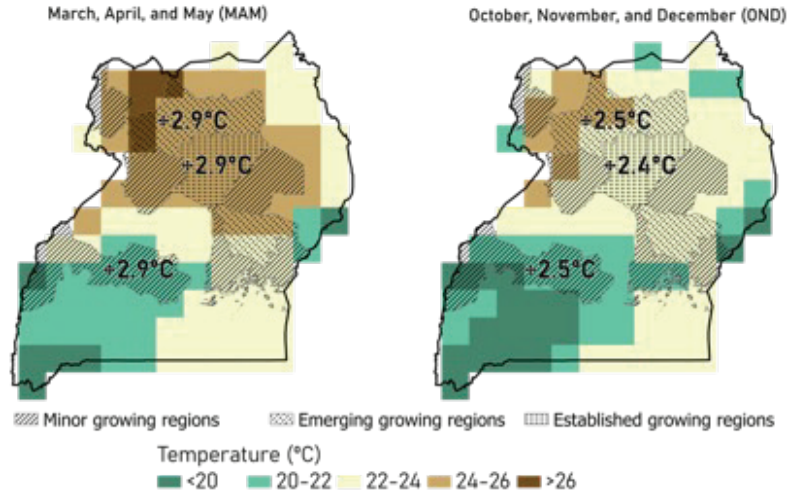
Future climate

Temperature: In the 2050s, the temperature in soybean-growing districts in Uganda will probably increase by +2.9°C in the March, April, May season and +2.6°C in the October, November, December season.

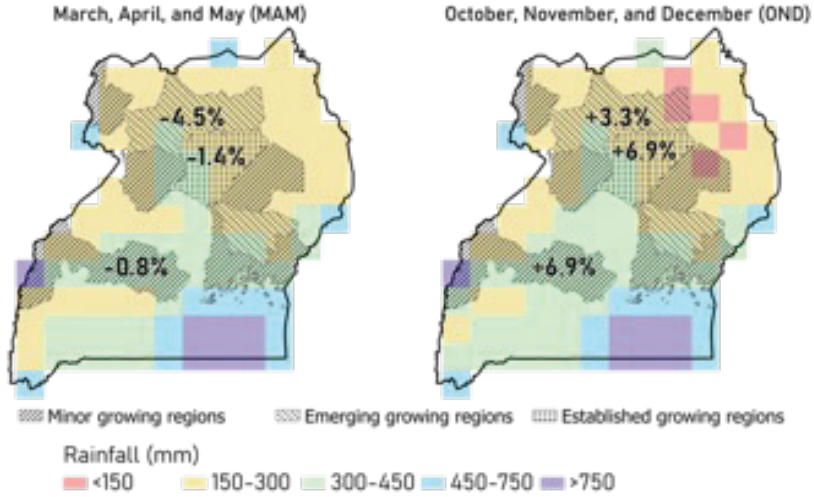
Rainfall: In the 2050s on average, soybean-growing districts in Uganda is projected to be almost unchanged (0.1%) in rainfall during the March, April, May season and is expected to lightly increase (+6%) in the October, November, December season.

Dry spells during the November, December season are expected to decrease by about 3-5 days over most parts of the country except the southern tip

The length of the longest wet spell in the southern half of the country during both the March, April, May and October, November, December seasons is expected to decline by about 2-4 days.



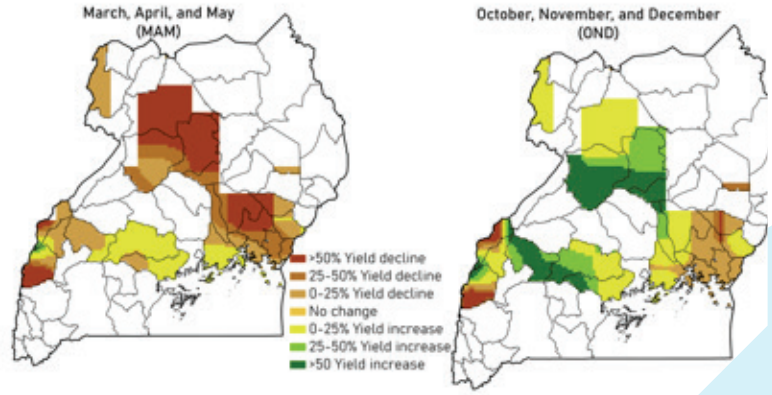
Note: The map shows the current seasonal temperature (°C) and the changes (°C) in the future (the 2050s) for the SSP3-RCP8.5 climate change scenario for various crop-growing regions



Note: The map shows current seasonal rainfall (mm) and the changes (%) in the future (the 2050s) for the SSP3-RCP8.5 climate change scenario for various crop-growing regions

Soybean crop productivity changes (%) in the future

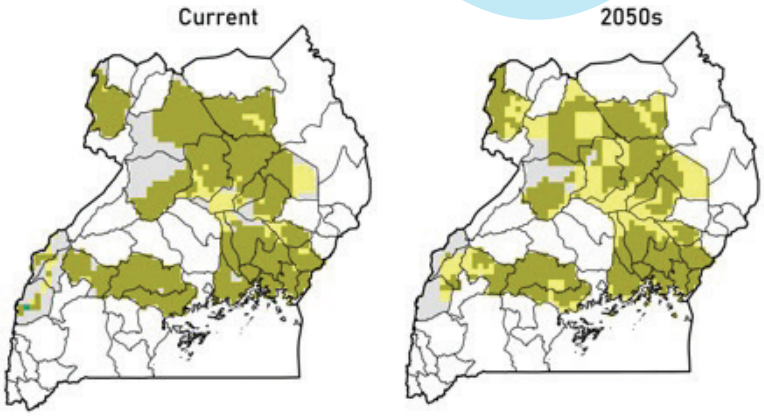
Overall, in the major soybean growing areas, yield is expected to increase (up to 70%) in the October, November, December season. In the March, April, may season major soybean-growing regions=such as Apac, Gulu, and Iganga, are projected to have >50% of yield loss in the future.



Soybean crop-growth suitability

Overall, in the 2050s the majority of soybean-growing areas (58.4%) has been projected to remain moderately suitable for soybean production.

The suitability of (small) parts in Apac, Lira, Gulu, Bundibugyo and Kasese is projected to reduce.

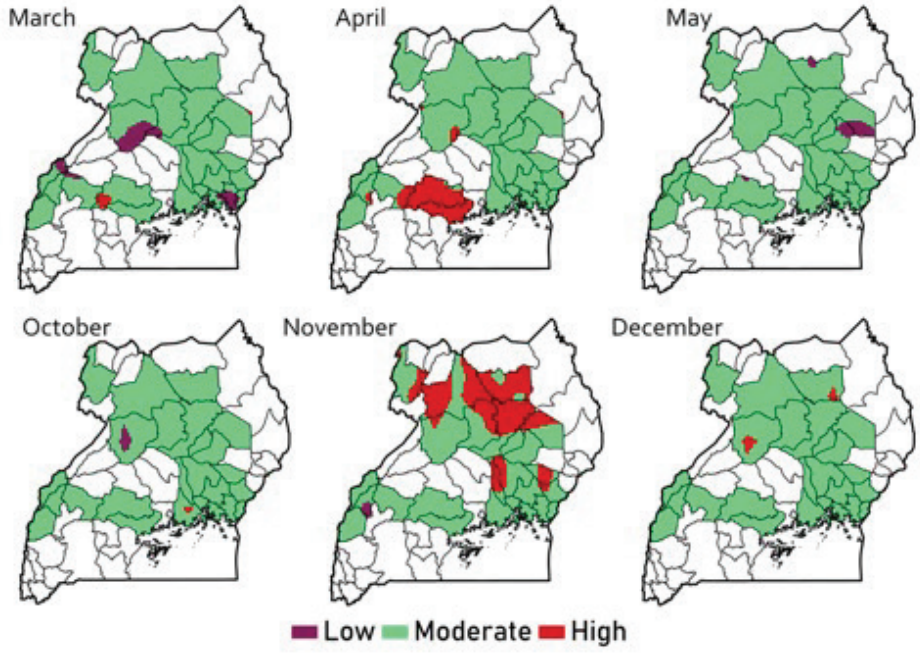


The probability of drought risks risks

In March and April, most soybean-growing districts are expected to experience moderate drought risk.

In October and December most soybean-growing districts are expected to face moderate drought risk.

In November, the major soybean-growing districts in the north such as Apac, Lira, Gulu, Pallisa, Kamuli and Padar are likely to face high risk of drought..



The probability of drought risks has been analyzed based on the Standardized Precipitation Index (SPI). The calculation of SPI is done based on the record of long-term precipitation for 45 years (2006-2050). To assess the risk, we calculated the occurrence of droughts over 45 years (2006-2050) for each month in rainy seasons (MAM and OND) and then calculated the probability by applying the following formula:

$$\text{Probability of drought risks} = \frac{\text{No. of droughts)}}{\text{Total years (45)}} \times 100$$

Note: In drought analysis, more than 30% of drought occurrence are classified as high-risk region, 10 to 30% of occurrences are classified as Moderate risk, and less than 10% of occurrences has been classified as Lower Risk.

Climate change adaptation strategies

Adaptation measures are listed based on the discussion with the CRAFT team from Uganda under the following objective, "To establish suitable adaptation strategies that will increase the adaptive capacity and resilience of the actors within the value chains." The listed adaptation measures mainly focus on the soybean value chain in Uganda.

Soybean is more climate-resilient than other pulses, fixes nitrogen, and as such can contribute to a reduction in the application of fertilizer.

Technologies used in CSA value chains 	Improved, early maturing & drought tolerant, drought escaping/ early maturing seed (varieties), mobile soil testing kits, tarpaulins, ICT, storage facilities, and products, devices, equipment, implements, tools, etc., used in crop growth and management
Practices used in CSA value chains 	Dissemination of seed information, weather information., timely planting to take advantage of weather information, crop rotation to maintain the quality of soil resources, soil testing with mobile soil testing kits, using tarpaulins for drying to reduce losses, accessing climate finance, establishing demonstration plots to showcase CSA technologies and practices, promoting use of conservation tillage services, improving storage facilities, facilitate access to improved seed and fertilizer, use of bio-fertilzers, weather index insurance, and using efficient energy roasters and grain grading equipment.

IMPACTS

Impacts in production 	Increase in soil fertility, higher yield, quality declared produce, strengthened market linkages
Contribution to adaptation/ resilience 	Increased resilience due to an improved safety net and adaptive capacity, higher yields, strengthened market linkages and partnership.
Contribution to mitigation 	Increase in carbon sequestration due to agroforestry/ soil conservation and use of bio-fertilizers and manure. Decrease in Greenhouse gas emissions due to reduction in post-harvest losses and use of solar driers, hermetic grain storage bags/silos and store/warehouse standards

Acknowledgment

This document was developed by Wageningen Environmental Research (Ponraj Arumugam, Confidence Duku, and Annemarie Groot) and CCAFS (Teferi Demissie) with contributions from Bashir Kasekende (SNV), Allan Wayira (SNV), Joab Osumba (CCAFS), the Uganda SNV team, Agriterra, and Rabo Partnerships B.V.

The climate risk assessment was carried out in the context of the Climate Resilient Agribusiness for Tomorrow (CRAFT) project. The project (2018 - 2023) is funded by the Ministry of Foreign Affairs of the Netherlands and aims to increase the availability of climate-smart foods for the growing population in Kenya, Tanzania, and Uganda. The CRAFT project is implemented by SNV (lead) in partnership with Wageningen University and Research (WUR), CGIAR's Climate Change Agriculture and Food Security Programme (CCAFS), Agriterra, and Rabo Partnerships. For More Information: Contact Kasekende, Bashir (Project Manager) (craft-info@snv.org: bkasekende@snv.org)

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