CRAFT
Climate resilient value chains for improved livelihoods

SNV Impact that matters

Climate Risk and Opportunities

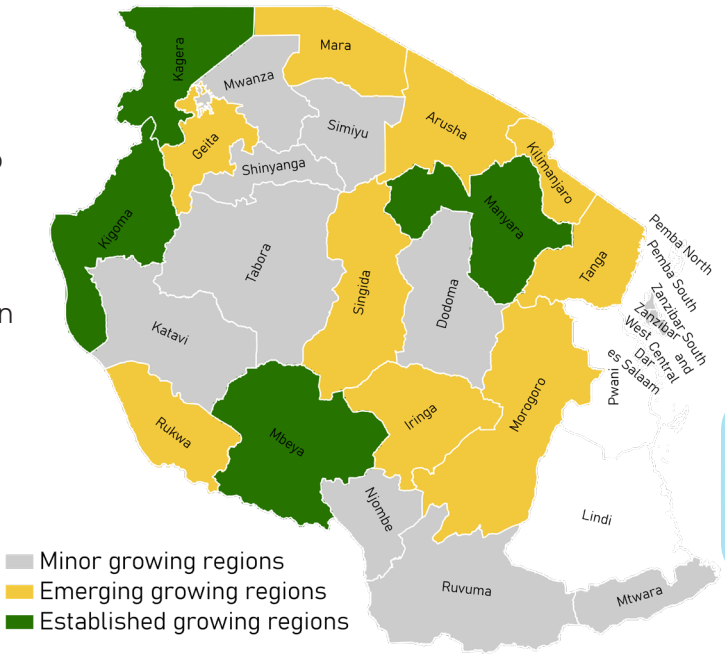
Common beans in Tanzania

In Tanzania, 7% of the land under production is used for the cultivation of common beans. Common beans, despite its relatively low profitability, is considered a key value chain crop because of its inclusiveness, nutritional value, food security contribution and cash-crop importance (60% of the produced volumes are commercialized in the local market), and nitrogen fixation. Bean is an important staple food in Tanzania, whose per capita consumption is about 19.3 kg per person per year.

Tanzania is ranked seventh among the top producers of common beans worldwide.

The average yield of common beans (dry) is 360 kilograms per acre (CIAT & World Bank, 2017), which translates into 3,6 bags /acre (1 bag = 100 kg). In the country, the common bean is mainly grown in Kigoma, Mbeya, Kagera, and Manyara.

Notably, Rukwa, Mbeya, and Geita are the country's largest producers (about 4 bags / acre)



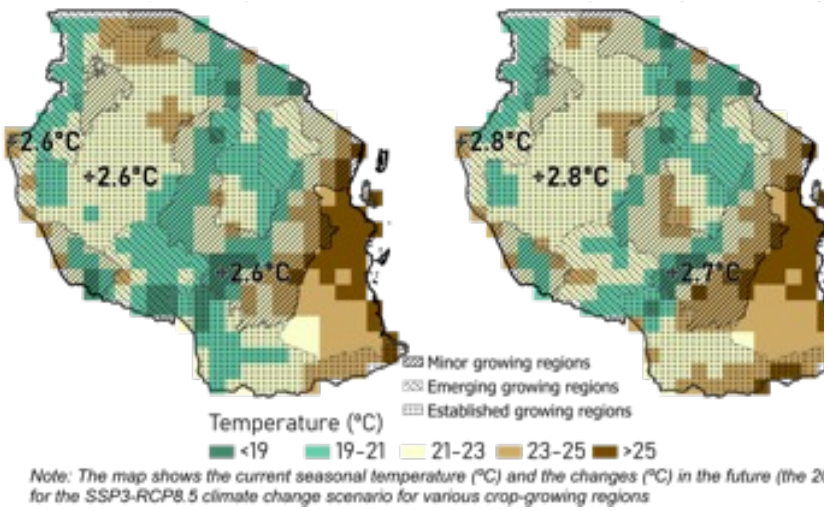
Data source: Ensembled CORDEX data.
Note: RCP 8.5 emission scenario has been used to assess the climate change events and impacts. For future analysis, the 2050s (2006-2050) timesteps were used. For the current, the period 1981-2005 had been used. MAM refers to March, April, and May. OND refers to October,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

Future climate under climate change

Rainfall: Comparing current rainfall with what is expected in future (2050s), the amount of rainfall is likely to change. The change varies across different growing regions and seasons.

In the Southwestern growing areas, precipitation is projected to slightly decrease (-10%) in the MAM season, but in the OND season rainfall will slightly increase (+10%). In the North– Northeastern growing areas, precipitation is expected to increase, especially in the OND season (> + 13%).

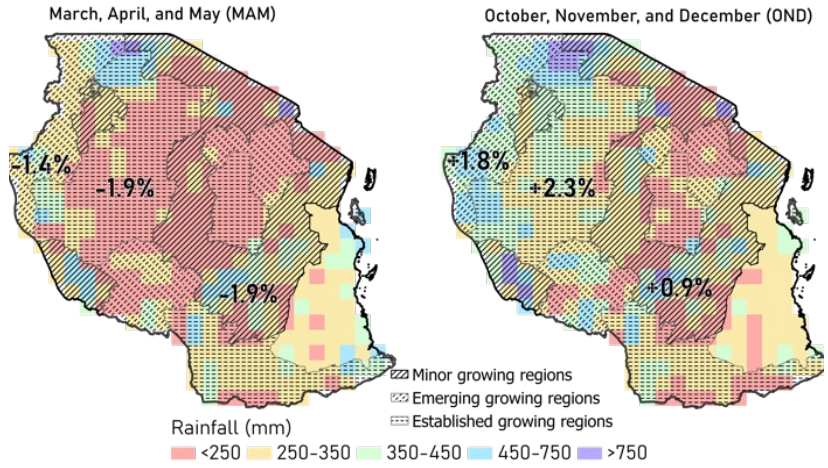
In the Southwestern and Northeastern areas extreme flooding events are expected in 2050, especially in the OND season



Note: The map shows the current seasonal temperature (°C) and the changes (°C) in the future (the 2 for the SSP3-RCP8.5 climate change scenario for various crop-growing regions

Temperature: In future, temperature is expected to rise in all growing areas, especially in the MAM season. In the emerging potato growing areas in the Northeast, temperature is projected to rise up to 2.9°C in the MAM season, whereas in the OND season up to 2.5°C.

In the Southwestern areas temperature is expected to increase up to 2.7°C in the MAM season, whereas in the OND season



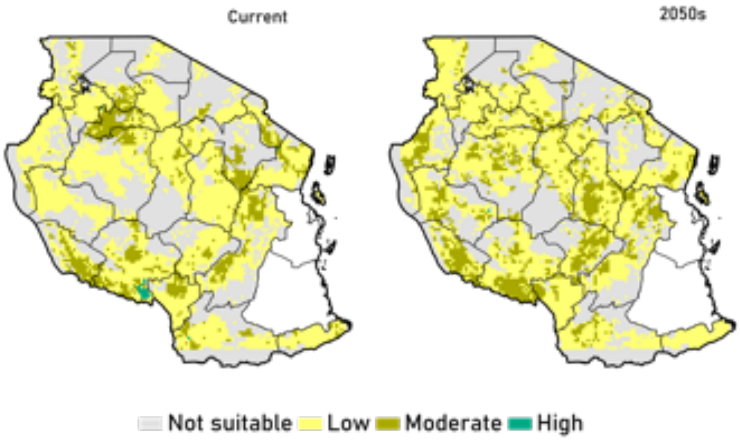
Note: The map shows current seasonal rainfall (mm) and the changes (%) in the future (the 2050s) for the SSP3-RCP8.5 climate change scenario for various crop-growing regions

Common bean crop-growth suitability

Crop suitability: Currently 75% of the common bean growing areas is low and moderately suitable for common bean porduction. This in not likely to change in future.

Some of the regions such as Kilimanjaro and Shinyanga are currently moderately suitable, but in future the suitability is expected to be low.

Other areas in the Southwestern part of the country will probably face a slight increase in suitability (from low to moderately suitable)



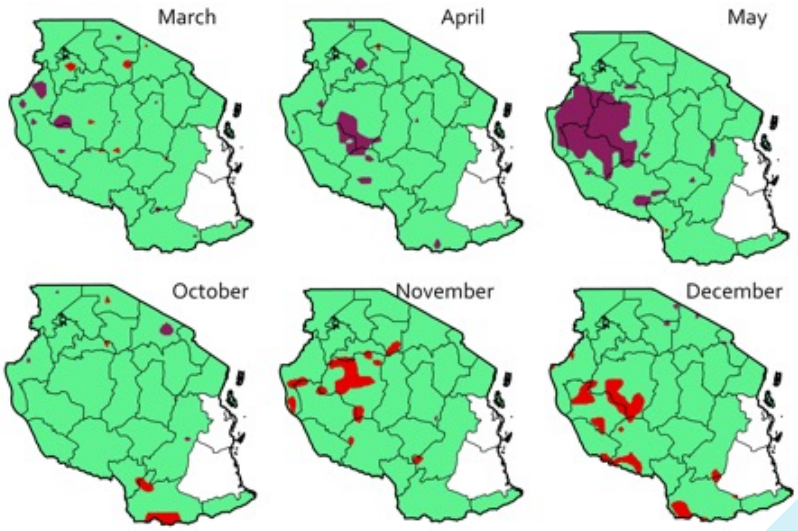
The probability of drought risks

In 2050, during the March, April, May season, most regions of the country are under moderate and low drought risks. In the October, November December season, most regions are under moderate and high risk.

In March, a few areas in Geita and Simiyu are expected to face high drought risk.

In April and May most of the common bean-growing regions could expect moderate drought risks.

In October, the Southern part of Ruvuma is expected to be under high risk. A small area in the Eastern part of Shinyanga is likely to experience high risk of drought.



In November, Southeastern and southern areas in Kigoma are projected to be under high drought risk. The central part of Tabora is also likely to face high drought risk.

In December, the Southern part of Mbeya, Ruvuma and Rukwa are expected 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 Tanzania 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 Tanzania's common bean value chain.

Climate risks/impacts	Adaptation measures	Impact of adaptation measures
Increase in temperature and Drought 	Planting of trees (i.e., agroforestry) and use of drought-resistant seed varieties	• Crop diversification • Increase in water holding capacity • Reduction in risk of crop failure • Increased resilience
Onset variation 	Timely dissemination of weather information.	• Reduction in risk of crop failure • Increased resilience
Low seed availability 	Improved seed multiplication and distribution of early maturing seeds	• Reduction in risk of crop failure • Increased resilience
Low soil fertility and low productivity 	Appropriate use of fertilizers and Improved GAP training.	• Increased soil fertility • Reduction in risk of crop failure • Increased yield • Increased resilience

Acknowledgment

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