

# Farmer Survey Results Capture the Impact of Changing Weather Patterns on Zambian African Indigenous Vegetable Production

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## Abstract

Zambia is a sub-Saharan country of 16 million people, many of whom suffer from malnutrition due to a lack of diversity in their diet. One strategy to diversify the diet is to increase the local production and consumption of African indigenous vegetables (AIVs). However, climate change may negatively impact these efforts.

In our IRB-approved 2015 baseline survey of AIV producers in Zambia, we asked producers if changes to local weather patterns had been observed.

Almost all Zambian farmers surveyed reported changes in their local weather patterns and seasonal cycles: 100% reported higher temperatures, 99.6% increased frequency of drought; 100% delayed onset of rainfall; and 100% reported increased erratic rainfall. When AIV producers were asked if weather patterns were impacting agriculture, 100% of AIV producers reported decreases in yield in 8 out of the 9 most common AIVs; 97-100% of AIV producers reported increases in weeds; and 92-100% of AIV producers reported increases in pests and diseases for 8 out of the 9 most common AIVs. Only kale appeared to be impacted the least.

These observations are consistent with climate change, and confirms that approaches which incorporate resiliency to ensure high yields with a changing climate are needed with AIVs.

## Background



Zambia is a land-locked country in the south-central region of Africa with approximately 16 million inhabitants. Zambia has one of the highest rates of malnutrition in the World (WHO, 2015) in part because malnutrition is common in rural households who depend entirely on seasonal agricultural production and income. Agriculture is mainly rain-fed subsistence farming with maize being the primary crop. The Global Hunger Index is very high.

AIVs are grown for home and market use and can diversify the diet. Zambia's climate is sub-tropical and temperatures in the southern and eastern region are moderated which makes it suitable for AIVs. The primary growing season is between mid-October and late March or early April due to rainfall.

Zambia's climate is predicted to change as follows (Niang et al, 2014):

- increases temperatures above 2 degrees C.
- changing rainfall patterns

These changes may significantly impact what is grown and how much can be grown, and these may influence the extent to which our horticultural and nutrition interventions can make a difference.

## Methods



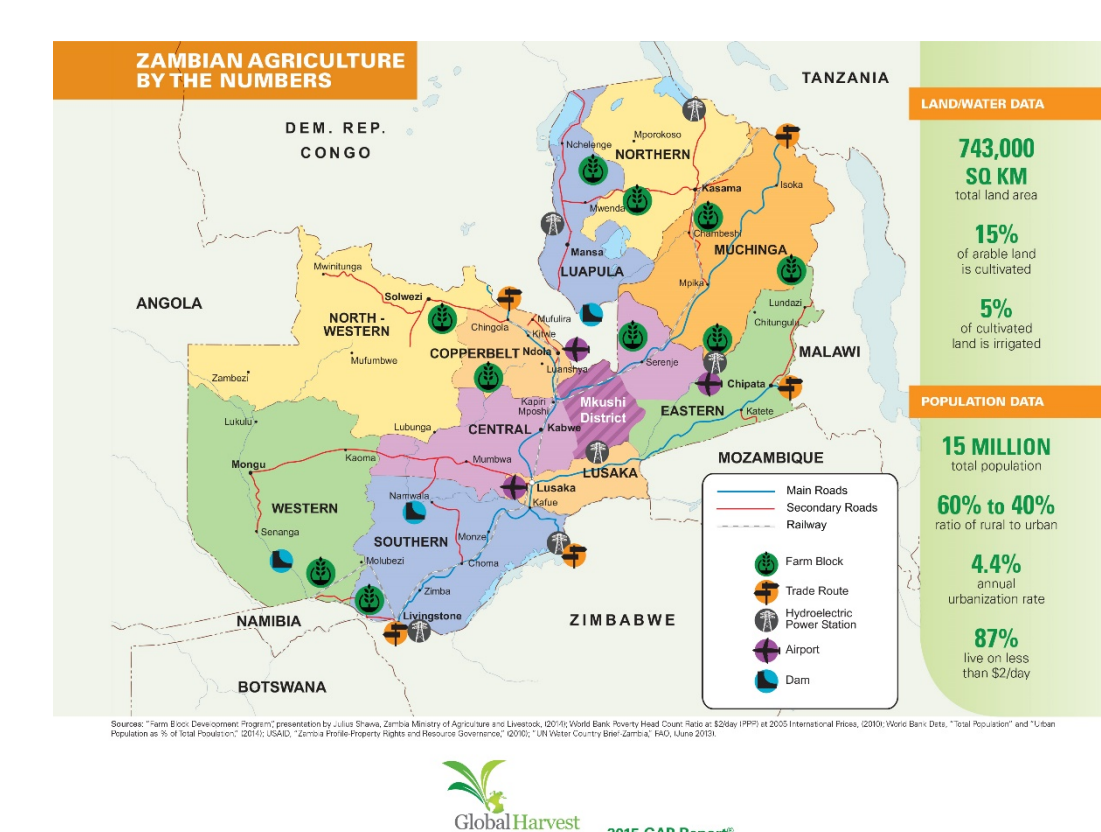
To document and analyze existing patterns of AIV production in Zambia, farmers were surveyed in person using a structured questionnaire by AgriSmart.

A total of 300 farmers were selected from Lusaka (50), Katete (50), Chipata (75), Lundazi (75), and Petauke (75), located in the Lusaka and Eastern Provinces. Most questions had 270 responses.

The data were collected in October and November 2015. Those questions related to farmer observations on crop growth and weather changes are reported here.

The surveyed region contains the most fertile soils and consistent rainfall and is home to over 40% of the populations (Mulenga et al, 2017).

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## Results

Results of the farmers survey are shown in Figure 1 and 2.

Fig. 1 Farmer Observations: Weather Patterns

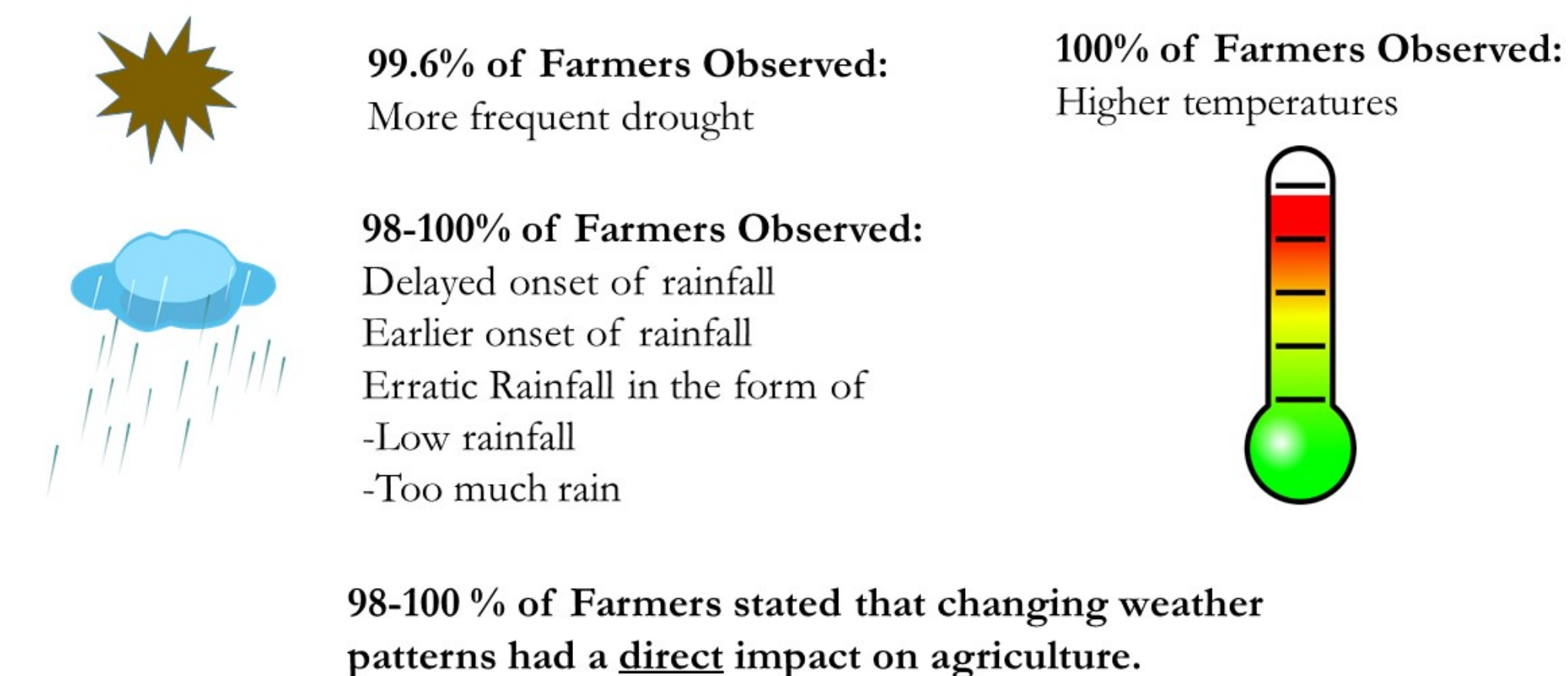
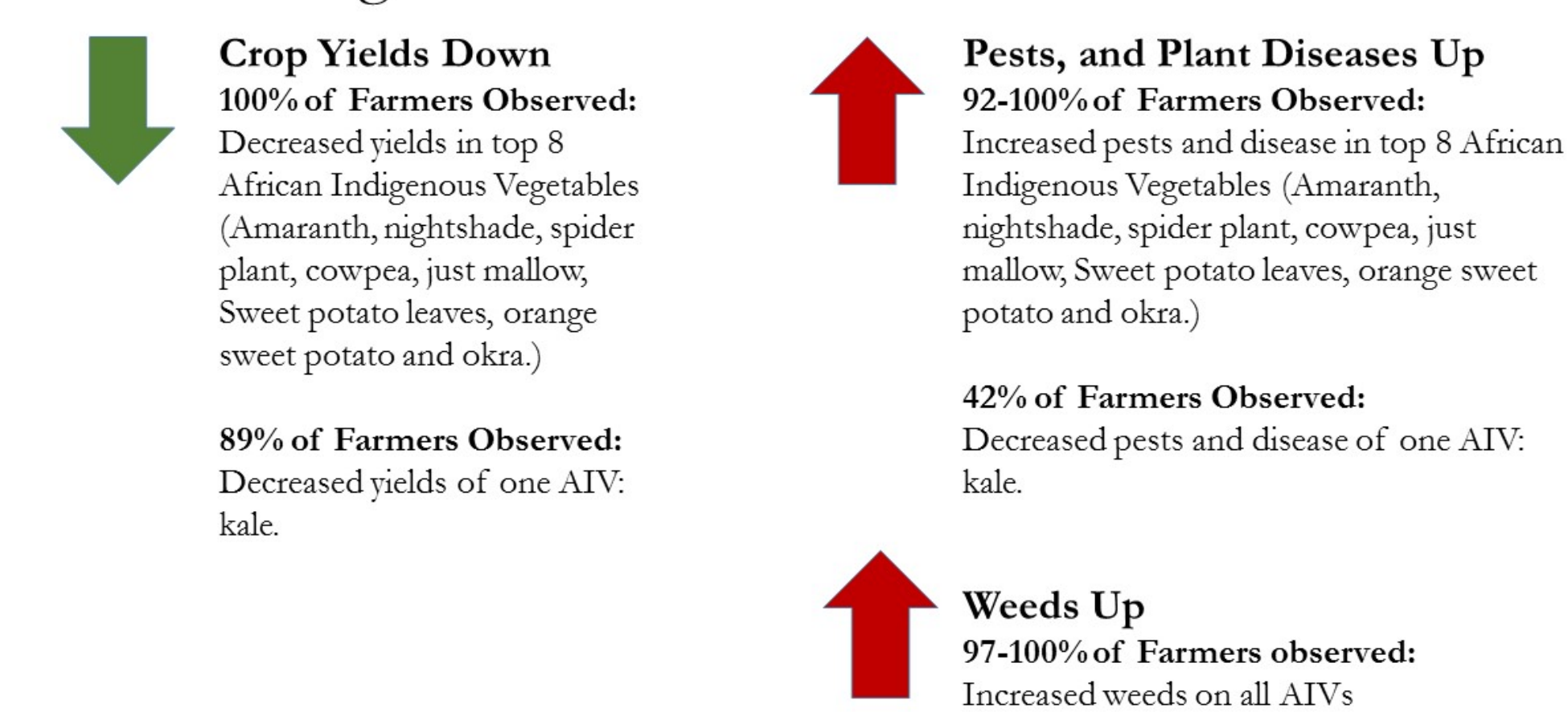


Photo credit: David Byrnes

Fig. 2. Impacts of Changing Weather Patterns on Zambian Agriculture



## Conclusion

The overall goal of this program is to improve the production and to increase consumption of AIVs in communities in an effort to improve nutrition, income and health outcomes of people at risk for malnutrition. These improvements must also take into account impacts by climate change.

Farmers are already seeing the impact of climate change on agricultural production and, therefore, additional adaptation strategies need to be taken. These results are consistent with other surveys and with recent reports of data collected from other weather stations in Zambia (Mulenga et al, 2017).

Our findings suggest that resilient adaptations to climate change are needed in order to ensure improvement in nutrition, yields, and control of weeds, pests and disease in Zambia in the years ahead.

## References

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