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Mitigating the impact of El Niño on hunger in Malawi

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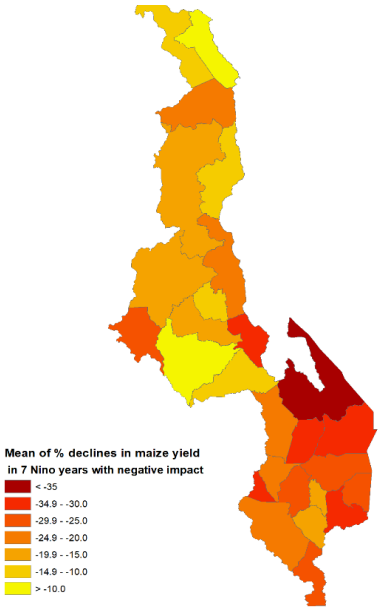
Impact of El Niño on Malawi

El Niño is a phase in an irregular periodic variation in winds and sea surface temperatures over the Pacific Ocean. It occurs on average every 2 to 7 years and typically lasts between 9 months and 2 years. El Niño affects the global weather patterns, resulting in above-average precipitation in some places and droughts in others. Malawi and its neighbors typically experience drier than usual weather during El Niño, which often leads to poor growing conditions and below-average harvests.

Figure 1. El Niño effects on maize production in negatively affected years



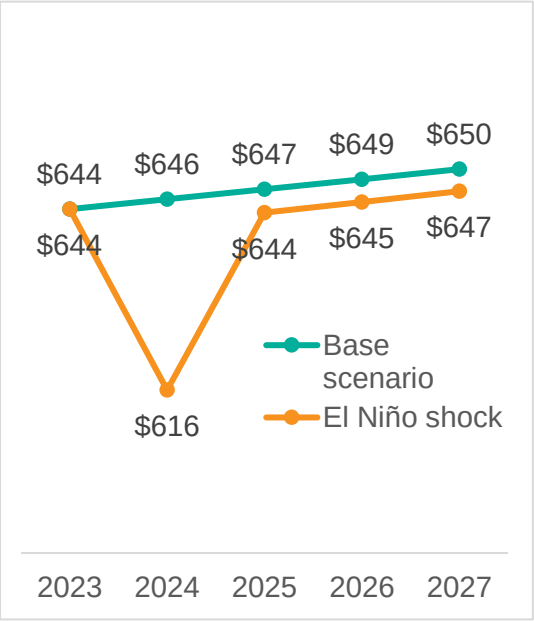
Over the past 4 decades, 11 years were affected by El Niño (1987, 1988, 1992, 1995, 1998, 2003, 2005, 2007, 2010, 2015, and 2016). In 7 of those years (1987, 1992, 1995, 1998, 2005, 2015, and 2016), maize harvest in Malawi was negatively affected. In these 7 negatively affected years, Malawi harvested on average 22.5 percent less maize than expected, with the biggest deficits occurring in the south of the country (see Figure 1). According to government estimates the country grows about 3.4 million tons of maize in a typical year – just about as much as it consumes. If El Niño affects maize yields similarly to the way it did in 7 out of the past 11 events, Malawian farmers can expect to bring in only some 2.6 million tons, leading to a deficit of almost a quarter the national requirement.

The consequences of such production shock would be far reaching considering the centrality of maize to Malawian diets and economy. Our modelling[1] work suggests that a 22.5 percent decline in total maize production would reduce Malawi's GDP by 4.4 percent in 2024.

[1] To model impacts we use IFPRI's Rural Investment and Policy Analysis (RIAPA) model (see https://www.ifpri.org/project/riapa-model)

Maize production would recover in 2025 unless El Niño conditions persist, but Malawi's economy would permanently lose two years of growth (Figure 2).

Figure 2. Effect of maize production shock on GDP per capita



A drop in maize yields is not certain in 2024 (there was none in 4 of the last 11 El Niño years), but likely (it did occur in 7 of the last 11 El Niño years). Malawi can therefore hope for the best, but should prepare for the worst.

Two recent El Niño events illustrate the danger ahead. Following the record-low El Niño-affected harvest in 2005, 5 million Malawians, then 39 percent of the population, required humanitarian assistance to prevent famine. In the 2015/2016 growing season, when rainfall in the southern and central regions fell 20 to 50 percent below usual levels, and lower still in certain pockets of the country, total national maize production was estimated to be 30 percent below average, leaving 6.7 million people, or 38 percent of the population, at risk of hunger. For comparison, 9 percent of Malawi's population needed assistance in the average year since 2006 (excluding the 2016/17 lean season).

Mitigation strategies

What can be done to prevent a similar outcome this time around? Two broad sets of strategies exist: those to minimize the impact of El Niño on agricultural production and those to minimize the impact of reduced agricultural production on food security. As indicated in Figure 1, effects of El Niño in southern Malawi are likely to be worse than in northern Malawi. Resposes need to be specific to the context and extension messaging must be consistent.

Minimizing the impact of El Niño on agricultural production

- Malawi usually experiences relatively dry growing seasons in El Niño years, particularly in the south. Maize variety choice can improve farmers' prospects. Short season varieties, and drought tolerant varieties employ different mechanisms to respond to drought stress. Early-maturing maize varieties can confer drought escape, and therefore have a better chance of producing harvestable crop, in the case of terminal drought while drought-resistant varieties have a better chance than others to mature in dry conditions. Extension workers and radio programs should encourage farmers to plant early-maturing and drought-resistant maize varieties.
- The government should create an enabling environment that ensures the availability of appropriate seed, on time, in sufficient quantities and at competitive prices. This will entail leveraging the capacity of private sector players. The southern region of the country should be prioritized for seed distribution of drought tolerant and early maturity maize varieties.
- Additionally, farmer crop choice should embrace staple crops which are naturally more tolerant to drought than maize. These include sorghum, cassava, sweet potato, and pearl millet.

- Staggering planting dates may reduce the risk of total crop failure. Otherwise, farmers should be prepared to replant multiple times in case of early crop failure due to a dry spell to increase the chance that at least one crop matures.
- Soil moisture management is critical for local drought avoidance. Conservation agriculture and minimum tillage approach to land preparation have been shown to improve soil moisture retention. Planting basins promote rainwater harvesting. Mulching where biomass is available will help to reduce moisture loss. Increased spacing between plants and frequent weeding will reduce competition for moisture and soil nutrients.
- Diversification will reduce the risk of total farm loss. Intercropping maize with drought tolerant, nitrogen fixing legumes crops can reduce risk of total crop failure. Cowpea and pigeon pea are suitable options.
- Irrigated farms can be contracted to grow staple crops, allowing supplementation during dry periods and the possibility of maximizing yields with late maturing, high yielding maize varieties.
- Fertilizer management through micro-dosing and split application will improve fertilizer use efficiency and reduce drought effects.
- Drought conditions that arise from El Niño may worsen pest infestation (e.g., fall army worm) and migratory pests (locusts). It is important to closely monitor for early warning as these can decimate yields in very short time periods.
- Extension systems should be capacitated with localized forecasts and mechanisms to relay information to farmers in a timely and consistent manner.

Ensuring food security after a poor harvest

- Farmers should prepare to employ proper post-harvest management to reduce losses of produce. Extension trainings should capacitate farmers with appropriate methods and tools in time for harvest.
- If Malawi does not produce enough food to sustain its population, it will have to import staple crops, most likely maize. Provisions for imports should be made early so that maize can be procured when it is most advantageous to do so, which is around the middle of the calendar year if sourced regionally. If

Lessons from the 2015/16 El Niño

In response to the poor El Niño-affected harvest in 2016, the 2016/17 Food Insecurity Response Programme (FIRP) used in-kind and food distribution and cash transfers to reduce food insecurity, alongside a set of multi-sectoral interventions in agriculture, nutrition, health, WASH (water, sanitation, and hygiene), education, and social protection. Approximately USD 265 million in resources were mobilized for FIRP and the response was considered largely successful in restoring food security and livelihoods. However, it also highlighted the vulnerability of Malawi's food system to weather-related shocks the country's high level of dependency on development partners for resources to undertake such humanitarian responses. Assessments of the response, with lessons on how to prevent future crises were drawn in, among others, Babu et al. (2018) and Botha et al. (2018).

El Niño leads to poor harvest in the whole region, maize may have to be brought from places where El Niño tends to improve growing conditions, such as parts of East Africa or North America. Regardless of who imports the grain, forex availability will be crucial.

- Cash transfers can be used to help vulnerable households buy food, and lessons for their successful implementation can be drawn from past programs (see box). However, they will only improve the situation if food is available for purchase, that is if Malawi grows or imports enough food to satisfy its domestic consumption needs. Without sufficient food in the market, cash transfers will only push prices up, as consumers compete to purchase a scarce good.
- The impact of reduced production will be particularly pronounced in urban areas, where very little food is self-produced. It will therefore be important to include vulnerable urban households in social protection programs.

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