Agriculture Knowledge, Learning, Documentation and Policy (AKLDP) Project

Field Notes

January 2016

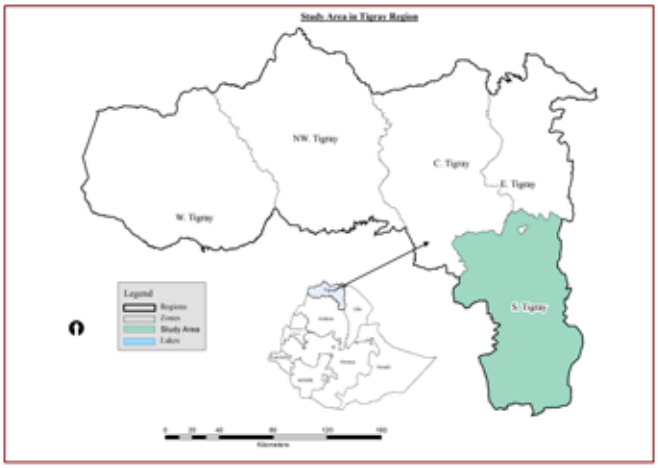
El Niño in Ethiopia

Early impacts of drought in South Tigray Zone

Introduction

In September 2015 an AKLDP Technical Brief explained why the failure of the spring *belg* rains was a major problem in some areas of Ethiopia.[1] The Brief also reported a deepening El Niño episode, causing delays in the onset of the main summer *kiremt* rains which normally fall from June to September, leading to the main *meher* harvest from October to January. In December 2015 a second Technical presented more detailed information of the impact of the El Niño on the summer *kiremt* rains, using June to September monthly rainfall maps, as deviations against the 30-year average rainfall.[2] The rainfall maps confirm National Meteorological Agency (NMA) reports that the *kiremt* rains were delayed, erratic, below normal and that the withdrawal was early. The impact of the 2015 El Niño episode on rain-fed farming was forecast to be significant.

In these **Field Notes** the AKLDP describes some of the impacts of the failed spring *belg* and the 2015 El Niño-induced erratic and poor summer *kiremt* rains on rain-fed smallholder farming communities in South Tigray Zone, Tigray National Regional State. The Field Notes are based on visits to communities in November and December 2015, and the use of focus group discussions, key informant interviews and participatory methods[3] with smallholder farmers, traders and government staff. A more detailed report on this work will be released later in 2016. Secondary data was gathered from zonal and *woreda* Early Warning and Response Departments, and from the 2016 Humanitarian Requirements Document.[4] The fieldwork also enabled smallholder farmers to prioritize emergency response interventions that might best mitigate the impact of the El Niño at household and community level.



Rural livelihoods

In the study area, smallholder farmers are dependent on rainfed crop and livestock farming for their livelihoods. Sorghum is the dominant staple crop, followed by teff and maize. Early maturing sorghum, teff and maize are sown from January to March according to the onset of the spring *belg* rains, and are harvested from late April to June. Teff is often grown as a cash crop and sold in local markets. Slower maturing or 'long cycle' sorghum is also sown in April and May after the late spring *belg* rains, and continues to grow through the summer and into the autumn when it is typically harvested between October and January.

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Smallholders in South Tigray also keep livestock with richer households owning mixed herds of cattle, small ruminants and some camels. Poorer households keep small ruminants only. Both small ruminants and camels are increasingly preferred as they are better able to withstand dry conditions and drought years. All livestock serve as a source of income particularly during the periods of crop failure. Livestock are typically sold in the dry season and income used to purchase of cereals and ensure adequate food throughout the year. Large numbers of livestock, particularly cattle, are typically sold in a drought year when production is well below normal. Information on the seasonal agriculture calendar is summarized in Table 1.

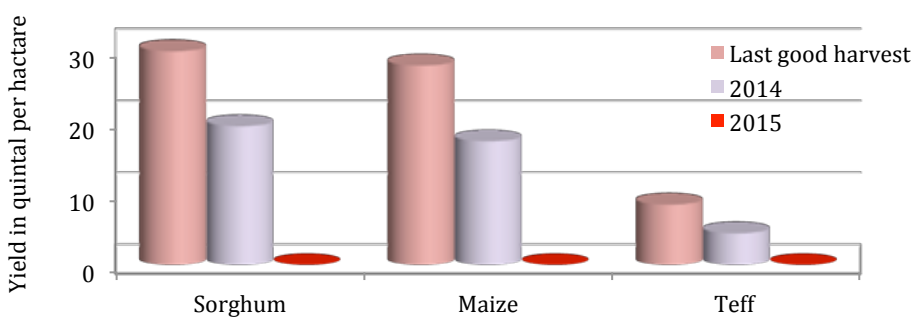
Table 1: Combined spring *belg* and summer *kiremt* seasonal calendar in Raya Azebo and Raya Alamata woredas, South Tigraty Zone

Agriculture activity	2014		2015									
	N	D	J	F	M	A	M	J	J	A	S	O
Rains: Spring *belg*			√		√		√			√		
Summer *kiremt*							√		√	√	√	√
Land preparation	√	√	√	√	√		√					
Planting: Sorghum/maize							√		√			
Teff									√	√		
Replanting										√	√	√
Harvesting & threshing	√	√										√
Foodstocks	**	**	***	**	**	**	**	*	*	*	*	*
Food prices	*	*	*	*	*	**	**	**	***	***	***	***
Livestock prices	***	***	***	***	***	**	**	*	*	*	*	*
Key: * - *low*, ** - *medium*, *** - *high*												

Impact of the failed 2015 spring *belg* rains and poor summer *kiremt* rains

Rainfall in South Tigray is bimodal with both spring *belg* (January to March) and summer *kiremt* (June to September) rains in normal years. However, in 2015 the *belg* rains were poor and in some areas, failed altogether, with the result that the majority of smallholder farmers did not plant *belg* crops.[5] There was some rain in late March, albeit well below normail, and some farmers planted maize and teff at this time. However, April and the early part of May were dry and so seeds either failed to germinate, or young plants quickly wilted in the early stages of growth. These wilted crops were grazed by livestock in late May and June. Farmers again planted fields after the rains of July and August and even in some cases in September and October, but in almost all cases rainfall was erratic, germination rates were poor and crops quickly wilted.

Figure 1: Farmers' estimated trends in crop yield in South Tigray



Smallholder farmers reported widespread losses of all major crops in both spring *belg* and summer *meher* croping seasons, relative to the last good year of production, and 2015 (Figure 1). These estimates were

confirmed by Government *meher* crop assessment reports (2015) that indicated that losses in the summer *meher* season were as high as 85 per cent in the most severel drought-affected woredas of south Tigray.[6] Largely dependent on arable cropping, household food security in the drought-affected areas is not expected to improve until after the *belg* harvest of May and June 2016, and assuming that the 2016 *belg* rains are normal to above normal.

Failed crops in Alamata woreda, South Tigray

Rain failure has also impacted on the livestock sector - the lack of livestock feed has resulted in poor growth rates and affected both production and prices. Poorer livestock production led to a decline in the availability of milk, and lower prices resulted in reduced household purchasing power.

Pest infestation causing damage to cacti, Raya Azebo woreda, South Tigray

Informants also reported that the drought has accelerated the spread of an insect pest that infests cactus plant which is a major source of dry season livestock feed in south Tigray. The price of livestock feed has increased and in late November and early December the price of a kilogram of teff straw was trading at the same price of a kilogram of maize.

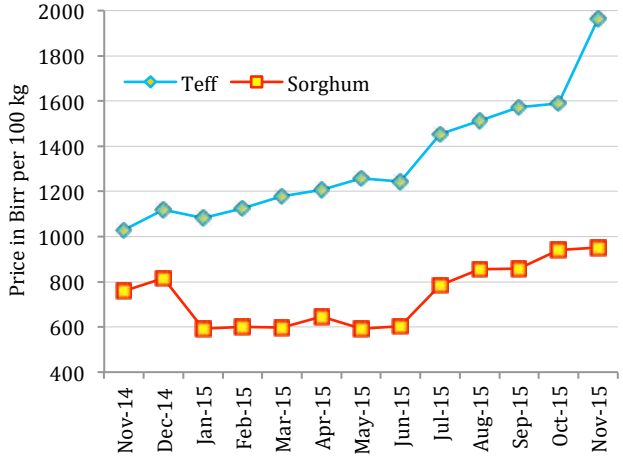
The poor rains have resulted in reduced access to drinking water as wells, water ponds and *horayes* - community managed water reservoirs for both human and livestock drinking water - have failed.

Impact of the El Niño drought on market and labour prices

The failed spring *belg* and poor summer *kiremt* rains had negative impacts on prices. The prices of sorghum and teff increased (Figure 2), as did the prices of pulses and other staple foods. In contrast, cattle prices in all markets in the study area were reduced by around 30 per cent for oxen and 50 per cent for cows in November 2015 (Figure 3).[7] Reasons for these low prices included poor livestock body condition due to poor pasture and feed availability, and a substantial increase in the numbers of livestock being presented at market as households are forced to sell, even if prices were low, as they urgently needed cash to purchase food.

Based on a standard 100kg sack of sorghum, the purchasing power of smallholders trading livestock for sorghum

Figure 2: Sorghum and teff prices in South Tigray, 2014 to 2015



has declined from June to November 2015 across the study area. Declines for markets in South Tigray are presented in Figure 4. The combination of poor/failed harvests and declining terms of trade threatens household food supply. Also, the increasing rate of livestock sales represents a depletion of the main financial asset in many houeholds.

The increasing numbers of plough oxen sales was of particular concern, as without access to oxen, households need to hire oxen from neighbours. This both delays planting - the owners will use the oxen on their plots first - and requires a payment for hire in the form of a substantial portion of the harvest.

Household members of poorer households and unemployed young people are partly dependent on seasonal employment - land preparation, planting, weeding and harvesting - on larger and more productive farms. However the result of the poor spring *belg* and summer *meher* cropping seasons, seasonal employment opportunities were reduced to irrigable commercial farms. As seasonal employment declines, daily wage rates fell to around Eth Birr 50 to 80 (US$ 2.5 to 4) per day – or together with lunch and dinner for the labourer - to Eth Birr 25. Wage rates on larger commercial farms in Raya Azebo and Alamata *woredas* fell to Eth Birr 100 (US$5) per day to Eth Birr 50 to 60 (US$2.5). For this reason, an increasing number of men and young people were migrating to nearby urban areas where daily wage rates were between Eth Birr 50 to 80. Interviewees also reported that many more young adults have migrated to the Middle East.

Figure 3:Trends in livestock prices in South Tigray, 2014 to 2015

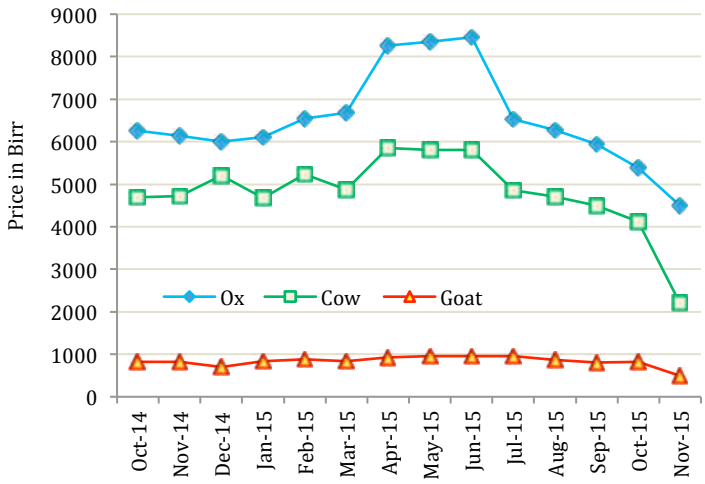
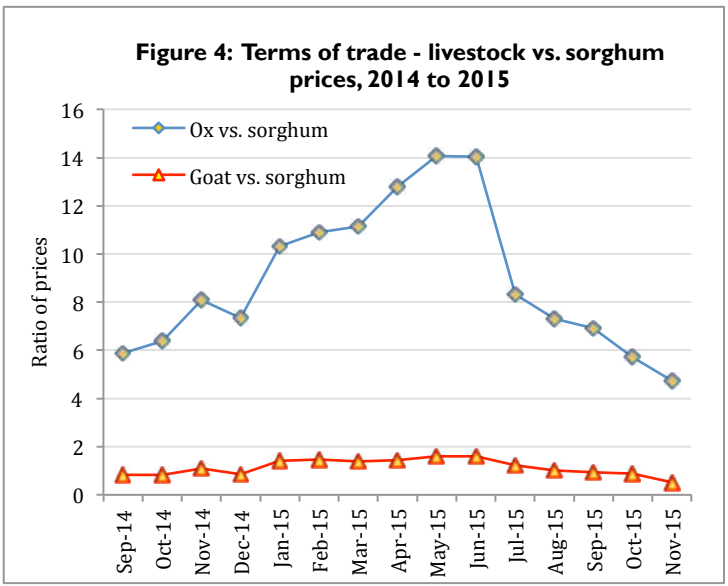


Figure 4: Terms of trade - livestock vs. sorghum prices, 2014 to 2015



Other impacts of El Niño-induced drought

Smallholders and others interviewed also reported other impacts of drought as follows:

- *Impact on nutrition:* rain failure and poor harvests have resulted in an increase in malnutrition, especially in young children. Heath Extension Workers reported an increase in the number of children receiving supplementary feeding;
- *Impact on health*: with declining incomes from agriculture people were less able to cover household medical costs, esepcially for hospital referrals. This problem was confirmed by Health Extension Workers who reported that the number of poorer farmers who were visiting health centres and hospitals was much reduced in the second half of the year;
- *Impact on education*: the drought also led to more children 'dropping out' of school as their familes were no longer able to cover costs such as uniform, school books, etc. The problem was particular acute for children who were schooling away from home in secondary and tertiary education, as the costs of board and lodging have also to be found;
- *Impact on livelihoods*: a key concern was the increase in oxen sales. Farmer's estimated than in 2016 the cost of hiring a pair of plough oxen would be as high as Eth Birr 500 to 600 (US$ 25 to 30) per day. This estimate assumed that oxen would have access to adequate feed and would be fit enough to

plough, and the owners would be prepared to hire them out. This additional oxen hire cost will make the 2016 croping season less profitable, especially if plough oxen are required for more than a day. If the hire cost or health of oxen proves to be problematic, it can be expected that less land will be ploughed and planted in 2016, with the result that the drought of 2015 will have knock-on effects into the harvest of 2016.

Late replanting of maize in Raya Azebo woreda

Coping strategies

Interviewees were asked about current coping strategies and the following examples were reported:

- increased consumption of cheaper and less preferred foods including poorer quality cereals; none of the poorer households in the study area were eating teff, and sorghum was consumed alone;
- fewer poorer households were able to afford the price of pulses and other supplements, and few if any, were consuming animal source foods;
- fewer meals were eaten daily and portion sizes were smaller - in particular for women as priority was given to children; few adults were eating breakfast;
- increased borrowing of money from relatives and neighbors to support household food purchases;
- increased requests for remittances;
- forced livestock sales - for the purchase of food and also to reduce livestock numbers, making it easier to feed and water the remaining livestock;
- increased child labor and out-migration to neighbouring towns, and migration to the Middle East;
- renting-out of farmland for cash payments to better off smallholder farmers and non-farming households;
- sale of household assets.

Priority emergency assistance interventions

Smallholder farmers reported increasingly erratic spring *belg* and summer *meher* rainfall pattersn over a period of four to five years with an almost complete harvest failure in the cropping seasons of 2015. Until the next harvest therefore, they will be increasingly dependent on the sale of livestock, off-farm employment, loans, remittances and food aid. Interviewees expressed concerns that despite Government investment in more than 200 deep boreholes, which might increase the availability of water during drought, less than half were working. Informants prioritized short and medium/ long-term interventions as listed in Table 2.

Table 2: Short and medium-term priority emergency assistance intervention

Short-term priorities	Medium/long term priorities
1. Food aid and school feeding for school children 2. Drinking water supply/ water tankering 3. Supplementary livestock feed	1. Emergency - improved drought tolerant early maturing sorghum, teff and maize - seeds 2. Rehabilitating boreholes and drilling new boreholds to improve potable drinking water supply and expand irrigated agriculture 3. Restocking including with plough oxen

Conclusions

The visit and interviews to South Tigray confirmed the Government estimates that there was little or no crop production in 2015, with the exception of some areas that received run-off from neighbouring hillsides, and farms with access to irrigation. As a result, sorghum prices in particular had substantially increased at a time when in more normal years, food prices would be falling and household food security at its best. As cereal prices rise, smallholders are selling an increasing number of livestock to purchase food that they have been unable to produce this year on their farms. As the number of livestock being taken markets increases, livestock prices fall and smallholder farmer's purchasing power declines.

An increasing number of people were leaving their farms in search for employment, and daily wage rates had declined significantly across South Tigray as a result - in some areas by as much as 50 per cent.

In response to decling terms of trade and reduced seasonal labour opportunities, interviewees prioritized food - including school feeding for their children - and emergency water interventions[8] followed by supplementary livestock feed to protect livestock assets - plough oxen, dairy cattle and small ruminants. As the drought withdraws and the agriculture sector returns to normal, smallholder farmers in the study area prioritized: drought-tolerant crop varieties and small-scale irrigation - both of which reduce dependence on rainfall - and restocking.

Critically, until more normal rainfall returns, people have few options but to continue to sell their livestock assets in order to buy food, unless emergency food assistance is adequate and timely. Looking to the longer-term, the future of smallholder farming in more marginal areas seems to be increasing uncertain due to increasing rainfall variability, increasing population pressure and declining farm size. For this reason, the AKLDP proposes that improvements in rural resilience will increasingly depend on investment in alternative, non-agriculture related employment.

For further information:

- Visit www.agri-learning-ethiopia.org
- Email Adrian Cullis, AKLDP adrian.cullis@tufts.edu

Disclaimer

The views and information in this brief are an output of the AKLPD project and do not necessarily reflect the views of USAID or the United States Government.

Endnotes

[1] AKLDP (2015a). El Nino in Ethiopia: Uncertainties, impacts and decision-making. AKLDP Technical Brief, September 2015 http://www.agri-learning-ethiopia.org/wp-content/uploads/2015/09/AKLDP-El-Nino-brief-Sept-2015.pdf

[2] AKLDP (2015b). El Nino in Eyhiopia: Analyzing the summer *kiremt* rains in 2015. AKLDP Technical Brief, December 2015 http://www.agri-learning-ethiopia.org/wp-content/uploads/2016/01/AKLDP-El-Nino-Rains-Technical-Brief.pdf

[3] Including proportional piling and ranking, seasonal calendars, coping strategies index, year ranking, transect walks and observations.

[4] Crop Assessment Reports in Wag Himra, North Wollo and South Wollo zones (2015); Humanitarian Requirement Documents (released in January and August 2015) as well as products of the Ethiopia Humanitarian Country Team-EHCT (released in September and November 2015).

[5] For further information see:
Early Warning and Response Reports of South Tigray zone- Raya Azebo and Alamata woredas (2015)
Humanitarien Requirements Document (HRD). Mid-Year Review 2015, Joint Government and Humnaitariean Partners' Document, August 2015, Addis Ababa.
Ethiopian Humanitarian Country Team (EHCT) Report (2015). Ethiopia- slow onset natural disaster: El Nino driven emergency, September and November 2015 issues
Famine Early Warning Systems Network (FEWS NET) Report (2015). Ethiopia- Food Security Outlook update in June 2015: poor households in central SNNPR and northeastern Amhara to enter crisis in July 2015

[6] Early Warning and Response analysis as well as monthly marketing Reports in Raya Azebo and Alamata woreda, South Tigray

[7] Monthly marketing Reports in Raya Azebo and Alamata woreda, South Tigray

[8] Subsequent to the field work the AKLDP researcher has been informed that as increasing numbers of water points fail, that water is now prioritized over food in some areas.