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The 2015-2016 El Niño event: expected impact on food security and main response scenarios in East and Southern Africa

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Abstract

This report provides a short analysis of the main risks associated to the El Niño phenomenon in East and South Africa and provides recommendations for improved monitoring and for humanitarian response.

Summary

El Niño is a periodic climate phenomenon defined by anomalously warm sea surface temperatures in the eastern and central tropical Pacific Ocean which affect local weather worldwide and generally leads to increased drought risk at global level.

In 2015, since July a strong El Niño is being observed with increasing intensity in September and October. It is expected to last for the first 3 months of 2016 and could reach a very high level of intensity in this period. To date, it has already affected climate in many parts of Asia and in the Northern parts of East Africa, causing serious rainfall deficits.

Although the impact on agriculture is not directly proportional to the intensity of the climatic anomalies, the event is expected to impact East and Southern Africa in different ways. In East Africa, for the bimodal areas, El Niño events in the second half of the year usually lead to wetter than average conditions and are generally beneficial for agriculture. In other areas with a long crop season in the second half of the year, such as parts of Ethiopia, Sudan and Eritrea, it can cause drier than average conditions followed by rainfall at harvesting time causing drying problems. For both bimodal and single season zones it can lead to flooding in riverine areas and increase the risk of livestock diseases. On the contrary, in Southern Africa, strong El Niño events frequently cause drought and reduce crop production and this effect could be particularly dangerous considering the low crop production of this region in the 2014-2015 season.

These risks need to be taken into consideration for response planning in East and Southern Africa and this report lists some main recommendations for improved monitoring and humanitarian response in the regions concerned.

Ongoing and expected El Niño effects around the world

The current El Niño event is well established and according to NOAA models, is expected to strengthen and continue well into 2016, impacting weather patterns around the world. Models currently show that it is likely to be the strongest El Niño since 1997-98. However, the influence of El Niño events on weather anomalies is complex and depends also on a multitude of regional climatic drivers. The impacts on agriculture are highly variable according to the timing, strength and evolution of the El Niño event: If at the global scale, it is generally known for causing droughts, at regional level it can have either positive or negative impacts on crop growing conditions and can increase the risk of extreme weather events. Furthermore each El Niño is different from the previous ones and therefore the comparison with single previous events can be misleading.

It is therefore of primary importance to evaluate El Niño impact and related response scenarios at regional level.

El Niño has already affected growing conditions, particularly in Asia, with drier than average conditions in parts of India, Thailand, Vietnam and the Philippines, and these conditions are forecast to continue and spread to Indonesia. North-central China has experienced below average rainfall, impacting spring and summer crops, whereas parts of southern China has experienced much wetter than average conditions. Over Central Asia, El Niño generally increases chances of above average rainfall and snowfall providing abundant water for growing crops, but also increasing the probability of spring flooding.

In Australia, El Niño is generally associated with reduced precipitation in the east and warmer temperatures in the south. However, increased sea surface temperatures across the Indian Ocean are likely moderating these conditions and to date conditions have been largely favorable for Australia's winter crops, though continued rain in coming weeks will be critical.

In South America, El Niño generally results in wetter than normal conditions during summer months (soy and maize season) in Southern Brazil and Argentina, and drier than normal conditions in Northern Brazil. In the US and Canada most effects are expected during the upcoming winter season with warmer than average temperatures expected in western and central regions and wetter than average conditions in the west.

As suggested by a recent study by FAO (Rojas 2014)¹, the final impact of El Niño on global agricultural areas seems to be related not only to the amplitude of the anomaly, but also to its length and even more to whether the El Niño is followed in the same year by a strong La Nina (the opposite temperature anomaly), in which case its effect could be reduced.

Expected impact in East and Southern Africa

In East Africa the El Niño phenomenon is generally associated with wetter-than-normal seasonal rainfall patterns in the second part of the year, though the specific impact depends on the intensity and duration of the El Niño episode coupled with the response of the Indian Ocean conditions. The worst El Niño in the last 20 years was the 1997-1998 episode which caused floods in large parts of the Horn of Africa, triggering surface erosion which is still visible in large parts of Ethiopia and Somalia. Also, as for other more recent events for example in 2005-2006, it is remembered as one of the main causes of livestock diseases such as Rift Valley Fever. However, apart from these effects, the rainfall surplus associated with El Niños generally has a favorable impact on food availability in East Africa.

In 2015, the ongoing drought in Northern Ethiopia, Eritrea and parts of Sudan can also be associated with El Niño, although a clear causal relationship cannot be fully confirmed. In Ethiopia an expected low main (Meher) harvest in January 2016 will follow a drier than normal short season in early 2015. Also any abnormal rainfall in the harvesting time in December/January due to El Niño would further deteriorate crop production. In this country, due to the high levels of vulnerability, the risk of increasing food insecurity from now to the next crop season in April 2016 is particularly high. Overall the situation in the region in terms of output of the main agricultural season is considered in line with the average for the main 2015 rainy season in Kenya and Somalia.

The ECWMF seasonal rainfall forecast for the Horn of Africa for Oct.-Dec. predicts wetter than average conditions for large parts of Kenya, Somalia, South Sudan and Uganda, concentrated especially in the equatorial belt. However, because the Indian Ocean Dipole anomaly is much less strong than in 1997-1998 we can assume that the El Niño effect of high rainfall and especially of flooding will be less severe than during the dramatic 1997-1998 event.

¹ "Understanding the drought impact of El Niño on the global agricultural areas", FAO. May 2014 (<http://www.fao.org/3/a-i4251e.pdf>)

In Southern Africa, El Niño traditionally results in below average rainfall during the main growing season and major recent droughts in the region are clearly connected with El Niño, although again, the relationship between El Niño strengths and impact is not linear. The 1991-1992 drought with its tremendous impact on crop production (-54%) followed a moderate El Niño. The strong El Niño of 1997-1998 caused localized drought in Northern Namibia and Botswana whilst the moderate 2002–2003 El Niño caused severe drought in Botswana and in South Africa.

The ECMWF rainfall forecast for Southern Africa for Oct. Dec. seems to confirm the expected El Niño impact with significantly drier than normal conditions concentrated in Botswana and large parts of South Africa. Only the Northern part of Mozambique is expected to experience clearly above normal rainfall.

General preparedness

In general it is recommended to raise awareness and monitoring frequency levels of climate impact on food security for both East and Southern Africa. In the first case, to anticipate the combined effects of drought in northern Ethiopia, Sudan and Eritrea and the potential effect of flooding and livestock diseases in an area concerned by many civil conflicts. In the second case (Southern Africa) to prepare for the likelihood of drought in a region which already experienced production deficits and localized droughts in the 2014-2015 season, leading to cumulated effect on livelihoods and assets.

Contingency plans are being prepared by many countries in the region and should be supported where possible and in collaboration with the national and international development and humanitarian organizations.

In both cases continuous near real time monitoring will be useful and JRC can collaborate closely with UN agencies and national organizations by using its monitoring capacities based mainly on remote sensing and meteorological data as well as on its network of partnerships with local institutions. Such monitoring would also provide a base for possible rapid ex post assessment.

Specific Response scenarios

East Africa

The 2015 long-rains season was mostly favorable for crop production in countries with a long rains season in April-June like Kenya and on the opposite below average for the areas with a single crop season (Sudan) or the main seasonal rainfall concentrated in June-Sept like in Northern Ethiopia and Eritrea. The region is affected by high levels of vulnerability due to civil insecurity in South Sudan, Somalia and Eritrea and recent food security projections for Ethiopia have rapidly deteriorated.

In such a context, although rainfall surplus towards the end of the year is generally beneficial for agriculture and grazing land, there are strong risks linked to flooding of river systems (mainly in Kenya and Somalia) and to the impact of humidity on crop drying associated with high postharvest losses (Ethiopia, Sudan) and livestock diseases.

Potential response actions:

Livestock:

Before the expected rainfalls in October promote vaccination for Rift Valley fever and support countries in buying vaccine (according to FAO, in Kenya vaccine availability on the market is critically insufficient). After the rainy season in early 2016 support households in rebuilding of their herds with livestock supply in particular poultry which can support poor households quickly.

Agro-pastoral system:

Areas currently hit by drought: activate response mechanisms for low cereal availability and high food prices. Strengthen existing safety nets and plan for possible food and cash interventions.

Other areas: support storage possibilities and strengthening of the transport system for the short rains harvest. Procurement and maintenance of grain driers. Supply of pesticides and fungicide for grain protection.

Southern Africa

Many countries in Southern Africa were affected by drought in the 2014-2015 season such as South Africa, Zimbabwe, Namibia and Southern Angola (ref. 2015 JRC reports for these countries) leading to major production deficits. Other countries like Malawi were hit by floods and also experienced production shortfalls. In such a context a likely main season failure due to the current El Niño is a major threat to food security, due to cumulated effect on livelihood and assets.

Potential response actions:

Main food commodities:

Foresee import from international markets as early as possible but especially in early 2016 if indicators confirm low harvest expectations

Foresee transport capacities of these commodities to remote and high vulnerability areas such as Southern Zimbabwe, Southern Angola and subsistence agriculture areas of Namibia.

Income support:

Strengthen existing safety nets

Livestock:

Support livestock migration and livestock fodder stocks. After the drought event, support pastoralists in rebuilding their herds.

Main reference reports attached for additional information:

El Niño: Implications and Scenarios for 2015. WFP VAM, Sept. 2015

El Niño response options for Kenya. Draft prepared by FAO Kenya, internal circulation.

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