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STATUS OF THE 2015 EL NIÑO EVENT IN KENYA

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What is El Niño?

Print, electronic and social media in East Africa have portrayed El Niño as a condition with exceptionally heavy rains, perhaps because of the phenomenal occurrence in 1997/98. However, El Niño is not always associated with heavy rains in East Africa. As a matter of fact, some of the wettest years on record in East Africa (the classic example of which was 1961) were not linked to El Niño!

The phrase *El Niño* (pronounced as El Ninyo) literally means “the boy child”, the shortened form for *El Niño de Navidad*, which means *The Boy Child of Christmas*. This phrase was coined by fishermen in Latin America who observed that during certain years around Christmas time the fish catch was adversely affected by warm ocean waters, which they associated to spiritual forces.

During El Niño events, a warm ocean current flows off the coast of northern South America in the south-eastern Pacific Ocean. This warm current, which results from weakened surface easterly winds, is often accompanied with decreased upwelling of ocean water and reduced upward transport of plankton that is necessary for the countries’ thriving fish industry.

El Niño is a fairly frequent phenomenon with a rate of recurrence of one every three to seven years.

How El Niño Influences Rainfall in East Africa

Global oceans continually interact with the atmosphere in complex non-linear feedback

processes referred to as *coupling*. The drag of winds on the ocean surface induces ocean waves and changes in sea surface temperatures, which subsequently generate pressure gradients that govern the atmospheric motions. Changes in ocean temperatures over the Pacific Ocean sometimes coincide with higher or lower than normal ocean temperatures over the Indian Ocean and altered atmospheric systems, which is referred to as the El Niño-Southern Oscillation (ENSO) phenomenon. These complex interactions between distant places are termed as *teleconnections*.

For El Niño to influence the rainfall over East Africa, its occurrence should be in agreement with the Inter-tropical Convergence Zone (ITCZ) and many other systems that control the weather over the region. More often than not, warm south-eastern Pacific Ocean temperatures (El Niño) are associated with warm waters in the western Indian Ocean near the coast of East Africa. When the warming of the western Indian Ocean is accompanied by cooler ocean temperatures in the eastern Indian Ocean (near the Indonesia/Malaysia maritime continent), this phenomenon is referred to as the Indian Ocean Dipole (IOD). A well-developed IOD was associated with heavier than normal rains over East Africa in 1961, 1977, and 1997; but 1961 was in fact an ENSO neutral year (i.e., neither El Niño nor La Nina, the antithesis of El Niño)!

El Niño does not necessarily translate into heavy rainfall for the entire equatorial East Africa region (Ogallo, 1994). Statistically speaking, El Niño accounts

for just 36% to 46% of the variability of rainfall across the counties in Kenya (Muthama *et al.*, 2013).-The “short rains” season (from October to December) is significantly and positively influenced by the El Niño system (Muthama *et al.*, 2013).

It takes some time for different oceans and atmospheric systems to adjust in response to the El Niño phenomenon. The patterns and impacts of different El Niño events are never exactly the same.

Current Status and Projected Trends of the 2015 El Niño

The 2015 El Niño is very similar to that which was observed in 1997 in many respects; being slightly superior with regard to its areal spread (Figure 1), but slightly inferior in respect of its intensity (Figure 2).

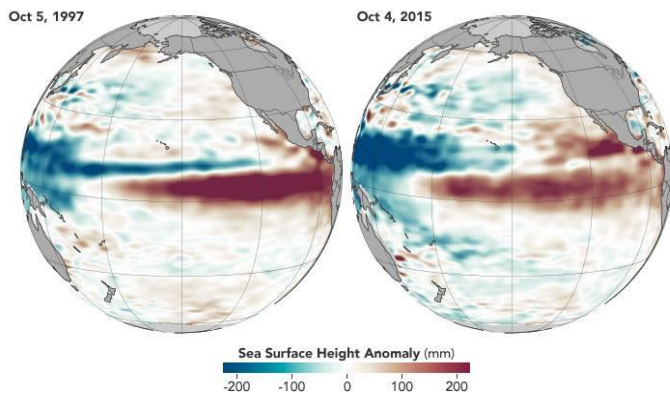


Figure 1: The strengthening El Niño with each passing month showing striking similarity between the 2015 sea surface height anomalies and 1997. (Source: NASA)

Most global models indicate that the 2015 El Niño will reach its peak during the Northern Hemisphere winter (November-February) season, persist into spring (March-May) season, and transit to ENSO-neutral conditions by June 2016. The western Indian Ocean is expected to remain warm (i.e., a positive IOD index) until December. There is a high probability of wet conditions persisting into the New Year over western and central (including Nairobi) regions, and some counties in southern and coastal Kenya.

Impacts Associated with El Niño in Kenya

In view of the projected patterns of El Niño in the Pacific Ocean and the warm currents in the western Indian Ocean, we expect the ongoing rains in East Africa to impact many areas in Kenya, which is likely

to adversely affect the physical infrastructure, including the road, air and rail transport networks; buildings, and telecommunications. There are possibilities of the outbreak of diseases like malaria, cholera, and dysentery in flood-prone areas of the country. Rift Valley Fever outbreaks have also been associated with ENSO conditions in the past and there is need to take precautions in good time to curb such outbreaks. Heavy rains may present various challenges and opportunities to farmers across the different counties, forestry, the hydropower energy sector, communities that experience domestic water shortfalls, and all sectors of the economy that depend on water supplies, but only if the water is harnessed and stored properly.

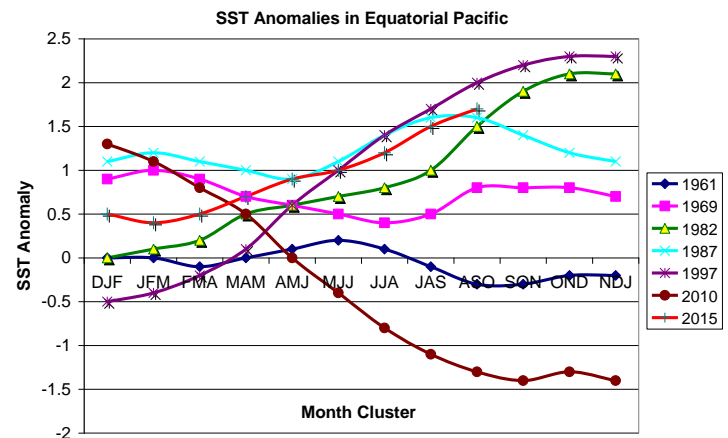


Figure 2: Trends of sea surface temperature (SST) anomalies for various years in 2014/2015/2016, with positive values in excess of 0.5 points indicating El Niño (Note that 1961, the wettest year on record, was ENSO neutral). (Source: plotted using CPC data)

References

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