Review Article

An Analysis on Cyclic Variations that Indicate a Catastrophic Famine Event in East Africa in 2028-2035*

Rogers Ndichu[1], **Misiani Zachary**[2]

[1]Kenya Meteorological Department, Ministry for Environment, Climate Change, and Forestry, Nairobi, Kenya.
[2]International Center for Humanitarian Affairs-Kenya Red Cross Society, Nairobi, Kenya.

Email: rogerndichu@gmail.com*, misiani.zachary@icha.net

Abstract

This review article provides an analysis of cyclic variations in East Africa that indicate a catastrophic famine event. Using historical and contemporary data, we examine the cycles of drought and famine that have occurred in the region over the past centuries. Our analysis reveals that the frequency and severity of droughts and famines in East Africa have increased significantly in recent decades, with a clear cyclic pattern that suggests a looming catastrophic event in 2028-2035. We explore the underlying causes of these cycles, including climate change, population growth, and political instability, and consider the implications of our findings for future food security and humanitarian aid efforts in the region. Ultimately, this analysis highlights the urgent need for proactive measures to prevent and mitigate the impact of catastrophic famine events in East Africa.

Keywords**:** *Drought, Food insecurity, Hunger, Malnutrition, Famine warning systems, Crop failure, Climate change, Conflict, Relief efforts*

Introduction

When one mentions the term “famine”, several things come into our mind; lack of food, starvation, disease, malnutrition and mortality. The given definitions of famine in popular literature are derived from those factors, however, its proper definition can be very complex because of the many salient factors considered and these definitions tend to take into account the unique character of individual famine events of the past.

It is universally agreed that famine can be caused by a number of factors e.g., drought, war , disease, epidemics, human displacements and migrations amongst others. A primary factor, drought, is associated with almost all the notable famine cases in the East African region and is caused largely by below-average rainfall or, in a worst-case scenario, a complete lack of rain for a prolonged period. The other factors, mainly considered secondary, only compound the situation by rendering the vulnerable populations weak, physically and economically, therefore, making them unable to work on their farms, or the situation may place them in an untenable position in food procurement due to food market failures. Famine conditions of this nature are what the current generations are familiar with and are classified as “Category I Famine”.

A severe famine, on the other hand, is associated with a more lethal condition that becomes more conspicuous when conditions span a large area extent and duration. Events of this nature are mainly continental or regional and may last for years. Severe famine is characterized by consecutive years of little or no rain, with the secondary factors taking the center stage. In such cases, natural water reservoirs; swamps, wells, oases, lakes and rivers momentarily dry up. The current generations have not experienced a famine of this nature. These severe famines are classified as “Category II Famine”. The older generation have experienced this conditions but not to the level that would be associated with a catastrophic famine.

But what is a catastrophic famine?

A catastrophic famine creates a condition we can only imagine. This imagination will come from famine events we learn in ancient history that the current generations do not “know” about. In many respects, it is a severe famine with additional attributes that include revolts, crusades, large vulnerable population movements and migrations, genocidal deaths, rebellions and occurrence of environmental refugees on a large scale. In addition, a situation of this nature is known to have influenced politically triggered revolutions and population uprisings that bring down governments or civilizations in many parts of the world throughout human history. This type is of famine is considered here a “Category III Famine”.

Our greatest fear is that a catastrophic famine is imminent in East Africa and the indicators used are not the conventional climate modelling initiatives used around the world. Our focus here is to send out an alert of a possible occurrence of a catastrophic famine event likely to occur between 2028 and 2035. According to some recent analysis , the famine event or events may be very severe and may not have been witnessed in the recent past for us relate to. Further scrutiny has led us to conclude that we may be dealing with an event not witnessed in this generation.

In the recent past, we have been observing unusual climate and weather occurrences in the region such as extreme flooding intertwined with dry spells and there has been a lot of talk of climate change attribution. While we cannot deny the role of climate change in the occurrences, we cannot rule out long-term climate variability brought about by rainfall cycles attributable to astronomical cycles generated from the orbital motions of the planets in the solar system. This cyclic feature is the basis of this analysis. Some recent scientific works have shown that certain rainfall cycles generated in scientific studies in the region can answer questions on why we have been having some "unusual" occurrences in the recent past. This is in addition to climate change contributions to these occurrences as outlined in the IPCC Assessment Report No.5 (AR5).

Over the years, sociologists have presented some interesting findings that are worth mentioning here. History is full of social-political cycles defined by events and stages of society and history generally indicates a repeat of these events in cycles. Similarly, climate is full of cycles that seem to, hypothetically, match those of the social-political events. In the Bible, the Old Testament is replete with repeating periods of decay, repentance and regeneration . And in the ancient times, people noticed that times of war and peace seemed to move in a regular cycle as well. In these cases famines are mentioned frequently although not given the necessary attention. In the recent past, the same case is evident in East Africa and we should not contemplate the prevailing peaceful conditions as if they will transit linearly into the future.

The findings further suggest that after every social-political cycle, a crisis occurs and is followed by a recovery period. During this recovery period, institutions and community values are strong and the economy is doing fine. Ultimately, the population evolves into a generation characterized by autonomy and individualism and this starts weakening the institutions, which ultimately creates a chaotic and disorderly political environment that leads to a low period associated with a crisis. At this point, the economy is doing poorly or is collapsing.

This social-political cycle was found to last between 80 and 122 years. Remarkably, this period matches the rainfall / drought cycles ; 84-years, 88-years and 120-years used here!

The main objective of this analysis is to show that a Mega-Drought-Famine of Biblical Proportions is eminent and that cyclic variations in rainfall and drought conditions in East Africa have a lot to do with it. The rainfall / drought cycles generated in the scientific studies in the region have been found to be; 8-year, 12-year, 13-year, 15-year, 30-year, 84-year and 164-year and are considered basic rainfall cycles associated with each planet of the solar system. Others considered are 88-year, 120-year, 172-year, 207-year, 500-year, 1000-year and 4284-year drought-rainfall cycles and are derivatives and amalgamations of the basic rainfall cycles referred to here as "Unified Cycles". Each of the cycles has associated dry and wet climate phases or Warm and Cold climate eras.

In the 30-year cycle the very dry phase have been associated with the periods; 1998-2005, 1968-1975, 1938-1946, 1909-1916 and even a little further back, the 1880-1887, amongst others. A further scrutiny into the periods showed that all the periods were characterized by seasonal rains failure in one or both annual seasons, low river water flow and lake levels and a severe famine conditions in the region. Recently, we can recall a famine where "food transport" relief initiatives by good Samaritans in Kenya were directed to the starving populations in different parts of the country in the period 1998-2005, specifically 1999-2000. From oral and archival evidence, the periods, 1938-46 and 1880-1887, are associated with severe famine, displacements or migrations and high mortality traditionally cited by some communities in Kenya. The next very dry period will fall 2028 to 2035

Although the 30-year cycle is generated using local rainfall, it may have some global appeal. The very dry phase conditions of this cycle may have contributed or inspired the following events, both local and international, as a silent factor; The Harry Thuku Revolts (1920), Mau-Mau Rebellion (1950-1960), Shifta War (1967-1974), the Kenya Post-Election Crisis (2007-2008), Ethiopian famine crises (1972-1976 and 1983-85), WWI (1916-1918), WWII (1939-1945), the Russian Revolution(1916-1919) and the French Revolution (1790s). The attribution to these events has always been focused on geopolitics and the underlying factor, worsening climate conditions, is relegated to the back or not considered at all.

The 84-year cycle dry phase is associated with 1997-2039, 1914-1956, 1830-1872 and 1658-1700 and are all associated with extremely dry conditions and some severe drought events in most East Africa.

They are all linked to some of the worst cases of drought and subsequent catastrophic famine events. The current dry phase 1997-2039 so far has shared some of the extreme attributes of the earlier dry phases, i.e. the period 1997-2020, but the remaining period, 2021-2039, may be even more extreme especially where it coincides with 2028-2035.

The 164-year cycle is better understood when it is taken together with the 84-year cycle. Both are due to the orbital motions of the two outer-most planets; Uranus and Neptune. The configuration of the orbital motions of the two planets shows that the "conjunction" (occupying the same spot in the sky) of the two planets Uranus and Neptune occurs every 172 years. That introduces a cycle that is more pertinent than the 164-yr cycle. This conjunction was last observed closest to the sun in 1993 in what can be referred to as a Neptune-Uranus-Sun conjunction and this also happened in the years 1821, 1650 and 1478. Broadly, there were very dry conditions and drought events within a duration of approximately 50 years after these conjunctions.

For example, after the conjunction of 1821, there was a severe drought between 1845 and 1858 in the region in which Lake Naivasha was reduced to a paddle and at the same time some communities in Tanzania were selling themselves as slaves for food. After the conjunction of 1650, the region experienced very dry conditions especially in the 1660s and 1670s. Rivers and lakes dried up,"Engaruka" and "Pangani" settlements in Tanzania wound up as populations left. The "famine of sweeping the courtyard" in central Kenya and "Mbofu famine" in Tanzania also occurred about this time. After the 1478 conjunction, the famine events were even more dramatic. A mega drought in the 1520s and 1530s put the whole region into an unprecedented upheaval. There was fighting and conflicts everywhere with disease outbreaks compounding the situation.

The same is likely to apply for the period after the Uranus-Neptune conjunction of 1993, where the period 1997 to 2039 is likely to have severe arid conditions. As we have already experienced the conditions of the period 1997- 2020, what we should be asking ourselves is if the arid conditions have been felt so far. And yes, they have; we have had drought events and further; tribal conflicts, failed seasons, diseases (read COVID-19) and locust invasions, some of which have not been experienced in our generation. Now, we have up to 2039 of more extreme events.

In addition to the above deliberations, It has been noted that the last time similar planet configurations, the Uranus-Neptune Conjunctions observed close to the sun, like those of 1993, 1650 and 1478, took place about ~4285 years ago in ~2291 BC (analogous to 1993 AD), ~2460 BC (analogous to 1821 AD), ~2630 BC (analogous to 1650 AD) and ~2800 BC (analogous to 1478 AD). The next Uranus-Neptune Conjunction after 1993 will occur in 2165 AD (that corresponds to ~2119 BC). All these analogue years to the present period fell in the Biblical era.

What is curious about the Biblical era is that there was a notable mega-drought event that is said to have span between 4000 years to 4400 years ago. This event is known as the "4.2 Kyr Event" by paleo-climatologists and archeologists and is associated with a fall of an Egyptian kingdom due to its severity and extent. It is also known to have adversely affected most of Africa, Europe and large parts of Asia. This event has been associated with the time of the Biblical Joseph and the 7-year famine in Egypt, a situation that shows a scary picture of a terrible famine being considered analogous to the present era and the fear of it being repeated. It is good to note that the Nile River, the source of water in Egypt, has its source basin in the larger East Africa region that includes Ethiopia, Sudan, and South Sudan which means the mega-drought events in Egypt may have been there in the greater East African region.

The ~1000-year cycle gives further evidence of the bad times. This cycle has been associated, hypothetically, with the 4 warm climate epochs from about 4000 years ago. We are now entering into the middle of the Current Warm Period (CWP) similar to that of the Medieval Warm Period (MWP) which occurred between 850 AD and 1350 AD. In East Africa, MWP may have been more pronounced between 950 AD and 1200 AD which is well demonstrated by the extremely low lake levels in a nearly all lakes in East Africa an indication of extreme aridity during the period. The ~1000-year cycle puts the CWP at 1850-2350 AD and the corresponding extreme period at 1950-2200 AD.

It was noted that, in all the warm epochs, climate conditions would shift suddenly into warm and arid conditions and a new climate regime is ushered-in about 100 years after the onset of the warm epoch. This is what happened in 950 AD and this is what is happening since 1950 AD and the situation is likely to extend to 2200AD! Experts have warned that our wetlands are now disappearing 10 times faster than the forests , a sign of a new climate regime taking control. The IPCC Assessment Report (AR5) had indicated that global warming would increase by 1.5oC in the near term, 2021-2040, and that there was likely increased agricultural and ecological droughts. The IPCC blames this on Climate Change due to anthropogenic CO2 and other GHG emissions while, this report focuses more on climate variability due to long term rainfall cycles. The combined effect of the two makes 2021-2040 a very challenging period environmentally.

In general, all the cycles indicate unanimously a dry / drought period from 2023 to 2035 and the longer term cycles indicated an arid period mainly in between 1993-2039. To illustrate these findings, a Unified Cycles Model for 2028-2035 catastrophic famine prediction is developed and attached as an annex to this report.

Given the facts, it is expected that from 2020 to 2022, we are likely to have relatively heavy rains interrupted by dry spells in most areas of East Africa, however, the situation is likely to change from about 2023 to a more arid condition, where some areas in Kenya and Uganda may start experiencing some seasonal rain failures that may lead to a mild or a severe famine event between 2023-28. This may also extend to the greater Horn of Africa which includes Somalia, Sudan, South Sudan and Ethiopia but the situation may have relatively less effect in Tanzania. It is likely that El Niño and La Nina events may play a big role in changing the projected situation during the period 2023 to 2035; nevertheless, their occurrence is difficult to predict. We know from past experiences that when El Niño occurs, it lessens the burden of the famine event and when the La Nina occurs it may deteriorate an already difficult and terrible situation. Apart from a little interruption from the two events, the famine event will continue to a more serious stage from 2028 to 2035, a period of about 7 years of intense famine. The famine may turn catastrophic from 2029 to 2033 when drought will be most severe. By about 2035-36 we may have the return of heavy rains a recovery period around the period 2036-2039 is very likely although the adverse effects of the catastrophic famine on the populations may still be felt.

During the period, it is likely that widespread famine conditions and drought events not seen in the modern times will be experienced. Re-emergence of diseases and epidemics is very highly likely. Lack of water supply may result in poor sanitation and increased malnutrition. If El Niño occurs and a lot of water is received in the middle of a drought, cholera, typhoid, mosquito-borne-diseases and measles may break out. We may have such diseases as smallpox re-emerging especially in the early 2030s when the situation is most disastrous. Water repositories like dams, rivers, lakes and water pans will dry up and in some places completely vanish. Given the gravity of the event, there is also a likelihood of large–scale human migration that may lead to large number of refugees into unfamiliar territories. Increased mutual contact between communities will cause conflict. Encroachments of people into forests and protected areas as well as invasions of wild animals into human settlements will be common.

Mortality rate towards the end of the 2028-2035 may be high and the population may resort to violent conflicts, inter-tribal wars and heightened insecurity. There is likelihood of having civil disobedience, fueled by high levels of starvation, discontent and hate-politics.

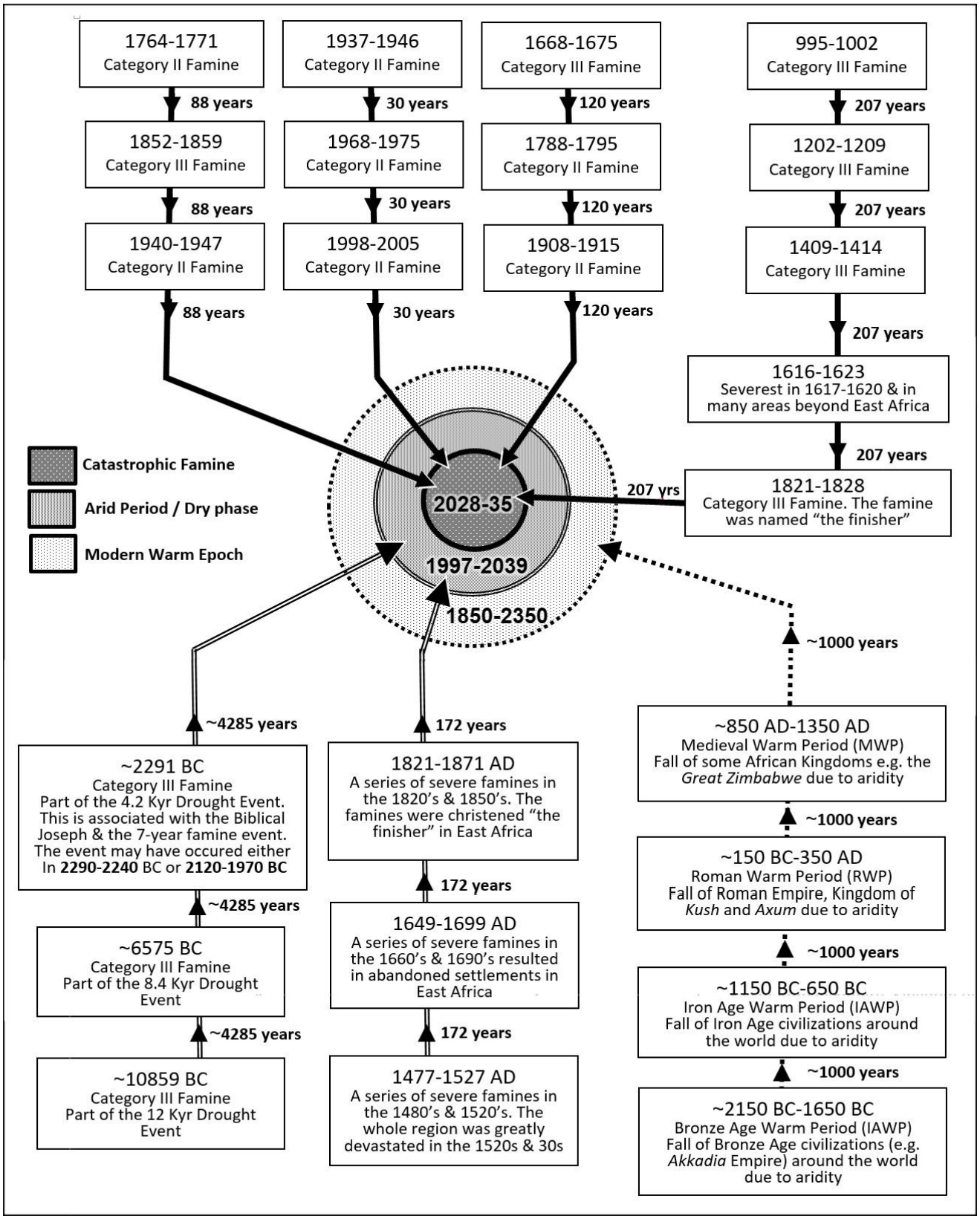
To alleviate the problem, we suggest certain quick measures for a long term effect. First, it is recommended that water storages like water pans and tanks be built locally by communities and dams to be initiated by county and national governments. Their designs should put into consideration storage that can last more than 3 years without rains or with poor rains. The water storage systems should be in place immediately or before 2023 and the large systems should be filled with water when the El Niño event comes around before 2028. The government should reorganize the food systems; growth, distribution and storage. Particularly invest in grain silos to store food grains that would last not less than 5 years without harvests or with poor harvests. Smart agriculture and good storage practices should be encouraged at three levels; Personal or community, county and national government. Long-term storage should start today! Health facilities to be well equipped to deal with health issues of the day. Lastly, Security management on a long term basis should be re-engineered to deal with ethnic conflicts and external threat from communities in our neighbouring countries (Uganda, South Sudan, Ethiopia and Somalia).

Conclusion

The authors have noted that this matter is very grave and should not be taken like any other in the recent past. Currently, the climate situation is a risky one and the general global economic situation is dire. Other famine causative factors are gradually setting in. We are transiting into a worse climate situation in a few years' time and a small trigger, especially of political nature, can easily shake the stability of the state. This normally happens through violent revolts and if that happens, chances of its recovery will be impossible in foreseeable future. Immediate action is required.

Conflict of interest: The authors have no conflict of interest to declare.

Annex



Unified Cycles Model for 2028-2035 catastrophic famine prediction, *by Roger Wambugu*