

SLOW ONSET DROUGHTS IN SUB SAHARAN AFRICA AND IMPLICATIONS FOR LOSS AND DAMAGE

by

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OUTLINE

Background to drought in SSA

The experience of Drought in the Sahel over the last 3,000 years and in more recent decades.

Loss and damage from droughts in the Sahel and the Greater Horn of Africa (GHA).

Other African Droughts (loss and damage) and the value of Early Warning.

Conclusion (Prospects for Adaptation).

AN INTRODUCTION TO SAHELIAN DROUGHTS

- ❖ The Sahel lands which lie immediately south of the Sahara Desert are well known for slow onset droughts which have been some of the worst experienced in the world in respect of loss and damage.
- ❖ Sahelian droughts have been experienced for centuries, and it is only recently that their occurrence has been linked to climate change. More recent droughts have also been studied

Sahelian droughts have been known to last for decades

And have been responsible not only for massive losses in life, but some authors have blamed them for the large-scale migrations which have been experienced in the arid lands of Sub-Saharan Africa in general, and of West Africa in particular.

RAINFALL RECORDS IN THE SAHEL

- ❖ There are not many good long-term rainfall records in the Sahel which one could use to build a story, but the available records (see Figure 1) indicate the phenomenon already described, with experiences of several years below the annual mean (also low in itself), which may be followed by years of above normal rainfall.
- ❖ Below normal records show periods of intensive drought, and much human suffering.

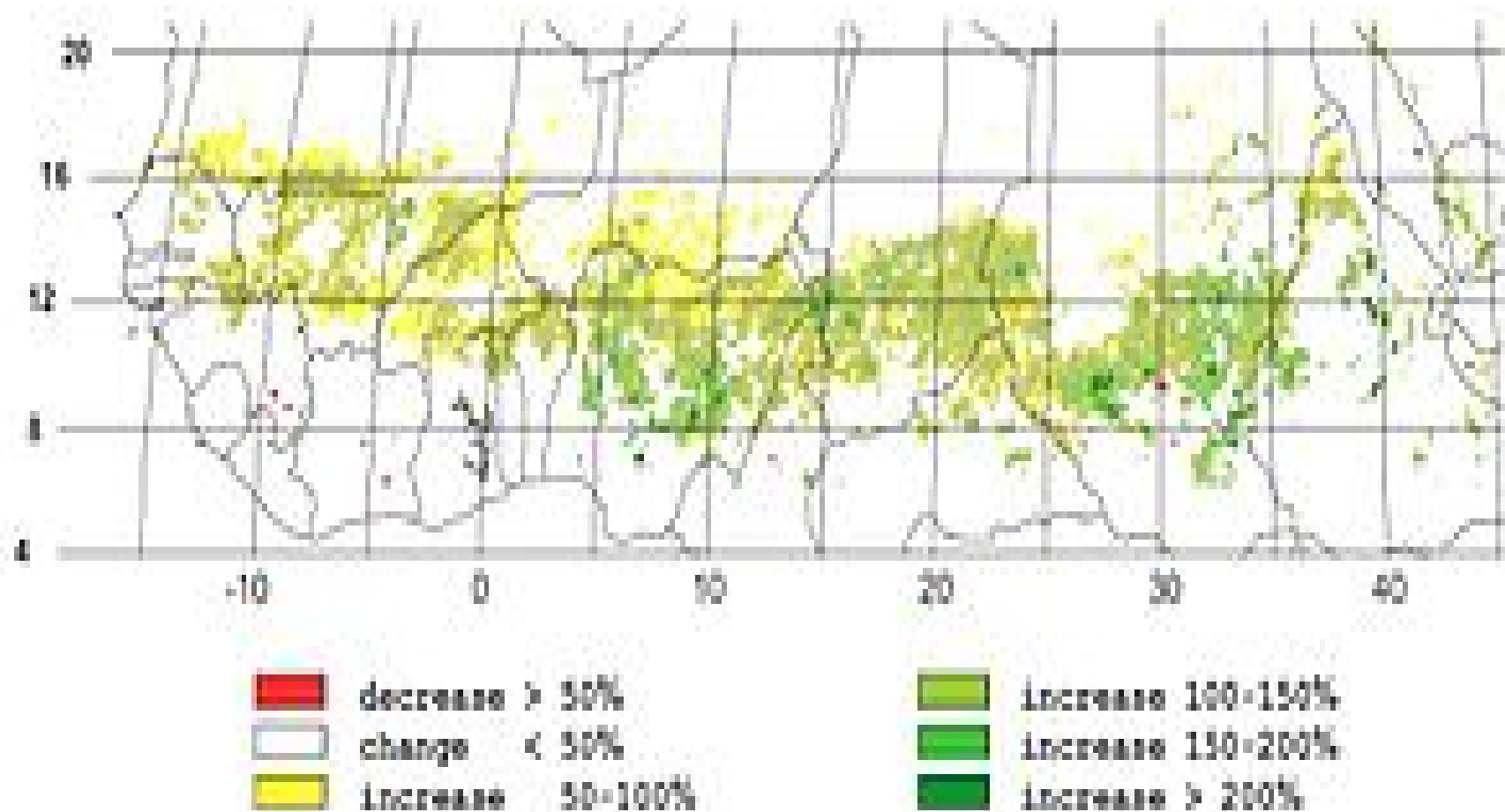
LOSS OF LIFE AND MASSIVE LIVESTOCK MORTALITY

- ❖ During unbearable droughts, famine is the order of the day, and there is severe loss of life, especially among the elderly, and the children.
- ❖ It has been established that the massive Sahelian Droughts are even today, responsible for widespread migrations in West Africa with several destinations, some to the humid coastlands, and others to urban centres, and others even to Southern Europe. The latest Sahelian Drought was in 2010.

SAHEL 1968-73-THE GREAT SAHELIAN DROUGHT

- ❖ The 1968-73 Drought in the Sahel affected all the Sahelian lands of West Africa and spread to Ethiopia and Kenya. Its reverberations led to the creation of the United Nations-Sudano-Sahelian Office. It was one more in a series of droughts in 1910, 1940, and 1960s
- ❖ It was typical of the slow onset and long lasting drought. Between 1968 and 1984, the death toll was 100,000, with 750,000 on food aid and 50 million affected.

PATTERNS OF DROUGHT IN THE SAHEL

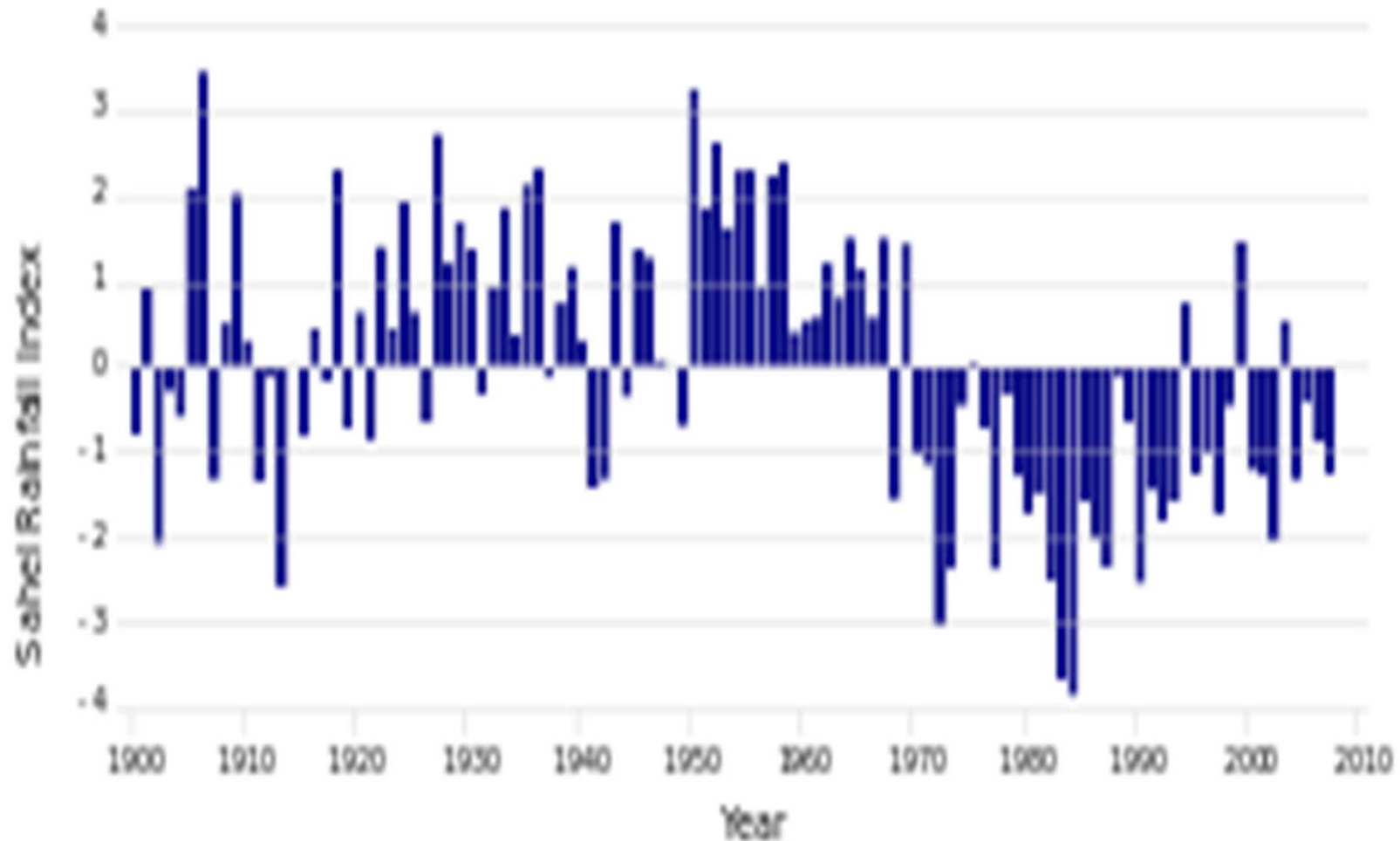


MAP OF THE SAHEL

Figure 2 depicts the extent of the Sahelian lands, which are equated with the arid and semi-arid lands in the region. As a technicality Sahelian land like conditions are also experienced in the Greater Horn of Africa (GHA). In West Africa the countries affected include Tchad, Burkina Faso, Mali, Senegal, Gambia. Northern Nigeria. In Eastern Africa the affected countries include Ethiopia, Somalia. Eritrea, Somalia, Kenya, Djibouti and Sudan.

RAINFALL VARIATIONS- SAHEL

1900-2010



CLIMATE CHANGE AND THE SAHEL

- ❖ Although Africa is not well-studied, climate change evidence points to reduced precipitation (-15%to-20%) in most of West Africa, and the Sahel in particular. But for the next few decades there is the suggestion of a slight humidification in the area, with possible implications for drought.
- ❖ It is not clear to what extent this will be reflected in the drought climatology.

AFRICAN DROUGHT PROJECTIONS

- ❖ Climate change models suggest an expected decline in precipitation in much of arid and semi-arid Southern Africa, and a slight increase in precipitation in the Horn of African countries. This latter case could be reflected in a slight reduction in droughts or drought severity in the coming decades.
- ❖ IPCC noted (2007) a likely increase in droughts and floods in West Africa in the last few decades, and going with global trends an increase rather than a decrease in extreme events should be expected.

AFRICA'S MEGA DROUGHTS

- ❖ Africa's Mega Droughts have for centuries been linked with Sahelian lands, and with massive damage and death. In terms of numbers of deaths, there is no clear estimate.
- ❖ The mega droughts have also been linked to large scale migrations of peoples trying to escape drought and famine.
- ❖ In the Sahel we talk of long term desiccation rather than just drought.

WRITING ABOUT DROUGHT AND LOSS OR DAMAGE IN SSA IS HISTORICAL

- ❖ The history of Africa is full of tales about drought and famines, and it is not possible to understand the history of Sub Saharan Africa(SSA) without following the innumerable droughts and how they resulted in massive population migrations throughout the continent.
- ❖ It may never be possible to quantify the loss and damage which can be attributed to droughts in Africa, but one can learn from recently well-recorded episodes such as those quoted here which can be used for comparison.

- As possible signals of climate change
 - The repeated pattern of drought occurrences interspersed with floods, over the last 40,000 years suggest some causal relationships which are explained in the paper
 - Extreme events such as droughts and floods are common in the sub-region as witnessed by the disastrous flooding linked to the

DROUGHTS AND FAMINE IN THE SAHELIAN LANDS OF AFRICA

The history of Sub Saharan Africa in the last one thousand years is littered with big losses of human lives due to prolonged droughts, accompanied by famines. The particular localities most affected are covered by the ecological conditions which could loosely be called “the Sahelian Lands of Africa”, but more appropriately they could be referred to as the “Semi-Arid Lands”

OLD AND NEW DROUGHTS

- ❖ Droughts in the Sahel go back to the 16th century according to Wikipedia which surprisingly are contemporaneous with the start of the agrarian and industrial revolution in Europe
- ❖ In Africa this was also the beginning of mass migrations which have previously been attributed to droughts, famines and wars.

REGIONAL AND SUB-REGIONAL DROUGHTS

In order to fully understand the litany of African droughts one needs to focus on both regional, as well as sub-regional droughts.

Both the Sahel in West Africa, and the Greater Horn of Africa have repeating patterns of drought which are now well understood by the scientific communities, and which will be the basis of this short presentation.

WHY THE UNSO

- ❖ The creation of the UN Sudano Sahelian Office meant that world attention was now drawn to African droughts, especially those in the Sahel. It was clear that 50 million people were at risk with no easy solution. Available scientific evidence were pointing to the fact that multi-decadal “mega-droughts” were part of the Sahel story, being repeated in the Greater Horn of Africa, particularly in Ethiopia and Somalia and parts of Northern Kenya.
- ❖ Long-term solutions were being called for.

MEGA-DROUGHTS AND CLIMATE CHANGE

- ❖ Sooner or later the link between mega-droughts and climate change would be apparent, and the need to seek ways of adapting would state its own case. In the case of West Africa the link between drought and famine was backed by plenty of historical evidence. Drought is nowadays called an extreme event, and the arrival of famine is a rapid onset event.

HUMAN DISPLACEMENT

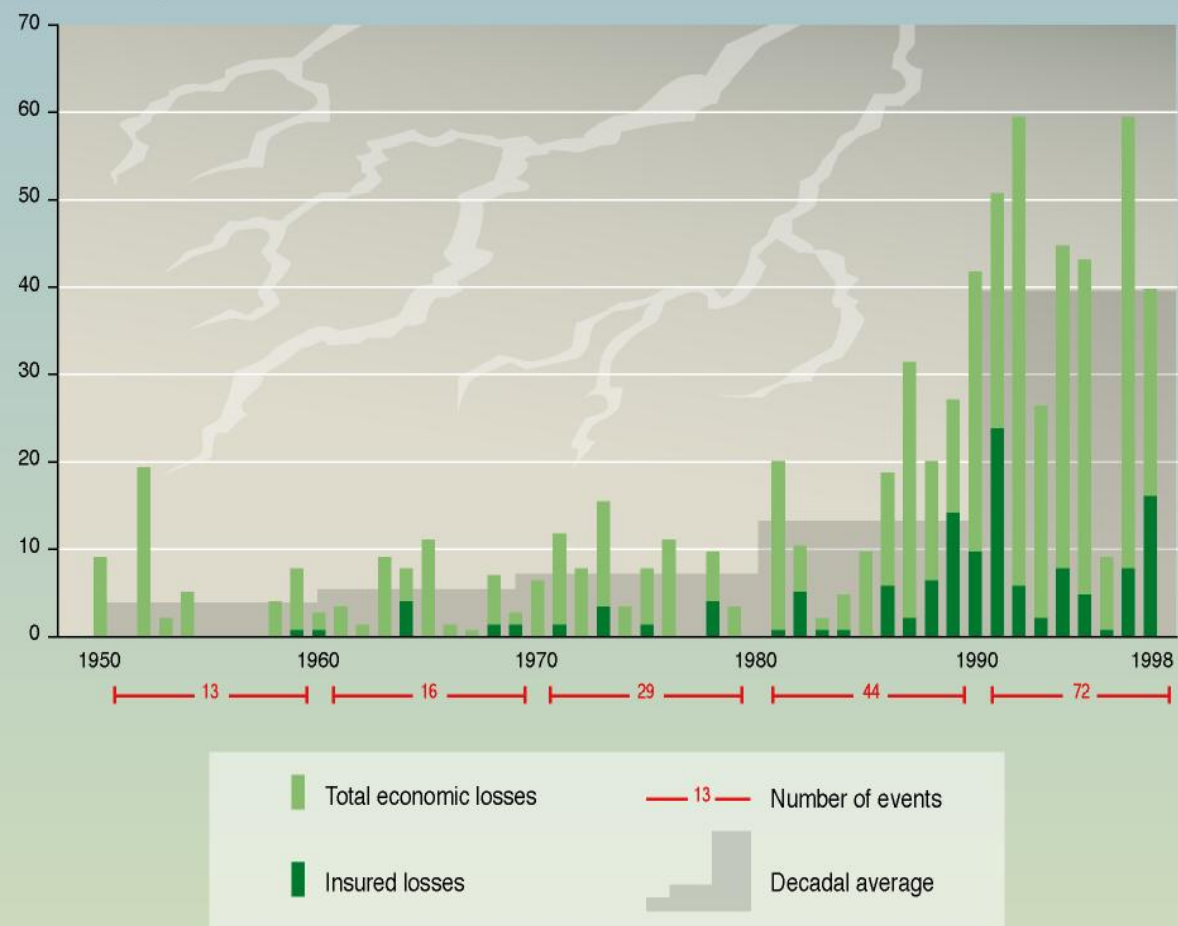
- ❖ A recent report by Bailey of Chatham House has indicated that extreme events, in particular drought and floods have been responsible for the displacement of hundreds of thousand people, and tens of thousands have died in the process.
- ❖ An example from GHA can be quoted where in 2011 drought created an emergency affecting 12 million people, and this was the fourth such event since 2000.

❖ THE COST OF DROUGHTS

- ❖ The impact of global extreme events,(see Fig) including droughts and floods contained in the analysis by the IPCC (2007) is categorized as
 - a) Total economic losses by year
 - b) Portion of total losses insured, and
 - ❖ c)Decadal average losses
- ❖ It is important to note that in most of Africa, poverty rules out the possibility of insurance

Global costs of extreme weather events (inflation-adjusted)

Annual losses, in thousand million U.S. dollars



SYR - FIGURE 2-7

COST IN AFRICA-2

- ❖ More often than not, the aftermath of a big extreme event leaves many countries in Africa insolvent. Such was the case during the Sahelian Drought in 1968-73. In Ethiopia the 1984 Drought, the very survival of the country was truly tested. Most SSA countries have no reserve finances to weather a bad drought.

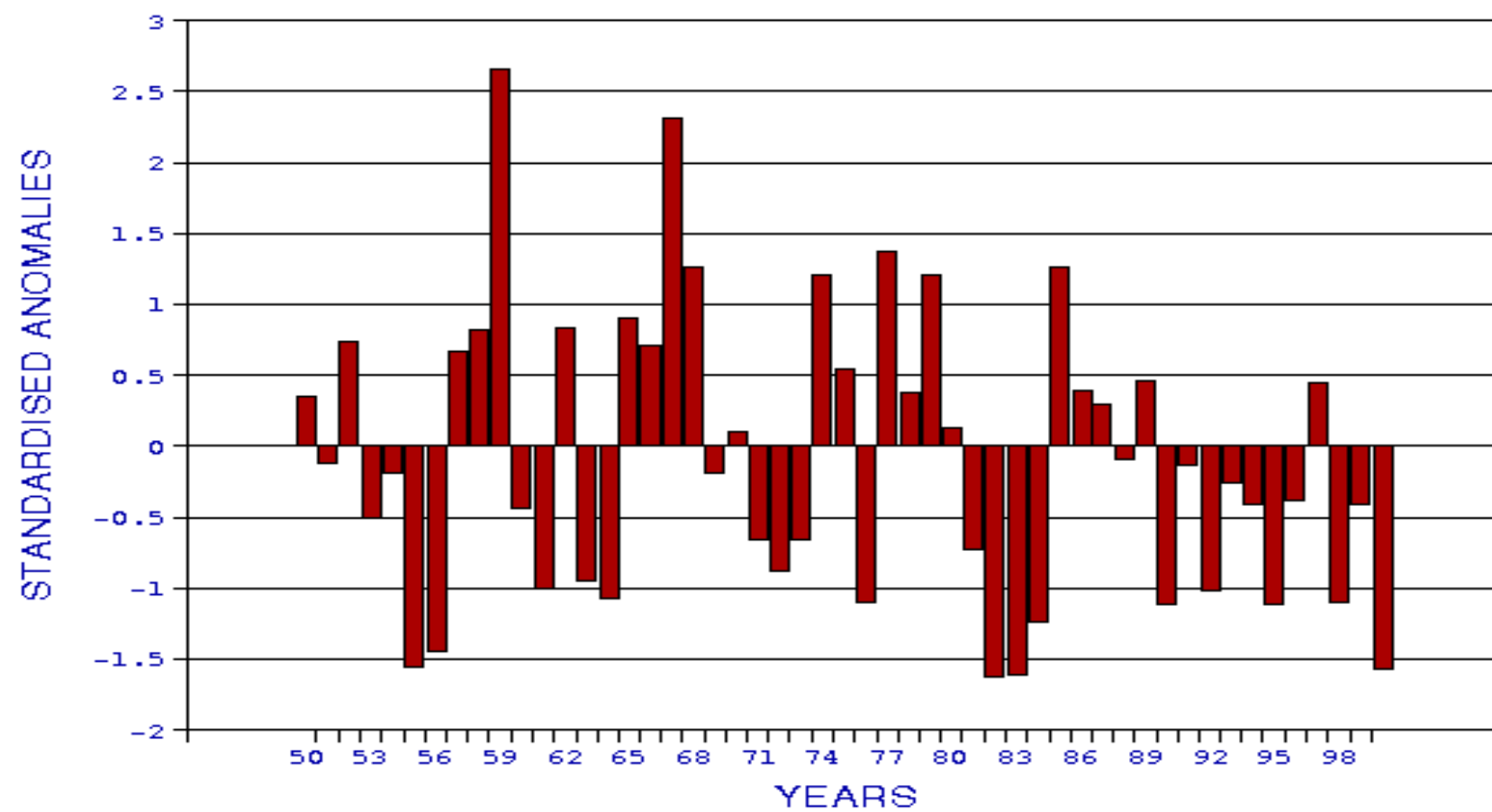
A Summary of Droughts during the Instrumental Record

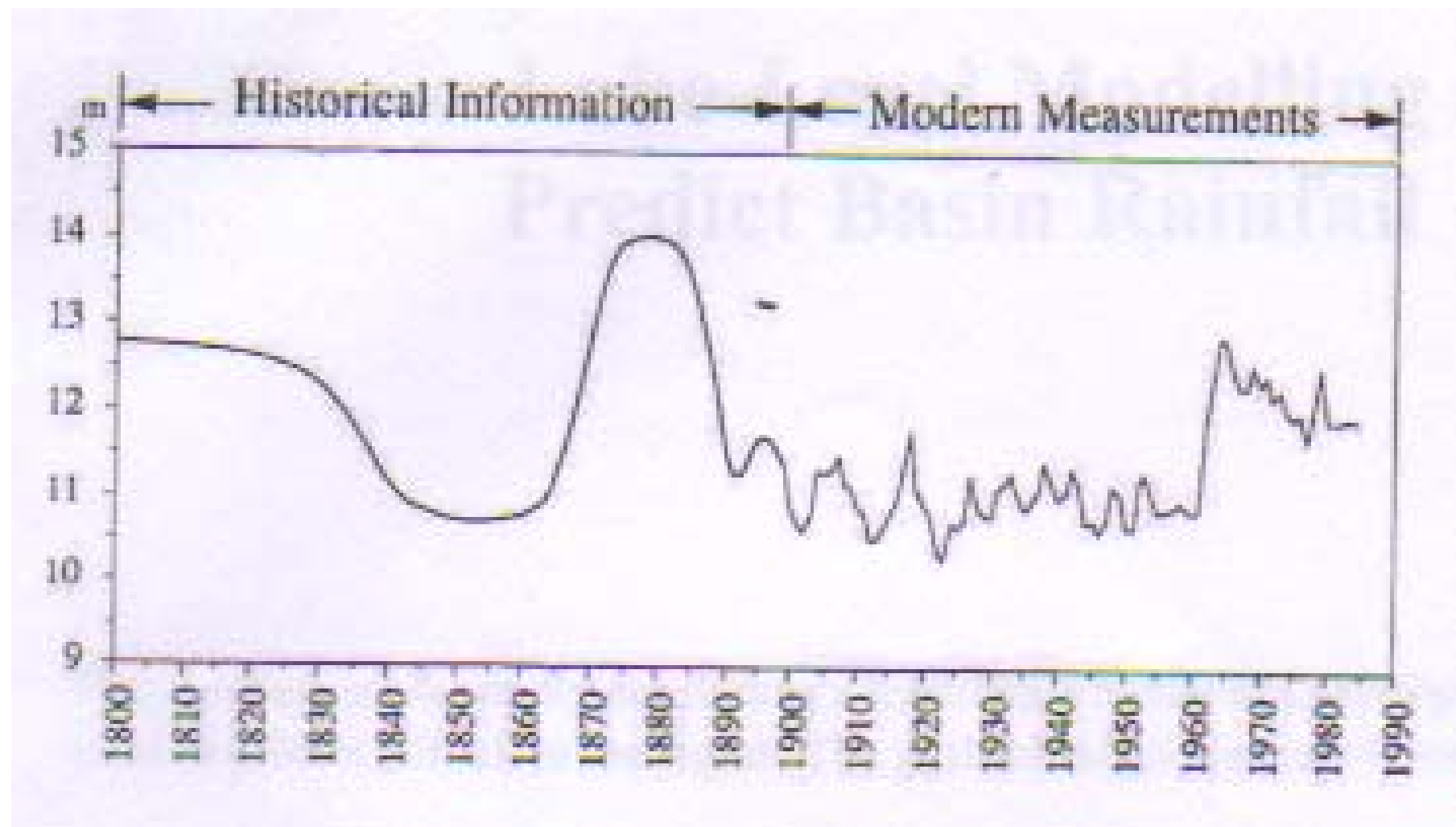
- Drought occurrence in Eastern Africa during the instrumental record is being constantly evaluated
- Comprehensive explanations for drought occurrence must be linked to variations of the global climate system
- Variations in SSTs(Indian Ocean and Atlantic Ocean), ENSO events, and human-induced processes need exploring.

Reconstruction of recent history of Drought

- Sharon Nicholson (1976 and later), as well as the Sahara and the Nile Study by Williams, et al., have confirmed the prevalence of past droughts linked to population movements, as well as the traditional climatic influences
- Verschuren et al (2000), in a study of human impact of Lake Victoria and its surroundings

MAM SEASON
N.W. KENYA





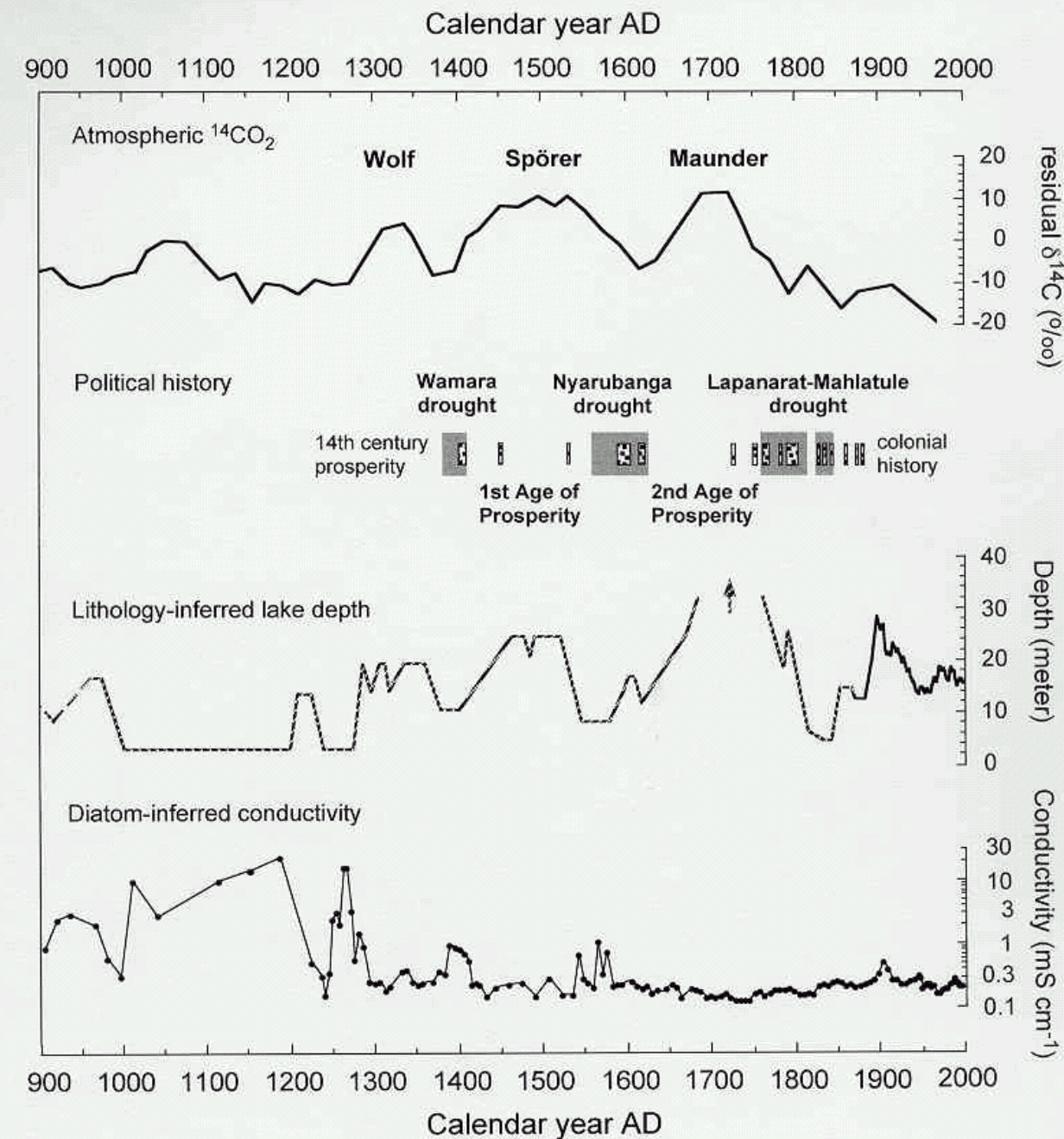
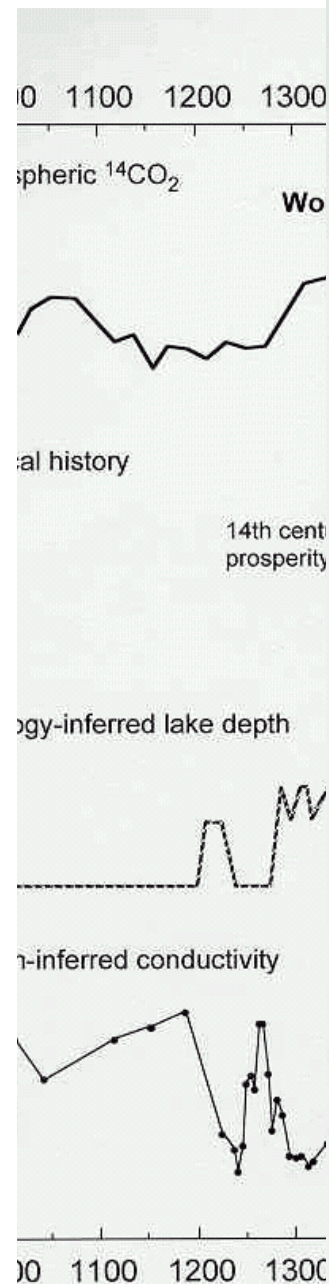
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SOME EXAMPLES OF DROUGHT STUDIES IN EAST AFRICA

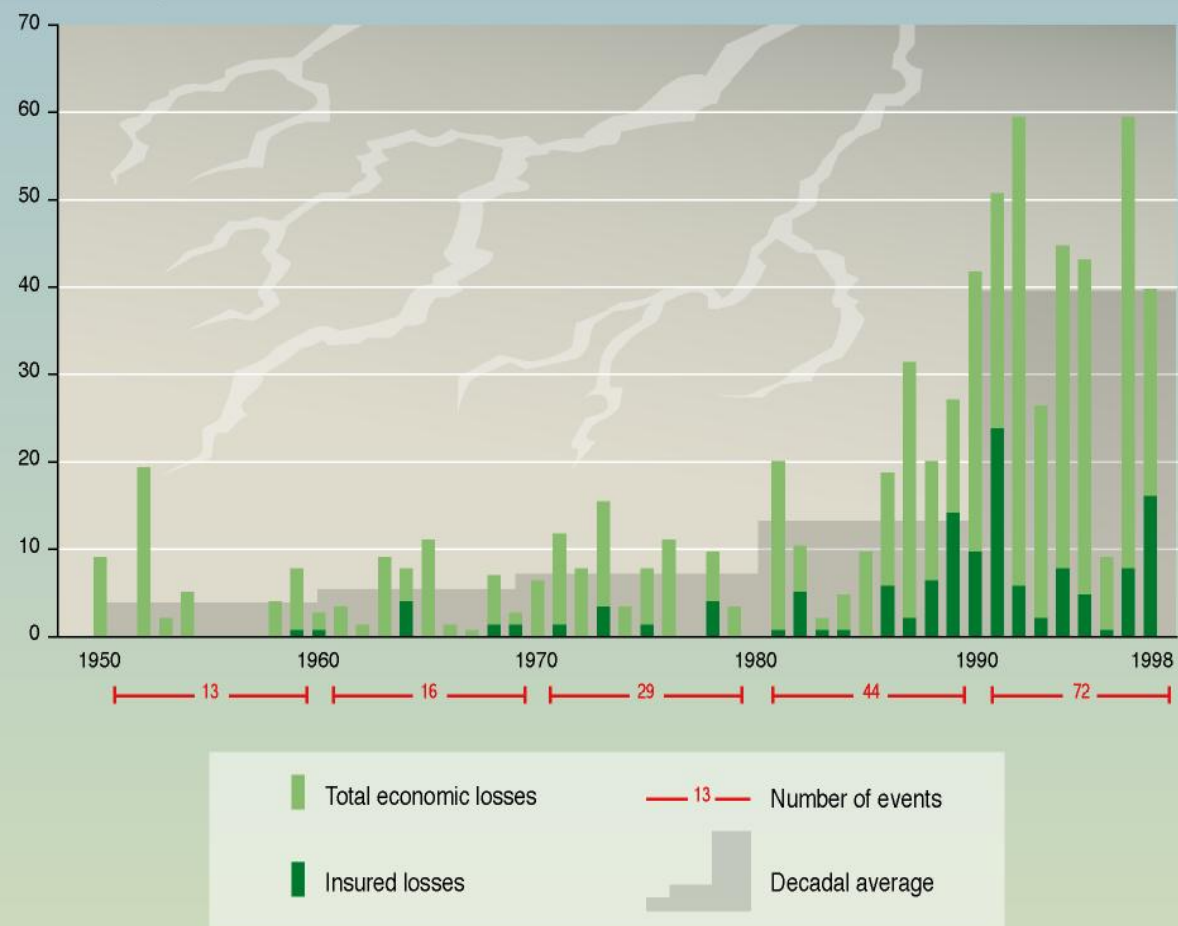
- ❖ There is a wealth of studies of drought occurrence in Eastern Africa from instrumental records, historical records, famine reports, palaeoclimatic records, which speak of the severity of past droughts in the sub-region. A series of graphs have been used to depict the various sources. Unfortunately it was not possible to comment on the degree of damage associated with each episode. But the pattern observed in the Sahel is repeated.

2010 2011 RAINFALL SEASON IN GHA



Global costs of extreme weather events (inflation-adjusted)

Annual losses, in thousand million U.S. dollars



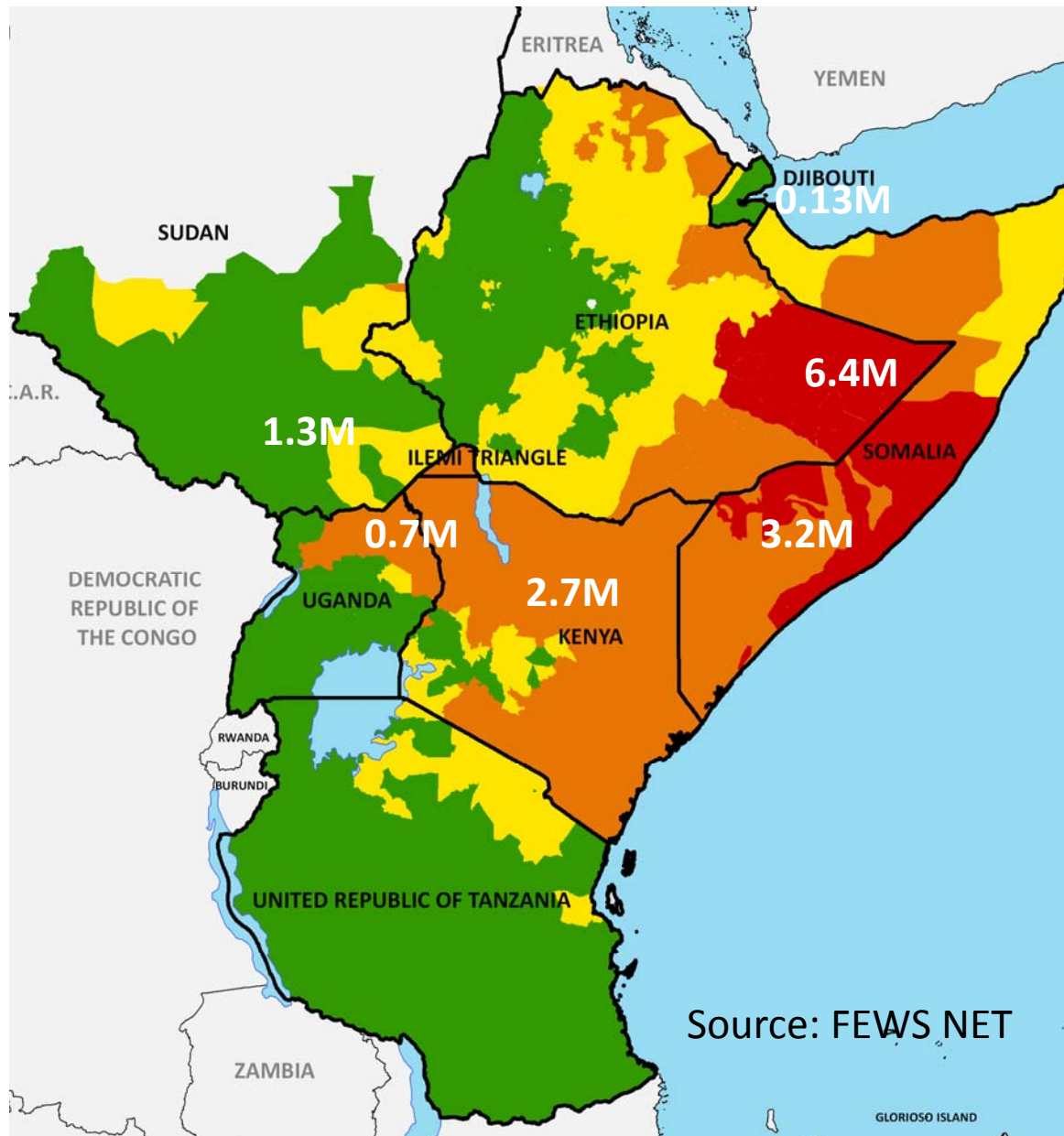
SYR - FIGURE 2-7

DROUGHT EARLY WARNING IN GHA

- ❖ Droughts are the worst most experienced climate risks encountered by communities and Governments in GHA, and the history of GHA is full of bad droughts. In 2010 more than 12million people were found to be at risk from drought-induced famine, and there were many fatalities among the human population. Most of the livestock owned by pastoralists were wiped out. Drought earl warning was abundant and timely. Governments were paralysed

- The presence of early warning while favouring those nations who want to donate food rescue leaves the affected Governments paralysed. It was estimated that from 11-15 million people were without food. The majority of them were in Somalia, a country with no government at the time because of past instability which could partly be blamed on droughts and floods.

Current Food Security Status: Affected Population and Underlying Issues



15 – 16 Million

- Recurrent climate extremes (drought & floods) in marginal areas
- Conflict and civil insecurity
- Transboundary diseases
- Hyperinflation/Market disruption
- Declining Pastoral Terms of Trade
- IDPs and refugees
- Poverty/Malnutrition
- Policies

DROUGHT - loss of livestock



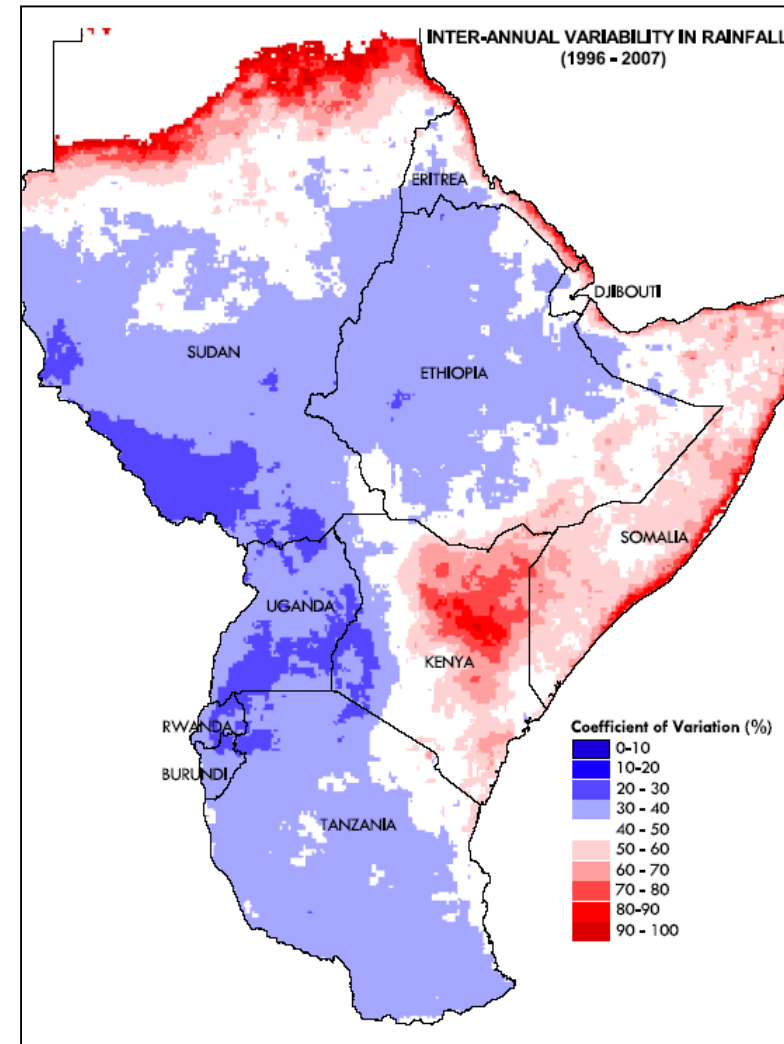
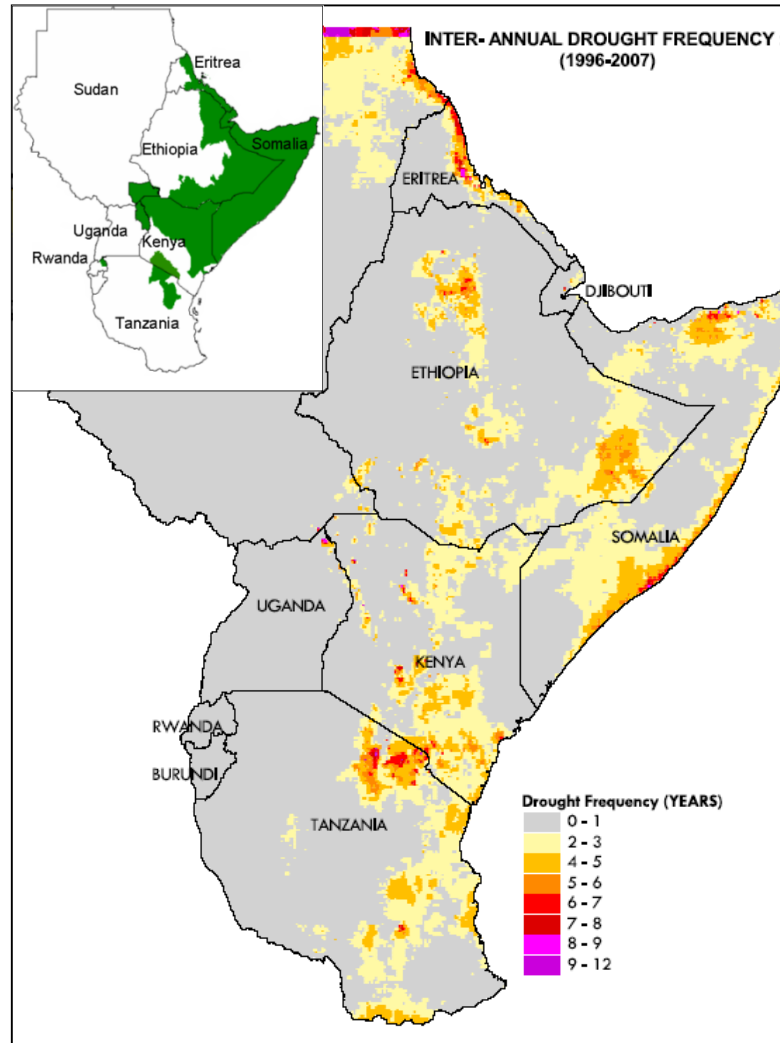
EVER PRESENT CONFLICTS IN SPITE OF EARLY WARNING

- Despite the presence of food early warning provided by FEWSNET, the GHA situation was no better because of climate extremes, conflict and civil insecurity, trans-boundary diseases, hyper-inflation and market disruption, declining pastoral terms of trade, and poverty and malnutrition.
- Early warning and early action are always touted as recommended adaptation practices.

GHA AND SAHEL

- ❖ To all intents and purposes the characteristics associated with the Sahel in West Africa are repeated in the Greater Horn of Africa (GHA) countries. The similarity of the experiences are largely because we are dealing with arid and semi-arid lands. So the same can be said of droughts in Southern Africa.
- ❖ The two accompanying maps from Fewsnets show the extent of arid lands in GHA.

GHA: RECENT CLIMATIC VULNERABILITY



1. Investigated severe inter-annual drought, using a threshold of **“less than 50%”** of long-term average
2. Rainfall variability was computed using the **coefficient of variation** on annual totals (1996-2007)

Recurrent severe droughts and/or high rainfall variability in pastoral & agro-pastoral areas ...