

# Spotlight on Agriculture

Ministry of Agriculture, Water and Rural Development • Directorate of Agricultural Research and Training • Private Bag 13184 • Windhoek

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## El Niño and its effect on Namibia

### INTRODUCTION

El Niño (Spanish name for the male child) initially referred to a weak, warm current appearing annually around Christmas time along the coast of Ecuador and Peru and lasting only a few weeks to a month.

Every three to seven years, an El Niño event may last for many months, having significant economic and atmospheric consequences worldwide. During the past forty years, ten of these major El Niño events have been recorded, the worst of which occurred in 1997/98. Previous to this, the El Niño event in 1982/1983 was the strongest. Some of the El Niño events have persisted more than one year.

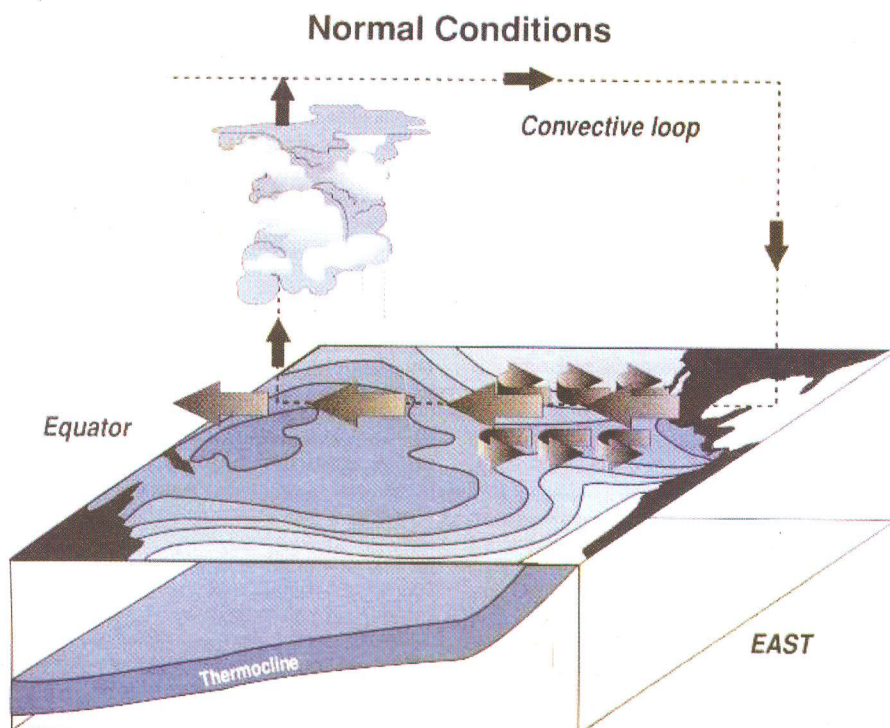
In the tropical Pacific, easterly trade winds generally drive the surface waters westward. The surface water becomes progressively warmer going westward because of its longer exposure to solar heating. El Niño is observed when the easterly trade winds weaken, allowing warmer waters of the western Pacific to migrate eastward and eventually reach the South American Coast. The cool nutrient-rich seawater normally found along the coast of Peru is replaced by warmer water depleted of nutrients, resulting in a dramatic reduction in marine fish and plant life. In contrast to El Niño, La Niña (female child) refers to an anomaly of unusually cold sea surface temperatures found in the eastern tropical Pacific. La Niña occurs roughly half as often as El Niño.

The following figures illustrate the circulation during El Niño and normal years.

### EL NIÑO'S INFLUENCE

Although El Niño has been known for many years, it was not obvious that it affected the weather in large parts of

the globe. The fishermen and inhabitants of the South American west coast knew all too well how it influenced their lives and livelihood. The same could probably be said of the inhabitants of some of the desert islands in the Pacific, which receive copious amounts of rain during El Niño events, but are otherwise rather dry. During an El Niño year, tropical rains usually centered over Indonesia shift eastward, influencing atmospheric wind patterns worldwide. Possible impacts include: a shifting of the jet stream, storm tracks and monsoons, producing unseasonable weather over many regions of the globe. During the El Niño event of 1982 - 1983, some of the abnormal weather patterns observed included: Drought in Southern Africa, Southern India, Sri Lanka, Philippines, Indonesia, Australia, Southern Peru, Western Bolivia, Mexico, Central America. Heavy rain and flooding in Bolivia, Ecuador, Northern Peru, Cuba, U.S. Gulf States.

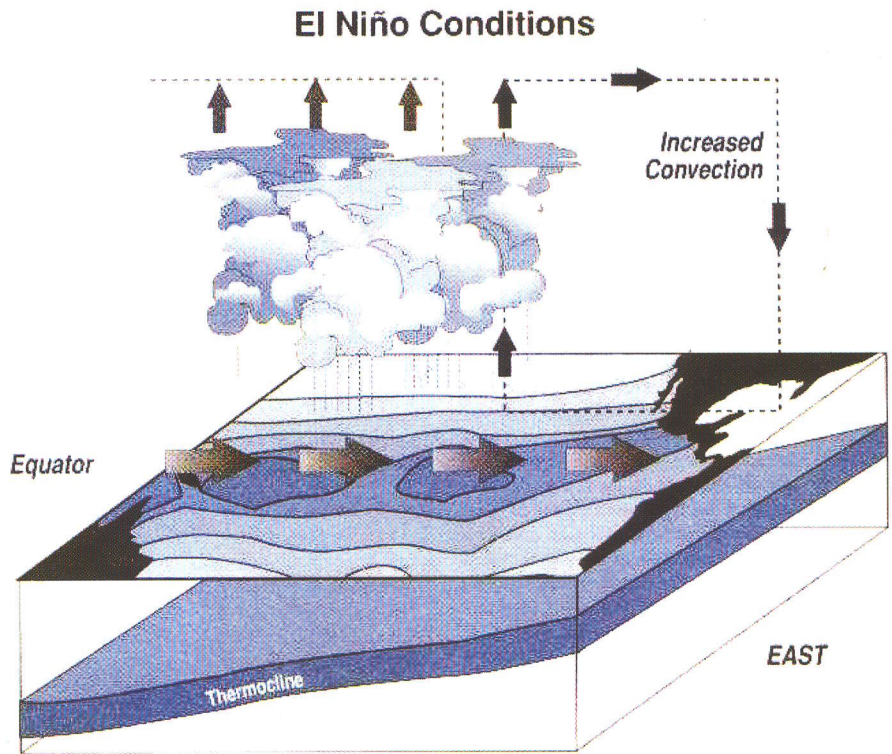




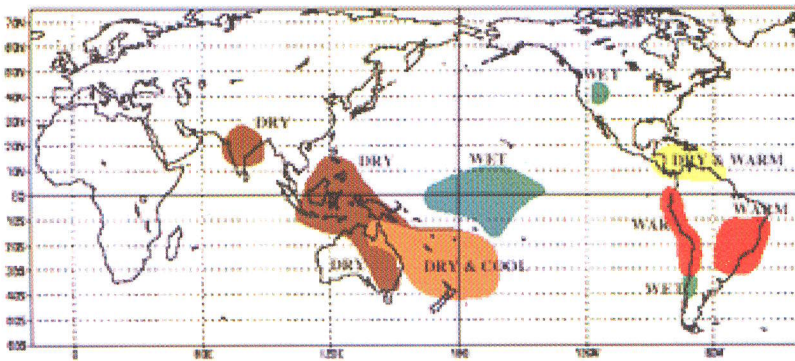
# INFLUENCE OF EL NIÑO ON NAMIBIAN RAINFALL

During a study of Namibian rainfall, the following general observations were made from the influence of the Southern Oscillation Index (SOI), which is the atmospheric index, which characterises El Niño events, on the rainfall of Namibia during the three months following the month with a specific SOI phase. SOI is calculated by taking the deviation of the mean difference in atmospheric pressure between Tahiti in the Pacific ocean and Darwin in Northern Australia.

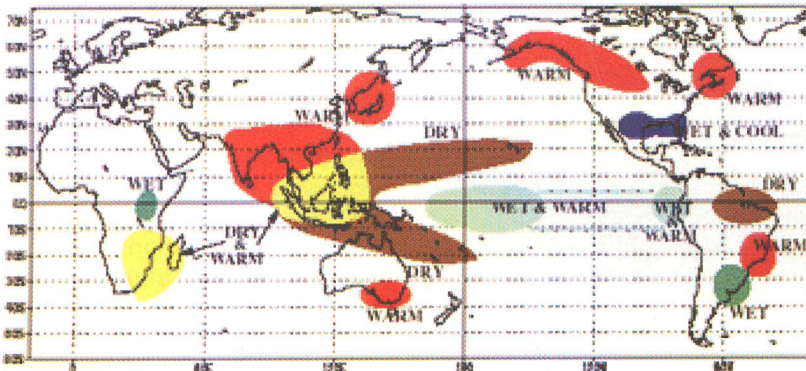
**Phase 1 (El Niño)** – Generally this is a phase where below-normal rainfall can be expected for most of the country, except for some early season positive anomalies in the north-central part (October to December) and middle season anomalies in the north (November to January). These conditions would tend to have a negative



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effect on total seasonal rainfall and sometimes also an early end to the rainfall season.

**Phase 2 (La Niña)** – This seems to have a positive effect on seasonal total rainfall, especially after November and also seems to last until at least April, or even May. Generally the best seasonal total rainfall seems to coincide with La Niña conditions.

**Phase 5 (Normal)** – On the whole, this does not seem to have great positive or negative effects, thus one would expect a “normal” rainfall season.

These are only general conclusions and the science of seasonal forecasting is still in its children’s shoes as many other factors influence seasonal rainfall.

The El Niño phenomenon is an anomaly that occurs on a large scale and affects both the ocean and the atmosphere in the equatorial Pacific. Since the global atmosphere is interconnected, this anomaly can ultimately have an effect on the weather at the opposite side of the globe.