

## El Nino [UPSC Notes]

El Nino is an important phenomenon. In this article, one can understand what an El Nino is, how it occurs due to changes in the surface temperature of the Pacific Ocean off the coast of Peru, its effects in general and its effect in India. This is an important topic from the perspective of the Geography syllabus in the UPSC Exam.

Aspirants would find this article very helpful while preparing for the [IAS Exam](#).

### El Nino - How Does it Occur?

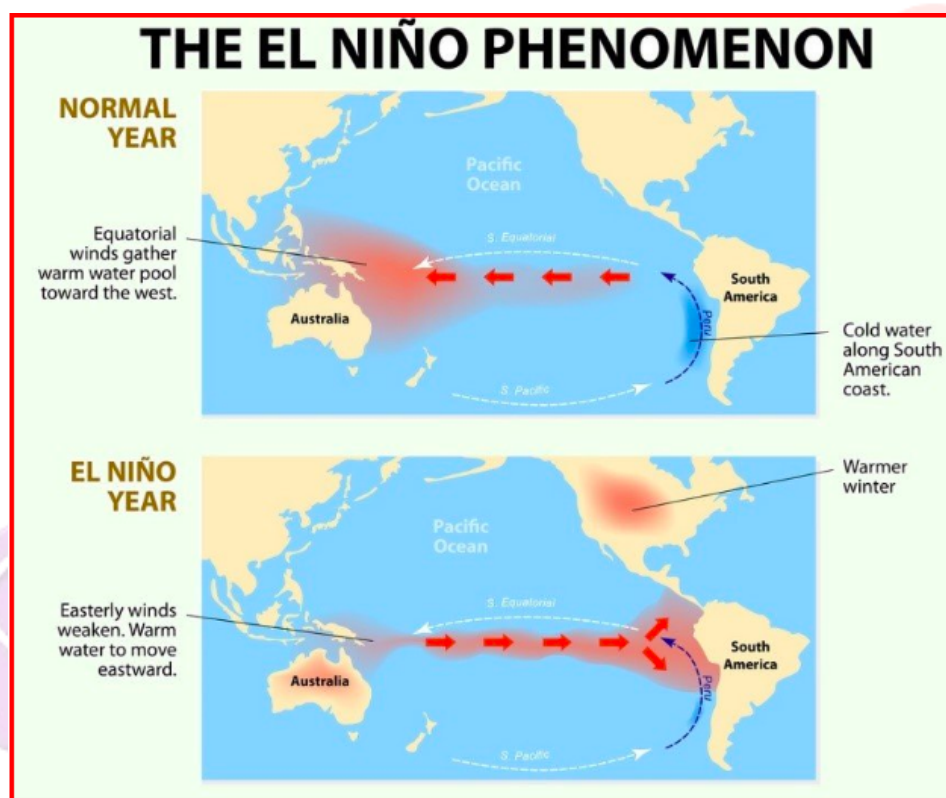


Image source: [www.terraconindia.com](http://www.terraconindia.com)

El Nino can be understood as a natural phenomenon wherein the ocean temperatures rise especially in parts of the Pacific Ocean. It is the nomenclature which is referred to for a periodic development along the coast of Peru. This development is a temporary replacement of the cold current along the coast of Peru. El Nino is a Spanish word. The term El Nino basically means ‘the child’. This is due to the fact that this current starts to flow around Christmas and hence the name referring to baby Christ.

Another natural phenomenon, similar to El Nino is La Nina, which is also in the news these days. The term La Nina literally means ‘little girl’. It is termed as opposite of the phenomenon of El Nino as it

results in the 'cooling' of the ocean water in parts of the Pacific Ocean. Both of them also result in changes in atmospheric conditions along with oceanic changes.

Aspirants can read about [La Nina](#) in detail on the page link provided here.

### **El Nino Southern Oscillation (ENSO)**

It is called El Nino Southern Oscillation. In normal times, when the tropical South Pacific Ocean experiences high pressure, alternatively the tropical Indian Ocean experiences low pressure conditions. However, these pressure conditions are sometimes reversed, and result in low pressure in the Pacific and alternatively high pressure in the Indian Ocean. This is the periodic change in pressure conditions which is referred to as the Southern Oscillation. These changes in the pressure conditions being developed in the Pacific and Indian oceans are connected with the phenomenon of El Nino. This connected phenomenon is referred to as the El Nino Southern Oscillations or the ENSO.

Aspirants can check out the relevant links provided below to prepare comprehensively for the upcoming Civil Services Exams-

### **El Nino - Effects on India**

In a normal monsoon year (without El Nino), the pressure distribution is as follows:

1. The coast of Peru in South America has a higher pressure than the region near northern Australia and South East Asia.
2. The Indian Ocean is warmer than the adjoining oceans and so, has relatively lower pressure. Hence, moisture-laden winds move from near the western Pacific to the Indian Ocean.
3. The pressure on the landmass of India is lower than on the Indian Ocean, and so, the moisture-laden winds move further from the ocean to the lands.

If this normal pressure distribution is affected for some reason, the monsoons are affected.

### **El Nino Effects**

1. El Nino results in the rise of sea surface temperatures
2. It also weakens the trade winds of the affected region
3. In India, Australia, it can bring about drought conditions. This affects crop productivity largely. It has been also observed certain times, that EL Nino may not bring drought but cause heavy rainfall. In both the cases, it causes heavy damage.
4. However, in some other countries, it may result in a complete reversal, i.e., excessive rainfall.

### **Mitigation Of Effects:**

1. Keeping a check on the sea surface temperatures

2. Maintaining sufficient buffer stocks of food grains and ensuring their smooth supply
3. Ensuring relevant support to the farmer community including economic help
4. Alternative ways to be promoted such as the practice of sustainable agriculture

## Measuring El Nino

Scientists, governments, and non-governmental organizations (NGOs) collect data about El Nino using a number of technologies such as scientific buoys.

- A buoy is a type of object that floats in water and is used in the middle of the seas as locators or as warning points for ships. They are generally bright (fluorescent) in colour.
- These buoys measure ocean and air temperatures, currents, winds, and humidity.
- The buoys transmit data daily to researchers and forecasters around the world enabling scientists to more accurately predict El Nino and visualize its development and impact around the globe.

The Oceanic Niño Index (ONI) is used to measure deviations from normal sea surface temperatures. The Oceanic Niño Index is a measure of the departure from normal sea surface temperature in the east-central Pacific Ocean, is the standard means by which each El Nino episode is determined, gauged, and forecast.

- The intensity of El Nino events varies from weak temperature increases (about 4-5° F) with only moderate local effects on weather and climate to very strong increases (14-18° F) associated with worldwide climatic changes.

## How does El Niño Affect Agriculture in India?

The India Meteorological Department (IMD) forecasted a normal monsoon for 2023 in April, with rains expected to be 96% of the long-term average.

- However, it added a rider, which many observers were quick to notice, and rightly so.
- According to the IMD, both its models and those of others predict that "El Nino conditions are likely to develop during the monsoon season."

### Impact on Indian Agriculture:

- **Weak Monsoon for India:** The formation of an El Nino in May or June 2023 may result in a weakening of the southwest monsoon season, which accounts for roughly 70% of total rainfall in India and on which most farmers still rely.
- **Sporadic increase in rainfall:** Sub-seasonal influences, such as the Madden-Julian Oscillation (MJO) and monsoon low-pressure systems, can temporarily increase rainfall in some areas, as shown in 2015.

- **Drought:** Typically, El Nino causes drought. El Nino has previously produced drought or a weak southwest monsoon in the country.
  - A bad monsoon could have an impact on the growth of Kharif crops. Paddy, a water guzzler, groundnuts, and pulses are the crops most likely to suffer from a severe El Nino. Cotton and sugarcane crops may suffer as well.

### Government Response

- **Past pattern:** The IMD may examine prior patterns and identify the areas that might be most vulnerable. States should give farmers consulting services to help them prepare for such challenges and advise them on farming strategies.
- **Price monitoring:** Continuous weather and pricing indications must be delivered in real-time.
  - To be effective, the ban on futures trading in specific farm products such as rice, pulses, and oilseeds must be lifted so that adequate signals may be received.
  - The market is the **best predictor of perceptions**, and futures prices will reflect how much agricultural damage will occur. Otherwise, one must rely on futures prices on global exchanges, which is likely not the best option.
- **Contingency measures:** Furthermore, contingency plans, such as sourcing imports, should be in place to buffer against a possible shortfall in the output of some prime commodities.
  - Finally, the government must ensure that banks are aware of this issue in order to maintain credit flow to farmers.

### Frequently Asked Questions about El Nino

#### Q. How did El Nino get its name?

The phenomenon became known as El Niño because of its tendency to occur around Christmas time. El Niño is Spanish for "the boy child" and is named after the baby Jesus.

#### Q. What are the negative effects of El Nino?

Severe drought and associated food insecurity, flooding, rains, and temperature rises due to El Niño are causing a wide range of health problems, including disease outbreaks, malnutrition, heat stress and respiratory diseases.