

risk, which shows that El Niño is already negatively affecting many countries. An estimated report by the World Food Programme shows that El Niño has negatively affected more than 60 million people.

Developing countries that are extremely dependent on agriculture and fishing are primarily affected by El Niño, because these countries primarily depend on agricultural sources for economic gain. El Niño events have been thought to be occurring for thousands of years; with at least 30 events from the 1900s onwards. However, this anomaly does not have a very set pattern, although a general outline is that it happens every 2 to 7 years with a period of 9 to 24 months.

Definition of Key Terms

El Niño Southern Oscillation (ENSO)

A climate pattern in the Pacific Ocean that describes unusual warming of surface waters, which has impact on weather patterns.

El Niño

“El Niño” refers to the warm phase of ENSO. The El Niño cycle begins in the western Pacific Ocean and shifts towards the east, which warms water pools especially near the south-east Asian area (Indonesia and the Philippines).

La Niña

“La Niña” refers to the cool phase of the El Niño Southern Oscillation. During this period, sea surface temperatures are generally lower by 3-5°C, and has extensive effects on the weather in North America. La Niña often follows El Niño.

Food security

Please use either UK or US spelling throughout the entire report and don't switch between the two. Keep the language formal and **refrain from using “I.”**

Walker circulation

The walker circulation is a conceptual model of the air flow in the tropics in the troposphere (lower atmosphere). This is caused by heat distributions and differences between oceans and land, and named after Gilbert Walker, its discoverer.

Background Information

Areas affected by El Niño

Many areas worldwide have been affected by El Niño. In terms of food security, the land affected by El Niño is often too dry or too wet, which makes it unsuitable for the usual crops that the land may yield. While recently, the El Niño phenomenon has been affecting many areas perversely, there have also been historical impacts in each of these regions. In addition, for each region mentioned, the governments of each specific region have started taking measures to help achieve food sustainability for its citizens. Their actions, while helpful, can be elaborated and improved upon.

Africa

As of June 2016, around 24 million people in the East Africa region are severely affected by food insecurity issues, primarily caused by droughts. A primary country in Eastern Africa that needs attention is Ethiopia, as around 10.2 million people in Ethiopia face the need for emergency food assistance. Many children suffer from malnutrition during the year. In addition, in some areas, there have been enhanced rainfall. This was beneficial for some crop yield in countries such as Kenya and Rwanda, however, in the late 2015, excessive raining led to flooding in areas in Somalia, Kenya, Uganda, and more. Heavy rain affected food safety in not only reducing the amount of crop yields but eliminating them all together. Ethiopia, Somalia, and Sudan are major countries that have been trying to assist their people in eliminating food security by calling for humanitarian aid. However, that has been large funding gaps, and they have not been able to acquire the amounts needed for enough food for the people. Humanitarians in these areas have been focusing on the educational sector, and providing extra water and food to teachers, as students learning have often been discontinued due to the food.

The worst drought that has ever occurred in Southern Africa occurred due to El Niño. This drought exacerbated vulnerabilities that previously existed in developing countries such as Lesotho, Malawi, Swaziland, and Zimbabwe. Recently, there has been highly increased levels of malnutrition in Southern Africa, and difficulty in accessing water. 70% of the population in this area is dependent on agriculture for food, income, and employment, which makes an increase in poverty also expected. Previous economic gains in these developing countries are expected to be cut back, due to the difficulty with agriculture management in South Africa due to El Niño. In addition, in Western and Central Africa, countries such as Chad, Cameroon, and the Democratic Republic of the Congo have been affected by El Niño in 2016. Precipitation has decreased, while temperature can range from a slight increase to a slight decrease.

The Pacific

In the Pacific, countries that have been primarily affected by El Niño are Fiji, Vanuatu, and the Solomon Islands. Of these concerns, the two primary concerns are water shortages and food insecurities. In addition, the cyclones that have been occurring in these regions have negatively affected these islands, with more cyclones expected to occur. In Vanuatu, 90 thousand people are being targeted with food distributions. In contrast, in the Solomon Islands, 70% of crops have been damaged due to the extreme heat. Due to the lack of resources and extreme malnutrition, many countries have been negatively affected through their schools, police stations, and hospitals closing down.

Asia

In Asia, the countries most affected by the El Niño phenomenon are Indonesia, Mongolia, Philippines, and Vietnam, and up to 11 countries in the region. Recent rainfalls, after the ending of the El Niño phase this year, have improved drought conditions. However, there is a prediction of 50% chance that La Niña may occur in these regions, continuing to negatively affect crops and fish. La Niña would likely affect the same regions that El Niño has. Currently, humanitarian assistance has been helpful in these regions, however, actions should be taken to ensure more government readiness in the preparation of La Niña and the next phase of El Niño.

Latin America and the Caribbean

Other countries such as Guatemala, Haiti, and other countries in these regions have been negatively affected by El Niño as well in the instance that there are many droughts occurring. In particular, Peru is has had an extremely negative impact on its agricultural sector. “Communes” have started forming in these areas, and almost 600 thousand people are in need of food in these communes because of sharp food price rises due to lack of food.

Key Issues

Crop yield

Crop yield is severely affected by two different factors. Because El Niño can change the temperature of the surrounding environment either by making it more dry or more wet, this can result in either droughts or floods. Both of these will affect crop yield negatively.

Drought areas

Rain-driven agricultural economies are severely affected by droughts. This can affect agricultural output and construction. In addition, droughts will likely create inflation, especially in the food price sector, and this will make it extremely difficult for families to acquire food. Below-average rain levels for sustained periods of time may not seem to affect crop yield at first, however, when this is observed in a longer-term capacity, this has extreme economic repercussions.

Flood areas

The same consequences happen for flood areas, however, the effect is sort of reversed. Floods will over-hydrate the existing crops. Similar to drought areas, there will be inflation and economic repercussions in agricultural based economies. Areas that have had wildfires recently will find it even more difficult to absorb rainwater, due to charred ground. Flood risk is higher in these areas with less vegetation. In addition, coastal areas are also prone to flooding due to slightly higher sea levels that may be caused by El Niño. Floods can not only affect agriculture, but infrastructure and people as well.

Fishing

Plankton and fish

Plankton is affected by El Niño because cold water brings up nutrients that usually lie near the bottom of oceans. Plankton, which depend on these nutrients, are then deprived of these nutrients, making them unable to grow. Then, fish that usually depend on plankton for food do not get their nutrients as well. This, in turn, reduces the population of fish, as they either die or migrate to other areas where they can find more food. Because many fish may die, this severely affects the entire ecosystem of the ocean, which can affect fishing as overfishing may limit the resources of the commons.

Migration of fish

In addition, fish will likely migrate to other locations due to the strange temperatures that occur from El Niño. For example, in California, fishes that are usually found near the coast will migrate closer to Mexico. In addition, some other fishes may travel further to the North, and game fish may follow because they need these small fish as sources of food.

Major Parties Involved and Their Views

Food and Agriculture Organization of the United Nations (FAO)

The Food and Agriculture Organization regards El Niño as a dominant issue that needs to be addressed. Currently, it is implementing early actions such as assisting governments and providing support through drought mitigation and other means. Currently, it is also developing a 'disaster risk program' that helps aid countries in food security and nutrition before any disasters hit.

World Food Programme (WFP)

The World Food Programme has acted similarly to the FAO in response to the El Niño disaster, and believes that the primary sustainable development goal that El Niño is related to is the goal on "zero hunger." WFP's response is built up of two parts: rapid relief and long term resilience. WFP is mostly working with governments and providing emergency food.

World Meteorological Organization (WMO)

The World Meteorological Organization, which focuses on weather, climate, and water, is the primary reporting organization on the whereabouts and effects of El Niño. WMO acts as a reporting organization, and can distribute information to humanitarians or other organizations that can further aid these countries.

United Nations Office for Disaster Risk Reduction (UNISDR)

El Niño is being treated as a high risk disaster. Although the current oscillation has ended, El Niño has irregular intervals which means the timing of it cannot be perfectly estimated, but the UNISDR is working to help improve these conditions.

International Research Centre on El Niño

The International Research Centre on El Niño, located in Guayaquil, Ecuador is developing a climatic database on El Niño sensitive countries, that conducts applied research on climate change and vulnerability assessment for a variety of factors.

Timeline of Relevant Resolutions, Treaties and Events

The most recent El Niño phase occurred during the late 2015-2016 period. During this period, many countries were severely affected and humanitarians were rushing to provide aid and relief. Now that the El Niño period has passed, these countries aren't struggling as much, but the effects have long

outlasted the cycle itself. In addition, countries may need to prepare for the next oscillation period, or the La Niña phase, as the next phase is expected to occur soon.

Date	Description of event
May 29, 2013	<p data-bbox="432 383 1203 418">FAO Organizes a Knowledge and Flavor Exchange Fair</p> <p data-bbox="432 472 1473 658">During the Flavor Exchange Fair, communities in the surrounding regions came together to share their experiences. New vegetable seed varieties were introduced to improve crop production yields, as learned from the example of the small village Cocalito where agriculture is the main livelihood activity.</p>
August 21, 2015	<p data-bbox="432 712 979 748">El Niño Significantly Damages Somalia</p> <p data-bbox="432 801 1473 987">In August, 2015, Somalia received significant increases in rain level. This damage was equivalent to some of the damage before that caused the 2011 famine. More people have been classified as food insecure and agricultural production has decreased significantly.</p>
October 19, 2015	<p data-bbox="432 1041 1139 1077">UN Agencies Respond to Growing Food Insecurity</p> <p data-bbox="432 1131 1473 1368">In Southern Africa, the WFP and the FAO worked hard to provide relief for food insecurity. The WFP and the FAO built resilience through climate smart technologies for livestock and crop production, as well as increased general resilience among countries. There are also cash and food-for-work established projects developed by the WFP and the FAO.</p>
January 15, 2016	<p data-bbox="432 1422 1050 1458">FAO Presents a \$50 Million Emergency Plan</p> <p data-bbox="432 1512 1473 1646">This emergency response plan was initiated by the FAO to provide rapid response to protect livestock and rebuild crop production in the Horn of Africa region.</p>

Relevant UN Treaties and Events

- International cooperation to reduce the impact of El Niño phenomenon (**A/RES/69/218**)
- Resolutions and Decisions of the Economic and Social Council on the El Niño phenomenon [**E/2000/99(SUPP)**]
- Natural disasters and vulnerability (**A/RES/63/217**)

- Implementation of the International Strategy for Disaster Reduction (A/70/282)

Evaluation of Previous Attempts to Resolve the Issue

Initiatives have been developed by multiple organizations to help deal with this issue. One example is the R4 Rural Resilience Initiative, developed by the WFP and Oxfam America, which aspires to help rural households pay for crop insurance. This builds long-term resilience for those citizens affected by El Niño, as if their crops fail they will have a backup economic plan to turn to. This initiative has also helped provide payouts to struggling families in Ethiopia and Senegal.

FoodSECuRE, or the Food Security Climate Resilience Facility, is an initiative that starts funding for countries before a disaster occurs. Funding is allocated to strengthen existing and developing nutritional programs. Africa Risk Capacity (ARC) is a program that aims to develop responses for droughts and food security crises, as well as the capacity to manage disaster risks in general. Other digital technologies have been deployed in an attempt to track and market prices of food in these countries. This helps inform for more targeted and known responses.

Possible Solutions

The strongly proposed solution, currently, is a combination of **rapid relief** and **long-term resilience**. While previous attempts and initiatives can be improved upon, these strategies can be further developed using different mediums.

Rapid relief primarily refers to providing food and support for those countries that have recently been severely affected by El Niño. This may be in the form of monetary support, or perhaps directly donating food to these countries. In contrast, long term resilience is more directed at a long-term approach that will encompass not only the countries that have been affected by El Niño but also countries that could be affected. Long term resilience can be measures taken to help prevent disasters, or insurance that helps repay these populations and citizens directly after they have suffered through an economic deficit.

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