

Lesson Plan: The Locust Plague, Food Insecurity, and Climate Change

As a **High School** or **Undergraduate** teacher in **Environmental Sciences**, **Social Sciences**, or **Agricultural Sciences**, you can use this lesson plan to teach your students about the desert locust outbreaks of 2019-2020, how it may be causing food insecurity in some countries, and the link between the current locust outbreak with unusual weather and climate conditions.

Massive locust swarms, sometimes as large as the size of cities, have caused widespread damage to crops in parts of East Africa, South Asia, and the Arabian peninsula since October 2019 leading to a potential food crisis in some nations. The situation is further exacerbated as relief measures are hampered due to the ongoing COVID-19 pandemic. It is thought that unusually wet and warmer weather conditions driven by climate change caused favorable breeding conditions for the locusts. According to the UN secretary general, António Guterres, “There is a link between climate change and the unprecedented locust crisis plaguing Ethiopia and East Africa. Warmer seas mean more cyclones generating the perfect breeding ground for locusts.”

This lesson plan provides teaching resources to introduce the desert locust plague of 2019-20 and how it is causing a potential food crisis in some countries such as Kenya, Ethiopia, Somalia, and Yemen. It focuses on how unusual weather conditions caused by the Indian Ocean Dipole could have led to favorable conditions for the locust breeding and that future locust outbreaks could become more common in a warmer world.

Thus, the use of this lesson plan allows you to integrate the teaching of a climate science topic with a topic in **Environmental Sciences**, **Social Sciences**, or **Agricultural Sciences**.

Use this lesson plan to help your students find answers to:

- What is a desert locust? How big are locust swarms?
- What countries are affected by the locust plague of 2019-20?
- How is the locust plague causing food insecurity in some countries?
- What weather conditions are favorable for locust breeding?
- How has climate change affected weather patterns in East Africa?

- Is climate change responsible for the current locust outbreak?

About the Lesson Plan

Grade Level: High School, Undergraduate

Discipline: Environmental Sciences, Social Sciences, Agricultural Sciences

Topic(s) in Discipline: Locust Plague, Desert Locust, Food Security, Agriculture, Climate Change and Food Security

Climate Topic: Introduction to Climate Change, Climate and the Biosphere

Location: Africa, Asia, Kenya, Ethiopia, Somalia, Yemen, India, Pakistan

Access: Online

Language(s): English

Approximate Time Required: 60 min

1 Contents

1. Reading (10 min)

A reading on desert locusts and locust plagues from the Desert Locust Information Service of the Food and Agricultural Organization (FAO).

This can be accessed at:

<http://www.fao.org/ag/locusts/oldsite/LOCFAQ.htm>

2. Reading (15 min)

A reading on food security and the countries that experienced potential food shortages due to the locust swarms of the World Resources Institute (WRI). This reading is titled 'Which Countries Are Most Vulnerable to Locust Swarms?' by Tina Huang.

This can be accessed at:

<https://www.wri.org/blog/2020/05/coronavirus-locusts-food-insecurity>

3. Readings (30 min)

Two readings on how the current locust plague is potentially linked to climate change.

Reading 1: 'A plague of locusts has descended on East Africa. Climate change may be to blame' by Madeleine Stone for the National Geographic:

This can be accessed at:

<https://www.nationalgeographic.com/science/2020/02/locust-plague-climate-science-east-africa/>

and

Reading 2: 'Are the 2019-20 locust swarms linked to climate change?' by Daisy Dunne at CarbonBrief.

This can be accessed at:

<https://www.carbonbrief.org/qa-are-the-2019-20-locust-swarms-linked-to-climate-change>

4. Video (4 min)

Optional: A video on the Indian Ocean Dipole which affects the weather patterns in East Africa to West Australia by Prof Tracey Rogers, UNSW, Sydney.

This can be accessed at:

https://www.youtube.com/watch?v=3Dk1r_lid18

5. Suggested questions/assignments for learning evaluation

- What is a desert locust? How big are locust swarms?
- What countries are affected by the locust plague of 2019-20?
- How is the locust plague causing food insecurity in some countries?
- What weather conditions are favorable for locust breeding?
- How has climate change affected weather patterns in East Africa?
- Is climate change responsible for the current locust outbreak?

2 Step-by-step User Guide

Here is a step-by-step guide to using this lesson plan in the classroom/laboratory. We have suggested these steps as a possible plan of action. You may customize the lesson plan according to your preferences and requirements.

1. Introduce the topic of locusts

Introduce your students to desert locusts and locust plagues using a reading from the Desert Locust Information Service of the Food and Agricultural Organization (FAO).

This resource can be accessed at

<http://www.fao.org/ag/locusts/oldsite/LOCFAQ.htm>

Use the Frequently Asked Questions section and direct your students to read the following short sections.

- What is a Desert Locust?
- What countries are affected by the Desert Locust?
- Do Desert Locust plagues occur with any regularity?
- How long does a Desert Locust live?
- How many eggs does a Desert Locust female produce?
- How far and how fast can Desert Locusts migrate?
- How big are swarms and how many locusts are there in a swarm?
- What percentage of the Desert Locust's exoskeleton is chitin?
- How much food can a Desert Locust eat?
- What is the relationship between locusts and ecology?
- Why do locusts change their behaviour?

2. The Locust Outbreak and Food Insecurity

Introduce the topic of food security and the countries that experienced potential food shortages due to the locust swarms through an interactive reading of the World Resources Institute (WRI) titled 'Which Countries Are Most Vulnerable to Locust Swarms?' by Tina Huang.

This resource can be accessed at:

<https://www.wri.org/blog/2020/05/coronavirus-locusts-food-insecurity>

Discuss with your students which countries are hotspots of locust activity in the Horn of Africa, the Arabian Peninsula and South Asia and how the locust swarms are causing potential food insecurity there. The resource includes datasets and visualizations of vulnerable countries from the World Food Programme, real-time data on locust outbreaks, Famine Early Warning Systems Network, WRI's Resource Watch platform, amongst others.

3. Climate Change and the Locust Plague

Next discuss with your students how the current locust plague is potentially linked to climate change through two readings.

Reading 1: 'A plague of locusts has descended on East Africa. Climate change may be to blame' by Madeleine Stone for the National Geographic: <https://www.nationalgeographic.com/science/2020/02/locust-plague-climate-science-east-africa/>

and

Reading 2: 'Are the 2019-20 locust swarms linked to climate change?' by Daisy Dunne at CarbonBrief:

<https://www.carbonbrief.org/qa-are-the-2019-20-locust-swarms-linked-to-climate-change>

Explain to your students how there was an unusually wet weather in East Africa over the last year or so. This included several cyclones which are rare in the region. This wet weather and storminess is thought to have caused favorable conditions for the locust breeding. Further explain to the students how the wet weather and storminess is related to the Indian Ocean Dipole system. It has been hypothesized that climate change may be affecting the Indian Ocean Dipole.

Further discuss with your students how future locust outbreaks could become more common in a warmer world.

4. Optional: The Indian Ocean Dipole

Optional: You may choose to emphasize the Indian Ocean Dipole, a climate system that impacts the weather from East Africa to West Australia using this short video by Prof Tracey Rogers, UNSW, Sydney.

This resource can be accessed at

https://www.youtube.com/watch?v=3Dk1r_lid18

5. Questions/Assignments

Use the tools and the concepts learned so far to discuss and determine answers to the following questions:

- What is a desert locust? How big are locust swarms?
- What countries are affected by the locust plague of 2019-20?
- How is the locust plague causing food insecurity in some countries?
- What weather conditions are favorable for locust breeding?
- How has climate change affected weather patterns in East Africa?
- Is climate change responsible for the current locust outbreak?

3 Learning Outcomes

The tools in this lesson plan will enable students to:

- learn about desert locusts and the locust plague of 2019-20

- understand how the locust plague is causing food insecurity in several countries
- understand how climate change is causing a change in weather patterns potentially responsible for the breeding of locusts
- discuss climate change and how it is affecting food security

4 Additional Resources

If you or your students would like to explore the topic further, these additional resources will be useful.

1. Video; 'United Nations explains the mystery of desert locusts in Eastern Africa'

'United Nations explains the mystery of desert locusts in Eastern Africa', KTN News.

This can be accessed at:

<https://www.youtube.com/watch?v=TKHsO4jXgX4>

2. Video; 'Desert Locust in Kenya - Impact on Pastoralists in Turkana County'

'Desert Locust in Kenya - Impact on Pastoralists in Turkana County' by Food and Agriculture Organization (FAO).

This can be accessed at:

<https://www.youtube.com/watch?v=aXnXPtDeDdc>

3. Video; 'Billions of locusts threaten food security in East Africa'

'Billions of locusts threaten food security in East Africa' by DW News.

This can be accessed at:

<https://www.youtube.com/watch?v=a4KEUoeZ0fU>

4. Video; 'Locust swarm threatens Somalia food crisis'

'Locust swarm threatens Somalia food crisis' by AP Archive.

This can be accessed at:

<https://www.youtube.com/watch?v=AoclW68b0mM>

5 Credits/Copyrights

All the teaching tools in our collated list are owned by the corresponding creators/authors/organizations as listed on their websites. Please view the individual copyright and ownership details for each tool by following the individual links provided. We have selected and analyzed the tools that align with the overall objective of our project and have provided the corresponding links. We do not claim ownership of or responsibility/liability for any of the listed tools.

1. Webpage: FAQs

[Desert Locust Information Service, Food and Agricultural Organization \(FAO\).](#)

2. Reading: 'Which Countries Are Most Vulnerable to Locust Swarms?'

By Tina Huang for the [World Resources Institute \(WRI\)](#).

3. Reading: 'A plague of locusts has descended on East Africa. Climate change may be to blame'

By Madeleine Stone for the [National Geographic](#).

4. Reading: 'Are the 2019-20 locust swarms linked to climate change?'

By Daisy Dunne at [CarbonBrief](#).

5. Video; 'The Indian Ocean Dipole and its impacts'

[Dr Tracey Rogers](#), University of New South Wales, Sydney.

6. Additional Resources

[KTN News](#)

[FAO](#)

[DW News](#)

[AP Archive](#)