

# Agriculture Impacts: Agroecosystems

by Sophia



## WHAT'S COVERED

In this lesson, we will discuss several negative environmental impacts that result from agricultural practices, in addition to the impacts of agroecosystems and their practice of monoculture. Lastly, we will understand the practices that are employed to mitigate these problems. Specifically, this lesson will cover the following:

## 1. Impacts of Agriculture on the Environment

At the time of making this tutorial, nearly half of our planet is used for agriculture. The following are some of the many negative environmental impacts that result from agricultural practices:

- **Water pollution:** Mainstream agriculture employs the use of synthetic fertilizers and pesticides. These chemicals are not inert and lead to chemical runoff into water systems, causing water pollution.
- **Loss of biodiversity:** Most agricultural land was once a natural ecosystem. The changing of previously undeveloped land destroys habitat and threatens wildlife. As a result, there is a loss of biodiversity while there is an increase in agricultural land.
- **Soil erosion:** Mainstream agricultural practices commonly cause soil erosion. Over time, this depletes nutrients and topsoil available for growing crops.
- **Deforestation:** It is common for forest land to be razed for agricultural use, and this practice is reducing wildlife habitat and total forest area globally.

---

## 2. Agroecosystems

As more land gets transformed for agricultural use, we are changing natural ecosystems into agroecosystems. Agroecosystems tend to have low genetic diversity, low species diversity, and low habitat diversity. All three are problematic for a stable, healthy ecosystem.

Agroecosystems tend to have low diversity because they are designed to control a small number of species in a given area for human use, whereas natural ecosystems allow for a larger diversity of species to have progression and succession over time.

---

## 3. Monoculture

In order to have the highest amount of efficiency and control, most agriculture tends to practice monoculture, which is the cultivation of a single crop, like the corn crop shown below.



Monoculture can cause a number of issues including the following:

- Reduction of soil nutrients: Because only one type of crop is grown on a plot of land, there is an increased need for fertilizer, which leads to the depletion of the same type of nutrients that the crop needs to grow.
- Pest adaptation to a single crop species: Because there is no crop diversity, local pests can adapt to decimate whole fields, which then increases the need for pesticides.
- Degradation in water quality: Because there is an increased need for both fertilizer and pesticides, chemical runoff increases, polluting water systems and damaging aquatic ecosystems, all of which eventually harms human health.

---

## 4. Addressing Negative Impacts of Agriculture

Luckily, there are ways to mitigate and transform these negative environmental impacts. Organizations and government institutions can provide information on methods, and they can subsidize technologies to mitigate impacts.

The following are three primary methods of transforming the negative impacts:

- Organic agriculture
- Sustainable agriculture



- Regenerative agriculture

Organic agriculture seeks to avoid synthetic compounds, using more natural sources and methodologies instead. These methodologies include crop rotation, composting, and natural pesticides and fertilizers. In this photo, an organic cattle farm in Ohio is pasture-raising cows instead of giving them processed feed.



Sustainable agricultural methods seek to prevent negative impacts through practices like composting and no-till farming. These methods involve the natural cycles around them instead of degrading resources. For instance, the farm shown below composts its waste and reuses it to grow food instead of using chemical fertilizers.



Regenerative agriculture's main goal is to improve the resources in the surrounding ecosystems. This is primarily done by creating and replenishing soil and its nutrients. In the photo below, you can see topsoil being slowly recreated with leaves and other organic materials.



## SUMMARY

In this lesson, we learned about the various **impacts of agriculture on the environment**, such as water pollution from chemical runoff, the loss of biodiversity in land developed for agriculture, soil erosion, and deforestation. We learned about **agroecosystems** and the negative impacts of practices like **monoculture**, or the cultivation of a single crop. Finally, we explored ways to **address the negative impacts** through practices like organic, sustainable, and regenerative agriculture.

Source: THIS TUTORIAL WAS AUTHORED BY JENSEN MORGAN FOR SOPHIA LEARNING. PLEASE SEE OUR [TERMS OF USE](#).



## ATTRIBUTIONS

- [Hybrid corn](#) | Author: Lindsay Eyink | License: Creative Commons Attribution 2.0 Generic
- [Cattle](#) | Author: U.S. Department of Agriculture | License: Creative Commons Attribution 2.0 Generic
- [Compost mound](#) | Author: Red58bill | License: Creative Commons Attribution-Share Alike 3.0 Unported
- [Compost](#) | Author: Unknown | License: Public Domain