

**Compelling Question Was the Agricultural Revolution Good for Humanity?**

*Provide simple student-centered instructions Read the following documents and write down evidence either proving or disproving the compelling question.*

**Inquiry**

*Below are differing documents in favor and against ...*

1. As you read, record sentences or ideas that show...
2. After you finish the two middle columns, look back at the evidence. Which information is most persuasive to you? Mark that #8. Which evidence is least persuasive to you? Mark that #1.

Rank	Evidence	Evidence	Rank
	<a href="https://bettermeetsreality.com/the-potential-negative-effects-of-agriculture-on-humans-health-society-economy/#:~:text=A%20potential%20negative%20effect%20of%20agriculture%20on%20the,up%20or%20treat%20water%20polluted%20by%20agricultural%20chemicals">https://bettermeetsreality.com/the-potential-negative-effects-of-agriculture-on-humans-health-society-economy/#:~:text=A%20potential%20negative%20effect%20of%20agriculture%20on%20the,up%20or%20treat%20water%20polluted%20by%20agricultural%20chemicals</a>	<a href="http://anthropology.iresearchnet.com/agricultural-revolution/#:~:text=Socioeconomic%20Implications%20of%20the%20Agricultural%20Revolution%201%20Transition,Origin%2C%20Prestige%20Economy%20...%204%20Demographic%20Revolution%20">http://anthropology.iresearchnet.com/agricultural-revolution/#:~:text=Socioeconomic%20Implications%20of%20the%20Agricultural%20Revolution%201%20Transition,Origin%2C%20Prestige%20Economy%20...%204%20Demographic%20Revolution%20</a>	

*Questions for Analysis*

1. Add up the rank on each side. Which side weighed more? Why do you think it worked out that way?

2. In conclusion, *Was the Agricultural Revolution Good for Humanity?*



**Document A: Title**

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The Potential Negative Effects Of Agriculture On Humans, Health, Society & The Economy

November 19, 2021 January 22, 2019 by Better Meets Reality

Agriculture has a number of positive effects on society.

Employment and income, and food production are just a few things agriculture provides

However, in this guide, we list some of the potential negative effects of the agriculture on humans, human health, society and the economy.

Summary – Potential Negative Effects Of Agriculture On Humans, Health, Society & The Economy

There's several ways agriculture might impact human health, although much of it can depend on how agriculture is regulated/managed in a specific region/country.

There can be farm level occupational health and safety hazards, such as exposure to agricultural chemicals like pesticides (which can be breathed in), and the potential injury by heavy machinery.

There can also be other potential hazards like hearing loss from repeated exposure to louder sounds.

Some of these effects might be worse in countries or regions with less focus on workplace health and safety.

At the consumer level, people may be exposed to pesticide residue on different types of food, although there might be debate on whether the exposure levels to this pesticide residue are high enough to be a significant risk to health.

There's also potential for viruses/diseases to be transmitted that originate in livestock and animals.

In addition to viruses, bacteria and pathogens can be spread from the farm.

Heavy metals and antibiotics may be other substances and chemicals that spread from the farm.

There's potential for agriculture to contaminate or change the water quality in some instances (with agricultural chemicals like pesticides, animal manure, other chemicals and waste, and bacteria, pathogens and antibiotics), but whether or not it impacts humans depends on the level of water treatment before humans are exposed to it, or consume it.

The use of GMOs in agriculture is something that might be debated in terms of the impact they have on human health over the long term.

The use of hormones in livestock is another technology that may be debated.

In some countries, the quality of nutrition, and nutritional diversity being made available to consumers for their diet may also impact the health of the population

- Society

Agriculture can contribute to problems relating to water scarcity, which can cause problems in other areas of society, where water is used widely.

- Economy

A potential negative effect of agriculture on the economy could be the economic cost to address environmental problems that agriculture contributes to e.g. the cost to clean up or treat water polluted by agricultural chemicals

Another might be the subsidies required to support different agricultural products in different countries (as there are tax dollars that go towards these subsidies)

Another might be the opportunity cost of investing finances and resources towards inefficient forms of agriculture, that could be directed towards more efficient forms of production.

Another might be the economic impact pesticides can have on wildlife, or even the indirect economic impact that using certain fish species for livestock feed might have.

### Agriculture Impacts Many Different Aspects Of Society

Agriculture impacts many areas of society overall, such as:

- Soil, water, and air
- Animals, plants, and wild living organisms
- Humans
- Our food supply itself

... agriculture itself is even impacted upon by factors such as a changing climate, population growth, and technological advances.

### Potential Negative Effects Of Agriculture On Human Health

A few of the ways agriculture may negatively impact human health might be:

- At the farm level with occupational health and safety hazards and risks

These may include: Exposure to organic matter, hay, dust and other substances that can be inhaled

Exposure to pesticides and other toxic or harmful chemicals that can come into contact with the skin or eyes, or be inhaled and breathed in (there's potential for poisoning, latent development of cancer and other diseases, and other health issues). This might particularly be an issue in regions where workplace OHS might not be as regulated, and safe pesticide use might not be as regulated

Exposure to bacteria (agriculture may present some bacteria and biotic risks), pathogens and antibiotics  
High levels of noise exposure – which might lead to hearing loss over longer time periods  
Injury or death risk due to exposure to heavy farming machinery  
Heat stress could be another one in hot climates, and workers may be at risk of skin cancers if they don't protect their skin properly  
Worldwide, agriculture accounts for at least 170,000 occupational deaths each year: half of all fatal accidents.  
Machinery and equipment, such as tractors and harvesters, account for the highest rates of injury and death, particularly among rural laborers.

Farmers and farm workers suffer from increased rates of respiratory diseases, noise-induced hearing loss, skin disorders, certain cancers, chemical toxicity, and heat-related illnesses ([nasdonline.org](http://nasdonline.org))

The [wikipedia.org](http://wikipedia.org) resource listed goes into more detail about the potential toxicity of different pesticides from different chemical families

– Exposure to pesticide residue at the consumer level, and exposure to other substances or chemicals, or even microorganisms

Some foods may have more pesticide residue than others, and consumers may come into contact with this residue when they eat their food.

Read more about pesticide and fertilizer use in agriculture, and also food pesticide residue in this guide.

There's also potential for exposure to other chemicals and substances (and even bacteria and microorganism) other than pesticide residue.

[Health concerns where it comes to substances in food include the] presence of pesticide residues, heavy metals, hormones, antibiotics and various additives in the food system as well as those related to large-scale livestock farming ([greenfacts.org](http://greenfacts.org))

Bacteria and pathogens in manure can make their way into streams and groundwater if grazing, storing manure in lagoons and applying manure to fields is not properly managed ([wikipedia.org](http://wikipedia.org))

Antibiotic issues can arise in two ways:

Humans are becoming less able to be treated by antibiotics because we are building a resistance to them through the foods we eat

Humans can be exposed to antibiotic-resistant bacteria when antibiotics end up in the water, soil and air around us through excess use on livestock

- Viruses and diseases originating from livestock and farm animals  
There's potential for viruses, diseases and pathogens and bacteria to develop from livestock and animals on farms.  
Depending on how far these diseases are transmitted, they could impact people at the farm level, or society as a whole.  
As one example, H1N1 allegedly started in swine

Also, agricultural practices have been responsible for development of malaria in some African countries (research.msu.edu)

More than 60 percent of the emerging diseases affecting humans have an animal origin, and of these, 75 percent come from wildlife (fao.org)

Animals form a significant reservoir of diseases that affect humans; avian flu, the best known example, is far from an isolated case: 60% of human diseases are shared with animals and three quarters of new infectious diseases of people were first found in animals (economist.com)

- Agriculture's potential impact on water quality  
In some regions, agriculture may impact the quality of surrounding water sources or even human water supply in various ways, via fertilizers and pesticides, livestock manure, and other agricultural substances and products.  
Depending on the water treatment used before humans come into contact with the water (and especially if they drink it), this could be an issue for human health.

- Other  
When it comes to human health, there can also be some debate over the use of GMOs in agriculture, the use of hormones, and the use of other technology, additives, and so on.

### Potential Negative Effects Of Agriculture On Society As A Whole

- Contribution to water scarcity  
Agriculture is one of the heaviest users of water of any industry.  
In regions where irrigated water and other types of slow to renew, or non renewable water are used for agriculture, agriculture could contribute to water scarcity problems.  
For example, some reports indicate that the heavy use of groundwater for agriculture in India (for crops like cotton for example) contributes to water scarcity problems in some regions.  
Water is used widely in most societies for not only agriculture, but also industry and municipal use.

So, poor management of freshwater resources in agriculture can contribute to water issues elsewhere in a society.

... irrigation practices can lead to groundwater depletion, water quality degradation, and competition for drinking water, among other impacts (journals.plos.org)

– Some agricultural systems and practices might contribute to food supply problems

Agriculture is responsible for food production.

With a growing population expected into the years 2050 and 2100, there is some concern that the current agricultural systems, practices and approaches may not be able to ensure food security in all regions worldwide

Although, it might be more accurate to say that population size, consumer choices and lifestyles, and agricultural systems all play a part in determining whether there are issues in food supply.

Food supply and food security are also separate issues in lower income regions who don't have as much money to invest in agriculture and other infrastructure, to address these problems.

### Potential Negative Effects Of Agriculture On The Economy

– Economic cost to manage, or address environmental problems that agriculture contributes to

Agriculture can contribute to a range of environmental problems.

A few examples are water pollution, green house gas emissions, deforestation, and others.

If we take climate change as an example, there can be a cost to address climate change in some regions through adaptation, mitigation, and sequestration

In the case of water pollution, there's a cost to treat waste water, or clean up or treat water pollution and water contamination.

One estimate is that it cost up to billions a year to remove nitrates and algal blooms from one water source that has been polluted by agricultural caused nutrient pollution.

Even plastic pollution can a cost to clean up, and agricultural plastics are a waste product of agriculture.

Managing waste from agriculture also costs money (but can sometimes result in beneficial by products being created too – such as biogas from organic farm matter, or compost, or organic fertilizer)

Another example might be the impact of pesticides on wildlife: 'The economic impact of pesticides' impact on wildlife and biodiversity is estimated to run into the billions' (beyondpesticides.org)



Better Meets Reality. “The Potential Negative Effects of Agriculture on Humans, Health, Society & the Economy.” Better Meets Reality, November 19, 2021.  
<https://bettermeetsreality.com/the-potential-negative-effects-of-agriculture-on-humans-health-society-economy/#:~:text=A%20potential%20negative%20effect%20of%20agriculture%20on%20the,up%20or%20treat%20water%20polluted%20by%20agricultural%20chemicals.>

### **Document B: Agricultural Revolution**

The agricultural revolution is a notion applied to a wide spectrum of new kinds of human activities and a variety of new forms of social and cultural life resulting from the practice of soil cultivation, cattle breeding, and livestock raising. In some cases, it could be understood as opposition to the “Neolithic revolution” concept, proposed in the 1920s by W. G. Childe in order to characterize the origin of self-sufficient societies that produce their food. Such understanding emphasizes a broader sense of an agricultural revolution versus a Neolithic one, implying at the same time their common economic and ecological background. Unlike the Neolithic revolution, which indicated strict chronological frameworks of the event, in most cases we apply the term agricultural revolution to long-lasting gradual processes and their historic consequences. So, the “evolutionary” is interpreted as “revolution,” exclusively based on its important impact in all spheres of human life.

### **Technological Components of the Agricultural Revolution**

The origin of a productive economy was accompanied by a series of technological innovations. One of the most important among them was the origin of ceramics, which is regarded as the first artificial raw material used by prehistoric populations. Pottery enabled the process of boiling and cooking; it gave rise to soups and cooked cereals, an introduction to the paleodiet, substantially broadening its spectrum of microelements and vitamins that human beings could receive from food, and changing in some manner the processes of metabolism. Pottery utilization also greatly promoted storage strategy development, which helped to secure subsistence as well. Beginning with primitive handmade multipurpose forms, pottery gradually evolved toward fine vessels made with the help of a potter’s wheel. Pottery ornamentation traditionally is regarded as one of the basic ethnic markers, while the morphology of ceramic artifacts is connected with the sphere of their utilization and economic orientation of their makers.

### **Tool-Making Technology Improvement**

The beginning of land cultivation required new tools. New forms of tools connected with wood processing (deforestation being the first stage of land preparation) appeared at the Neolithic times, and a variety of axes is the most striking feature of the tool kit of this time. A series of tools for land cultivation was also widely distributed. The technique of polishing and grinding widely distributed in the

Neolithic enabled the origin of specific tools for cereal processing (for example, millstones, graters, and the like). The peculiarities of the natural habitat of early forms of productive-economy promoters contributed to spatial differentiation of their tool kits and techniques of tool production.

House building gradually replaced hunter-gatherers' temporary huts, and tent construction could be regarded as another important technological innovation connected with agricultural revolution. The necessity of looking after their crops and herds promoted the need for a well-prepared house accompanied by special facilities for crop storage and domestic animals and birds.

The origin of spinning and weaving was an inevitable reply to the need for food transportation and storage, and enabled interior house decoration as well.

Transportation meant improvement. Transport by wheel and sail is one more important technological element of agricultural revolution. It mirrors the needs of the socioeconomic processes accompanying land cultivation and improved cattle breeding.

## **Socioeconomic Implications of the Agricultural Revolution**

### **Transition to a Settled Mode of Life and the Premise of Town Origin**

The origins of plant cultivation and cattle breeding helped to secure the food procurement system and contributed greatly to the creation of a rather settled mode of life. It was grounded on a relatively stable quantity of product, which could be obtained during a long period of time from the same territory using different sources or/and different ways of their exploitation, combining traits of hunter-gatherers with a productive economy. The most suitable areas for living later were developed into towns with wide specialization (trade or/and crafts, war shelters, ritual and/or administration centers).

### **Exchange System Transformation**

The establishment of a productive economy caused a transformation of the exchange process function. Traditional for hunter-gatherers' community rituals and "strategic" implication of exchange aimed to establish peaceful contacts among different communities after the beginning of land cultivation and cattle breeding was added by real economic value. The appearance of intercommunity exchange of food obtained from different sources in many cases guaranteed the survival of communities and satisfaction of their vital needs and, in this way, contributed to the growth of prestige of early agricultural communities. The origin of the first equivalent of money, "protomoney," occurred in such exchange. A specific form of exchange, so-called prestige, or potlatch, became one of the basic elements of the transformation of prehistoric communities, promoting the appearance of individuals possessing relatively more authority, property, and power in their groups.

## Surplus Product Origin, Prestige Economy

The development of farming and cattle breeding, for the first time in human history, guaranteed the existence of surplus product during a rather long period of time (till the next crop or next calving, for example). Crucial for its basic existence (excluding the display of any sort of inequality in its frame), prehistoric society faced the necessity of managing this surplus. The original form of prestige exchange, potlatch, which appeared at organized festivals, promoted the redistribution of surplus product among the community members. As a result, a restricted number of “big men,” relatively more authoritative and wealthy persons, appeared in the historical arena. This group gave rise to private property, exploitation, and class structure formation, promoting in this way the origin of civilization and state power.

## Demographic Revolution

Food base improvement and the gradual growth of the term of occupation on the same settlement removed earlier natural limitations on child birth rate and thus caused rapid population growth, accompanied by the formation of heterogeneity. Thus, territories more suitable for productive economy became more attractive for occupation, and the tendency toward overpopulation was demonstrated. In turn, the tension of excessive population on the territory created the first ecological problems for early farmers and cattle breeders. Most probably, one such crises originated a special form of productive economy, nomad cattle breeding, which has often been interpreted as an accelerated way to property accumulation, trade, and nonequivalent exchange development. Territories with excessive population density gave rise to the first wars, contributing to an early form of exploitation.

## Ideological and Cultural Displays of Agricultural Revolution

Another development in the productive economy was the appearance of leisure, that is time free from subsistence, in particular from food procurement activities. And the needs of new forms of economy and social relations required rational knowledge as well as an ideological background and ritual sanction.

The fertility cult is one of the most striking features of mental life with origins in the productive economy. Fertility cults usually were accompanied by the growth of the role of Woman-Mother (foremother), as well as inspiration by natural forces and phenomena. Common economic backgrounds and the extreme importance of such forms of ideology in everyday life of early agriculturists caused the curious situation in which similar ritual activity was realized in principally different forms in different locations.

Rapid development of astronomy and time-count systems could be regarded as a specific element of the agricultural revolution and at the same time as its necessary premise. The first calendars enabled rational and well-timed agricultural processes, in this way guaranteeing surplus product.

Protoscientific knowledge development (zoology, veterinary, etiology, agronomy, genetics, geography, climate, and soil studies, among others) also contributed greatly to the development of agriculture and promoted the rise of its effectiveness.

Primitive writing systems used for the fixation and transmission of new knowledge systems and newly formed traditions is also connected with the agricultural revolution.

### Other Displays of the Agricultural Revolution

The gradual transition from hunter-gatherers to an agricultural mode of life was accompanied by changes in human morphology. This is displayed in the modification of facial and postcranial (connected with the consumption of boiled instead of roasted food), the degradation of human dens (because of lack of necessity to chew fresh vegetation), and many diseases and epidemics connected with a stationary mode of life that included constant contact with animals.

Alongside the weakening of the human body, the natural habitat also deteriorated. Human society has participated in the disturbance of the balance in nature by its intervention into physical geographic processes, in particular, by deforestation, by soil erosion, and by introducing new sorts of plants and animals into environments. Changes in the mode of life, from a subsistence system to the formation of a prestige exchange network, resulted in the degradation of prehistoric social dogmas and stereotypes and promoted modification of the marriage system (polygamy) and changes in community structure (formation of lineage) and kinship systems.

It should be stressed, nevertheless, that most components of the agricultural revolution displayed themselves only when farming and cattle breeding became not only a guaranteed supplement but the necessary bases of food procurement system in prehistoric populations. The replacement of hunting, gathering, and fishing in prehistoric subsistence was a long and gradual process, whose realization in different parts of the world depended on a set of natural geographic, economic, and cultural agencies.

Anthropology. Accessed December 13, 2022.

<http://anthropology.iresearchnet.com/agricultural-revolution/#:~:text=Socioeconomic%20Implications%20of%20the%20Agricultural%20R evolution%201%20Transition,Origin%2C%20Prestige%20Economy%20...%204%20De mographic%20Revolution%20>