



Root of all evil: How agriculture became our bane and worst mistake

In 1987, esteemed Professor of Geography, [Jared Diamond](#), stunned many people with his article in the Discover magazine entitled, "[The worst mistake in the history of the human race](#)" in which he argued that agriculture, far from being a blessing, was instead our worst mistake. Agriculture has indeed changed the world - but for the worst, causing gross social and gender inequality and increases in malnutrition, starvation, and epidemic diseases. In some ways, Jared Diamond added, pre-agriculture societies were actually better off than post-agriculture societies. UK newspaper, The Telegraph, went as far as to ask in their article in 2009: [Is farming the root of all evil?](#)

How could that be? Could agriculture really be our worst mistake, the root of all evil?

No one is certain exactly how agriculture started, only that agriculture started around 10,000 years ago independently and almost simultaneously at six main locations in the world. [Charles Darwin](#), in his book, "[Descent of man, and selection in relation to sex](#)" (published in 1871), casually speculated that agriculture may have started when humans observed that seeds fallen to the ground have gone on to sprout and grow into plants that had desirable qualities.

But it wasn't until the late 1970s that [archaeologist Mark Cohen](#) of the State University of New York at Plattsburgh suggested that agriculture started probably more out of desperation than inspiration. Evidence suggest Cohen could be right: that rising human populations, combined with a cooling and drying climate, left

pre-agriculture societies short of food. People became desperate and started to grow their own food, rather than depend on the unstable food supply via hunting and gathering.

Considering that modern humans appeared about 250,000 years ago, agriculture is consequently a very recent human discovery - and a momentous discovery too. The start of agriculture is undoubtedly a very important milestone, for better or worse, in modern human history for several reasons.

Agriculture is the foundation upon which all human civilizations, past and present, from the least to the greatest, are built. Every civilization, without exception, begins near rivers for a simple reason. They required easy access to freshwater to feed their crops and animals. [Ancient Egypt and Nubia civilizations](#), for instance, began along the Nile River in North Africa, and the Yellow River in China was the birthplace of the [Xia, Shang, and Zhou Dynasties](#). Likewise, the [Harappan civilization](#) began along the Indus River and the [Mesopotamian civilization](#) along the Tigris-Euphrates River.



Agriculture is the foundation of every human civilization, from the least to the greatest. Only with agriculture could a civilization expand its population to large numbers quickly and to develop complexity and sophistication in its culture and socioeconomic and

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Agriculture allowed humans to stop moving from place to place in search of food and to settle down permanently in one area. This carried important consequences. Agriculture provided humans stability. And stability meant humans could increase their populations to large numbers and to do it very rapidly. Before agriculture, humans depended on hunting animals and gathering of fruits for food. Such a lifestyle would simply not be able to sustain a large population all year round.

It is estimated that the world population, without agriculture, could not exceed 150 million people. But today the world population stands over 7 billion people, nearly 50 times more than what a hunter-gatherer world could cope.



Hunter-gatherer
societies or tribes are
small, nomadic, and
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Having stability also meant post-agriculture societies could develop increasingly complex and sophisticated culture, education, and socioeconomic and political structure. Human skills, no longer limited to just hunting and gathering, became more diverse, specialized, technical, creative, and methodological. Because of agriculture, societies could now comprise a myriad of professions such as teachers, doctors, politicians, musicians, artists, engineers, farmers, and builders.

But a farm is no Garden of Eden. Agriculture has several important and serious drawbacks. In recent years, anthropologists have quietly revised the view that the outcome of agriculture, rather than a blessing, was more of a fall from grace. Why?

Because of agriculture, we have inadvertently traded quality of our food for quantity. True, agriculture has allowed us to produce abundant food consistently, but agriculture has also limited the types of food we eat. This in turn caused higher incidences of nutrient deficiencies and unbalanced diets. Hunter-gatherers, for instance, ate a much more varied of food, as many as 60 to 70 types per year. But once we converted to agriculture, we became dependent on a much smaller number of food types.

Today, for instance, half of our daily calories come from only three crops: rice, wheat, and corn. Without these three grain crops, we would truly have difficulty in fulfilling our daily calories. Such staple foods are rich in carbohydrate but low in protein and do not contain the essential nutrients in sufficient amounts for a healthy life. Having to depend on a very limited number of crops means we are vulnerable to food shortages and society upheavals should our crops fail from drought or pest and disease attacks, for example.

The [Great Famine in Ireland](#) between 1845 to 1879 highlights such a case. The Irish's over-reliance on a single crop (potato) as their staple diet and the lack of genetic diversity in the planted potatoes meant that when the potato blight attacked in the 19th century, the blight disease caused devastating and widespread losses to their food supply. Mass starvation ensued during which a million people either died from starvation or famine-related diseases and another one million people emigrated. Even those of whom emigrated, it is estimated that one in three still lost their lives.

Examinations of human skeletons in the [Nile Valley, Egypt](#) showed that the hunter-gatherers who lived there some 13,000 years ago had lower signs of malnutrition and illness (as indicated by their teeth) by as much as 40% than their farming successors 1,000 years after they had adopted agriculture. Furthermore, the average height of a hunter-gatherer was 5' 8", but when agriculture was practiced, the average height of people fell by four inches.



Examination of human skeletons showed that the hunter-gatherers were actually more healthy and longer-living than their early farming successors (c) ymgerman @ fotolia.com.

Such discoveries in Nile Valley in Egypt are not unique. Skeletons in Greece and Turkey showed similar signs. Prior to agriculture, the average height of a hunter-gatherer there was 5' 9" for men and 5' 5" in for women, but after agriculture, people's heights fell by nearly half a foot on average. Yet again, people's health deteriorated as a result of agriculture, where early farmers, compared to their hunter-gatherer predecessors, had 50% more enamel defects which is indicative of malnutrition, four times more iron-deficiency anemia, three times more bone lesions which are indicative of infectious diseases, and an increase in degenerative spine conditions which are indicative of harder, more physical labor. Even life expectancy fell from 26 years for hunter-gatherers to 19 years for people in the early post-agriculture period.

And the fact that agriculture allowed humans to settle permanently in one area and in large numbers and in crowded spaces encouraged the occurrence and spread of infectious diseases and pestilence. Keeping farm animals close to people further exacerbated the risks of epidemic diseases.

Besides encouraging malnutrition, starvation, and epidemic diseases, agriculture worsened social divisions and inequality. Research from the 1960s to 1970s showed anthropologists such as [Richard Lee](#) (University of Toronto) and the late [Yehudi Cohen](#) (then Rutgers University) that hunter-gatherer societies were more egalitarian and consensus-based. Food was not always available and whatever

food that were available were consumed quickly; little were stored. Such survival conditions meant that hunter-gatherers had to closely depend on one another for finding food; thus, cooperation, sharing, and mutualism were essential in such societies.

But with the adoption of agriculture, food became abundant, so much that now not everyone needed to be involved in obtaining food. The society eventually divided into food producers and non-producers. Skills became diversified and specialized, some of which were more useful and more sought after than others. Distribution of wealth became more disproportionate, depending on how well one could control the production and distribution of resources. Social hierarchy gradually evolved and became institutionalized, polarizing groups of people, creating the haves and have-nots, the elites and peasants, the rich and the poor. Social inequality was inevitable and that meant some people had more food and were consequently in better health than others.

Examinations of skeletons from the [Greek tombs at Mycenae](#) around 1500 B.C. suggest that royal members had a better diet than the commoners, since the royal members were two to three inches taller and had better teeth than the commoners. Likewise, [Chilean mummies](#) around the year 1000 showed that the elites were healthier, as indicated by their lower bone lesions by as much as four times, than the peasants.

There have even been suggestions that agriculture created gender inequality, or at least made it worse. In farming, it is the women who often have the harder, more physical labor than the men. [Frederick Engels](#), the German philosopher and social scientist, remarked nearly 150 years ago that farming was the onset of social and women inequality and the time when political innocence was lost.



Agriculture may have worsened

gender inequality. Women often had the more labor-intensive, back-breaking jobs than the men in the farms (c) cronopia @ fotolia.com.

Agriculture, together with forestry, are today responsible for a third of the world's total greenhouse gases (GHG) emissions - gases that are responsible for global warming. In 2003, [William Ruddiman](#) of the University of Virginia proposed that it was the start of agriculture about 10,000 years ago, not the start of Industrialization period in the early 18th century, that started the detrimental climate change which we now experience today. Ruddiman could well be right. Atmospheric levels of carbon dioxide (CO₂) and methane (CH₄) have risen steadily since 8,000 and 5,000 years ago, respectively. Their rise in atmospheric levels are consistent with the timeline of farming intensity. Ruddiman proposed that large scale land clearing and expansion of irrigation have been increasing GHG emissions ever since farming begun. A study in 2011 by [Dorian Fuller](#) of the University College London suggested that the expansion of rice and livestock could be responsible for the additional atmospheric methane levels 1,000 years ago.

The litany of detrimental effects due to agriculture activities is long. Climate change is only one of them. Loss of biodiversity and environment damage due to land clearing and farming activities are two more.

Talk about returning to our hunter-gatherer roots is pointless. Even if we could reset history and have humans return to their pre-agriculture days, it is most likely that nothing would change: that humans would again discover and practise agriculture. Agriculture is not a random event, started spontaneously out of chance. As discussed previously, agriculture occurred not once but six times around the world, independently of one another and nearly simultaneously. In other words, agriculture was *inevitable*. As human populations grew, humans simply needed another way to obtain their food in a more reliable and effective manner.

Do we want to return to a hunter-gatherer life anyway? A hunter-gatherer life was hardly romantic or idealistic but arduous, short, and ruthless. Violence was common in such societies. Two-thirds of hunter-gatherer societies were in constant warfare, and nearly 90% of them would go to war at least once a year.

The death rate due to tribal warfare was about 0.5% of the population per year, as calculated by [Lawrence Keeley](#) of the University of Illinois. This rate is equivalent to 2 billion people dying during the 20th century. Other research estimated that 15% of young men in hunter-gatherer societies were murdered, and [Richard Wrangham](#) of the Harvard University calculated that more people had died before than after the advent of agriculture.

Incessant innovation is our intrinsic characteristic. We cannot help but innovate. Agriculture is only one of our innovations, as means to obtain food more reliably and abundantly. Without agriculture, nearly all of our innovations we see today would not have been possible.

Yes, our innovations have caused us problems and crisis, often as unintended side-effects, but our innovations have also brought much benefits to improve our quality life. Health during the early periods of agriculture may be worse off than that before the advent of agriculture, but today, health has greatly improved due to better knowledge and more effective resource management.

Agriculture practices today too have changed, no longer solely focusing on profits and productivity but also on adopting sustainable practices to reduce agriculture's negative impacts on the environment and society. Zero burning (during land clearing practices), mixed farming, organic agriculture, permaculture, intercropping, crop rotation, minimum soil tillage, mulching, composting, and biological pest control are only some of our agriculture innovations to reduce our energy use and detrimental impacts.



Agriculture practices today are moving towards greater sustainability to reduce agriculture's detrimental impacts on the climate,

environment, and society. This photo shows an intercropping field of maize and rice in Daklak, Vietnam (c) xuanhuongho @ fotolia.com.

There is no turning back; only onward. So, whether agriculture is for our better or worse would very much depend on how we respond to agriculture and its consequences.

References

1. Diamond, J. (1987). [The worst mistake in the history of the human race](#). Discover, May 1987, pp. 64-66.
2. O'Connell, S. (2009). [Is farming the root of all evil?](#) The Telegraph, June 23, 2009.
3. The Economist (2007). [Noble or savage?](#) The Economist, Dec 19, 2007.
4. Tollefson, J. (2011). [The 8,000-year-old climate puzzle](#). Nature online, March 25, 2011.