Increasing agricultural productivity across Sub-Saharan Africa is one of the most important problems this century

Agricultural productivity across Sub-Saharan Africa needs to improve to reduce hunger, poverty, and the destruction of biodiversity.

by Hannah Ritchie
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To grow food you need two things: some land and some of your time. These two – land and labor – are two of agriculture's 'inputs'. To build a food system that works for people and the planet, humanity needs to achieve high productivity in both of them.

To escape poverty, farmers need to increase **labor productivity** – to produce more food per hour worked. It is a deep societal problem when most of the population works in farming and gets little money in return. The farmers' families are unable to get a good education; improve healthcare; and to free up labor so that their children can become teachers or build new industries outside of agriculture.

To protect the world's wildlife, we need high **land productivity** – to produce more food per unit of land area. Land productivity for crops is measured as 'crop yields'. If humanity wants to reduce deforestation and protect habitats rich in biodiversity then we need to use less land to grow food.

Across much of Sub-Saharan Africa, the productivity of both input factors is low. Agricultural productivity across the region needs to improve to reduce hunger, poverty, and the destruction of biodiversity. This is why I think that it is one of the most important problems to tackle this century.[1]

Labor productivity is low across much of Sub-Saharan Africa

Rates of extreme poverty across Sub-Saharan Africa are still very high. While it has made progress in recent decades, 40% of the population still live below the international poverty line of 1.90 international-dollars per day. This is a very low poverty line, used to identify those in the deepest poverty.

Much of this is explained by the fact that more than half of the labor force work in agriculture, and labor productivity in the sector is poor. Most of the region's poorest people are farmers: the majority (82%) of those in extreme poverty live in rural areas, and more than three-quarters (76%) of working adults in extreme poverty are employed in agriculture.[2]

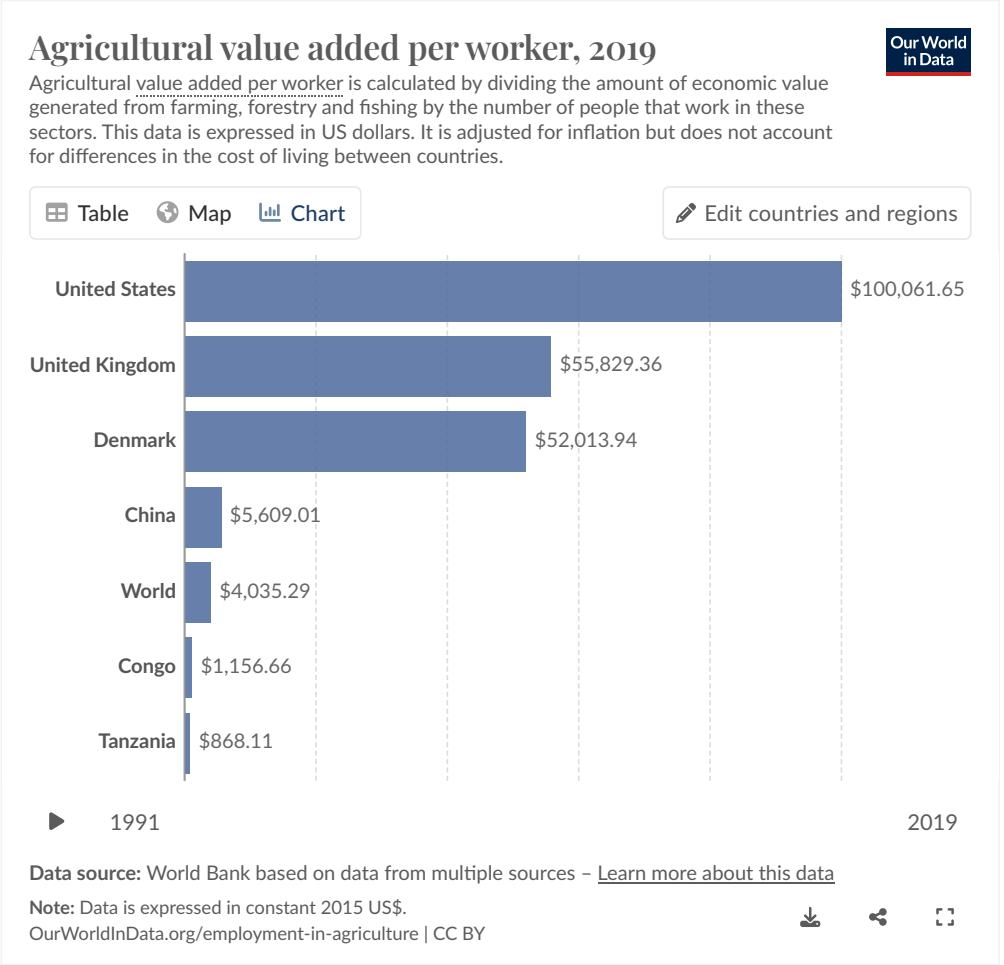
These farmers are both producers and consumers. Poverty means that there are not only barriers in food supply, but also in the *demand* for agricultural products. Farmers need access to local markets where others can afford to buy from them. If that market does not exist, or farmers lack road infrastructure to get there – as has been the case in many African countries – there is less of an incentive for productivity to improve.[3]

This is also due to rich countries' policies towards Africa. Trade policies in other regions have made this even more challenging for African farmers. The EU's agricultural policies, in particular, have received criticism for their impact on global markets.[4] It developed strong trade agreements between EU countries, and at the same time limited export markets for other regions, including Africa.[5]

We see just how low the productivity is in the chart which compares the amount of agricultural 'value added' per person working in agriculture.

The amount of 'value added' per worker in Sub-Saharan Africa is less than half the global average, and more than 50-times lower than in the countries in which farmers are most productive.

Some countries within Sub-Saharan Africa generate as little as half of this regional average.This makes it impossible for families to escape poverty. Most are smallholder farms.[6] They need family members to work and contribute. They also often cannot afford to invest in education or other opportunities that

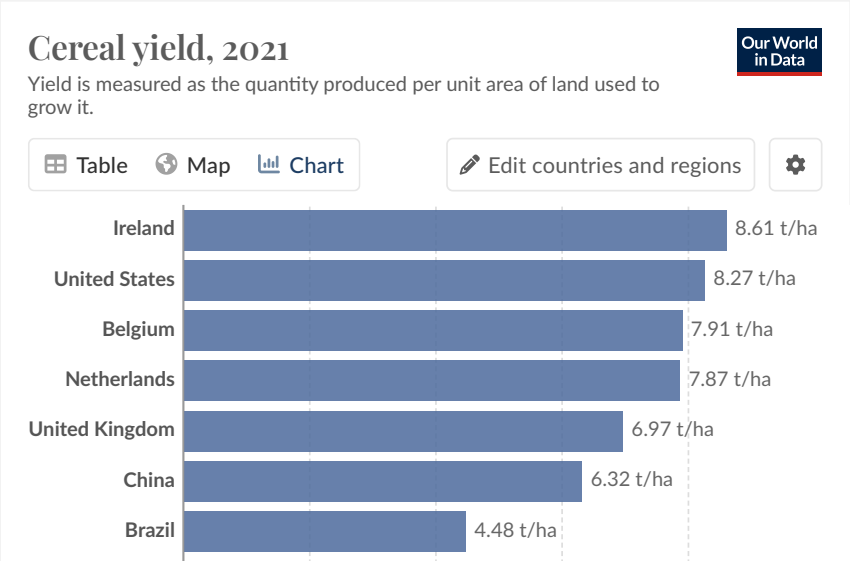


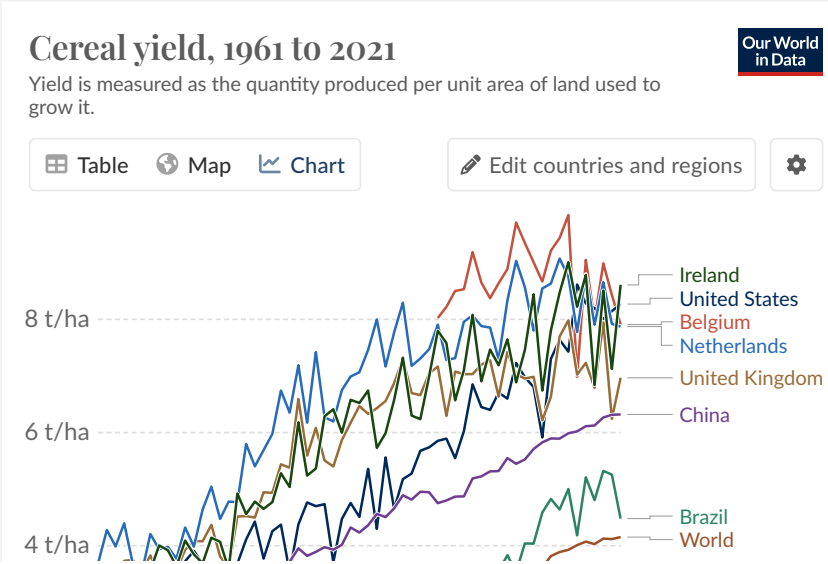
might allow them to move into industries with higher wages. Without increasing labor productivity, most of the population will have to continue working in agriculture.

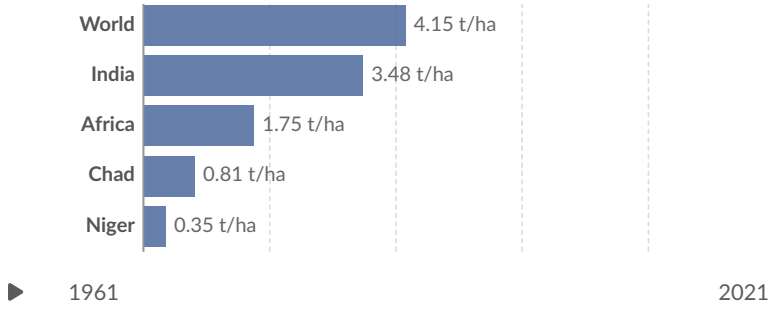
Land productivity: Crop yields in Sub-Saharan Africa are very low relative to other regions

The other – strongly-related – problem is that most countries across the region have very low crop yields. We see this in the charts, which compare cereal yields across the world. The average across Africa is half that of India and one-fifth of the yields in the US.

Growing food in this way means using a lot of land; land that would otherwise be habitat for wildlife. Africa's yields have lagged behind most of the world as the time-series chart shows. Most countries have achieved a significant rise since 1961. But across much of Africa, yields have stagnated.[7] As a consequence the global inequality in yields has increased.







Data source: UN Food and Agriculture Organization (FAO) – Learn more about this data
Note: Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains.
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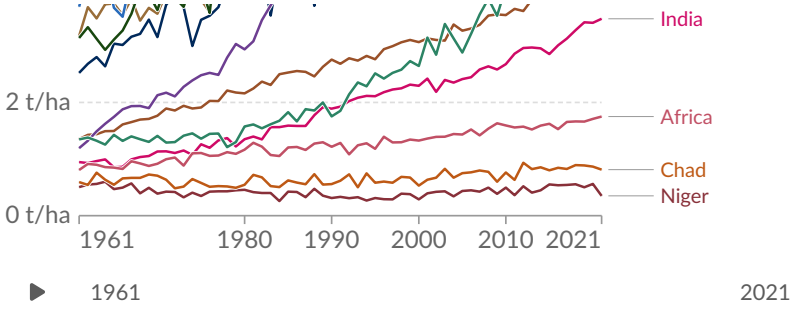

Data source: UN Food and Agriculture Organization (FAO) – Learn more about this data
Note: Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains.
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Crop yields in Sub-Saharan Africa have lagged behind, at the cost of natural habitat

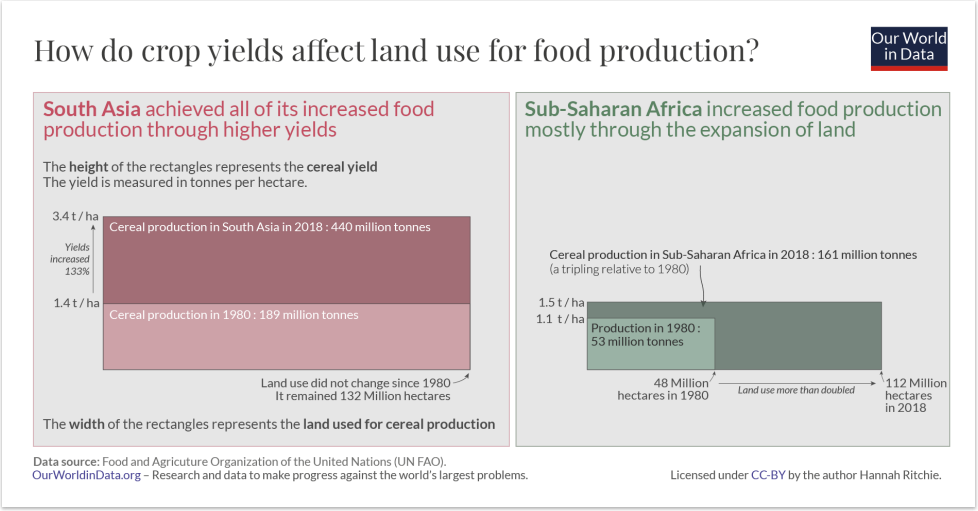
There is an environmental cost to these low yields.

This is because there are two ways to increase food production: one can either increase yields or one has to use more land.

Improvements in yields in other regions meant that they could grow much more food without taking over natural ecosystems. Because Africa did not increase yields, increased food production came at the cost of turning natural habitats into agricultural land.

We see this if we compare what has happened to agriculture in South Asia versus Sub-Saharan Africa since 1980.[8]

Both charts consist of two rectangles. The inner rectangle shows cereal production in 1980. The outer rectangle shows cereal production in 2018.



- The *height* of each rectangle represents the cereal yield – how much was produced per hectare of land. The taller the rectangle, the higher the yield.
- The *width* of the rectangle represents the amount of land used for cereal production – the wider the rectangle, the more land is used for crops.
- As a consequence, the total area of the rectangle represents the total cereal production: it is the number of hectares used to grow cereal, multiplied by how much cereal is produced on each hectare.

Both regions produced a lot more cereal in 2018 than they did three decades earlier. In South Asia it increased by 133%; in Sub-Saharan Africa, it tripled.

But, *how* the regions achieved this increase was very different. In South Asia, *all* of this growth came from higher yields: The rectangle got much taller, but did not get any wider. Land use did not change at all.

Almost the opposite is true in Sub-Saharan Africa. Yield improvements have been small. They increased just 30%. Nearly all of this growth in food production came from using more and more land. Land use more than doubled from 48 to 112 million hectares.

Both regions have increased food production a lot, but only in Sub-Saharan Africa did this come at the cost of the loss of natural habitat.

We know that it is possible to increase agricultural productivity

If Africa does not improve its agricultural productivity, what would happen?

Progress on poverty will be slow – much of its population will continue working in agriculture, and will earn very little in return.

Africa will also need to grow a lot more food. First, because undernourishment rates are high. That food gap needs to be filled to end hunger. Second, its population will grow a lot over the coming decades. If yields do not increase, the continent will need to use more and more of its land for agriculture.

Studies have shown that if progress on crop yields does not improve, the continent will lose large amounts of its natural habitat to farmland.[9] In many countries across Sub-Saharan Africa, researchers estimate that cropland area could almost triple by 2050. This will come at the cost of wildlife: in these same projections, 10% to 20% of animal habitats will be lost.

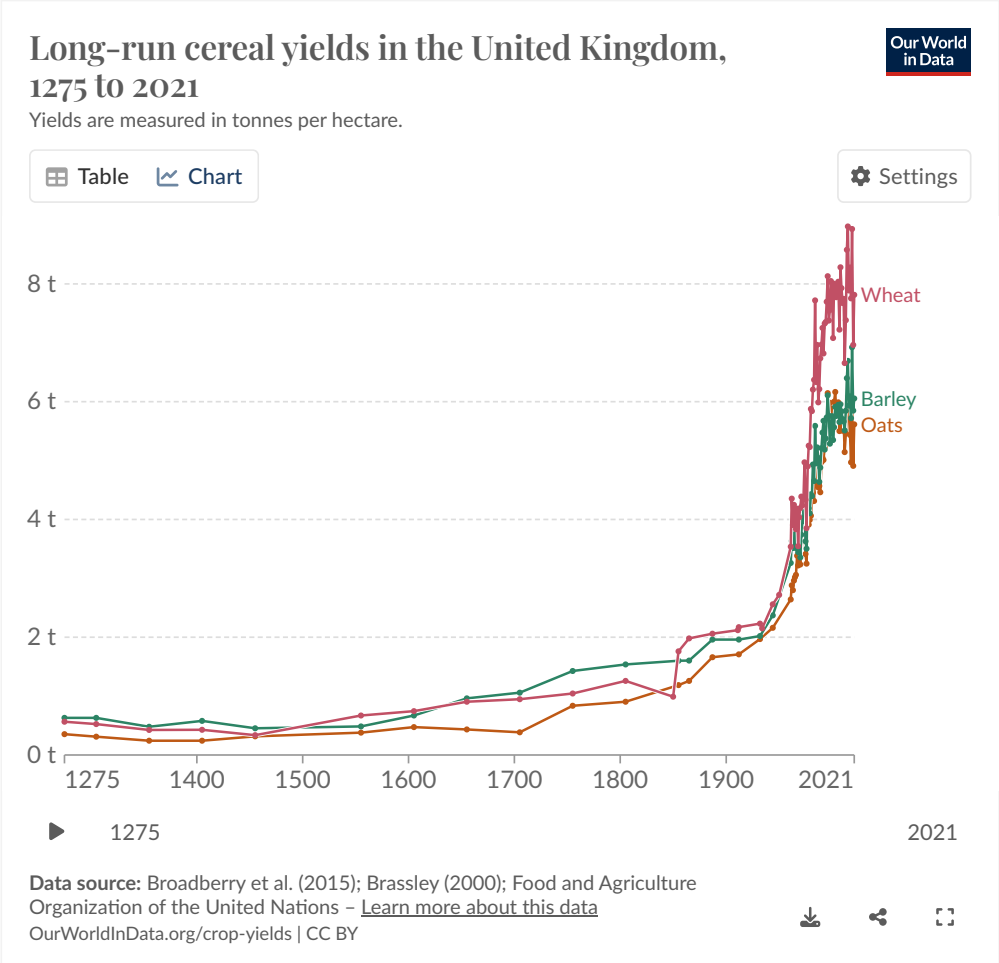
But, it doesn't have to be that way. Things *can* change.

All countries were once in the position that many African countries are in today. Take England, France or Italy as examples. Until two centuries ago more than half of the labor force worked in agriculture – similar to the African average today. During that period, agricultural output per worker was very low, and therefore most lived in extreme poverty.

That has changed dramatically: less than four percent now work in agriculture, and the amount generated per worker is much higher – at least 30 times higher – than across Africa today.

This was the result of a significant improvement in productivity. As we see in the chart here, the UK was also struggling with persistently low crop yields for most of its agricultural history. Average cereal yields were one to two tonnes per hectare – very similar to what many African countries currently achieve. Since then, yields have quadrupled as a result of improved seed varieties, fertilizers, and access to other inputs such as machinery and irrigation.

We see this same trend across Europe.



There are more recent success stories across other regions. Rapid improvements across China. The same in Brazil. And also massive improvements in some countries in Sub-Saharan Africa itself. In South Africa and Nigeria, for example, the agricultural value-added per worker has roughly tripled over the last few decades.

Crop yields might seem like an odd choice to pick as one of the world's most pressing problems. But, if yields and labor productivity do not increase it will have far-reaching consequences for global poverty, and protection of the environment. For people and planet, it's one of our most important problems to work on.

Keep reading at *Our World in Data*:

To protect the world's wildlife we must improve crop yields – especially across Africa →

The economies that are home to the poorest billions of people need to grow if we want global poverty to decline substantially →

Crop Yields Data Explorer →

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Endnotes

1. Jayne, T. S., & Sanchez, P. A. (2021). Agricultural productivity must improve in sub-Saharan Africa. *Science*, 372(6546), 1045-1047.
2. Castaneda, R., Doan, D., Newhouse, D. L., Nguyen, M., Uematsu, H., & Azevedo, J. P. (2016). Who are the poor in the developing world?. World Bank Policy Research Working Paper, (7844).
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5. Europe is also a large food exporter and, until 2017, would offer export subsidies to reduce the price for international buyers. This was part of the EU's Common Agricultural Policy, which included export subsidies until 2017. This flooded other markets – including many across Africa – with cheap European goods that local farmers could not compete with. For example, it's estimated that over 90% of chicken meat in supermarkets in Ghana are frozen poultry imported from the EU or the United States.
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8. The data for this chart is sourced from the Food and Agriculture Organization of the United Nations (UN FAO). Available at: https://www.fao.org/faostat/en/#data.

   In its World Development Indicators, the World Bank aggregates this data from the UN FAO to produce regional figures for Sub-Saharan Africa and South Asia. This is where these aggregates are sourced from.
9. Williams, D. R., Clark, M., Buchanan, G. M., Ficetola, G. F., Rondinini, C., & Tilman, D. (2021). Proactive conservation to prevent habitat losses to agricultural expansion. Nature Sustainability, 4(4), 314-322.

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