JESUITS
SOCIAL JUSTICE AND ECOLOGY SECRETARIAT
PROMOTIO IUSTITIAE
"FOR RECONCILIATION WITH GOD DEMANDS THE RECONCILIATION OF PEOPLE WITH ONE ANOTHER." (CGS 32, 34, 36)
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Sustainable Diets and Agricultural Practices

The Ethical Challenge

On a fundamental level, the planetary crisis is a collection of challenges where natural resources and processes are overused and overloaded by the growing demand of an increasing population. The planetary system and local ecosystems have some resilience to withstand the pressure, but their fragility is becoming increasingly visible. In the past decades – despite timely early warning – humanity decided to ignore the limits of the planet and crossed the planetary boundaries in multiple ways (Richardson et al., 2023).

After the energy sector (including energy for transport), the second most significant source of resource use and pollution is agriculture (Ritchie, 2019). The most widespread form of land use is intensive crop monoculture (wheat, maize, sunflower, soybean, rice). This production method produces greenhouse gases in multiple ways, destroys habitats, depletes and pollutes water systems and reduces soil fertility. In addition to these environmental impacts, this system establishes dependence on corporations that provide seeds, machinery, chemicals, processing capacity and market demand for the harvest. The highly optimized scheme provides little income on a smaller scale. Thus, the agricultural sector in Europe became increasingly centralized and dependent on a complex structure of subsidies that further stabilized an agricultural sector that is destroying our planet. This makes farmers vulnerable to economic challenges and takes away most of their control over food production (Neumeister, 2022).

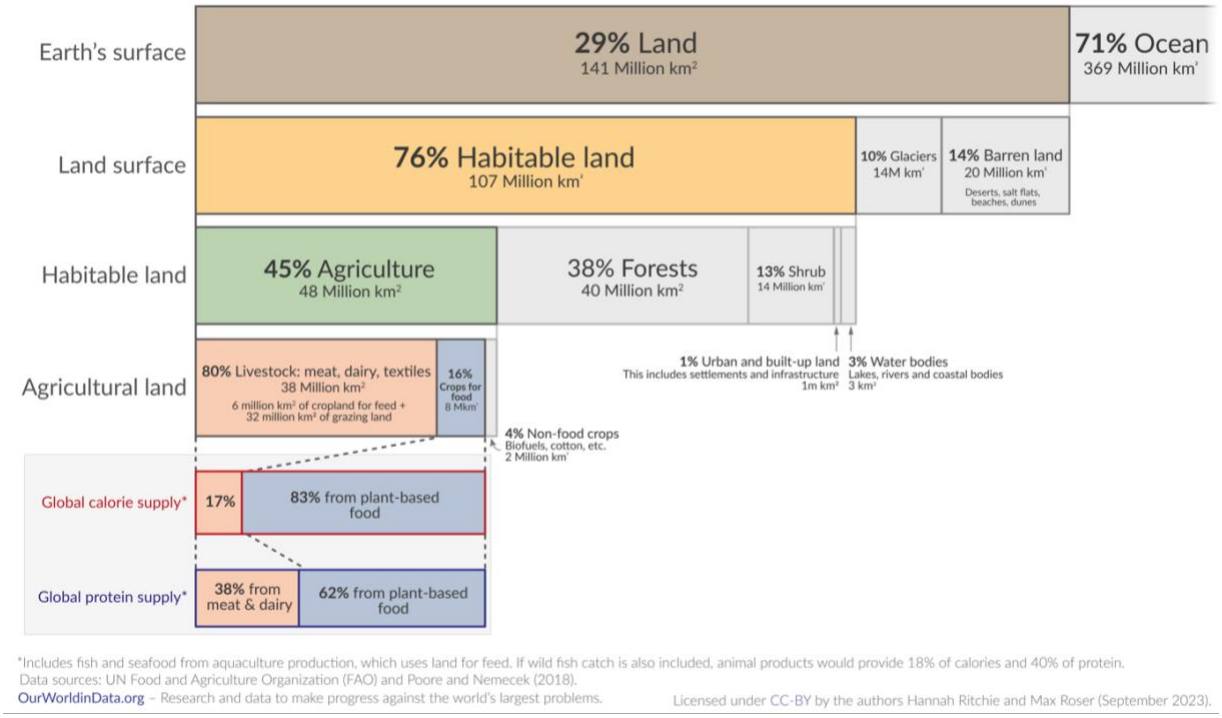

Figure 1: Global land use for food production (source: Our World in Data)

While being among the most important causes of the planetary crisis, the agricultural sector is also highly vulnerable. Droughts, extreme weather events, and desertification are becoming increasingly common and cause significant losses to the farming sector. This further increases the social vulnerability connected to food systems, as sudden shocks to supply can cause food shortages or price hikes (IPCC, 2021). The global trade system may occasionally ease these problems. Still, long value chains also introduce an additional vulnerability: supply may be disrupted by disasters and conflicts far away from the consumers.

The risks to the food supply often lead to a narrative in which food security becomes the primary challenge. Thus, proponents of this view argue for the further expansion and intensification of agriculture to increase the supply (Figure 1-2). (Hefele, 2023).

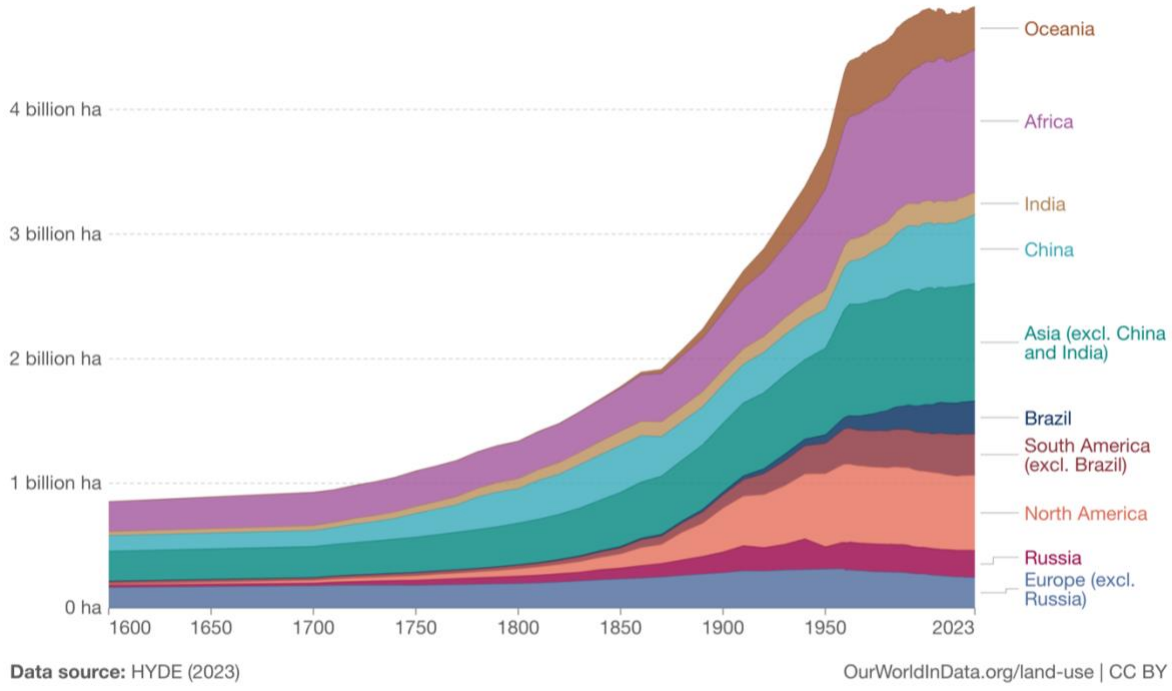

Figure 2: total areal land use for agriculture, measured as the combination of land for arable farming (cropland) and grazing in hectares (source: Our World in Data)

Perhaps surprisingly, the solution lies in the other direction: we need less farming and less intensive production, smaller farms, and shorter supply chains. Further increasing production would increase the economic challenges to farmers while also exacerbating the ecological destruction that is the root cause of the problems.

The risks that threaten food systems globally can be mitigated to some extent by nature-based solutions: restoring habitats, introducing complex crop combinations, ecological pests, and water management. The critical component in all these methods is biodiversity: the variety and abundance of non-human beings that dwell in the landscape, from bacteria to shrubs, from birds to wolves. A healthy ecosystem is more resilient against all the challenges that occur due to climate change, and these ecosystems usually provide some degree of resilience to their surrounding agricultural areas, even if those are farmed intensively (Miles et al., 2021).

In this context, I approach biodiversity in an entirely utilitarian manner, as if it were a necessary unproductive area that serves as a protection service for maintaining the useful and productive landscape. On the one hand, the supporting function of healthy ecosystems cannot be overstated, and it is not an exaggeration to claim that without ecosystems, humans could not exist in a society that is even remotely similar to what we value in our world today. On the other hand, we need to go beyond this understanding. We have to recognize that the scientific term "biodiversity" refers to a great variety of beings who live, fear, and suffer, who are often surprisingly intelligent, and who are often capable of comprehending the

destruction that we cause to them and their homes as if they were just inanimate objects. In this recognition, our spiritual journey may encounter surprises in realizing similarities not just in our fate on a planet that is being destroyed but also in our existence that has the same roots and experiences and that awakens empathy in us. We cannot be fully human without non-humans (Naess, 1989, 1995).

Ethical food policy with two feet on the ground

To stop biodiversity loss, we need to save habitats (BirdLife, 2020). We can do this in two ways: giving back land to nature and making land use more friendly to biodiversity. These two models are called *"land sparing"* and *"land sharing",* respectively (Loconto et al., 2020). Land sparing is giving up economic activities or keeping them on a minimal level (like low-impact tourism). In this model, land management is essentially done by ecological forces, and depending on external factors, some conservation-oriented human activity might be necessary. In 'land sharing', agricultural areas are used to produce food. Still, landscape management and agrotechnology are designed in a way that helps biodiversity to use the land on the side of agricultural production. This model does not work in all places and with all species but has a role in expanding the space available for biodiversity and connecting habitats. It is important to note that the policies that protect biodiversity also improve carbon sequestration (storing carbon in soil and biomass), water retention (essential for soil fertility), and many other ecosystem services crucial to human well-being and economic activities.

After all these arguments, I conclude that we need to develop food policies extending the area available for land-sparing and land-sharing. At the same time, we must take food security and affordability seriously, as we cannot protect biodiversity to the detriment of human health and well-being.

In practical terms, this means we need to produce food in less space and with less intensive technology, but we need to produce at least a similar amount in terms of calories and deliver all this at reasonable prices. The challenge sounds daunting, but a few factors show the way forward in practice.

First, I want to point out that reducing food waste can maintain food security even if production levels shrink. In the European Union, about 20% of all produced food is wasted, more than the total imported amount (Vera et al., 2022). Additionally, the EU uses a significant amount of land to produce biofuels. Biofuels, however, are inefficient for energy provision and provide less "carbon neutral" fuel than the carbon uptake capacity of the same amount of land given back to nature. If we gave up on this practice, another significant area could be returned to nature. (Fehrenbach et al., 2023). These two decisions would have no substantial consequences or effects on our lifestyles but would offer important opportunities for habitat restoration.

Our primary interest, however, is agriculture for food production and how we could spare and share more land for and with nature. A key concept in considering this question is the efficiency of production systems. Efficiency means how many resources are necessary to produce a unit of food. If we want to use less land and produce at least the same amount of food (or more, as it is desirable), we need to increase production efficiency.

Probably the most widespread approach to land-sharing is organic agriculture. Using significantly fewer chemicals enables wild plants and animals to live alongside the production crop. Such a production system has a range of benefits but, in most cases, produces lower yields (between 8-25% on average) than the same crop in a conventional system (Reganold & Wachter, 2016; Tuomisto et al., 2012). Increasing the complexity of the land cover (by introducing more crop varieties, leaving space for hedgerows, trees, small water bodies, etc.) usually also reduces productivity simply by lowering the net area used for economic activity. To some extent, better organic technologies can close the yield gap. Still, the challenge will never be fully solved since the goal is to give up some of the primary production to benefit biodiversity.

The most important and potent intervention point to increase food systems' efficiency is what we produce and what it is for. Different plants have different efficiency rates in their yields, and more importantly, different food types have staggering differences in their environmental impacts if we consider the product's entire life cycle. Animal-based protein is "grown" by animal bodies that are fed plant products throughout their life until they reach the point where they are slaughtered and processed. These animals are most often fed with plants suitable for human consumption; if not, the feed production occupies space suitable for producing human food. We do not consume the entire animal, and not all food the animal consumes becomes meat. Thus, this "protein production system" is inefficient. One thousand kilocalories of beef require about 119,5 m^2 of arable land, while 1000 kilocalories of wheat require 1,44 m^2 (Halpern et al., 2022; Poore & Nemecek, 2018; Ritchie et al., 2022 see also: Figure 3.). For this reason, most of the cropland is producing feed for animals – to provide meat for humans.

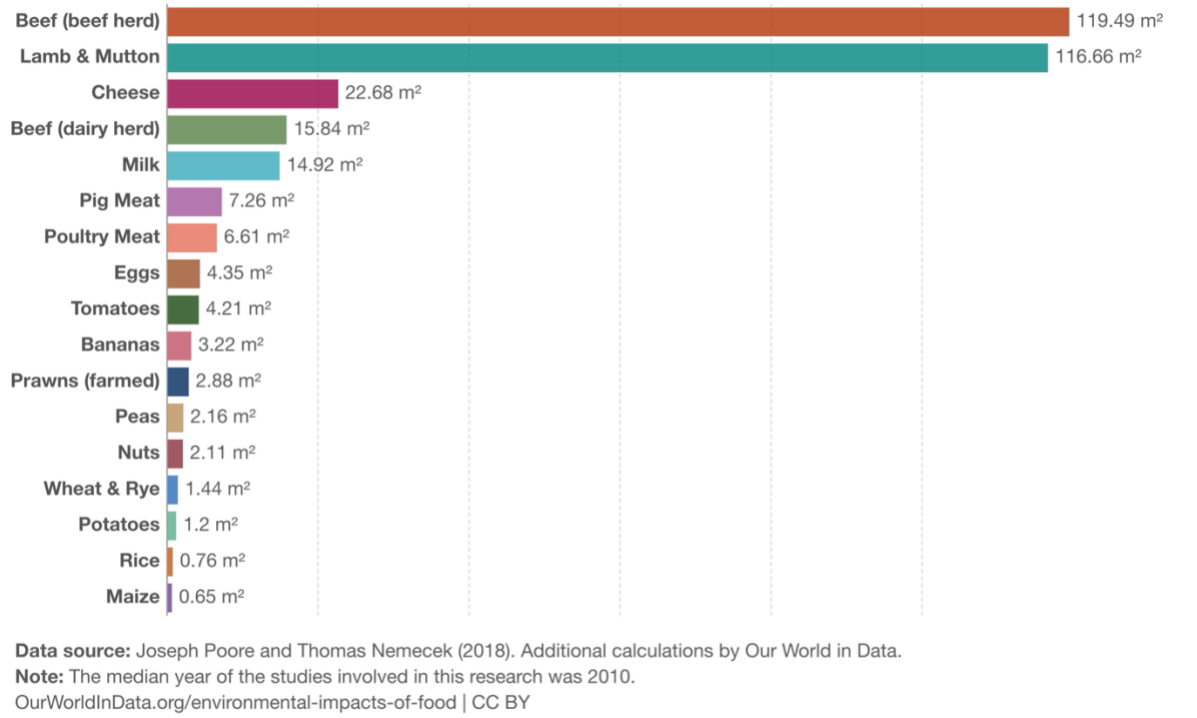

Figure 3: Land use (m^2) of foods per 1000 kilocalories (Source: Our World in Data)

The two orders of magnitude difference between these extremes show how inefficient animal-based protein consumption is. Additionally, ruminant animals (most notably beef and lamb) also produce methane, a powerful greenhouse gas (GHG), in their guts. If we produced less animal-based protein and replaced it with plant-based protein sources (probably the most qualified candidate for this role would be legumes), we would need much less land to produce the same amount of calories, we would make much less GHGs, and we would release much less chemicals in the environment.

If we need to adjust our production systems to significantly less animal farming, we also need to adjust our consumption patterns—diets—to make the change in production possible. One could argue that changing diets is the first step towards changing the production system.

In a globally optimized sustainable food production system, animal protein is not necessarily eliminated, as certain ecological conditions are not suitable for human food production but could be used for producing animal feed, such as grass, and some of the byproducts of human food production (straw) can be used for similar purposes (Van Zanten et al., 2018). Low-intensity grazing is the best way to preserve natural grasslands in most cases. Large herbivores become extinct in most parts of the world, so farm animals are the best candidates for grassland maintenance. This intensity and the resulting volume of meat production is, however, negligible compared to the meat industry currently in operation (Tälle et al., 2016).

As we have seen, the resource requirements of plants are about a hundredfold less than beef and lamb and about tenfold less than pig and chicken. This also implies that changing our production portfolio would allow us to give up some of the efficiency gains made over the last century and could transform the food production system (that is only about 8-25% less efficient than conventional) into a fully organic agriculture and still using less land than today.

A healthy and sustainable diet

Defining a perfect sustainable diet is a complex task that may not even be necessary. Production costs of plant-based products are lower, even if an organic production system is applied. Diet change requires cultural change, and such a cultural change would also bring more affordable food (Figure 4.). Even if animal-based proteins are not eliminated from diets, eating less meat has significant health benefits (Pushkarev, 2021).

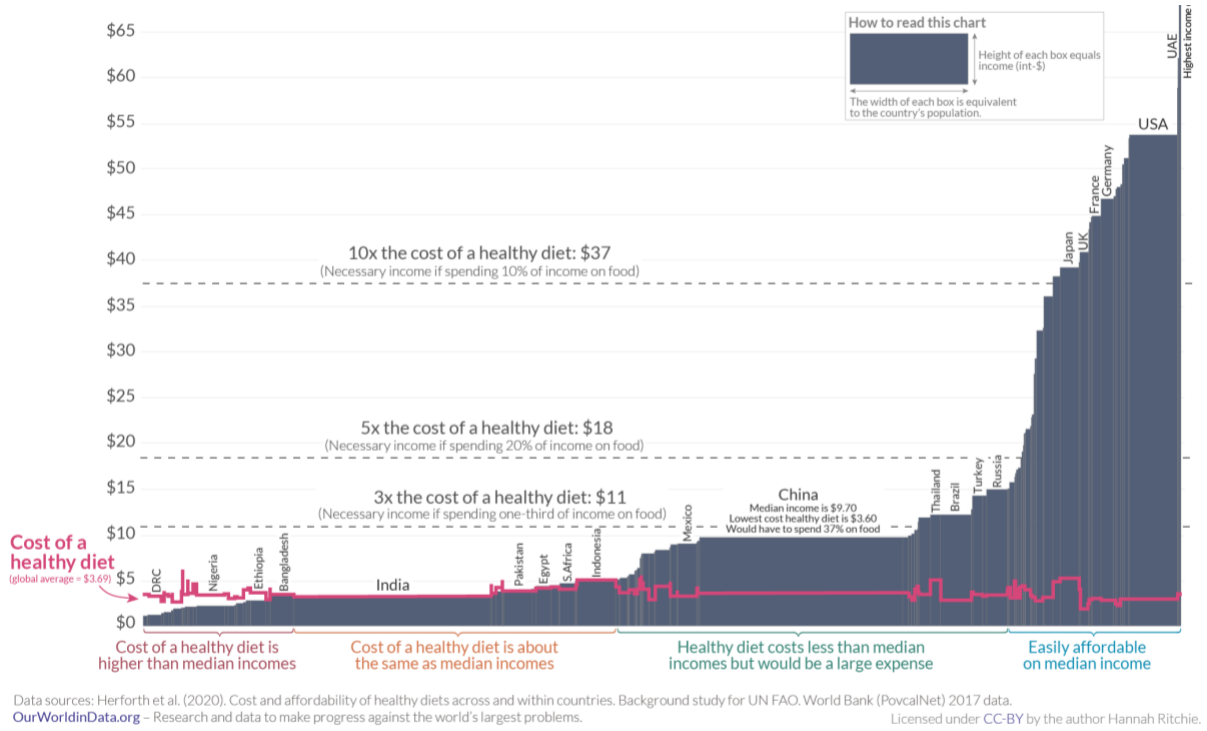

Figure 4: How does the cost of a healthy diet compare to daily median incomes? (source: Our World in Data)

There is no single diet that is truly sustainable or healthy. Sustainable diets are primarily plant-based, and the plants used should reflect the production seasonality and the producer and consumer geography. Cultural factors, including traditional cooking methods, religion, and personal taste, also condition a good diet.

I did not discuss seafood consumption (farmed or wild) in this paper. Those systems have similar considerations, and overfishing is a challenge in most fisheries globally. Yet, fish is considered a more sustainable protein source than farm animals, and fish production is generally a more environment-friendly operation (Ritchie & Roser, 2021). Fish consumption can be part of a sustainable diet.

The transition to a sustainable economy and food system is a great challenge to a society that is primarily to be solved through policies. Too many structural elements cannot be tackled on the individual level. The most effective action we can take to facilitate the green transition is to advocate for better policies. At the same time, reading the news, we can see significant resistance against such policies – even if the origin of the disagreements is not always visible. Cultural change is, therefore, crucial, as our culture around food defines the policies that are acceptable in society. Our personal choices in our diets are, therefore, not just impactful through our ecological footprint but also through the cultural impact we have on others when we show that a healthy and sustainable diet can also be delicious.

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