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Deforestation

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EXECUTIVE SUMMARY

- Agriculture, Forestry and Other changes in land use (AFOLU) accounts for 11% of CO₂ emissions globally and almost 20% of total Greenhouse gas (GHG) emissions, second only to energy generation. 5.8% of GHG emissions come from Livestock and manure and 4.1% are from Agricultural soils (Ritchie and Roser, 2020).
- Deforestation destroys carbon sinks and increases carbon dioxide emissions
- Industrial farming of cattle for dairy and meat is the main reason for mass forest clearance
- The Amazon rainforest is the region worst affected by deforestation. Indonesia also has one of the highest deforestation rates in the world, with less than half of the Country's original forest cover still remaining.
- Climate change is the greatest ever threat to humanity: and deforestation is accelerating the process.

WHAT IS DEFORESTATION

The planet is made up of 29% land and 31% of this area is currently covered by forest. More than half of all forests have been cut down since the dawn of agriculture, but half of this loss has occurred in the past 70 years. Forests are vital to the functioning of global systems and societies for several reasons. Forested areas provide people with jobs, regulate and purify water and air supplies, provide habitats for animal species, provide food and potential medicines, They also provide goods such as fuels and timber and act as carbon sinks (WWF, 2020).

Deforestation and forest degradation are however putting these vital areas under threat at an increasingly alarming rate. The Oxford dictionary defines deforestation as “the action of clearing a wide range of trees”, but in reality, deforestation is so much more than this. Deforestation can happen at different scales; from small farmers to large agribusinesses; but the net result is that the Amazon is losing the equivalent of 32 football fields every minute (WWF, 2020). On a global scale, we are losing 15 billion trees every year. Only 5 billion are being planted.

Deforestation has strong links with climate change for three key reasons:

- 1) It wipes out one of the World's biggest natural carbon sinks.
- 2) It creates mass carbon emissions.
- 3) Deforested areas are mostly replaced with highly polluting activities such as agriculture (Rainforest alliance, 2018).

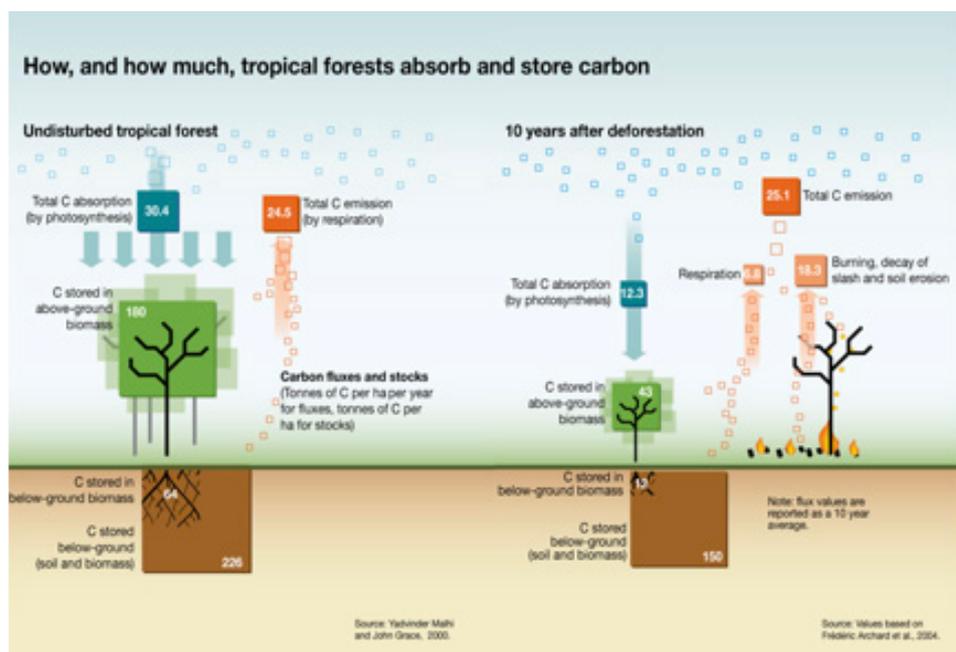
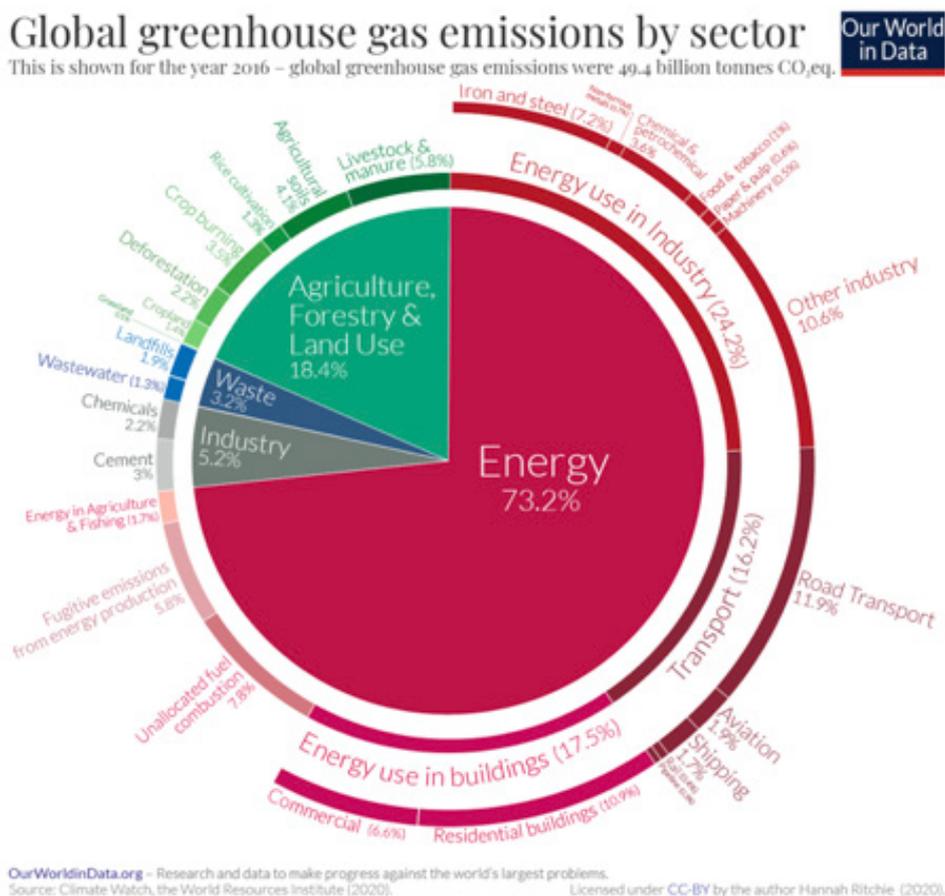


Figure 1 :How, and how much, tropical forests absorb and store carbon (Image taken from <https://www.grida.no/resources/6948>)

WHY DOES DEFORESTATION HAPPEN?

Agriculture is one of the primary reasons for high level and intensive deforestation. The farming of cattle for meat in particular as it requires soybean farms to feed the livestock as well as grazing land. The deliberate setting of fires is used to clear large areas for practices such as the planting of palm oil plantations. Palm oil has been a large driver of deforestation and has led to the destruction of habitats for species such as the orang-utan (WWF, 2020). In Indonesia, the Sumatran tiger, rhino and pygmy elephant are all now on the endangered list.



Another substantial threat to the world's forests is illegal logging, which is difficult to control and regulate. This is a particular problem in the tropics where much of the logging occurs without state permission or Government permits (Boekhout van Solinge, 2014).

Our global society is also hugely dependent on forest for resource production. Notably timber used for buildings, fencing and floorboards, in furniture and in goods such as paper. In addition the demand for palm oil is increasing relentlessly, since it is now used in roughly half the items found on supermarket shelves. Countries that have cut down their own forests, such as China, now have to go further afield to find sources of timber and are buying up tracts of forest in Indonesia, Africa and elsewhere. The transportation of timber to processing sites across the world adds significantly to the consumption of fossil fuels.

WHAT ENVIRONMENTAL EFFECTS DOES IT HAVE?

The three largest carbon sinks in the World are the oceans, plants and soils. Deforestation leads to the destruction and degradation of both vegetation and soils thus reducing the ability of the planet to absorb carbon dioxide from the atmosphere.

Large areas of forest have a significant effect on regional rainfall patterns due to their vital role in the water cycle. The water cycle is the flow of water through all of its different states (liquid, solid and gaseous). Forests interact with water by intaking it from soil using their roots and by releasing water back into the atmosphere from pores in their leaves as vapor through transpiration. These processes can affect both local rainfall and global temperatures. The removal of forest also leads to flooding as it reduces the soils capacity to hold water and increases surface run off dramatically.

Deforestation causes loss of habitat, often in a very destructive manner such as through burning. This can force animals out of their territory or in many cases directly lead to their deaths. In many areas where de-

forestation is focused there are rare or endangered animal and plant species which may be destroyed permanently. Plants in tropical rainforests in particular often have potential or ongoing medicinal use: so potential treatments can be lost in perpetuity.

Deforestation can also increase the chance of diseases jumping from animals to humans as it pushes the human and natural world into increasingly close contact. This will increase the likelihood of more future global pandemics.

WHERE DOES DEFORESTATION HAPPEN THE MOST?

In the 1970's the first mass deforestation started in Brazil, at this point only 2% of the Amazon had been deforested (Boekhout van Solinge, 2014). Deforestation of the Amazon rainforest is currently at a 12-year high, with around 15% of its area having been destroyed (BBC NEWS, 2020). Around 70% of this deforestation has been for the creation of cattle ranches and much of the rest has been for various other agricultural practices (Boekhout van Solinge, 2014).



Figure 2: The intentional burning of the Amazon rainforest in order to make room for agriculture (<https://www.nature.com/articles/d41586-020-00508-4>)

There is a potential tipping point of the Amazon rainforest if it reaches a level of 20-25% deforestation. If this tipping point is reached it could potentially lead to a cascade effect on the entire forest ecosystem, which could collapse irreversibly (WWF, 2020). Instead of being a net absorber of carbon dioxide, the Amazonian rain forest could become a net emitter.

WHAT CAN WE DO PERSONALLY TO HELP?

Reduce means to produce as little waste as possible. For example, try to make the move away from paper, even something as simple as not printing documents can make a big difference.

Reuse refers to using items multiple times. This can include moving away from single use items such as disposable bottles or straws and opting for alternatives like reusable bottles or metal straws.

Recycle means using products for something else instead of throwing them away. This can be done at an individual or manufacturing level.



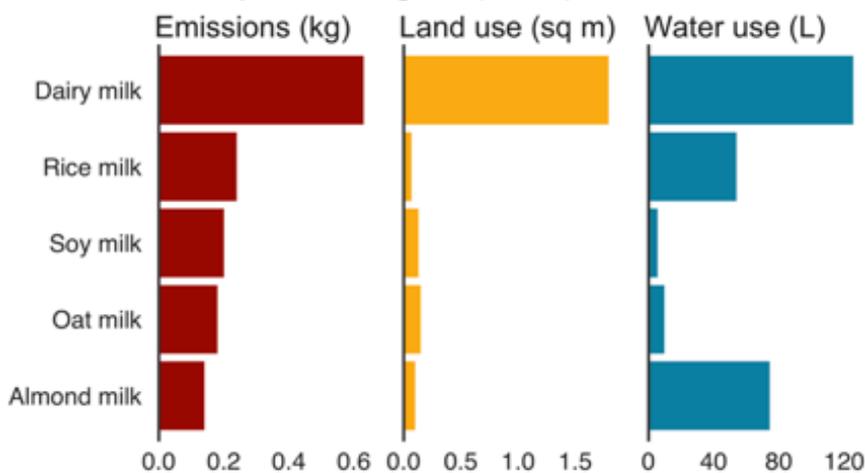
Figure 3: REDUCE-REUSE-RECYCLE (<https://www.savethesound.org/take-action/resources/cut-your-carbon-footprint/reduce-reuse-recycle/>)

Find local tree planting projects in your area and spend some time getting involved and making a difference in your local area. In urban areas especially tree planting can not only help to mitigate climate change but also reduce air and noise pollution in the area.

Using dairy milk alternatives can be a really quick and easy way to do your part to reduce the demand for forest clearance for cattle grazing (BBC, 2019).

Which milk should I choose?

Environmental impact of one glass (200ml) of different milks



Source: Poore & Nemecek (2018), Science. Additional calculations, J. Poore

Eating vegan is often said to be one of the “single biggest ways” that we can reduce our environmental impact on earth. A study by Oxford University researchers, published in Climatic Change, showed that meat-eaters have on average twice the carbon footprint of vegetarians, and two and a half times the dietary green house gas emissions of vegans. (Scarborough 2014). Thus, vegetarian and vegan diets greatly help to reduce land use and overall environmental impacts of our consumption. If we reduce our meat consumption as a society the need for deforestation will be reduced greatly. Supporting forest protection and reforestation organisations can also help to make a large difference in the fight against global deforestation. Some may think that surely eating a plant-based diet would require more land for crop growth but in reality, this is not the case. This is because the majority of cattle farming uses both land for grazing and to plant crops, which are used to supplement the consumption of livestock (Baroni, Cenci, Tettamanti and Berati, 2007). This is shown in the figure below. If a switch to more sustainable livestock practices is another alternative to an entire switch to meatless diets. This would involve improving animal health, which would lower emissions and moving away from intensive crop fed diets to only grazing.

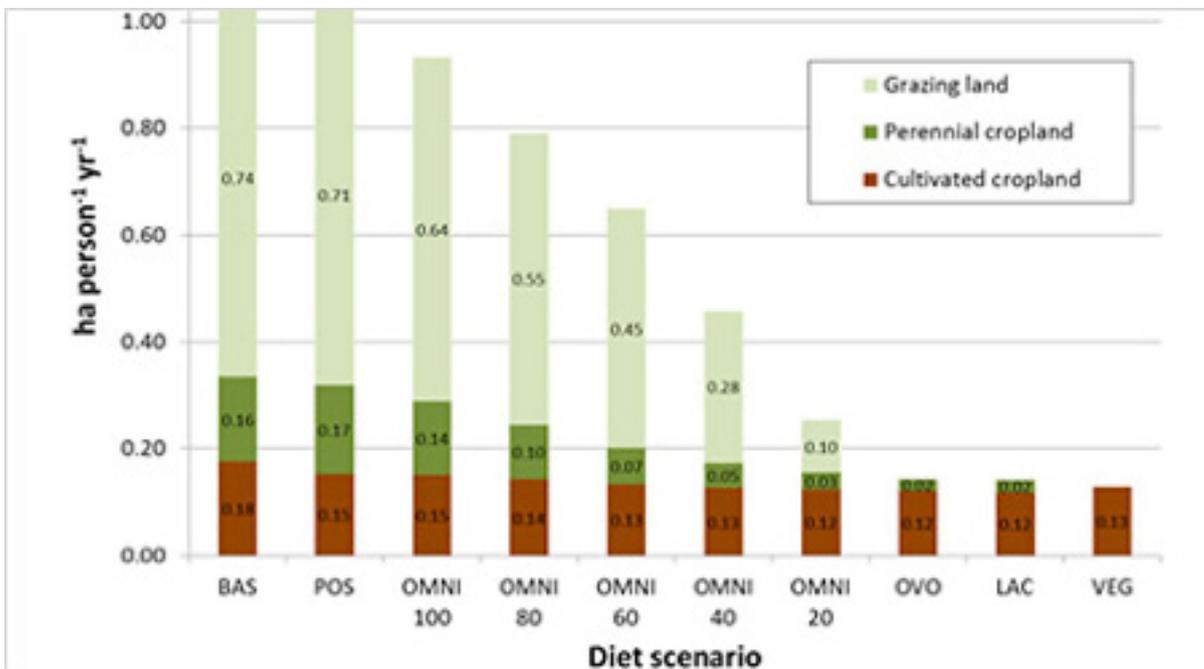


Figure 4: <https://ensia.com/notable/which-diet-makes-best-use-of-farmland-you-might-be-surprised/>

WHAT CAN GOVERNMENTS DO?

Governments should enact policies that prioritise the protection of our forests. They can change nationwide agricultural practices through funding and policy and facilitate community-based forest management: this works very well in areas where locals still have strong connections with the local environment. Governments and local authorities can also promote sustainable tourism to protect areas that may otherwise be deforested and bring in alternative income to locals.

CONCLUSION

Deforestation and forest degradation contribute and will continue contributing to global warming without urgent intervention. Deforestation is a major contributor to global anthropogenic carbon emissions and so could push the planet over an environmental tipping point. Climate change is the greatest ever threat to humanity and tackling the issue of deforestation will be one of the keyways of preventing a global catastrophe.

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