Nature is one of the most under-appreciated tools for reigning in carbon

by Emma Bryce | Oct 20, 2017 Anthropocene Magazine

A new study shows that better global land stewardship—conserving and restoring wild habitats and practicing more sustainable farming—could get us more than one-third of the way to the Paris climate mitigation targets. Nature may not be the sexiest tool in the shed, but it has tremendous power to move the climate change needle. In principle, the authors say, natural climate solutions could remove 23.8 billion tons of carbon dioxide equivalent from the atmosphere each year.

Land management receives just 2.5% of the global climate mitigation budget, the international team of researchers note in their *PNAS* study. And

yet, it has a huge capacity to both store carbon and control the release of other greenhouse gases. For instance, carbon-sequestering peatlands, if undisturbed, can keep vast amounts of this greenhouse gas on lockdown. More sustainable fertilizer use on farms could reduce the amount of nitrous oxide leaching into the atmosphere, while improved animal feed can cut down on the huge quantities of methane that cows spew.

To put a figure on this potential, the researchers modeled 20 options for improvement at the global-scale, which they labeled 'Natural Climate Solutions' (NCS). These included reforesting deforested land–as well as land that has been converted to livestock pasture–restoring peatland and wetland areas, improving livestock feed, and boosting conservation agriculture practices, like planting trees amid crops.

They added constraints to the model that ensured the solutions aligned with necessary land requirements for food production. Based on that, they found that NCS could save a maximum 23.8 billion tons of CO2 equivalent annually. Then the researchers applied a financial constraint to the model, to ensure that land-use options would also be cost-effective. Under this scenario, the annual emissions savings were still over 11 billion tons, which could provide 37% of the mitigation needed to limit a temperature increase to 2° C.

Reforesting and conserving forests globally had the biggest impact: trees alone could save 7 billion tons of emissions each year. Better farming practices also showed huge promise: methods like improved livestock management and fertilizer use accounted for 22% of the emissions reductions the researchers calculated in their study.

They note that a large portion–about 42%–of the potential reforestation included in the model depended on restoring lands that are currently used to graze livestock. And yet, this would require that only 4% of grazing land worldwide is reforested to achieve that goal, something that could be possible if we made a global shift away from meat-heavy diets towards more plant-based foods, they say.

Overall, the study's estimates are conservative. It didn't include other mitigation options where the data was limited, such as reduced tilling on farms to keep soil carbon intact, and improved manure management to reduce methane release. So, undertaking those measures could potentially lead to even greater emissions savings.

The researchers warn against delaying adoption of land management solutions. By providing a glimpse of what's necessary and possible–however broad and ambitious in scale–they intend for the study to spur on policies, designed at the country level to protect and restore habitats, and improve farming. Study author Justin Adams says, "Managing our lands better is absolutely key to beating climate change."

Source: Griscom et. al. "Natural Climate Solutions." *Proceedings of the National Academy of Sciences*. 2017.