Using forests to curb climate change threatens human rights

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by Fred Pearce (Thomson Reuters Foundation News)

Trees offer ways to help achieve "negative emissions", but what does that mean for forest communities?

The 2015 Paris Agreement on climate change was a landmark the world rightly applauded. Its pledge to limit global warming to well below 2 degrees Celsius – and preferably 1.5 degrees – lays down one of humanity's greatest challenge for the 21st century. But how to achieve it?

Climate scientists say it is almost an impossible task if we only rely on reducing emissions from our power stations, transport systems and factories. Even ending deforestation will be insufficient. They say we will have to find ways of removing carbon dioxide from the atmosphere: "negative emissions" in the climate-change jargon.

There are many schemes for how do this using chemistry and geology, but some are wildly expensive and others are not yet feasible. The most likely current option though, is giving terrestrial plants such as trees or bioenergy crops a helping hand in photosynthesising more CO2 from the air.

Here are the four main proposals for how this could be done, and their implications – which until now have barely been considered:

1. Sink forests: The most straightforward method of removing CO2 from the atmosphere is to boost nature's primary terrestrial carbon store, by creating giant “carbon sink” forests to permanently hold carbon in timber and soil.

To assure these forests did their job, there would have to be a programme to maintain their carbon-holding power as they age and trees die. A critical question is how permanent these carbon sinks could be in the face of inevitable climate change. They could succumb to droughts or migrating pests – potentially releasing their carbon stores into the atmosphere and turbo-charging climate change.

One huge potential drawback is that calculations to date suggest that planting enough trees to soak up and store 500 billion tonnes of CO_2 before the end of the century would likely require around 10 million square kilometres of land. That is an area the size of the Sahara or the US.

2. Bioenergy forests: Rather than trying to create carbon-sink forests that hold carbon forever, an alternative is to make productive use of them, by harvesting the timber and burning it in power stations as a substitute for fossil fuels. Provided the burned trees are replaced by new ones, the CO_2 emissions from burning would be neutralised by the regrowth. That’s the theory, anyhow.

Would it work in practice? The best place to look is where bioenergy is already used as a strategy for reducing CO_2 emissions. The European Union already incentivises biomass burning in power plants and heating systems. Almost half of harvested timber in the EU is now used for the generation of electricity or heating.

It has led to a boom in industrial forestry. Yet, worryingly, countries that rely most on biomass for energy, such as Slovakia and Romania, have the least credible systems for ensuring that harvested trees are replaced. Without that obligation, the idea that the fuel is renewable or carbon-neutral is a sham.

“You could cut down the Amazon, turn it into a parking lot, ship the trees to Europe to replace coal, and Europe would claim a reduction in emissions,” argues Tim Searchinger of Princeton University.

The presumed carbon-neutrality of biomass forests ignores the time lag involved. Burning trees in a power station results in the immediate mass release of their carbon in the form of CO_2. But the replacement trees only soak up the equivalent amount of CO_2 gradually, as they grow.

There are therefore serious questions about the sustainability and carbon credentials of bioenergy in its current form.

3. BECCS: The third proposal for turning forests into a way of generating negative emissions is, for many climate scientists the Holy Grail. It involves combining bioenergy forests with technology being developed for capturing CO_2 going up the power station stack and then burying it out of harm’s way – for instance in old salt mines or abandoned oil wells. This is known as Carbon Capture and Storage.

In the complete system, known as Biomass with Carbon Capture and Storage Carbon (BECCS), carbon is captured from the air by growing trees, burned to generate energy and then buried. In theory, the more energy is generated, the more CO_2 is sucked out of the air.

BECCS is a better use of land than permanent carbon-sink forests, say its advocates, because harvested trees can be replaced with new trees. And it is better than normal bioenergy because it avoids emissions from power stations. So every time the land set aside for trees is replanted, more carbon can be captured, doubling up on the negative emissions. If two growing cycles could be accomplished by the end of the century, then the amount of land needed to capture 500 billion tonnes by 2100 could be halved to maybe 5 million square kilometres.

No BECCS project is yet in operation. And while the basic technology is used on a small scale in the oil industry, the idea of doing it on a huge scale, as a continuous process that remove emissions from major power plants across the world, raises huge questions about its practicability and sustainability.

Whatever the carbon gains from negative-emissions technologies, they have to exist in a world of competing demand for – and rights to – land. And converting land into carbon-sink forests would involve a land grab on a scale never seen before: a human rights calamity, with major implications for food security and biodiversity.

Looked at from the forests, this appears neither green nor renewable. It seems like a recipe for the industrialisation of environmentalism, with vast swathes of the world’s most diverse forest ecosystems turned into barren carbon factories – and their inhabitants into, at best, factory hands.

A new approach is required. One based not on creating a vast new industry for sucking carbon from the air, but on reinstating nature's ability to store carbon in a landscape also occupied by humans – which leads us to the last of the four current options for creating carbon sinks:

4. Natural regeneration: Properly conceived, many argue, reinstating natural ecosystems could play a huge role in negative emissions, without riding roughshod over other global priorities. The Stockholm Environment Institute recently concluded that simply allowing former natural forests and degraded forest areas to regrow could lock up some 330 billion tonnes of CO2.

There are plenty of examples already of what this could mean. Twenty-five years ago, Guatemala created the Maya Biosphere Reserve. The aim was to protect the largest remaining tropical rainforest in Central America. At the time, conservationists were angry that government officials set up a dozen zones inside the reserve where local communities could do small-scale logging.

Today that seems like a stroke of genius. The forests in the core protected areas of the reserve are rapidly being lost, as cattle ranchers invade. But the community forests, jealously guarded by locals, thrive. Their deforestation rates are only 5 percent of those in the supposedly "protected" areas. On current trends, 40 percent of the reserve will be stripped of forests by 2050, and most of what survives will be in the community-run areas.

There is a lesson here for those who seek to commandeer the world's forests as carbon sinks. Community consent is not just vital; it is the touchstone for success.

Fred Pearce's new report for Fern on negative emissions technologies is called Going Negative – How carbon sinks could cost the Earth.